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**Power dynamics in environmental  
decision-making for large-scale infrastructure projects**

The Ruataniwha Water Storage Scheme, New Zealand

A thesis presented in fulfilment of the requirements for the degree of

Doctor of Philosophy (PhD)

in

Resource and Environmental Planning

at

Massey University, New Zealand

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2024

# Abstract

Environmental assessment (EA) has been internationally recognised in the last three decades as an important tool for managing environmental damage from development projects and has been integrated into environmental planning and decision-making systems around the world. However, questions are increasingly raised as to whether EA is achieving its intended purpose. A major concern is the technocratic nature of EA that overlooks the socio-political influence of different actors within the process. This research explores power dynamics that enable or constrain stakeholders' influence on the environmental assessment of infrastructure projects.

Institutions shape large-scale infrastructure projects through highly complex combinations of factors that include the features of political regimes, regulatory frameworks, and the role and flow of resources. By using the theory of power, this research explores how these factors influence large-scale infrastructure projects. A theoretical framework is developed by extending the theory of power into political, technical and social power. Political power examines how institutional relationships, power and finance are influential in large-scale infrastructure projects. Technical power considers methods being used to analyse environmental problems and present solutions. Social power considers how environmental problems are perceived by the local communities affected by large-scale infrastructure projects.

Taking New Zealand's largest irrigation project, the Ruataniwha Water Storage Scheme (RWSS) as a case study, this research highlights how power dynamics enable and constrain stakeholders' influence on the impact assessment and decision-making. Through in-depth analysis of relevant project documents and an online survey, the research examines the influence of political actors, technical experts and individuals. The applicant's Assessment of Environmental Effects [the form of environmental impact assessment adopted in New Zealand in the Resource Management Act 1991 (RMA)], submissions made by interested groups and individuals, the hearing transcripts and the Board of Inquiry's report and decisions were examined to determine how environmental assessment information provided by different stakeholders was incorporated and valued in the decision-making process.

First, the research discovers an increasing influence of the Minister for the Environment after 'streamlining and stratifying' the consent process in 2009. Therefore, large-scale infrastructures are becoming politicised in order to advance the government's agenda. The research finds that the RMA is gradually creeping away from the principle of sustainable management towards a form of centralised planning that the Act was introduced to replace. Second, the research finds significant deficiencies in water contaminant modelling, addressing risk and uncertainty, and practicability of proposed mitigation measures. However, these deficiencies have been undervalued under a greater technocratic influence in predicting environmental impacts of the infrastructure project. Third, the research highlights that the opportunities for the general public to participate in the decision-making for large-scale infrastructure projects are constrained due to the technical nature of the information. Overall, the research concludes that the complexity of the political, technocratic and social dynamics of power hinders the effectiveness of environmental assessment in achieving its intended goal of safeguarding the environment through informed decision-making for permitting infrastructure projects.

# Acknowledgements

Arriving at this point in my PhD journey when I am writing the acknowledgements was not possible without the will of Almighty Allah. He, who has brought me to this life and to whom I shall return.

To start with, I am very grateful to my supervisors Professor Imran Muhammad, Dr Jeff McNeill, and Associate Professor Christine Cheyne. Their constant guidance and assistance are deeply acknowledged. Imran, thank you for never letting me down during the hard times in this PhD Journey. Your positive attitude and constant encouragement were very helpful. Jeff, thank you for providing big ideas and constantly challenging me to improve my work. Christine, thank you for being my first source of contact at Massey University. Your expertise and interest in freshwater planning has helped me design this project. The guidance and support of Dr Paul Perry was also quite helpful and is equally acknowledged.

I am indebted to the online survey participants, without whom this research was not possible. I thank the College of Humanities and Social Science for providing the Doctoral scholarship to study at Massey University.

I want to thank the faculty and staff at School of People, Environment and Planning, particularly, Glen Banks, Beth Greener, Richard Shaw, Mary Roberts, Kevin Butler, and Rosie Mclean for their support at various stages of my PhD journey. The administrative support and cooperation of Graduate Research School especially Dean Research, Professor Tracy Riley is sincerely recognised.

Thanks to all my PhD fellows at the School, especially to Jermi Hanning, a reliable friend in bad and good times. I am grateful to know you and your family.

Lastly, special thanks to my family in New Zealand and Pakistan. The moral support of my family has given me the strength to complete this PhD project. Most importantly, I want to extend profound gratitude to Uncle Wajid and Aunt Sarah. Without their support, I could have not even begun this PhD. Also, very special thanks to my wife Shema. This PhD journey only became possible due to her constant patience and support. Shema! pushing me to work harder, especially at the end of the PhD was quite helpful. Shafiya - when I come home, you will run to the door and give me a big hug, and stress of my PhD just melts away. Thank you for making my life so pleasant.

# Table of Contents

Abstract	i
Acknowledgements	ii
Table of Contents	iii
List of Tables	vii
List of Figures	viii
List of Appendices	x
List of Abbreviations	xi
<b>Chapter 1 Introduction</b>	<b>1</b>
1.1 Problem Statement	1
1.2 Aim, Research Question and Objectives	4
1.3 Thesis Outline	5
<b>Chapter 2 Environmental Assessment – A Literature Review</b>	<b>7</b>
2.1 Introduction	7
2.2 Environmental Assessment: A review	7
2.2.1 The concept of environmental assessment	7
2.2.2 The basis for environmental assessment in the decision-making process	9
2.2.3 Effectiveness of environmental assessment	12
2.3 Environmental assessment versus other tools	14
2.3.1 Cost-Benefit Analysis	14
2.3.2 Social impact assessment	15
2.3.3 Strategic environmental assessment	17
2.3.4 Life cycle assessment	19
2.3.5 Summary	20
2.4 Challenges to implementing environmental assessment	21
2.4.1 Addressing uncertainties	22
2.4.2 Public Participation	23
2.5 Rationality, politics and power in environmental decision-making	25
2.6 Summary	27
<b>Chapter 3 Conceptualising environmental decision-making</b>	<b>28</b>
3.1 Introduction	28
3.2 Power – A theoretical debate	28
3.3 Types of power influencing decision-making	31
3.3.1 Political power	31
3.3.2 Technocratic power	34
3.3.3 Social power	39
3.4 The power dynamics in large-scale infrastructure projects	43
3.5 Theoretical framework	47

<b>Chapter 4</b>	<b>Research Design</b>	<b>52</b>
4.1	Introduction	52
4.2	Philosophical and methodological approaches	52
4.3	Case study approach	55
4.1.1	Case study selection	56
4.4	Data collection methods	57
4.4.1	Policy and planning documents	57
4.4.2	Electronic survey	57
4.4.3	Ethical considerations	58
4.5	Data Analysis	59
4.5.1	Document and policy analysis	59
4.6	Methodological limitations	65
4.7	Summary	66
<b>Chapter 5</b>	<b>Environmental decision-making in New Zealand – A critical review</b>	<b>67</b>
5.1	Introduction	67
5.2	The origins of EA in New Zealand	67
5.2.1	The introduction of formal EA in New Zealand	67
5.2.2	The National Development Act 1979	69
5.2.3	Resource Management Law Reform	70
5.3	Environmental decision-making in New Zealand	71
5.3.1	The role of central government, regional councils and territorial authorities	73
5.3.2	Role of EA in council-led conventional decision-making processes	76
5.3.3	Environmental Protection Authority	82
5.3.4	The Environment Court	83
5.4	Proposals of national significance	84
5.5	Amendments to the RMA 1991	84
5.6	Summary	87
<b>Chapter 6</b>	<b>The Ruataniwha water storage scheme – Background analysis</b>	<b>89</b>
6.1	Introduction	89
6.2	The Hawke’s Bay Region – Background	89
6.3	Evolution of the RWSS	94
6.3.1	The role of the HBRC	94
6.3.2	The need for water storage	94
6.3.3	Feasibility study	95
6.3.4	Central government support for irrigation schemes	97
6.3.5	Financial setup for the scheme	98
6.4	The Tukituki Catchment Proposal	100
6.4.1	The RWSS Proposal	100
6.4.2	Potential environmental effects and concerns	105
6.5	Institutional Framework of the RWSS	106

6.5.1	A nationally significant proposal	106
6.5.2	The Board of Inquiry	107
6.5.3	Revocation of conservation land and the court cases	109
6.5.4	The Law Change Dilemma	110
6.6	Financial set-backs to the scheme	111
6.7	The regional council politics regarding the RWSS	112
6.8	The HBRC's review of the scheme	114
6.9	Summary	115
<b>Chapter 7</b>	<b>Thematic analysis of the submissions and evidences submitted to the BOI</b>	<b>117</b>
7.1	Introduction	117
7.2	Content Analysis	129
7.2.1	Water quality assessment	130
7.2.2	Uncertainties about potential and expected environmental effects	134
7.2.3	Terrestrial ecology	136
7.2.4	Aquatic ecology	138
7.2.5	Effectiveness of proposed mitigation measures	140
7.3	Membership of the Board of Inquiry	143
<b>Chapter 8</b>	<b>Political, technocratic and social analysis of the RWSS</b>	<b>145</b>
8.1	Introduction	145
8.2	Political–institutional analysis of the RWSS	145
8.2.1	Central government narrative of economic growth	146
8.2.2	Government control over the EPA	152
8.2.3	Ministerial influence over the board of inquiry for large-scale projects	153
8.2.4	The HBRC's conflicting role as an applicant in the scheme	157
8.2.5	Board of inquiry process	160
8.3	Social analysis of the RWSS	162
8.3.1	Public participation in the planning process	162
8.3.2	Power of the applicants and environmental groups	164
8.3.3	Barriers to the participation of non-experts (lay people) in the hearing process	168
8.4	Summary	170
<b>Chapter 9</b>	<b>Discussion and Conclusion</b>	<b>172</b>
9.1	Introduction	172
9.2	Efficacy of EA	172
9.3	Types and dynamics of power in decision making	174
9.3.1	Political power in infrastructure decisions	175
9.3.2	Technocratic power in infrastructure decisions	176
9.3.3	Social power in infrastructure decisions	179
9.4	The value of the theoretical framework	182

9.5	Lessons from the decision-making process for the RWSS	184
9.6	Conclusion	185
9.7	Contribution of the thesis	187
9.8	Future Research	188
	<b>References</b>	<b>189</b>

## List of Tables

<b>Table</b>	<b>Title</b>	<b>Page No.</b>
Table 4.1	Analytical criteria developed for the research	63
Table 5.1	Timeline of changes in the agencies responsible for environmental assessment in New Zealand	71
Table 5.2	Classification of activities under the RMA 1991	76
Table 6.1	Evolution of the RWSS	96
Table 6.2	The RWSS Capital Investment Structure	99
Table 6.3	Key Dam characteristics	102
Table 7.1	Key terms used during the hearing for the RWSS	117
Table 7.2	Key actors and their relevance to the projects	118
Table 8.1	Questionnaires sent and responses received from each category	156

## List of Figures

<b>Figure</b>	<b>Title</b>	<b>Page No.</b>
Figure 3.1	Theoretical framework	50
Figure 4.1	Research approaches—the interconnection of philosophical paradigms, research designs and methods	53
Figure 5.1	Planning framework under the RMA	73
Figure 5.2	Resource consent process in New Zealand under the RMA	81
Figure 6.1	The decrease in the sheep population in the Hawke’s Bay region	91
Figure 6.2	The increase in number of dairy cattle in the Hawke’s Bay region	91
Figure 6.3	RWSS location	101
Figure 6.4	The RWSS irrigation distribution network	104
Figure 8.1	Respondents’ views on the role of central government on the decision-making process	147
Figure 8.2	Responses of supporters and opponents	148
Figure 8.3	RWSS proponents’ and opponents’ views on the increased influence of the central government on proposed infrastructure projects	149
Figure 8.4	RWSS proponents’ and opponents’ views on the economic vs. environmental benefits of the scheme	150
Figure 8.5	The EPA does not operate in a manner that is sufficiently independent from the executive government	152
Figure 8.6	Respondent views on the Minister’s role in the decision-making process	154
Figure 8.7	Proponents’ and opponents’ views on the influence of the Minister for the Environment over the board of inquiry	155
Figure 8.8	Respondents’ views on the lack of freshwater science expertise in the Board of Inquiry	156
Figure 8.9	Respondents’ views on the regional council’s involvement in developmental projects	157

Figure 8.10	Proponents' and opponents' views on the council's role as the applicant	159
Figure 8.11	Respondents' views on the board of inquiry process for nationally significant proposals	160
Figure 8.12	Respondents' views on hurdles to public participation in the decision-making process	162
Figure 8.13	Respondents' views on the influence of the applicant on the decision-making process	166
Figure 8.14	Expert vs. non-expert participation in the board of inquiry process	169

# List of Appendices

<b>Appendix</b>	<b>Title</b>	<b>Page No.</b>
Appendix I	Ethics Approval	207
Appendix II	Participants Information Sheet	208
Appendix III	Online Survey	209
Appendix IV	Schedule 4 of the Resource Management Act 1991	215
Appendix V	Land Exchange Map	217
Appendix VI	Thematic Analysis of the General Submissions made to the board of inquiry for Tukituki catchment proposal	218

## List of Abbreviations

AEE	Assessment of the Environmental Effects
AEP	Annual Exceedance Probability
BOI	Board of Inquiry
CADA	Computer Aided Data Analysis
CBA	Cost Benefit Analysis
CfE	Commission for the Environment
CIIL	Crown Irrigation Investment Limited
EA	Environmental Assessment
EDS	Environmental Defence Society
EIA	Environmental Impact Assessment
EIR	Environmental Impact Reporting
EPA	Environmental Protection Authority
HBRC	Hawke's Bay Regional Council
HBRIC	Hawke's Bay Regional Investment Company
IA	Impact Assessment
IAIA	International Association for Impact Assessment
IMOA	Integrated Management and Offset Approach
ISO	International Organisation for Standardization
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
LCIA	Life Cycle Impact Assessment
MfE	Ministry for the Environment
MUHEC	Massey University Human Ethics Committee
NEPA	National Environmental Policy Act
NES	National Environmental Standards
NGO	Non-Governmental Organisation
NIWA	National Institute of Water and Atmospheric Research
NSPs	Nationally Significant Proposals
NPS	National Policy Statements
NZ	New Zealand
OECD	Organization for Economic Cooperation and Development
PIC	Potential Impact Category
PMF	Probable Maximum Flood
RMA	Resource Management Act
RWSS	Ruataniwha Water Storage Scheme
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
TRIM	Tukituki River Model

# Chapter 1

## Introduction

### 1.1 Problem Statement

On a bleak midwinter morning in 2016, dozens of demonstrators defied the weather to register their distaste for the proposed Ruataniwha Dam protesting outside the Hawke's Bay Regional Council offices in Napier, New Zealand. Ranging from environmental groups to aspiring councillors to concerned ratepayers, protestors alleged that their voices regarding the negative environmental effects of the scheme were not heard in the planning for New Zealand's largest proposed irrigation scheme. Meanwhile, thousands of people around the country signed a petition asking the central government to stop funding large-scale irrigation schemes to protect the rivers from industrial dairy pollution.

The Ruataniwha Water Storage Scheme (RWSS) was not the first infrastructure project in the country opposed by environmental groups on environmental grounds. New Zealand has a history of contentious large-scale projects generating public controversies because of their significant negative environmental effects. In the late 1960s, the proposal to raise the level of Lake Manapouri by 30 m in order to generate electricity for an aluminium smelter sparked the Save Manapouri campaign. The campaign started in 1969 and continued until 1972 when the National Party<sup>1</sup> lost the general election (Whittle, 2013; Memon 1993). In the following years, several other environmental campaigns and protests were recorded; for example, the 1974 Save Aramoana protest against the proposal to build a second aluminium smelter at the mouth of the Otago Harbour. Thousands of people also protested against the associated proposals to build a dam on the Clutha River at Clyde (Sewell 1987; Wilson 1982).

Such environmental protests during that period were not limited to New Zealand but were witnessed in different parts of the world, with an enduring influence on local and global environmental politics (Rootes, 1999; Caldwell, 1982). In response to the growing public concern about the environmental consequences of developmental projects, environmental

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<sup>1</sup> New Zealand has a unitary system of government. The two main political parties are the right-wing National Party and the left-wing Labour Party.

assessment<sup>2</sup> emerged in the international environmental arena as a key instrument to guide planning and decision-making for major developments (Lawrence, 1997; Caldwell, 1988). The United States was the first country to formally introduce Environmental Impact Assessment (EIA) through the National Environmental Policy Act 1970 (NEPA). Following the USA's initiative, many other countries also formalised environmental assessment through legislation and formal procedures relating to environmental planning and decision-making, beginning with Canada (1973), Australia (1974), New Zealand (1974), Thailand (1975), France (1976), the Philippines (1978) and Israel (1981).

The environmental legislation in New Zealand, spearheaded by the Resource Management Act 1991 (RMA), has often been hailed as innovative and cutting-edge, making environmental assessment an integral part of the planning and project approval process. Instead of referring directly to EIA, the commonly used term for environmental assessment of projects, the RMA states that all development (locally called consent) applications must be accompanied by an assessment of the environmental effects (AEE). The word 'effects' in place of 'impacts', according to Milne (1992), was chosen to differentiate them from the internationally used concept of environmental impacts, which was associated with negative impacts only. However, from the beginning, the RMA faced substantial opposition from sections of the community, particularly the business community, about the costs associated with the process and the time consumed by resource consent applications (Palmer, 2015). The RMA was seen as complex, cumbersome and costly.

Boosting a campaign against the RMA, the fifth National government (2008–2017), made resource management reforms and introduced a new national approval process through the Resource Management (Simplifying and Streamlining) Amendment Act 2009. Crucial among the reforms was a nine-month limit on the consent process. Fast-tracking the consent process undermined the role of communities in environmental decision-making. The tight timelines put enormous pressure on consultation (locally called public submissions or submissions), making it difficult to participate effectively in the planning process. Similarly, the cost of participation and the highly formal judicial processes also discouraged public submissions (Palmer, 2013). Environmental groups in the country complained that the opponents in a national consenting

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<sup>2</sup> In this study, environmental assessment is taken to mean the broad process that emerged from the NEPA in the USA, an umbrella term that captures the essential idea of assessing the environmental impacts of proposed actions. It is used interchangeably with the more commonly used term 'environmental impact assessment'.

process would struggle to effectively present their concerns about the environmental effects of developmental projects, as the process is ‘stacked against the interests of submitters’ and favours the applicants. The Environmental Defence Society, a not-for-profit environmental organisation, expressed their concerns with the consent process for nationally significant proposals as:

It is a process that seems designed to facilitate the applicant getting consents. It is a process that appears designed to implement the government’s growth agenda at all costs – and to ride roughshod over serious and legitimate public interest and environmental concerns (EDS, 2013).

The central government’s approach to sidestep the usual planning process for large-scale projects, in order to pursue its economic development agenda, is not new in New Zealand. In the late 1970s and early 1980s, the third National government (1975–1984) promoted an economic strategy encouraging the development of indigenous energy resources and industrial activities based on those resources. This was known as the ‘Think Big’ strategy. The controversial National Development Act was enacted in 1979 to streamline the approval process. It was an attempt to bypass the lengthy planning process for projects considered to be of ‘national economic importance’ by creating a ‘fast track’. Significant constraints were placed around the ability of the groups opposed to such projects to challenge environmental impact reports or review the decisions in court (Morgan, 1983; Palmer 2013). Thus, opportunities for environmental groups and communities to be involved in the decision-making process were reduced.

Despite the international recognition of environmental assessment and its integration into environmental planning and decision-making systems around the world, as a legal instrument, questions are increasingly being raised as to whether environmental assessment is achieving its intended purpose. Such questions come as a response to the environmental degradation after large-scale infrastructure projects were permitted in many countries (Nykvist & Nilson, 2009; Jay et al., 2007). Examining the role of environmental assessment in permitting large-scale mining projects in Australia and Papua New Guinea, McKillop & Brown (1999) found that environmental assessment was poorly integrated into the decision-making process and thus failed to protect the biophysical and social environment of the mines. In another study conducted by Champion & Essel (2013) to evaluate the performance of environmental assessment in African countries, it was revealed that environmental concerns were not properly

addressed in the project planning and decision-making process. Similar results were reported by Barker and Jones (2013) in their examination of the performance of environmental assessment within the offshore oil and gas sector in the UK.

The immediate and conventional response in this regard has been to focus on the weaknesses in the existing environmental assessment practices and procedures. Hence, past and current efforts are mainly focused on understanding and improving the legal and technical aspects of environmental assessment (Haydar & Pediaditi, 2010; Nadeem & Hameed 2008; Wood, 2003; Ahmed & Wood 2002). In most of those studies, environmental assessment has been treated as an instrument free from its context. Chi et al. (2016) highlighted the need to examine the impact of governance, whereas others (e.g. Jay et al., 2007; Wood, 2009; and Weston 2010) emphasised the need for environmental assessment to be more closely adapted to the decision-making process. However, in recent years, the focus has shifted towards the power and political dynamics of environmental assessment and the decision-making process for permitting infrastructure projects (e.g., Enríquez-de-Salamanca, 2018; Cashmore & Richardson, 2013; Partidario & Sheate 2013; Cashmore et al., 2010).

After more than 40 years of practice and international experience, there are still different views about the purpose and nature of environmental assessment and especially its role in the decision-making for infrastructure projects (Dodson, 2017; Legacy, 2017). The debates surrounding the nature of environmental assessment highlight concerns about the dominance of the rationalist approach and the need for alternative approaches that can recognise the political realities of the decisions to permit infrastructure projects. Because of the political nature of decision-making, the power imbalances among different stakeholders and the uncertain and complex nature of the environmental issues, environmental assessments are often manipulated by dominant stakeholders, whose views about the environmental effects influence the outcomes (Enríquez-de-Salamanca, 2018; Williams & Dupuy 2017; Chi et al., 2016).

## **1.2 Aim, Research Question and Objectives**

The research aims to identify power dynamics that enable or constrain stakeholders' influence on the environmental assessment of infrastructure projects. This aim is achieved through the following research question:

How do power dynamics enable or constrain stakeholders' influence on the environmental assessment and decision-making for large-scale infrastructure projects?

The research objectives to achieve this aim and question are to:

1. Review the rationale of politics and power in determining environmental decision-making outcomes for infrastructure project approvals;
2. Develop a framework to identify the influence of different types of power on the planning and decision-making process for large-scale infrastructure projects;
3. Apply the framework to assess stakeholders' influence on environmental assessments as a mean of determining the outcomes in decision-making on large-scale infrastructure project proposals, using the Ruataniwha Water Storage Scheme (RWSS) in New Zealand as a case study.

### **1.3 Thesis Outline**

This introductory chapter sets the agenda for the thesis by discussing the background, and identifying the aim, research question and objectives of this research.

Chapter 2 critically reviews the literature on environmental assessment and the role of different stakeholders in environmental decision-making in New Zealand and internationally.

Chapter 3 reviews theories of power and proposes a theoretical framework for this research.

Chapter 4 outlines the research design. The chapter reviews the research paradigm, the rationale for selecting the case, the methods adopted for data collection and analysis, research ethics and the limits of the research.

Chapter 5 provides the empirical settings for the thesis by examining the institutional arrangements for resource management in New Zealand. The chapter describes the evolution of environmental assessment in New Zealand. The major reforms that took place in environmental management and legislation in the country are critically reviewed in this chapter.

Chapter 6 provides the background and the context to the case selected for the study (i.e. the proposed RWSS). The chapter critically reviews the developments regarding the project from when the application was lodged up to mid-2017. The chapter also analyses the environmental issues contested between the applicants and opponents of the project.

Chapter 7 thematically examines the role of major actors and key documents influencing the environmental assessment and decision-making for the Ruataniwha Water Storage Scheme (RWSS). The documents analysed in the chapter included the submissions made by interested groups and individuals, the applicant's AEE report, the hearing transcripts and the Board of Inquiry report to assess technocratic power influence on the outcomes of the BOI decisions.

Chapter 8 presents the results obtained through online survey for the research. The questionnaire sought the respondents' view on political influence on the outcomes of the statutory decision-making process for large-scale infrastructure projects in New Zealand.

Chapter 9 discusses the research findings to understand the influence of different types of power on environmental decision-making and draws a conclusion. The chapter also highlights the thesis contribution to the broader knowledge of environmental decision-making. The thesis concludes by providing possible trajectories for future research.

## Chapter 2

# Environmental Assessment – A Literature Review

### 2.1 Introduction

This chapter critically reviews the literature on the role of environmental assessment in planning and decision-making processes. The chapter begins with a brief account of the concept of environmental assessment, followed by debates concerning the role of environmental assessment in the decision-making process. This section explains the different dimensions and effectiveness of environmental assessment in influencing the decisions to permit infrastructure projects. A comparative analysis of environmental assessment and other decision support tools is presented in the next section. The third section discusses the various challenges faced in the implementation of an environmental assessment by addressing uncertainties and ensuring effective public participation. The final section illustrates the role of power in environmental decision-making, and identifies gaps in the literature and outlines the focus for this research.

### 2.2 Environmental assessment: a review

This section critically reviews the literature on the concept of environmental assessment and its basis, role and effectiveness in the decision-making process.

#### 2.2.1 The concept of environmental assessment

Environmental assessment has been defined differently in different contexts and at different times. As a result, there is no single universally accepted definition of environmental assessment. Moreover, the term is interchangeably used with impact assessment (IA) or environmental impact assessment (EIA). However, regardless of the variation in the definitions, environmental assessment is widely considered as an aid to decision-making through which the potential environmental consequences of planned developmental actions are assessed in advance, well before those actions become a reality. Thus, the basic concept behind environmental assessment is similar to the ‘look before you leap’ approach.

Environmental assessment comprises meaningful scientific information which is gathered step by step. This information predicts the impacts of proposed actions on the biophysical environment as well as on the human social environment. As predictions of the potential

impacts are mainly based on interpretations of the available information, Noble (2011) argued that environmental assessment generally depends upon individual values and professional judgements. Environmental assessment is also viewed as an environmental management tool because it recommends means and methods for managing the environmental impacts of a proposed project if consent for development is granted (Morrison-Saunders & Bailey, 1999). In this way, the mitigation measures for the predicted impacts can properly be incorporated in the project design. However, when unpredicted impacts arise during the implementation of the project, new management actions are required to mitigate the impacts, which EIA fails to address in the decision-making process.

As a planning tool, which, according to Ortolano & Shepherd (1995), seems to be the most common conception of environmental assessment, its basic function is to inform the decision-makers and other stakeholders of the potential environmental effects of a planned project. When it is concluded that the likely environmental effects of a proposed project will be so adverse that it will cause more harm than good, the project can be rejected. This way, environmental assessment promotes environmental consideration in planning and decision-making processes to achieve positive environmental outcomes. Therefore, the overall purpose of environmental assessment is not limited to the prediction and evaluation of impacts but also seeks to improve the quality of decisions (Formby, 1990).

In a broader context, environmental assessment may also be regarded as a means to provide a platform for public debate on a particular plan or project and thus influence government decisions regarding proposed developments. Cashmore (2004), in explaining the role of science in environmental assessment, considers that environmental assessment involves a broad spectrum of philosophical beliefs and human values. At one end of the spectrum is the view that the environmental assessment process should be based on scientific methods including verified observations, quantitative impact predictions and tested hypotheses. At the other end of the spectrum is the view that environmental assessment should be used as a tool for public participation, empowering local stakeholders and promoting social justice and equity. In practice, environmental assessment operates between the two ends, ensuring that environmental concerns are acknowledged in the decision-making process as well as facilitating a participatory approach towards development.

### **2.2.2 The basis for environmental assessment in the decision-making process**

The emergence of environmental assessment in the international arena was part of a public policy response to growing concerns about the consequences of human actions on the natural environment (Lawrence, 1997). Initially, it took the shape of a mechanism that enforced consideration of the environmental impacts of developments when making decisions. Such mechanism required a focus on technical aspects, supported by legislation. Therefore, limited attention was given to the theoretical foundation of environmental assessment. However, since the 1990s, the theoretical foundation behind environmental assessment has been the focus of many scholars (e.g. Ortolano & Shepherd, 1995; Bartlett & Kurian, 1999; Richardson, 2005; Weston, 2010). These theoretical debates attempt to answer questions relating to the foundation of environmental assessment, such as: what environmental assessment is, why we need it and the purpose it serves in the decision-making process.

The various models and theories of planning and decision-making make up a significant part of the theoretical foundation of environmental assessment. Lawrence (2000) outlined five planning theories: rationalism, pragmatism, socio-ecological idealism, political economic mobilisation, and communication and collaboration. He claims that each of these theories has shaped a particular view of environmental assessment. For example, rationalism provides a justification of the role of environmental assessment in decision-making through ecological rationality, attention to defining the problem formulation of objectives and the generation of alternatives. The negative tendencies attributed to rationalism are equally valid for environmental assessment processes. The process is often autocratic and technically biased, and fails to recognise the political nature of decision-making. Lawrence argued that planning theories offer many important lessons and insights for environmental assessment:

Obstacles and dilemmas already encountered and addressed in planning theory are still hampering EIA theory building and practice (Lawrence, 2000, p. 307).

Although Lawrence did not engage with the overarching subject of multiple rationalities, conflicting values and power imbalances, Richardson (2005) argued that the practice of environmental assessment in the real world requires an acknowledgement of the unavoidable relationship between conflicting values and multiple rationalities.

Whilst in agreement that there are insights to be learned from planning theory debates, ... we should also acknowledge that planning theory remains a field of struggle between competing perspectives... environmental assessment needs to engage with competing multiple rationalities, and that value conflicts and judgements about them are inescapably present in environmental assessment (Richardson, 2005, p. 343).

According to Richardson, values cannot be separated from the environmental assessment process and treating these values in an apolitical way does not correspond to reality.

Recognising the political nature of environmental planning and decision-making, Bartlett and Kurian (1999) approached the theory-building process from a political science perspective. They identified different categories of models which, according to them, had not explicitly been addressed in the prior literature. These include the information processing model, the symbolic politics model, the political economy model, the organisation politics model, the pluralist politics model and the institutional politics model.

The information processing model treats environmental assessment as a tool for producing, processing and transmitting information to the decision-makers, assuming that rational decision-making is not only desirable but possible. In the symbolic politics model, environmental assessment is seen as an instrument for legitimising the exercise of power by the powerful actors in the decision-making process. The political economy model is used mostly by the private sector to reduce financial risks and increase opportunities through the internalisation of environmental externalities, leading to anticipation of environmental harm. The organisation politics model assumes that changes occur in the internal politics of organisations in order to incorporate environmental values. These changes will transform environmental policy through the sheer force of individual beliefs. The pluralist model treats environmental assessment as an instrument to ensure that environmental issues are given due weight in the decision-making process through a higher degree of public participation. Common discourses in the discussion of most of these theories and models include attempts to centralise environmental assessment within the larger political and socio-economic context and criticism of the rationalist approach.

Morgan (2000) argued that rationalism had a strong influence on environmental assessment when it was first enacted in the US in the 1970s through the NEPA. From its inception,

environmental assessment was seen as a source of information that could inform the choice of the best solution when making decisions on project proposals. This form of environmental assessment has a strong technocratic influence and the information is processed by planners, scientists and other professionals, who produce independent evaluations of the alternatives for the decision-makers (Lawrence, 2000). This model has been criticised on the grounds that it is not possible to identify all the possible alternatives. However, rationalism still dominates institutionalised environmental assessment in many countries and has a strong influence on the kind of environmental assessment required by New Zealand's RMA for making decisions on proposed projects. Therefore, Morgan argues that:

... there is an abundance of literature, and more importantly an abundance of EIA practice, that suggests the centre of gravity of EIA thinking is still firmly rooted at the rationalist end of that spectrum (Morgan, 2012, p.8).

Criticism of the rationalist approach encouraged the exploration and development of new models to approach environmental assessment as a collaborative tool in planning and decision-making. These new approaches promote the involvement of communities and stakeholders in the process, address the importance of solutions based on consensus and negotiations, and urge for a shift in the role of professional technocrats from controlling towards facilitating the process (Elling, 2009). However, collaborative and negotiation-based models can be criticised for failing to recognize the subject of power relations between individuals and organisations, which affect the ability of these groups to reach an equitable consensus (Richardson, 2005).

Gaps between environmental assessment theory and practice are evident. Significant opportunities exist for building environmental assessment theories and linking them to project decision-making. However, advocating a pragmatic approach, Richardson (2005) and Morgan (2012) argued that instead of focusing on building new theories and models, environmental assessment practitioners can get inspiration from the current theoretical debates to design their own framework of actions in the context of a particular project. Weston (2010) also suggests that attempts to develop theories of environmental assessment in order to justify its use in decision-making are counterproductive:

The risk society factors that have undermined trust in politicians, science and experts, the social construction of environmental values and critical theory's telling critique of the theories that

seek to justify it have all eroded any meaningful role that EIA may once have had. It is perhaps the time that we stop searching for theories to defend it... (Weston, 2010, p. 370).

### **2.2.3 Effectiveness of environmental assessment**

Despite the international recognition of environmental assessment, and its integration into planning and decision-making systems as a legal instrument around the world, its effectiveness in protecting the environment through influencing decisions is widely questioned. Numerous studies have been carried out to examine the extent to which environmental assessment is achieving its intended goals (e.g. Sadler, 1996; Cashmore et al., 2004; Jay et al., 2007; Barker & Jones, 2013; Campion & Essel, 2013). However, even after decades of practice, the influence of environmental assessment on the decision-making process appear to have been far less than expected by its originators, with the gaps between expectations and performance remaining significant (Nykvist and Nilson, 2009; Wood, 2003).

The effectiveness of environmental assessment has been described from different perspectives (Morgan 2012), driven by expectations and depending on the position and interests of the different stakeholders (Theophilou et al. 2010). In his landmark research, the ‘International study of effectiveness of environmental assessment’, Sadler (1996, p. 37) defined effectiveness as “...how well something works or whether it works as intended and meets the purposes for which it is designed”. He identified three categories of effectiveness:

- Procedural: does the environmental assessment process conform to established provisions and principles?
- Substantive: does the environmental assessment process achieve the objectives set (e.g. supporting well-informed decision-making, resulting in environmental protection)?
- Transactive: does the environmental assessment process deliver the outcome at the lowest cost in the minimum time possible (i.e. is it effective and efficient)?

Backer and McLelland (2003, p. 584) added normative effectiveness to the set of categories identified by Sadler (1996), which they define as “... the extent to which the policy achieves the normative goals, which are presented by the purpose of the policy”. According to Gibson (2013), this dimension of effectiveness is related to improvement of the process through incremental changes based on the lessons learned from experience.

A deeper examination of the literature on the effectiveness of environmental assessment reveals quite different viewpoints. On one hand, effectiveness is viewed with reference to the nature and underlying purpose of environmental assessment (Elling, 2009), such as the influence of environmental assessment on restoring and maintaining environmental quality. On the other hand, Marara et al. (2011) and Cashmore et al. (2010) emphasised that the complex dynamics of politics and power should be a key focus when determining the effectiveness of environmental assessment. According to this view, an evaluation of effectiveness will only be meaningful when it is made in the political, socio-economic and cultural context of a specific country or jurisdiction. By considering this dimension of effectiveness, this research aims to evaluate the effectiveness of environmental assessment in large-scale infrastructure projects in New Zealand.

When we examine the political models of environmental assessment described by Bartlett and Kurian (1999) or Formby (1990) on the politics of environmental assessment, effectiveness from a political perspective can be seen through various aspects, such as (a) Whether the environmental assessment process ensured an opportunity for public participation in the decision, (b) whether any modifications were observed in the practices of companies dealing with developmental projects because of increased awareness of environmental issues and (c) the extent to which government organisations, decision-makers and other stakeholders comprehend and use the information provided to them through environmental assessment in the decision-making process?

Nevertheless, most scholars have focused on the procedural aspects of environmental assessment and therefore little is known about its substantive effectiveness (Cashmore et al., 2004). This is because of the difficulty of empirically exploring substantive effects (Jay et al., 2007) and the plurality in the interpretations of the objectives of environmental assessments by different stakeholders (Cashmore et al., 2004). However, increased attention has been placed on analysing the substantive aspects of environmental assessment, as both aspects are important for assessing the overall effectiveness. However, according to Morgan (2012, p. 10), “the procedural aspects are more amenable to study and analysis, while substantive considerations raise more difficult questions”.

In order to understand how different stakeholders' views of environmental effects are valued in an environmental assessment process, we need to examine the procedural and substantive aspects, as well as the political context surrounding the decision-making process.

## **2.3 Environmental assessment versus other tools**

Environmental assessment, over the years, has been used as one of the normative tools in planning and management. It is still evolving. The concept and practice of environmental assessment has been assimilated in a broad range of jurisdictions and is embedded into a large number of national and international laws and agreements. Its acceptance around the world reflects the desire and need for integrating environmental considerations into the decision-making process, and also indicates the flexibility of the tool. However, in this era of global environmental activism, EIA is not the only means for assessing the environmental consequences of proposed plans or actions. A large number of other tools for evaluating environmental effects are also available. These include: cost-benefit analysis, strategic environmental assessment, social impact assessment, life cycle assessment, risk assessment and many more, though some of these still require effective definition and implementation. An overview of the linkages between a few of these other tools and EIA is presented in the following section.

### **2.3.1 Cost-Benefit Analysis**

The desire to balance the costs of an action against its benefits is an appealing one (Winpenny, 1991). Cost-benefit analysis (CBA) is claimed to have deep-rooted theoretical foundations in relation to human behaviour and preferences (Petts, 1999). CBA is a systematic process for calculating and comparing the costs and benefits of a proposed policy, plan or project (including alternatives). These costs and benefits are usually expressed in monetary terms. When applied to environmental management, CBA can evaluate the pollution costs of a particular project and make developers and decision-makers fully aware of these costs. It can show how limited resources can best be utilized to achieve maximum benefits with the least environmental damage (Badre & Pearce, 1991).

As a simplified evaluation process, CBA can help in decision-making. Thus, we can relate it to impact evaluations in the scoping stage of environmental assessment. The aim of scoping in environmental assessment is to outline and define the central issues; CBA is equally

appropriate for accomplishing this task. Likewise, CBA can also be useful in monitoring the activities of a project, as impacts affect the resources valued by humans (Hundole et al., 1990). However, the credibility of CBA is often questioned for not reflecting the environmental impacts in monetary values. Similarly, like many other decision support tools and models, environmentalists have also suspected CBA of being biased towards justifying new projects, typically underestimating the costs and greatly exaggerating the benefits (Petts, 1999).

Environmental assessment plays a major role in ensuring that environmental considerations are taken into account in the decision-making process. However, the integration of CBA and environmental assessment can have the advantage of filling the gaps by specifying the balance between a project's benefits and its environmental costs for the decision-makers, which environmental assessment fails to produce (Bowers, 1997). In contrast to environmental assessment, CBA deals more in quantitative terms and presents an analysis in a form that can easily be understood by decision-makers as well as the general public. In addition, Hundole et al. (1990) argued that a CBA approach can integrate development with environmental resource conservation, rather than dividing them, as in traditional environmental assessment.

Debates on the usefulness of integrating environmental assessment and CBA focus on the differences in their scope. However, limitations arise when CBA is required to transform all the potential environmental impacts (e.g. ecological, recreation, scenic beauty, air pollution) into monetary values. This deficiency limits the scope of CBA compared with environmental assessment. CBA is primarily an evaluation tool; unlike environmental assessment, it cannot be used to identify and predict the impacts.

### **2.3.2 Social impact assessment**

Social impact assessment (SIA) is the process of assessing or estimating, the likely social consequences (intended or unintended, positive or negative) of particular actions, policies or programmes (Burdge & Vanclay, 1996; du Pisani & Sandham, 2006). Social impacts are those that alter the ways in which people live, work, play, arrange to meet their requirements, relate to one another and generally cope as a member of society (Becker, 1997; Barrow, 2000).

The primary purpose of SIA is to evaluate the expected differences in the quality of life in the community as a consequence of the proposed development (Barrow, 2000). It is used to assess the distribution of the costs and benefits of the impacts of a proposed project among different

stakeholders and over time. (McCracken & Parker, 1998). According to Freudenburg (1986), the hybrid nature of SIA gives it an edge over other decision support tools, as it is linked to both scientific research and public policy. Hence, Baines et al. (2003) argued that SIA has played a major role in diverting the focus of policy debates from the technical problems to be solved to a social issue that needs to be managed.

With the enactment of the NEPA, SIA was formally introduced in 1970. Since then, there has been a significant development in the theory and practice of SIA. Along with the biophysical impacts of a proposed project, social concerns are now addressed in the decision-making process and the meaning of environment has been expanded to include social components (Burdge & Vanclay, 1996). However, because SIA was developed under the shadow of EIA, it is considered to be a subset of environmental assessment by many practitioners. That is why there has always been an ongoing debate among the theorists of SIA about whether SIA should be conducted separately from or integrated within environmental assessment or other impact assessment processes (Barrow, 2000). This approach has fostered the misconception that social impacts only need to be considered if they result from environmental impacts. As a response to this approach, in some countries (e.g. the US, Canada, New Zealand and Australia), a clearer distinction between SIA and environmental assessment can be drawn by using different techniques (du Pisani & Sandham, 2006).

The application of SIA has raised awareness of how developmental projects and changes in plans or policies affect the lives of indigenous populations. This has resulted in a widespread consensus that social or human impacts should be considered as part of the environment in impact assessments. However, despite remarkable progress in the last few decades, SIA has not achieved the same degree of global recognition as environmental assessment or other impact assessment tools (Pope et al., 2013). One of the major issues limiting the use of SIA is finding out how project-specific knowledge about the social impacts can be utilized for wider assessments of plans and policies on a national level. In addition, the availability of a wide range of inconsistent guidelines for practitioners and the lack of a procedural framework for SIA have also hindered its use (du Pisani & Sandham, 2006).

Despite these shortcomings, SIA has considerable potential to highlight the social concerns alongside the economic and environmental concerns in the decision-making process. If conducted properly, it can help planners, developers, the affected populations and decision-

makers to anticipate the potential social consequences of a proposed project (Burdge, 2004). The challenge for SIA is the development of a consolidated framework to provide a common set of procedures to be followed by practitioners for a wide range of developmental projects. The establishment of such a framework may also help in the application of project-level research findings to the assessments of larger-scale national and regional policy decisions.

### **2.3.3 Strategic environmental assessment**

Strategic environmental assessment (SEA) is a systematic process for evaluating the environmental consequences of a proposed programme, policy or plan and its alternatives, including the preparation of a written report based on the findings of the evaluation, and ensuring those findings are addressed at the earliest appropriate stage (Therivel, 1993; Sadler & Verheem, 1996). It emerged as an extension of the concepts and practice of project-level EIA but was applied to the higher levels of decision-making (Lee & Wood, 1978; Lee & Wash, 1992). Over the past three decades, the process has evolved significantly but has always been associated with sustainability goals (Petts, 1999; Lobos & Partidario, 2014).

With the evolution of SEA, the need for more proactive and strategic approaches was recognised (Bina, 2007). The advocates of SEA aim to address the policy and institutional framework and assert that it should be applied to the preparation and development of policies, plans and programmes to facilitate the integration of the environment and sustainability in the decision-making process (Therivel, 1993; Partidario, 1996; Sheate et al., 2003). The evolution of the concept and practice of SEA has been accompanied by multiple interpretations of the process, expanding and multiplying the spectrum of SEA approaches (Silva et. al., 2014). These approaches have stimulated new debate among the supporters of SEA, where some have argued the need for new SEA practices beyond a simple tool for evaluating the environmental consequences and reporting to the decision-makers. As a result, the SEA systems have become more complex and diverse, and have been required to respond in different ways, depending on the context of plans and policies and economic and political cultures (Petts, 1999; Sheate et al., 2003).

As a result of this complexity, different SEA models have been developed. For example, based on different procedural, legal and institutional frameworks, Therivel (1993) identified and reviewed five different SEA systems. Similarly, three different structural forms in the SEA systems were identified by Sadler (1996):

- Standard Model: a model based on the same steps and activities as EIA but with a few changes introduced to fit policy requirements; this can be found in Denmark,
- Equivalent Model: an environmental appraisal model, where the evaluations of plans and policies are carried out to identify and address the environmental effects, as in the case of the United Kingdom,
- Integrated Model: an environmental management model, as in New Zealand, where carrying out SEA is made integral to the policy and planning process.

Since then, many different approaches have been introduced, leading to new SEA systems that reflect the political or cultural characteristics of the country or region concerned (Petts, 1999; Verheem & Tonk, 2000). Despite continual efforts towards different conceptual and procedural systems for the assessment of plans, policies and programmes, Sadler et al. (2011) argued that SEA, in practice, is still largely based on the philosophy of the project's EIA, inspired by the same technocratic and rationalist approaches.

An international study on the practice of SEA, conducted by Lobos and Partidario (2014), revealed that, in most cases, SEA enters the decision-making process at a stage when most of the strategic decisions have been taken and the plans, policies and programmes have already been drafted. In such cases, the SEA is merely used to evaluate specific development proposals, their alternatives and the mechanism for implementing the activities involved. A document is then prepared and presented to a specific public body for approval. Only in a few cases has SEA been brought into the decision-making process at an early stage and involved in discussions defining the strategic aims. In these cases, SEA was introduced into the system before the formal drafting of the plans, policies and programmes and was able to influence the strategic planning framework efficiently.

At this point, it is important to stress that the demand for a tool with the characteristics of SEA only arose because something different from project-oriented EIA was required. Therefore, the intent was that SEA should be simpler, less technocratic and information-dependent, and more proactive and interactive. It should be integrated into the decision-making process at a very early stage when the strategic plans for development are still unclear.

#### **2.3.4 Life cycle assessment**

Life cycle assessment (LCA) is an analytical tool used to evaluate the environmental effects of a product, process or activity. It goes beyond a particular site or facility to assess the cradle-to-grave environmental impacts of an entire industrial system, from raw material extraction through to processing, manufacturing, distribution, use, maintenance and repair, recycling and disposal (Owens, 1997; Petts, 1999; Manuilova et. al., 2009). The term ‘life cycle’ refers to the notion that holistic assessment is required to address all the inputs and outputs at any stage of the service or product’s existence. These inputs and outputs are considered as loads or burdens on the environment and are evaluated as quantifiable environmental impacts. LCA is generally conducted according to the internationally recognized ISO 14040 standards and is divided into four phases:

- **Defining the scope and goal:** in the first phase, the purpose of the study is defined, the alternative options for assessment are selected and the system’s boundaries are declared.
- **Inventory analysis:** a life cycle inventory (LCI) involves creating a database of all processes within the system’s boundaries and quantifying the inputs (energy and raw material requirements) and outputs (environmental releases) throughout the life cycle of a product or activity.
- **Impact assessment:** in the third phase (the life cycle impact assessment or LCIA), the potential environmental impacts associated with the selected inputs and outputs are evaluated. During the LCIA, impacts on both human health and natural resources are considered.
- **Interpretation:** the final stage involves a systematic evaluation of the results of the earlier two stages (the LCI and LCIA), with reference to the study’s goal. Significant issues are identified, and conclusions and recommendations are presented.

LCA studies were first carried out in the late 1960s (Owens, 1997). At that time, they were quite simple and restricted to measuring only the energy efficiencies of products and manufacturing processes. However, in the 1980s, LCA started to be widely used to evaluate potential environmental impacts. Private companies were interested in using LCA to label their products as eco-friendly, to improve the reliability of the company’s environmental policy and to guard themselves against the claims of environmental groups. Similarly, various industries also recognised the usefulness of LCA by gaining a competitive edge through green marketing and identifying cost-effective environmental products (Miettinen & Hamalainen, 1997).

A variety of interpretations of LCA can be identified. On the one hand, a large number of LCA advocates view it as a concept that provides a framework for overall environmental management and can include the use of other assessment tools like environmental assessment and risk assessment. Other practitioners and proponents of LCA view it as an accounting tool that can be used for assessing efficient resource use in the production of a particular good or service. Traditionally, LCA has been used to compare and contrast the environmental effects of various technologies adopted for the same purpose.

In terms of environmental impact identification and quantification through inventory analysis, LCA can overlap environmental assessment. In addition, it provides a simple accounting method for calculating the total inputs to and outputs from a system to the environment. Thus, being a quantitative tool, LCA can effectively evaluate alternatives in different projects, products or activities (Tukker, 2000). However, when it comes to accounting for intangible parameters such as aesthetics and visual impacts, LCA is less effective. Similarly, in addressing the issue of ecological effects or human health impacts, LCA fails to identify or measure the real effects.

In project-based environmental assessments, which seems to be the most common practice of environmental assessment, the system is typically defined by a single industrial unit. Assessment of the impacts is usually focused only on the effects in the close surroundings. In contrast, LCA is designed to cover the whole system that is directly or indirectly linked to a central product. In this way, impact assessment is generic and is more independent of the time and location constraints (Pennington, et. al., 2004). Therefore, the integration of LCA into traditional project environmental assessments may be more useful than is often thought.

### **2.3.5 Summary**

More than four decades of increasing attention to environmental planning and management have resulted in the development of numerous analytical and procedural tools to assist the decision-making process. Some of these tools are attractive for particular groups (e.g. LCA for industry, CBA for policy-makers). Similarly, other tools focus on a particular dimension of the environment; for example, SIA is anthropocentric. Most of these tools have intrinsic structural limitations that confine their potential for decision-making to only certain contexts. Greater integration will help to reduce the individual limitations of each of these tools and efficiently and effectively support the decision-making process.

Another advantage of integration is the inherent interconnections among most of these effects and their impacts. Some social impacts are caused by biophysical changes; similarly, some biophysical impacts are caused by changes in the social process that may occur as a result of socio-economic development and so on. Therefore, a complete understanding of the entire impact of a proposed policy, plan or activity can only be made possible by integrated, comprehensive assessments. Secondly, unlike environmental assessment, these tools do not all have any legal status in most countries (Vanclay, 2004). Therefore, when they are integrated into environmental assessment, these other issues will also receive greater consideration in the decisions.

However, there are certain barriers to the integration of these tools that needed to be addressed properly. One of these is the lack of political will to recognise the importance of these various tools, let alone the potential value of integrating the decision support tools. This is the cause of the weak or nonexistent regulatory basis for most of these tools (Petts, 1999). Another hindrance is that the protocols for specific tools are not standardised, creating inconsistencies in application and developing a lack of trust by the stakeholders about using such tools. Finally, division of decision-making powers among various tiers of government can splinter the process. Hence, decisions regarding plans and projects are made by different authorities, providing little opportunity to share the knowledge and assessment outcomes that are required for integrated decision-making.

## **2.4 Challenges to implementing environmental assessment**

Environmental assessment is sometimes perceived as merely a requirement to be adhered to, a bureaucratic add-on and an unavoidable hurdle for the approval of a proposed project (Ortolano & Shepherd, 1995; Pischke & Cashmore, 2006). This 'compliance approach' towards environmental assessment is exacerbated by a number of other challenges hindering its effective application in decisions regarding large-scale infrastructure projects. These challenges mainly include uncertainty in predicting the impact, a lack of public participation and the role of power and politics in the decision-making process.

### **2.4.1 Addressing uncertainties**

Environmental assessment involves the prediction of future impacts and uncertainty is therefore inherent. This uncertainty in prediction can be confirmed through a review of post-audit studies (see, for example, Flyvbjerg et al., 2003; Wood et al., 2000; Buckley, 1992). The purpose of post-auditing, according to Wood et al (2000), is to provide an evaluation of prediction performance in environmental assessment and thus improve future practice by learning from experience. These studies indicate that the actual impacts of major projects are often different from the expected impacts. Thus, uncertainty is an important issue when considering the role of environmental assessment in the decision-making process. However, according to Glasson et al. (2013), environmental assessment reports often appear more certain than they should in predicting the likely impacts of infrastructure projects.

When dealing with uncertainty in environmental assessment predictions, some authors have emphasised the role of monitoring and post-auditing (Flyvbjerg et al., 2003; Wood et al., 2000) but others have focused on the value of research to minimise uncertainty (Wathern, 1992; Glasson et al., 1999). Monitoring and post-auditing provide opportunities to learn from experience and identify the type of impacts that could not be predicted with greater accuracy. Similarly, scientific research focusing on the changes in the biophysical and chemical characteristics of the environment that occur in response to developmental activity can help reduce the uncertainty. However, as argued by Brown (2004), research may reveal more uncertainties. Probability calculations, the use of scenario analysis and adopting precautionary approaches (Leung et al., 2015; Tennoy et al., 2006; Glasson et al., 2005) are other ways uncertainty can be managed in predictions and decision-making. Uncertainty can also be managed through extended public participation (Dougherty & Hall, 2005). However, such efforts can only decrease the level of uncertainty in predictions; it cannot completely remove the uncertainty.

Dealing with uncertainty in environmental assessment is not a question of prediction accuracy only but also how uncertainties are addressed in environmental assessment and communicated to the decision-makers. Tennoy et al., (2006, p. 45) argues that:

Unless decision-makers are made aware of the possible impacts hidden in prediction uncertainty, they will not be able to react to such impacts by stopping, modifying or monitoring the activity.

Therefore, uncertainties have remained a matter of concern for many environmental assessment scholars and practitioners. Notwithstanding the consistent need for better consideration and reporting of uncertainties in environmental assessment, how uncertainties are considered and communicated in practice has received very little attention (Lees et al., 2016). Hence, we need to understand how uncertainties are considered in predicting environmental effects, and the measures adopted to deal with them, before the current uncertainty communication practices can be bettered. With decisions potentially based on limited environmental information and greater uncertainties, this requirement may become more urgent in the future as a result of increasing pressure for economic growth through resource development and demands for fast assessment and project decisions (Gibson, 2012; Bond et al., 2014).

#### **2.4.2 Public Participation**

Public participation has often been considered as a fundamental component of environmental decision-making. For example, the UN Conference on Environment and Development at Rio de Janeiro, Brazil, in 1992 stated in its declaration that “environmental issues are best handled with participation of all concerned citizens, at the relevant level” (UN, 1992, p. 3) Similarly, even a brief glance at the literature on environmental assessment shows that the lack of effective public participation in decision-making is a major concern for both scholars and practitioners (O’Faircheallaigh, 2010; Glucker et al., 2013; Devlin & Yap, 2008; Lawrence, 2003). Glucker et al. (2013) claims that public participation is considered to be a goal in itself in project decision-making and that there is widespread consensus that participation plays a vital role in effective environmental assessment (Hartley & Wood, 2005; Glucker et al., 2013). Indeed, for some authors, like Roberts (1998), the legitimacy of environmental assessment is doubtful if it is not based on meaningful participation.

However, despite increasing recognition of the need for participatory approaches to environmental planning and decision-making (Devlin & Yap 2008; Lawrence, 2003), the question still remains as to what exactly is meant by public participation. According to Glucker et al. (2013), in many cases, the authors highlight the benefits of participation without properly defining it. The few authors who provide a definition of the concept lack consensus. For example, the International Association for Impact Assessment (IAIA) (2006, p. 1) defines participation in environmental assessment as:

The involvement of individuals and groups that are positively or negatively affected, or that are interested in a proposed project, programme, plan or policy that is subject to a decision-making process.

There is no indication of the extent or form of involvement required; its effects on the decision-making process also remain unclear. However, Hughes (1998) believes that participation in the environmental assessment process should enable the individuals or organisations affected by a proposed project to ‘significantly influence’ the decision.

The lack of clarity on the meaning of participation is also reflected in its objectives. According to O’Faircheallaigh (2010), the main objective of participation is to fulfil the democratic right of individuals to be consulted and have a chance to express their views on matters that affect their life or property. Therefore, it would be undemocratic and unethical not to provide opportunities for the public to participate in environmental assessment (see, for example, Petts, 1999; van Tatenhove & Leroy, 2002). In contrast, Morrison-Saunders & Early (2008) believe that public participation should be viewed as a mechanism to fill information gaps in the decision-making process. This way, the knowledge of local stakeholders can be used to provide relevant ecological or social information for decision-makers and thus enhance the quality of the decision. Another objective of participation frequently voiced in the literature is conflict resolution (Lawrence, 2003; Devlin & Yap, 2008). Because of the diversity of interests among citizens and between citizens and project proponents, conflicts are frequently encountered, especially in large-scale construction projects (Awakul & Ogunlana, 2002). In this situation, public participation is supposed to provide a mechanism to resolve such conflicts before the final decisions are made. According to Arnstein (1969), participation is:

...a categorical term for citizen power. It is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future (p. 216).

Apart from disagreement about the meaning and objectives of participation, confusion also surrounds the question of who should participate. Petts (2009) notes that in elaborating the importance of participation, many authors lack clarity about who they actually mean by the ‘public’. In addition, the terms ‘public’, ‘citizens’ and ‘stakeholders’ are usually used interchangeably in the literature, creating further confusion. This theoretical and conceptual

confusion is not only restricted to the literature but also has a negative impact on the practice of public participation in the environmental assessment process. Therefore, effective and meaningful participation in the decision-making process requires clarity and precision in the understanding of what participation actually means in the context of environmental assessment, why participation is important and who should be given the opportunity to participate.

## **2.5 Rationality, politics and power in environmental decision-making**

From its inception, environmental assessment has been associated with the rationalistic way of planning (Elling 2009). The basis of the rationalist model was the adoption of a rational scientific process to guide the selection, out of a range of alternatives, of the best solution for a defined problem or need, based on the analysis of all the necessary information to make that selection (Morgan, 2012). The strong influence of this model can be seen in the kind of environmental assessment that was developed in the 1970s that is still dominant in most countries. This form of environmental assessment has a strong technocratic influence: information is processed by planners, scientists and other professionals, producing independent evaluations of the alternatives for the decision-makers.

However, a rational procedure may not automatically lead to a rational outcome (Kornow & Thissen 2000). A variety of stakeholders are involved in any infrastructure project, including the proponents of the project, environmental consultants, political parties and government officials, environmental and other interest groups, and the affected public (Dodson, 2017; Steele et al. 2017). These stakeholders usually have different levels and kinds of involvement and use different strategies at each stage of the process to optimally influence the decisions (Enríquez-de-Salamanca, 2018). Because of the objectives, the imperfect information and the fact that people do not always behave the way rational models assume, a rational process may not lead to a rational outcome. Therefore, in the absence of ideal rational scientific processes, we need to work with an understanding of power and the political nature of environmental decision-making. It has generally been considered that power has a negative impact on environmental decision-making (Richardson, 2005).

The limited literature on power, politics and environmental assessment is split into two categories: normative and analytical (Cashmore and Richardson 2013). Normative research explores how politics and power should operate within environmental assessment. These

studies focus on the public participation component of environmental assessment and tackle ideas such as environmental justice and deliberative democracy. Analytical research examines how politics and power actually operate within environmental assessment and decision-making processes. These studies focus on the political dynamics within a case study (Hansen et al. 2013), the limitations of rational decision-making in environmental assessment (Cashmore et al., 2008; Kørnø & Thissen, 2000; Cashmore, 2004), knowledge creation (Hayes & Westrup, 2012) and conflict resolution (Devlin & Yap, 2008). However, despite the studies listed above, relative to the broader literature on environmental assessment, the topic of power and politics in environmental decision-making remains understudied (Cashmore and Richardson, 2013).

Politics in environmental decision-making can broadly be examined from two different dimensions. Firstly, we can expose the role of various stakeholders involved in the project cycle such as the proponents of a proposed project, those involved in the preparation of environmental assessment reports, political parties and government officials, special interest groups and the affected public. Secondly, the politics at each stage of the environmental assessment and decision-making process can be examined (Formby, 1990). These stakeholders usually have different levels and kinds of involvement and use different strategies at each stage of the process to optimally influence the decisions (Enríquez-de-Salamanca, 2018). Although these interactions have a significant impact on the outcome of the process, they have received little attention in the environmental assessment literature (Rickson et al., 1990).

As noted earlier, the predominant paradigm of environmental assessment is technocratic and most of the extant literature is concerned with the techniques, methodologies and procedural steps of environmental assessment (Cashmore, et al., 2004). However, the value of political dynamics is now increasingly recognised and is highlighted in the literature as well. Marara et al. (2011) emphasised that the complex dynamics of politics and power should be a key focus when determining the influence of environmental assessment on decision-making. According to this view, an evaluation of an environmental assessment's effectiveness will only be meaningful when it is made in the political, socio-economic and cultural context of a particular country or jurisdiction.

Cashmore et al. (2010) took this approach to politics, power and environmental assessment a step further by arguing that environmental assessment is essentially political in nature and requires the use of political theory to examine its effectiveness. Thus, the notion of politics as

the possession or exercise of ‘power’ should also be examined when considering the role of environmental assessment in granting permission for infrastructure projects. Those who hold this view believe that it is impossible to create an impartial process. Although power can be mediated among different parties, it will influence the outcomes of the process (Cashmore & Richardson, 2013; Richardson, 2005).

## **2.6 Summary**

After more than 40 years of international experience, there are still a variety of views about the purpose and nature of environmental assessment and especially its role in the decision-making process. The debates surrounding the nature of environmental assessment highlight concerns about the dominance of the rationalist approach and the need for alternative approaches that can recognise the political realities of the decisions to permit infrastructure projects. Because of the political nature of decision-making and the uncertain and complex nature of the environmental issues, environmental assessment often yields to political considerations. Currently, little research examines how politics and power influence the entire environmental decision-making process. Research to help understand this issue is relatively new (Cashmore & Axelsson, 2013). More empirical case studies with different organisational and political structures may help us to understand the degree to which powerful stakeholders influence the decision-making process. Presently, research on the topic has focused on the impact of legislation or the dynamics of the relationships among stakeholders within the environmental assessment process. What we do not yet understand in any significant detail is how power operates within broader environmental planning and decision-making processes. By conducting an empirical case study, this thesis aims to understand how power influences the outcomes in a statutory decision-making process for large-scale infrastructure projects. The framework used to analyse the dynamics of power and their influence on environmental decision-making, is outlined in the following chapter.

## Chapter 3

# Conceptualising environmental decision-making

### 3.1 Introduction

The research aims to explore how do power dynamics enable or constrain stakeholders' influence on the environmental assessment and decision-making for large scale infrastructure projects? Chapter 2 reviewed the debate on the role of environmental assessment in planning and highlights the limitations of the rational decision-making process. The chapter highlights the role of power that gives some stakeholders privilege over other stakeholders in decision-making. The aim of this chapter is to review the literature on theories of power in order to develop a framework to investigate decision-making in large-scale infrastructure projects. The first section reviews the theories of power and its dynamics in politics. The second section discusses types of power that may influence environmental decision-making. The third section explains the politics of large-scale infrastructure projects and identifies the actors in the decision-making process. The final section will develop a theoretical framework to investigate the case study in more detail.

### 3.2 Power – A theoretical debate

Environmental assessment practices are guided by the evidence-based approach (Davoudi, 2015). Flyvbjerg (2001) argues that the strength of this approach lies in its ability to predict the future based on rationality. In contrast, the strength of social science approach lies in reflexive analysis of goals, values and interests (ibid). Social theorists Max Weber, Michel Foucault and Jürgen Habermas found that the values of the decision-makers define rationality (Flyvbjerg, 2001). This suggests that environmental policies and planning tend to follow values over rationality. For example, each mega-project is a unique case that needs specific attention to the values and politics and may not be evaluated within the narrow confines of scientific evidence. This approach may help to find contextual realities. In contextual realities, little things are important. Here, little things refer to insignificant issues or practices that are taken for granted (Flyvbjerg, 2004). Politics are an important aspect of the contextual realities and can be surrounded by little things.

The term 'politics' is used in a variety of ways; certainly, parallels can be drawn from the extended debates on the meaning of politics (Palumbo, 1987). Politics are linked to the activities associated with decision-making (Jasanoff, 2005). However, in the political sciences, the term 'politics' is interpreted and used more broadly. For example, Harold Laswell, the influential political scientist, defines politics as 'who gets what, when and how' (Laswell, 1958). This means that any action and process in which social decisions are made and implemented can be considered to be political (Jordan & O'Riordan, 2000). Therefore, many political scientists are interested in investigating the impacts of politics on the formulation and implementation of public policy (Richardson, 2005). However, despite being a public policy tool, research on this topic through a political theory lens that considers power as a core concept to assess politics is limited (Cashmore & Richardson 2013).

The concept of power has developed significantly in the past few decades, with diverse interpretations of its meaning having been debated. A popular understanding of power, supported by theorists such as Parsons, Luhmann, Barnes, Clegg, Giddens, and many others, is that power is created through social order (Haugaard 2003). This type of power in the literature is referred to as social power, as opposed to natural power, which is the physical manifestation of power through force. In this context, power is equated with influence or as according to Giddens (1984, p. 283) 'power is the means of getting things done'. Power may also be defined as the capacity to influence others (Foucault, 1977; Scott 2001). It is a social relationship between two or more actors, in which some actors exercise power and others are affected by this power. According to Sewell (1996), resources are important to put one actor into a powerful position. Emerson (1962) argued that power is rooted in relations of dependence, in which one organisation is dependent on another. Sometimes, powerful organisations exert influence formally and informally on other dependent organisations (DiMaggio & Powell, 1991). Scott (2001) pointed out that sometimes, organisations do not have any power in formalised relationships such as in a power structure. However, they command in terms of a process of pressure that makes it possible to exert influence during the decision-making process. Historical sociologists such as Thelen (1999) and Mahoney (2000) also stressed the importance of power in discovering in a policy process. However, power lies in institutional architecture such as the planning process and its political-legal interpretation, which needs to be investigated.

Power is both negative and positive. Power is inherent in institutions rather than the individuals making those institutions functional (Foucault, 1977). Therefore, environmental planning can be linked with the dominant power of systematic reason (Healey, 1992). In the decision-making process, Foucault points towards the importance of power in controlling and shaping discourses (Flyvbjerg & Richardson, 2002). Foucault, therefore, represents power as local, collaborative and productive rather than hierarchical and oppressive, suggesting prospects for change (McNay, 2013).

Environmental decision-making is not purely based on objective criteria (Hanna et al., 2000). Such decision-making may also be advanced through ideological agenda. Therefore, democracy and accountability are required to make power relations just and transparent. Improvements in the quality of decision-making depend on the governance and policy culture (Healey, 1998). Therefore, environmental decision-making processes need analysis of power at various levels and dimensions. Power is generally now interpreted as a multi-layered concept that includes a broad range of dimensions, such as opinion making, agenda setting, domination, manipulation, discipline, force and structures (Thomsen, 2005). Following the work of scholars such as Parsons, Giddens and Foucault (see Haugaard, 2002), power in this study is interpreted as a phenomenon that can operate both as a constraining and enabling factor in actors' roles in environmental decision-making. Environmental decision-making provides an arena for the exercise of politics and power by the different actors involved in the process. Several scholars recognise power struggles, and researchers in the field of environmental assessment have stressed the need to include theories of power to better understand the role and effectiveness of environmental assessment in decision-making (Cashmore & Richardson, 2013; Bixler, 2013; Cashmore et al., 2010; Juntti et al., 2009).

Several theories may further explain power in decision-making. For example, resource dependence theory explains inter-organisational relations on the basis of resources (Johnson, 1995). These may be financial, technical or human resources. The concentration of resources in an inter-organisational web determines the intensity of an organisation's power over other organisations (Hillman et al., 2009). The Advocacy coalition framework explains the interactions of actors and coalitions in the policy process (Sabatier, 1988). This process may include problem identification, policy selection, policy evaluation, legitimation and implementation. Actor-network theory explains how the growth and structure of knowledge can be interpreted and analysed through the interactions of actors and networks (Callon et al.,

1986). Power dependence theory argues that mutual dependence brings people and organisations together but inequalities in dependence relationships generate power imbalances (Molm, 1991). This theory focuses on power in organisational relationships in which complex power relationships that are pivotal in the decision-making process may not be resolved through scientific evidence. These theories and concepts will be useful for this research if we categorise power into different types, as discussed in the next section.

### **3.3 Types of power influencing decision-making**

The concept of power can be divided into political power, technocratic power and social power, which are discussed in the following sections.

#### **3.3.1 Political power**

Political scientists argue that the study of politics is the study of power (Jordan & O'Riordan, 2001). Politics determines the power relations among different stakeholders and is the foundation of political order. A political analysis of impact assessment may help to locate power. Power can be expressed politically by exploiting the political position and building narratives, as will be discussed in the following sections:

##### **(a) Power in political narratives**

In the past few years, the concept of narrative has become very popular in academic discourse in various social science disciplines (e.g., Buthe, 2002; Shenhav 2005; Cornog 2004). It is understood that people have a natural tendency to think in narratives. The recent interest in narratives has taken this approach in a useful direction by focusing on how people transmit and interpret information through stories. The power of stories in shaping beliefs and actions is supported by a variety of academic fields including communications (e.g., McComas & Shanahan, 1999), psychology (e.g., Gerrig & Egidi, 2003), neuroscience (e.g., Ash et al., 2007) and marketing (e.g., Mattila, 2000).

The dominant role of narratives in political discourse is based on the importance of prioritising stories when advancing public policy. A political narrative can be defined as one that develops from a formal political forum, such as a cabinet, a parliament, party meetings or political rallies (Shenhav, 2006). A second possible approach is to note the contents of the narrative. If the narrative contains themes that are considered 'political', and exhibits power relations and

decision-making, the narrative can be taken as political. Though both approaches can be used to understand a political narrative, the second approach might expand the definition to include almost any narrative, especially when politics itself is broadly defined (Shanahan et al., 2011; Shenay, 2006). Political narratives are strategically constructed stories. These stories contain predictable elements that aim to influence public opinion and create support for particular policies.

The literature on environmental narratives explores the diversity within environmentalism as a social movement. Schoenfeld (2005) broadly divided environmental narratives into three groups: romantic environmentalism, managerial environmentalism and environmental justice. Romantic environmentalism perceives environmental issues as part of a larger crisis of community, values and human reliance on the technocratic approach. Managerial environmentalism perceives environmental issues as essentially technical ones subject to technical solutions. Environmental justice perceives environmental issues as part of a larger crisis of systemic injustice in contemporary society. Distinguishing these different types of environmentalism helps us understand the views of environmentalists. Each of these groups approaches the origin, current state and possible remedy of environmental problems in different ways. Understanding these narratives helps to explain why environmentalists sometimes disagree regarding basic environmental concerns or priorities.

Bixler (2013) conducted a study on the political ecology of local environmental narratives regarding the conservation of mountain caribou in British Columbia. He noted that a political ecology narrative could bring power to the forefront. The social and ecological processes responsible for a decline in mountain caribou were products of complex power relationships among scientists, policy-makers and other forest users. Bixler (2013) concluded that alternative narratives could navigate political, economic, and ecological contexts and empower some stakeholders while constraining others. The process that translates those narratives to policy can produce either uncooperative local stakeholders or those willing to work in collaboration to conserve mountain caribou.

Betsch et al. (2011) investigated the influence of narratives on vaccination risk judgements when statistical information is available. They found that reading narratives about adverse events on the internet increases perceptions of the risk of their occurrence, which, in turn, decreased vaccination intent. Although presenting statistical information in an enhanced

graphical manner can reduce the effect of narratives, this effect was still evident and, in some cases, was stronger than that of statistical information.

### **(b) Positional (legitimate) power**

Positional power or legitimate power is the power of an individual by virtue of their position and duties of the holder of that position within an organisation, culture or other social structure (Raven, 2008; Morgan, 2006). A prime minister, president or monarch has legitimate power. So does a religious minister, a chief executive or a fire chief. Organisational structure, electoral mandates and cultural norms all provide the basis for legitimate power. The distinctive feature of legitimate power is that it is not based on rational arguments; instead, the power comes from the position or role of an individual (Haugaard, 2010; Raven, 2008; French et al., 1959).

In political science, legitimacy is the right and acceptance of an authority, usually a governing body or a political regime. Whereas authority indicates a specific position in an established government, the term legitimacy indicates a system of government. Hence, an authority viewed as legitimate often has the right and justification to exercise power. Power and legitimacy are usually associated with Weberian rule-based conceptions of authority. Following Weber (1978), the legitimacy of a legal system is based on the belief in the existence of a legitimate order. Consequently, those who accept the legitimacy of their legal system consider its rules as binding. This acceptance of the legal system then serves in shaping the behaviour of those subject to the law.

Reward and coercive power are considered to be different aspects of legitimate power (Atwater & Yammarino, 1996; Bass, 1990). Reward power depends on the power holder's ability to administer positive (and decrease or remove adverse) outcomes to a follower. The power to increase pay, recommend transfers and promotions or provide other financial benefits to followers are indicative of reward power. Likewise, coercive power is essentially the power derived from control over punishments or penalties such as being sacked or demoted. Coercive power is predicated upon fear, which makes the subject believe that he/she may be deprived of something if he/she does not comply. Whereas reward power encourages the subject to work with the aim of receiving benefits, coercive power is used to make the subject work out of the fear of not losing anything (Sing, 2008; Bass, 1990).

Legitimate power in formal political structures stems from the top ranks. Mostly, the top leadership has the power to intervene anywhere in the planning and decision-making process and set the tone for important decisions and choosing between alternatives. The relationship between power and political structures thus seems to be straightforward. A political position in the government enables politicians to use power to achieve more power; power is thus both a target and a means (Bacharach et al., 1995). Politicians are generally aware of their power and use it in their effort to influence the outcomes of various decisions (Ferris & Kacmar, 1992; Madison et al., 1980; Feldman, 1988).

### **3.3.2 Technocratic power**

Technocratic power makes scientific experts and their evidence responsible for the decision-making process. The outcomes are considered more rational than those achieved through the democratic process. The democratic process enables mediation between different preferences of the general public (Machin & Smith, 2014; Frank, 1990). This approach gives technical experts a privileged position to define policy and drive the decision-making process. Eventually, this approach empowers the technical elite and disempowers the general public and their representatives. Some scholars view the technocratic mode of decision-making as an impediment to democracy, in which experts have more influence on decisions regarding public policy than democratically elected politicians (Bertsou & Pastorella, 2017; Shapiro, 2004; Fischer, 1993).

#### **(a) Science is power**

Scientific rational knowledge is considered vital in identifying problems and devising solutions to global as well as local environmental problems. Environmental concerns are embedded in technical narratives, leading to the increased scientification of environmental policy, which stresses technical rather than social solutions to environmental threats. Consequently, environmental planning is becoming more science-driven and expert-oriented. This scientification of environmental planning and decision-making is rooted in the discourse of ecological modernisation. The ecological modernisation concept presents a win-win solution, in which environmental goals are perceived as compatible with economic growth (Fisher, 2000; Hannigan, 1995). In the language of ecological modernisation, environmental protection and economic growth are compatible and mutually reinforcing goals. In short, ecological modernisation promotes the notion of overcoming environmental problems without compromising economic development (Fisher, 2000; Hannigan, 1995).

According to some scholars, this systematic distinction between expert and lay knowledge is a political one and eventually concerns the allocation of power in policy decision-making (see for example, Haas, 2004; Redclift, 2005; Murdoch & Clark, 1994). Restricting the scope of evidence in favour of scientific knowledge is a powerful way of influencing decision-outcomes. This superior position of scientific evidence is institutionalised in environmental planning and decision-making (Cashmore, 2004) through a linear model of knowledge transfer, from the scientific experts to policy-makers. Not surprisingly, for some authors (Redclift 2005; Juntti et al., 2009), the enhanced value placed on scientific evidence in defining environmental policy is often taken for granted and the implicit technical power remains unquestioned.

In the applied science paradigm, environmental assessment is viewed as a process in which scientific knowledge and expertise are put to practical use. The scientific model of environmental assessment is based on conventional philosophical traditions that view science as an entirely rational process of objective enquiry. However, in practice, environmental assessments are often manipulated by powerful stakeholders to reinforce their positions of dominance in the decision-making process (Cashmore et al., 2010). Cashmore et al. (2010) suggested that impact assessment frames the discussion and analysis in scientific knowledge and denies any possibility of scrutinising alternate approaches.

Goldman (2001) identified a number of cases where impact assessment instruments and other scientific protocols were manipulated by development aid agencies to legitimise extensive interventions in the national policy framework. For example, Goldman (2001) cited the example of Lao People's Democratic Republic, where Western consultants undertook environmental assessment and related policy work because Lao's population lacks scientific knowledge and technical expertise. Consequently, the environmental assessment and related policy work advanced the Western scientific narrative, which was labelled as international trade in expertise (Dezalay & Garth, 2002).

In this approach, science has an authoritative position, with experts playing a crucial role in fact-finding and generating evidence. Regulatory science becomes a domain of its own, equipped with problem-solving instruments such as impact assessment, risk assessment and CBA (Mol, 2001). These heavily technocratic practices are mostly based on scientific evidence and technical expertise, and are regarded as key to environmental progress.

However, the growing importance of scientific knowledge in public policy has an effect on the power relationships within the society. Science creates systematic biases by presenting information in scientific terms. Such information controls participation in policy debates by privileging a particular way of knowing. Although the different assessment processes applied in policy debates may superficially appear to offer new opportunities for public participation, the scientific nature of the techniques adopted in the planning process establishes who is qualified to know and can contribute, and who is not (Hobart, 1993). Speaking the language of science, and the jargon of particular fields have become essential for participation in policy debates. In other words, actors who want to participate in the process must have the ability to understand and present a particular way of knowledge. This is seen as a very important act of power, for it devalues lay knowledge, and hence the citizenship, of large parts of society (Visvanathan, 1997). It also promotes the scientification of society (Cashmore et al., 2008) through reinforcing the social authority of scientific institutions.

Haas (2004) and Radaelli (1999) postulated that uncertainty about the environmental effects of proposed plans and actions is often used to justify the powerful position of expert knowledge and technocratic reason in the decision-making process in the European Union (EU). In such circumstances, policy-making tends to be highly technical and relies deeply on apparently apolitical committees of scientists, planners and legal experts to broker agreements and prepare policy decisions (Juntii et al., 2009; Jordan, 2001; Peterson, 2003). Radaelli (1999) drew attention to how uncertainty and a lack of transparency in planning and decision-making procedures provides opportunities for different stakeholders, such as representatives of administrative expertise or scientific research, to seize power over the 'logic' or mode of decision-making.

As the growing influence of science and technology has given rise to increasing public concern about its privileged status, more and more environmental groups, citizens and politicians have spoken of the need to regulate and control science. However, the scientific community sees such attempts as intervention in the pursuit of knowledge. The climate change expert James Lovelock, for example, claims that democracy impedes the urgent action needed to tackle climate change:

We need a more authoritarian world. We have become a sort of cheeky, egalitarian world where everyone can have their say [...] it may be necessary to put democracy on hold for a while (Lovelock, 2010).

### **(b) Information is knowledge; knowledge is power**

Over the last decades, enhanced access to information through new technology has given rise to a society that has become aware of and concerned about the social and environmental impacts of human developments. In a connected world, information provides power through its wide distribution. In this context, environmental organisations, local communities and the general public have access to information and are more willing to participate in initiatives perceived as good or bad for the environment.

However, to understand this relationship between information and power, distinguishing data, information and knowledge is a useful exercise. Data are the product of observations that need to be organised and processed. Information is data that have been processed so they can be used for a particular purpose such as understanding a phenomenon. Thus, information is influenced by the prior knowledge of the person processing the data (Rowley, 1998). Converting raw data into information has always been an important source of power. Finally, knowledge refines information by transforming information into instructions and makes control of a system possible (Rowley, 2007; Ackoff, 1989).

Alongside this discussion, Foucault (1977) suggested that power and knowledge are co-constitutive and that therefore discourse should not be considered value-free. He further argued that the production and reproduction of a regime of knowledge is tied to institutionally specific power relations, procedures, mechanisms and rules that draw the distinction between true and false statements. Hence, truth is not considered something that is universally accepted but is taken to be true within a specific institution. Foucault (1977) also highlighted that not all or even the majority within an institution will necessarily accept the discourses that prevail in a regime of truth and that there will always be visible or invisible resistance from those with diverging interests and values. Foucault sees competition among disciplines to define what is considered as truth as being a conflict of power rather than a purely intellectual debate. These activities may produce changes in what are considered legitimate truth claims.

Drawing on Foucault, it is important to recognise that knowledge claims (or facts) such as assessments of likely environmental effects are legitimate value choices. Hence, expert or technical knowledge is also central in legitimising environmental assessment results. The power knowledge claims relating to impact assessment methodologies are reinforced as a consequence of those undertaking particular roles and the legitimacy these roles provide. Professionals such as consultants, planners, lawyers and academics are involved in varying ways in devising models of effects, advising on assessment methodologies or auditing and reporting on the effects of a project. These professionals are typically employed by private funding agencies, non-governmental organisations or large donors such as the World Bank.

Environmental assessment is conceived of as a process whose main purpose is to provide information to the decision-makers so they can consider the effects of a proposed development on the environment before making any decision. In first stage, information is collected from experts and potentially affected people to prepare the environmental assessment reports. Later, access to information is disclosed on the basis of the characteristics and predicted impacts of the proposed development (O'Faircheallaigh, 2010; Glucker et al., 2013; Devlin & Yap, 2008; Lawrence, 2003). In most cases, the decisions are made only after the environmental assessment reports go through an administrative or judicial review. All of this aims to enhance the credibility of the information on which the decisions are based.

Public access to information is an essential part of the assessment process. It provides the public with the opportunity to consider the effects on the environment of the proposed development. It is common for developers and project proponents to withhold important information and merely present selected facts in order to achieve decisions in their favour or avoid criticism after decisions are made (Stone, 2002). According to Sidaway (2005), the information is often presented in a highly technical manner to a non-specialist public, which has the same value as providing no information at all. This is particularly relevant when providing information to vulnerable local communities and indigenous people.

Assessing public participation in China's environmental assessment regime, Zhao (2010) noted that public access to information about a project's EIA is limited. Limited access to information was seen as a constraint to effective public participation in the environmental assessment and decision-making process. Likewise, Haklay (2003) established that the public view environmental information in a holistic way. Most participants in the study wanted to see

environmental information as part of a larger cumulative picture of the environment. Furthermore, many were interested in environmental information as part of their general information consumption. In summary, technical information gives power to some actors over communities. There is a need to present environmental information in ways that are understandable to the general public.

### **3.3.3 Social power**

Social power is defined as the potential of the public to influence the direction of policy (Bargh & Lee-Chai, 2001). Societies can influence planning processes that determine resource allocation, coordination, alliance formation and negotiation (Pereira et al., 2016). According to Haugaard (2003), social power provides added capacity for action, which the actors gain from society through the existence of social order. It can be used as a tool to exert influence over other actors and bring a change in the direction of policy. Social power and social influence are thought to be distinct in the literature. Although social power is potential, social influence is an effect or an actual change in the beliefs, attitudes, behaviour or emotions of someone because of the actions or presence of another. The following sections discuss these concepts in detail.

#### **(a) Citizen power**

Citizen power means genuine partnership and the involvement of people in the decision-making process. In this process, power is redistributed through negotiations between citizens and decision-makers (Glucker et al., 2013; Arnstein, 1969). According to Arnstein (1969), citizen power lies in meaningful citizen participation in the planning process. She analysed citizens' power in terms of 'a ladder of citizen participation' ranging from low to high power:

1. *Manipulation*: placing citizens on advisory committees for the purpose of 'educating' them or gaining their support.
2. *Therapy*: trying to change citizens' beliefs, attitudes or values rather than analysing and changing the social conditions.
3. *Informing*: giving information to citizens but not requesting or listening to their points of view.
4. *Consultation*: asking citizens' opinions but not making a commitment to act on them.
5. *Placation*: placing a few citizens on committees or boards that have limited influence over policies and practices.

6. *Partnership*: sharing decision-making power with citizens.
7. *Delegated power*: delegating some decision-making power to citizens.
8. *Citizen control*: citizens have considerable independent power over decisions.

Arnstein argued that participation without redistribution of power is a meaningless exercise. It only allows powerful decision-makers to claim that all the options were considered. She advocated that people should refrain themselves from 'lower' forms of participation to obtain maximum power over decisions. However, authors such as O'Faircheallaigh (2010) and Devlin & Yap (2008) do not share this notion and argue that organised communities and individuals might successively increase their influence over decision-making through informal means of participation. In this regard, Devlin & Yap (2008) highlight the importance of informal participation in the context of environmental assessment as a means to open up the decision-making process:

Even quite closed and technocratic EA processes can be broken open if the public becomes aware of the project and begins to mobilize against it (Devlin & Yap, p. 19).

In several cases, informal public participation such as public protests, media campaigns and legal petitions have resulted in the revision of the environmental assessment procedure and repeal of the final decision. In Costa Rica, for instance, extensive public protest led to the shutdown of a gold mine in the province of Alajuela. The 55-ha mine, owned by a Canadian mining company, had previously gone through an environmental assessment process and obtained a permit. The protests also resulted in a complete ban on open-pit mineral mining in the country (Glucker et al., 2013). Similarly, Devlin & Yap (2008) cited examples from different parts of the world, including South Africa, Brazil, Taiwan and the Philippines, where formally approved large-scale development projects were abandoned because of opposition by local groups. Clarke & Harvey (2008) likewise reported that informal public participation has been influential in decision-making regarding infrastructure developments in South Australia and noted that 'the number of EIAs that have invoked informal participatory action is an indication that formal mechanisms are not as effective as they should be' (p. 1).

Because of the diversity of interests between citizens and project proponents and among citizens, conflicts are inevitable, especially in large-scale infrastructure projects (Awakul & Ogunlana, 2002; Olsson, 2009; Fuller, 2011). In this situation, public participation is supposed

to provide a mechanism for resolving such conflicts before the final decisions are made. From this viewpoint, the purpose of public participation in environmental assessment is to provide an opportunity for these opposing interests to pursue their desired outcomes and to resolve conflicts among them. A 'representative pluralist' approach takes the view that the role of environmental assessment is not just to generate information on the distribution of costs and benefits for decision-makers. Instead, environmental assessment provides a forum through which conflicts are resolved and the winners and losers are decided through a contest of competing interests (O'Faircheallaigh, 2010). The proponent represents one such interest and will push for rapid development of the project at least possible cost, whereas other interests (for instance environmental groups) will push for different outcomes. Hence, environmental assessment provides an arena for the power struggle between actors with different interests.

Finsterbusch (1995) argued that impact assessment is not an instrument for the revolution of social institutions to equalize power. Gagnon (1995) sees impact assessment as one of the most important and useful tools for empowering local communities to exercise increased control over their own territory, social setting and future development. Likewise, Vanclay (2003) argued that the role of effects assessment encompasses empowerment of local people and enhancing the position of disadvantaged or marginalised members of the community. This has a strong influence on the response of decision-makers, existing developers and other interested parties to marginalised groups that mobilise and push for change. It is unlikely that those who hold power will yield gracefully to groups demanding a share of it.

Another argument is that participation in infrastructure planning and decision-making is of value in its own right (Fuller, 2011). People cannot develop their full potential as citizens unless they are involved in decisions affecting their future (O'Faircheallaigh, 2010; Hasan et al., 2018). From this perspective, the environmental assessment process helps in educating people about the social and environmental consequences of infrastructure development and also provides them with an opportunity to exercise their power as citizens. The capacity of an environmental assessment to serve as an arena for personal development and a focus for exercising citizenship is diminished if the process allocates decision-making power solely to project developers and government officials and/or ministers. A critical factor involves how decision-making power is shared between government officials, either appointed or elected, and the citizens.

### **(b) Referent power**

Referent power (the power of social credibility) is the ability of individuals to influence others by building social credibility (Pereira et al., 2016; French & Raven, 1959). This power is held by someone because of their capacity to inspire and persuade people through well-developed interpersonal skills. A person may be admired because of specific personal attributes such as honesty, integrity and trustworthiness; this admiration creates the opportunity for social influence. In this case, the person under power gains satisfaction from being an accepted follower. Those who possess referent power are often distinct from their peers and respected by their followers. Referent social power is therefore directly proportional to the strength of the admiration held by the follower (Kudisch et al., 1995; Wainwright 2015).

For some scholars, referent power is the same as the charisma of an individual (see, for example, Griffin, 1990; Davis & Newstrom, 1989). Both referent power and an individual's charisma depend on interpersonal attraction and appeal. A follower submits to a charismatic leader because the follower identifies with the leader's attributes, thus increasing the leader's charisma or referent power. Therefore, in the literature on social power, these terms are sometimes used interchangeably (Kudisch et al., 1995). Other researchers have suggested that charisma can be thought of as a combination of French and Raven's (1959) referent and expert power (Halpert, 1990; Landy & Trumbo, 1980). These researchers suggested that along with referent power, an individual must also exhibit a certain level of expertise to be considered charismatic. By combining the use of referent and expert power, one can display a much stronger base of power than referent or expert power alone (Kudisch et al., 1995; Landy & Trumbo, 1980).

Wainwright (2015) analysed the influence of social power on negotiations among different groups and individuals involved in environmental decision-making in Australia. As an example, the study considered the case of a large foreign-owned ship, which sought permission to conduct commercial fishing in Australian waters in 2012. Initially, the government granted permission and the ship arrived in Australia in mid-2012. However, after a strong campaign by various environmental groups to ban the ship from fishing in Australian waters, the government asked the ship to leave. The results of the study show that the stakeholders involved in overturning this decision drew power through their reverence by the public (referent power). According to the study, the environmental non-governmental organisation (NGO) Greenpeace

was able to draw on the hearts and minds of the Australian public, largely through an emotive media campaign against the potential environmental impacts of the proposed large-scale fishing. The political party Tasmanian Greens primarily held referent power during the negotiations. This power was derived from their strong identification and association with the Tasmanian public and their reputation for drawing on people's hearts and minds to campaign against the likely environmental damage of commercial fishing. Likewise, representing recreational fishers, RecFish Australia evoked the emotive angle of a foreign fishing vessel diminishing the opportunity for everyday Australians to participate in the sport of recreational fishing.

An essential part of referent power is the notion of identification of one group with another (Pereira et al., 2016; French & Raven, 1959). The stronger the identification of a target group, the greater the referent power of the central actor. This kind of referent power is based on the social status, which is defined as an actor's social prominence and respect (Anderson et al., 2001). The referent power that an actor exerts over a target is the function of the actor's status as recognised by the target (Pereira et al., 2016). In this case, many common Australians could relate to the importance of recreational fishing, thus increasing the referent power of RecFish to influence the government's decision.

In another study, Lyngstad (2017) analysed the effect of different types of social power in physical education. The study determines how a teacher can potentially instil attitudes in the students through referent power. The teacher, with their values, personality and character, has an impact on the students' attitude towards physical activity and exercise. The study showed that teachers could motivate their students by passing on the importance of exercise through displaying their own active lifestyle, which goes beyond teaching itself. The type of referent power demonstrated in this work depends on interpersonal attraction and the liking that one individual has for another (Kudisch et al., 1995). The strength of the referent power in such a situation is directly proportional to how well the targeted likes the motivating agent (Pereira et al., 2016).

### **3.4 The power dynamics in large-scale infrastructure projects**

Planning and making decisions about infrastructure projects are political acts that exhibit different types of power. The decisions are made politically (Flyvbjerg, 2005; Lipponen et al.,

2017; Hall, 1982) and are subject to political contest and disruption (Flyvbjerg et al., 2003; Altshuler & Luberoff, 2004; Olsson, 2009). Because the planning process is time-consuming, uncertainty arises at different stages. For example, the changing nature of the economy, social values and the management structure develops complexity in these projects. Moreover, large-scale projects are subject to regulatory security under different frameworks and governance structures. These structures are devised on a rational planning framework and provides opportunities to different actors and organisations to influence the process and exercise power.

Despite the differences in the context and type of mega-projects, several sets of stages are common to all projects. These are: problem identification, agenda setting, alternative selections, weighing the evidence and project approval/disapproval. These stages are overlapping, simultaneous or, at times, reversed. Nonetheless, observing these various stages of decision-making can help us to understand where and how politics enter the process (Arts & Verschuren, 1999; Catarelli & Flyvbjerg, 2015) and which types of power influence the process.

*Problem definition* in infrastructure projects simply means identifying a need or gap in the existing infrastructure. Perceptions of what the gap is can vary significantly from analysis to analysis and from actor to actor. For example, projects could be planned to enhance traffic flows through building new motorways, provide new irrigation water through dams or to enhance business opportunities through a new shopping complex in the city centre. Therefore, government agencies, ministries and private sectors promote different kinds of project. This stage is one of the most important steps in the planning process that defines the direction of the whole project.

*Agenda setting* is the second stage after problem identification. When someone identifies the need for power, telecommunications, provision of water, disposal of waste or transport infrastructure, they must develop a business case or proposal. Depending on the project, this stage explores different steps for formulating and implementing the policy or project. Generally, we identify the stakeholders that have to be consulted formally and informally to develop the proposal. In terms of formal stakeholders, national ministries, regional council and city councils are important, whereas a list of developers and community groups are identified as semi-formal or informal stakeholders. Projects are more likely to get on the agenda when

they have powerful economic or political proponents, such as supportive party platforms, lobbies or business groups (Lipponen et al., 2017; Altshuler & Luberoff, 2003).

*Alternative selection* involves identifying and evaluating a range of potential choices in a way that facilitates decision-making. The evaluation process may include refining alternatives to develop the final option. For instance, a variety of routes or different modes of transport might be chosen to address a transportation problem. Competent authorities, planning agencies or independent consultants conduct studies based on criteria that are deemed to be relevant. The results of these studies are then delivered to the platform responsible for project decisions.

These planning and decision-making stages are informed by the political and institutional environment, contextual realities and the social culture of a state or region. The political and institutional environment comprises political, structural and regulatory factors influencing the future of a project. This includes macro-level factors such as the number of institutional levels a project is embedded in, the type of governmental system (e.g. federal systems have more political layers than centralised systems) and the structure of decision-making institutions. The political context influences the choices made throughout the decision-making process in two main ways. First, the political culture of a state affects project selection by creating incentives or disincentives for certain types of project (irrigation schemes vs. motorways) or in favour of certain region (urban vs. rural areas). Second, the political context also accounts for governance or regulatory regimes, which include power devolution, privatisation, and fragmentation trends. Where these dynamics are more advanced or complex, infrastructure investment decisions become more politicized because of the increased number of decision points involved (Lipponen et al., 2017; Steele et al., 2017).

The frequent changes that occur in the political composition of a government may further complicate the decision-making process (Priemus, 2010). As the entire process, from proposal to implementation, takes years or even decades, most large-scale projects are confronted with government elections and shifts in the balance of political power at national, regional and local levels. These complexities may increase because of the geographic extent of large-scale projects. Hence, the longer the decision-making and execution time of a project, and the more jurisdictions it covers, the more political hurdles must be overcome. Likewise, some projects are so politically driven that they are used as stakes during elections and the formation of

alliances and coalitions. This may happen not only at central or national levels but also at regional and local levels (Flyvbjerg et al., 2003; Altshuler & Luberoﬀ, 2004).

Outside the regular political process, infrastructure projects attract a wide range of potential proponents and opponents (Fuller, 2011; Olsson, 2009). Proponents may include businesses, farmers, planners, neighbourhood groups, unions and lobby groups like the construction or manufacturing industries. Some groups may combine their eﬀorts into coalitions that push for or against the project. These actors have direct and indirect ways to influence the planning and decision-making process and may be loosely taken together as interest groups. The central idea of interest groups is to bend decisions in their favour by organising like-minded individuals and groups and providing information to the decision-makers at every stage of a proposed project.

Project opponents are another set of interest groups. Opposition groups may include environmental groups, neighbourhood associations or other NGOs working for civil or human rights. Project opposition may be directed at the type of project, the chosen alternative or the project's social or environmental impacts. The motivation to oppose a project can range from personal interests, like not in my backyard (NIMBY) concerns, to public interests, such as environmental concerns. Altshuler & Luberoﬀ (2003) identified local and neighbourhood opposition to projects as an important factor in decision-making. It may not matter how broad the pro-project coalition is, 'proposals rarely proceeded to implementation if they imposed more than trivial costs on neighbourhoods or the natural environment' (Altshuler and Luberoﬀ, 2003, p. 258). They call this the 'do no harm paradigm'. In other words, they detected a high potential for project opposition in cases where costs are imposed on the local environment. As a result, mitigation and oﬀsetting measures have become very common for most projects, driving up the costs (Flyvbjerg et al., 2003; Altshuler & Luberoﬀ, 2003).

Since proper institutional or formal access points may be lacking, proponents and opponents may convince their political representatives to raise their concerns regarding the socio-economic or environmental impacts of a proposed project on political forums. Alternately, interest groups may hold demonstrations to ensure that their concerns are considered by the project planners and decision-makers. Popular protests have led governments to adopt rules that have greatly constrained public investment in certain kinds of projects, making the decision-making and implementation of such projects more diﬃcult, time-consuming and

costly (Atif et al., 2014; Altshuler & Luberoﬀ, 2003). In short, actor coalitions and interest groups have an influence on the political process in general and large-scale project decisions specifically; however, this influence is not evenly distributed. Their degree of influence varies according to the extent of the coalitions they are able to form.

### **3.5 Theoretical framework**

This section sums up the above debate and proposes a theoretical framework for the case study investigation. This section identifies the actors that hold political, technical and social power in large-scale infrastructure projects.

#### **a) Political power**

The following actors are important for investigating political power:

*Politicians:* Large-scale projects contribute to costs and distribute benefits. Therefore, these projects are a legitimate focus of political debate in liberal democratic societies (Beattie, 1995). Selecting these projects often involves making trade-oﬀs that try to integrate economic, environmental and social aspects (Kiker et al., 2005). Regardless of these eﬀorts, such trade-oﬀs fail to satisfy one or more actors and the project becomes politicised (Cashmore et al., 2010; Beattie, 1995). Decision-making prioritises the social, financial or environmental aspects of a project, depending on the context and overall purpose of the project. However, all these priorities are in the context of public interest. However, public interest is defined by political actors. Richardson (2005) notes that political support makes a project feasible in spite of engineering factors that were presented publicly. Another manipulation risk occurs when national, regional and local governments from various political parties participate in an environmental impact assessment process. Although general interest may prevail, there is still a risk of political attacks at the expense of the environmental impact assessment. It is also important to note that the boundaries between environmental benefits and political interests are unclear. Political influence is usually associated with the government in charge, but opposition parties may also use the predicted environmental eﬀects of a plan or project to attack politically or to improve their image.

#### **b) Technical power**

The following actors are important for investigating technical power:

*Experts/Consultants:* Environmental assessment is a process based on predictions (Glasson et al., 2012) and anticipatory judgments about the foreseeable impacts; it is not a pure science (Beattie, 1995) but an art and a science (Kennedy, 1988), or an applied or civic science (Cashmore, 2004). Predictions depend on the practitioners' experience and expertise, which may lead to intended or unintended professional bias. Project developers are responsible for drafting the assessment reports, directly or through environmental consultants. Consequently, the consultants work for the developers, which is a source of concern about independence of the assessment reports (Williams and Dupuy, 2017). The risk of influence depends on the pressure imposed by the developers and the consultants' professionalism; to minimise the developers' influence, the consultants should apply strict ethical standards (Mostert, 1996), such as those proposed by the IAIA (2009).

*Scientists and Experts:* Experts in various fields are engaged by both project proponents and opponents. Though the role of experts is essential in the assessment of environmental effects, the 'experts know the best' paradigm has been losing credibility in academic circles (Bond et al., 2004). Expert credibility does not depend solely on the accuracy of their predictions but also on the acceptability of the project (Kontic, 2000). Thus if the experts' opinion is in consensus with popular interests, their credibility is considered to be high.

*Project developers:* Developers promote projects and are certainly interested in executing these projects. When these projects are subject to an environmental assessment, the first step for successful development is to obtain a positive resolution. Consequently, developers have a personal interest in favourable assessment reports. Developers carry out projects and their assessment, so there is a risk that developers may influence and manipulate the environmental assessment. In addition, the role of environmental consultants is important, but their work is based on the project, so a manipulated project produces manipulated assessment reports, although consultants may not be aware of this.

Environmental practitioners generally believe that environmental assessment is beneficial for all stakeholders, but this message is not so obvious outside the practitioners community (Morrison-Saunders et al., 2015). For example, developers usually do not favour genuine public participation because they do not see any positive outcomes from public participation

(Glasson et al., 2012); as a result, they are likely to keep the data confidential or not share the information that may be controversial.

**c) Social power**

The following actors are important for investigating social power:

*Environmental groups:* Environmental groups have an interest in environmental conservation. For this purpose, they advocate environmentally sustainable alternatives at different stages of planning and decision-making (Jehong et al., 2004). They influence infrastructure projects by providing information to both decision-makers and citizens. This information is obtained through their research to facilitate improve understanding of the environmental effects of a project. More often, environmental organisations also act as pressure groups to ensure that environmental information is optimally incorporated in the project's planning and decision-making process.

*Affected or concerned public:* As discussed earlier in this chapter, public participation is a fundamental factor in environmental planning and decision-making. However, there are many types of public, each one with different views (Glasson et al., 2012) that may influence decisions. Most scholars (see, for example, Glucker et al., 2003; Petts, 2009; Hughes, 1998) also differentiate between the public and the concerned public. The first group is all society, whereas the second includes the people affected or likely to be affected or those with an interest in the environmental decisions of a project. It is possible to achieve social mobilization if there is a leader or pressure group preparing collective allegations. A lack of public participation resulting from passive attitudes, low capacity, lack of time or low technical, educational or financial resources (Wiklund, 2011; Glasson et al., 2012) may allow mobilised groups to monopolise the public response, although they may not represent the majority opinion. Strong support for or opposition to a project may not necessarily imply that it is environmentally or socially preferable, nor that confirms widespread social acceptance or rejection. Rather, it suggests that some lobbies and groups for or against the project are more mobilized than the rest of the population. This mobilization may protect general or private interests (Chi et al., 2013) and may be objective or biased, or at times manipulated. However, it cannot be an excuse to reduce public participation. On the contrary, greater public involvement diminishes the risk of manipulation from cooperatives with private interests.

Institutions shape large-scale infrastructure projects through highly complex combinations of factors that include the features of political regimes, the regulatory framework, and the role and flow of resources. These factors provide a context for actioning or opposing a project. If this context is studied carefully, it will help us to understand why decision-makers make specific choices and narratives. The objective of this research is to explore how these factors influence large-scale infrastructure projects and exert their power. Therefore, this research will explore the location and types of power and how that power has been exercised to promote or hinder large-scale infrastructure projects by exploring three secondary research questions (see Figure 3.1):

1. The research aims to examine political power by considering how institutional relationships, power and finance are influential in large-scale infrastructure projects.
2. The research aims to examine technical power by considering which methods are used to analyse environmental problems and present solutions in large-scale infrastructure projects.
3. The research aims to examine social power by considering how environmental problems are perceived (positively or negatively) by the local communities affected by large-scale infrastructure projects.

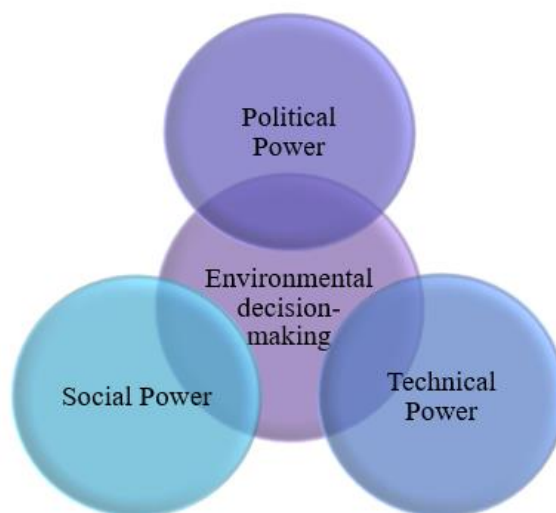


Figure 3.1: Theoretical framework

This theoretical framework can shed light on the primary research question proposed in Chapter 1. However, the theoretical framework used to addressing the study's objectives should meet three conditions. First, it needs to be able to clarify the decision-making process of large-scale

infrastructure projects by considering the political–institutional relationships among local and central governmental organisations. Second, it needs to be able to elucidate how technical knowledge influences in the decision-making process. Third, the analysis must accept that large-scale projects may be perceived positively or negatively by the community. The complexity of these issues requires a methodological approach that can explain these variables in the context of large-scale infrastructure projects in New Zealand. This methodological approach is discussed in more detail in the next chapter.

## Chapter 4

# Research design

### 4.1 Introduction

‘Good research requires a good research design’ (Murray & Overton, 2003, p. 17). A good research design is important because it operationalises the conceptual or theoretical debate into a practice. A good research design includes an appropriate philosophy and methodology. This chapter describes the philosophical and methodological approaches to research design, defines the research process, sets the boundaries on the topic and explains the process of case study selection, data collection and data analysis for this research.

### 4.2 Philosophical and methodological approaches

The world of reality, also known as ontology, is often understood in different ways or perspectives. According to Murray and Overton (2003), ontology refers to theories about the nature of the world. Understandably, various assumptions exist that explain how people view reality (epistemology). Desai and Potter (2006) defined epistemology as theories of how we discover what is possible to know about the world. In this process of discovering reality, different research methodologies have to be applied. Research methodologies are defined as theories of how the world can be interpreted, whereas methods are sets of tools or techniques used for this task (Murray & Overton, 2003).

Research theories constitute the philosophy or assumptions of a study. Murray and Overton (2003) observed that research philosophy covers issues of ontology and epistemology, and thus to methodologies and methods of research. This means that the task of designing one’s research is simply about putting philosophy into practice and linking ways of exploring theoretical ideas. Scheyvens & Storey (2003) emphasised that it is important for the researcher to understand these theoretical issues before embarking on designing or selecting research methodologies and methods. Proper application of the research philosophy makes the design, practice and defence of the arguments easier (Murray & Overton, 2003). Therefore, the research philosophy of any particular research flows to the research design as the internal logic that weaves ontology, epistemology, methodology and methods of the research together (O’Leary, 2004; Punch, 2006). In practice, different social science researchers apply different philosophical approaches

in line with their theoretical inclinations. A researcher’s philosophical approach or perspective is the viewpoint or way of thinking about how knowledge can be extracted and constructed from reality (Desai & Potter, 2006; Punch, 2006). It is important to appreciate that the researcher’s viewpoint can be influenced by different worldviews on research.

The broad methodological approach adopted in any research is situated at the intersection of philosophical paradigms, research designs and specific methods (see Figure 4.1). According to Slife & Williams (1995) philosophical ideas mostly remain hidden in the research. However, Creswell (2014) argued that they influence the practice of the study and need to be clearly identified. Therefore, it is important that a researcher should explicitly acknowledge the larger philosophical ideas adopted for a particular study.

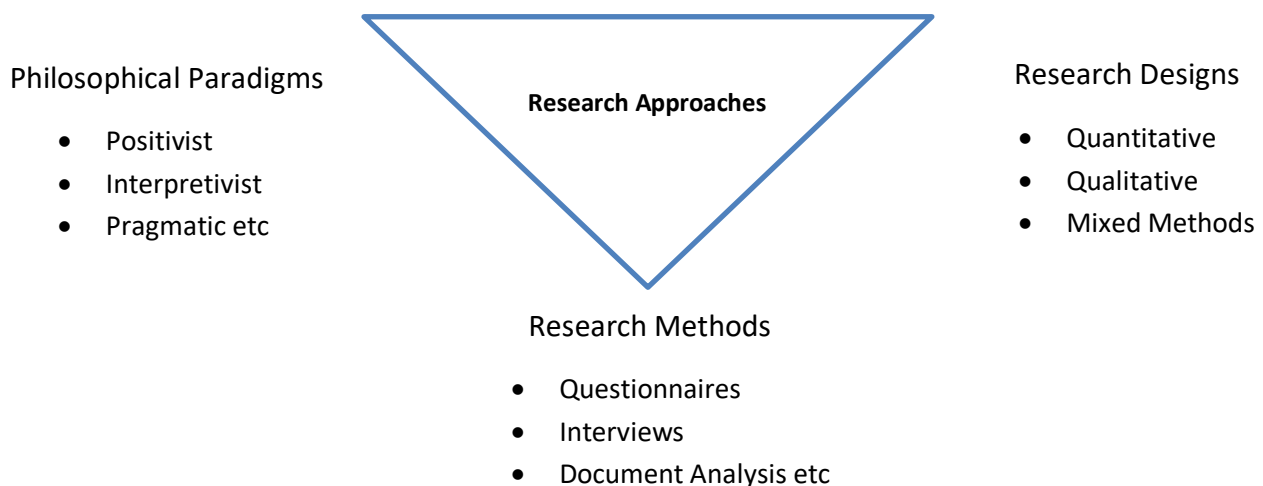


Figure 4.1 Research approaches—the interconnection of philosophical paradigms, research designs and methods (adapted from Creswell (2014)).

Several philosophies of science have influenced approaches to social research. One is the philosophical tradition of positivism, which promotes the methods of the natural sciences to the study of a social reality (Bryman, 2012). The positivist approach advocates that research must be value-free and the researcher should avoid any bias or influence on the outcomes. Seale (2004) argued that in the positivist approach the quality of a study is determined by three aspects: reliability, validity and replicability. Reliability refers to the consistency between the research methods and the results; validity concerns the truth-value of a project; and replicability refers to the extent to which repeating a project produces the same results again (see, for example, Kumar, 2011; Seale, 2004). Robson (2002) noted that positivism has been criticised on a number of grounds with particular reference to the notion of ‘value-free’ research. Can

social research be value-free? Can the researcher (or participant's) personal beliefs and feelings be left behind during the research?

In order to address these concerns, an alternative to the positivist approach emerged, known as interpretivism. The interpretivist approach is based on the view that the 'subject matter of the social sciences – people and their institutions – is fundamentally different from that of natural sciences' (Bryman, 2012, p. 28). Therefore, a different logic that reflects the distinctiveness of humans is needed. Interpretivist approaches to research view humans as socially constructed. They seek to understand the meaning of a social action in a given situation (Brownill, 2008). According to Creswell (2007), research studies that adhere to the interpretivist approach value human subjectivity and treat their research participants as subjects who create meanings from their own experience. According to this view, real-world research cannot be value-free.

Another philosophical tradition that underpins social research is known as pragmatism. A researcher with this approach accepts many different viewpoints and works to reconcile those perspectives through pluralistic means in order to address a problem (Tashakkori & Teddlie, 2010). Pragmatists are concerned with applications – what works – and solutions to problems and are 'not committed to any one system of philosophy and reality' (Creswell, 2012, p 11). In other words, the pragmatic approach involves using all available methods to understand and find solutions to the research problem and avoids philosophical debates about which is the best approach.

The current research aims to understand a social phenomenon in its specific context and has adopted pragmatism as the paradigm that underpins and informs the research design. Tashakkori & Teddlie (1998) suggest that pragmatism is a very practical and widely applied paradigm. It allows for the researcher's personal beliefs and values and is open to multiple methods, different worldviews and different assumptions (Creswell, 2014). Pragmatism has influenced the selection of methods for data collection and analysis, such as in the selection of the case study, identifying the potential participants for interviews and deciding how to conduct the interviews. The flexibility of pragmatism in terms of doing what works (Creswell, 2014) also helped by allowing some essential methodological changes throughout the research process.

This study focuses on the environmental assessment of a large infrastructure project in the domain of public policy. It seeks to explore how different types of power are exercised by the

actors involved in decision-making. The nature of this research can be best explored by using qualitative research into the selected case study. Kvale (2006) argued that qualitative research provides a powerful tool that captures the narrative of actors at different levels. The narratives are hard to capture in quantitative research (Overton & Diermen, 2014). Therefore, qualitative data are expected to explain the decision-making processes and power relations among multiple actors in the case study.

### **4.3 Case study approach**

This research uses a case study to develop insights into how power dynamics constrain and enable stakeholders' influence on the environmental assessment (EA) and decision-making process for large-scale infrastructure projects. Case studies are considered appropriate to gain an in-depth understanding of a contemporary phenomenon that the researcher has no control over and are especially suitable for answering the 'how' and 'why' questions in exploratory research (Yin, 2009). Numerous examples of the successful application of case studies to evaluate the influence of impact assessment on the decision-making process in different contexts and states can be found. For example, assessing the performance of social impact assessment in the context of environmental impact assessment Du Pissani & Sandham (2006) conducted a successful case study in South Africa. Bond et al. (2004) carried out research on public participation in the EA of nuclear power plant decommissioning projects in three European countries. Hansen et al. (2013) analysed the significance of structural power in strategic EA and decision-making for an aluminium production unit in Greenland as a case study.

A case study is crucial for uncovering the contextual details that are pertinent to the phenomenon under study (Wiebe et al., 2010; Yin 2014). The complexity of environmental decision-making requires an intensive analysis of the political contexts in which the decisions are made. Therefore, special emphasis needs to be given to the broader socio-political circumstances that influence the decision-making process. In this research, analysis of a single case study is preferred over examining multiple cases. A single case can provide an empirically rich, holistic account of specific phenomena (Bennett & Elman, 2006). A single case study can also be appropriate for understanding a context-specific phenomenon where the potential for generalisation may exist (Gerring, 2007).

### 4.3.1 Case study selection

In the first layer, this research focuses on the EA and decision-making of large infrastructure projects in New Zealand. In New Zealand, under the RMA, EA applies to all developmental projects for which resource consent is required, making it a central tool in the decision-making process (Wood, 2009). The administration of resource consent applications is principally the responsibility of territorial authorities and regional councils (Fookes, 2000; Wood, 2009). However, large-scale infrastructure project proposals, when called for by the Minister for the Environment, are administered by a central agency, the Environmental Protection Authority (EPA). These large-scale project proposals, under the RMA, are known as nationally significant proposals (NSPs). The Minister may refer NSPs to a board of inquiry or the Environment Court for a decision (Section 142, RMA). Subsequently, the EPA publicly notifies the Minister's direction and invites submissions on the proposal (Section 149C, RMA). Details of the NSPs, along with submissions, hearings, background information and decisions etc., are available on the EPA website ([www.epa.govt.nz](http://www.epa.govt.nz)). Hence, this website lists a number of these potential case studies. Many of these involve transport infrastructure and a few other NSPs include, for example, a prison and a proposal for farming King Salmon.

In the second layer, this research selected a large-scale infrastructure project for detailed investigation. The researcher selected a case that played a nationally significant role of a particular type (a water storage and irrigation project in this case) that was a relatively recently approved project. In this context, the RWSS was selected as a case study project. The RWSS is located in the Hawke's Bay region of New Zealand. The region is bounded on the east by the Pacific Ocean and on the west by the Ruahine and Kaweka Ranges. Hawke's Bay has seven major river systems, four major lakes and many minor rivers, streams, lakes and wetlands. Hawke's Bay has a generally dry and warm climate but the soils are fertile. This geography promotes a wide range of agricultural activities, including livestock farming, forestry, viticulture, horticulture, fruit growing and market gardening. These activities make the Hawke's Bay region increasingly more prone to water stress. Hawke's Bay went through a series of droughts over a 4-year period from 2006 to 2009, which negatively impacted agricultural production. Given the water scarcity issue, the RWSS was proposed in 2009 as a viable option for the future. The RWSS is one of the most politically contentious among recent infrastructure projects in the country. Taking the RWSS as a case study will help us to understand how different stakeholders influence the EA and decision-making process.

## **4.4 Data collection methods**

This research is predominantly qualitative. However, quantitative data were also collected through an online survey. Both primary and secondary sources were used for data collection. According to Kumar (2014), qualitative methods are characterised by flexibility and freedom, and typically enable the researcher to gain a greater depth of understanding of the case than the quantitative methods. Other social scientists (see, for example Sarantakos, 2005; Lapan et al., 2011) believe that ‘why’ and ‘how’ research questions do not require quantification but need more emphasis on the study of the phenomenon. Therefore, the qualitative research methodology is deemed more appropriate in this context. Despite its strengths, qualitative research methodology has some weaknesses, such as the subjectivity and validity and reliability of the data received (Petty et al., 2012; Sarantakos, 2005). However, to ensure rigour in any research, there should be methodological triangulation involving the collection of data through various means and from different sources as mentioned below.

### **4.4.1 Policy and planning documents**

The following documents available on the EPA and the council websites were critically analysed to determine how EA information was incorporated into the decision-making process.

- The applicant’s AEE report,
- The submissions received by the EPA,
- Transcripts and proceedings of public hearings,
- Expert evidence and conferencing,
- The Board of Inquiry (BOI) draft and final report and decisions.

Due to its political, socio-economic and environmental importance, there was significant local and also national media coverage of the proposed RWSS. These media reports were also analysed for insights into the use of EA information.

### **4.4.2 Electronic survey**

A survey questionnaire was developed (see Appendix II & III), seeking the opinions of various stakeholders involved in the Tukituki catchment proposal. The survey was divided into two sections. The first section sought the respondents’ overall view on the influence of different stakeholders on the outcomes of statutory decision-making process for large-scale infrastructure projects in New Zealand in general; the second section focused only on the Tukituki catchment proposal. At the end of the survey, respondents were asked to comment on

the role of EA in the statutory decision-making process in general and/or in the case of the RWSS. The online survey was conducted through the Massey University-supported electronic survey software package Qualtrics. The participants of the survey included expert witnesses, legal counsel, submitters, environmental consultants, Hawke's Bay Regional Council (HBRC) staff and elected members, and Hawke's Bay Regional Investment Company (HBRIC) board members. The survey was coded for analysis purpose.

#### **4.4.3 Ethical considerations**

Ethical considerations are regarded as the cornerstone of any reliable research (Sarantakos, 2005; Vallance, 2008). It involves the application of fundamental ethical principles to research in natural and social sciences. Because of the involvement of human participants, ethical issues in the social sciences are considered relatively more complicated than those in the natural sciences (Mertens & Ginsberg, 2009). Therefore, it is important to ensure that all necessary measures are taken to avoid any such circumstances that might pose a risk to the participants in the research.

Maylor and Blackmon (2005) suggests that researchers can ensure the well-being of their participants through following the golden ethical principle: do not do to others what you would not want them to do to you. Therefore, a researcher should ensure that all participants are treated with respect and fairness.

Massey University provides its staff and students with a comprehensive code of ethical conduct to ensure that research activities undertaken at the university adhere to the highest ethical standards. The document was thoroughly read by the researcher and the ethical considerations were discussed in detail with the supervisors. Following the Massey's online risk assessment form, the research was deemed to be low risk. Documentation was prepared for peer review and then submitted in accordance with the Massey University Human Ethics Committee (MUHEC) procedures (see Appendix I). The following were the key ethical considerations for this research.

*Voluntary participation:* Participants had the right to decide whether or not to participate. They also had the right to exit the survey or withdraw from participating at any time.

*Informed consent:* At the start of the survey, participants were provided with information about the survey, including an introduction to the researcher, a brief description of the project, an

explanation of how data will be gathered, stored and used, and the contact details of the researcher and supervisor.

*Freedom from harm:* The survey does not have any questions that would cause any physical, psychological, or social harm to the participants and no information will be used that would identify the participants. Data collected through the survey will only be used for the thesis and publications related to this research.

*Anonymity:* Participants were remained anonymous, as their names and email addresses were not included in the responses. The researcher did not know any particulars of the survey respondents. All data collected was stored in a password-protected computer. Table 8.1 only provides a coded breakdown of responses received from each category of the survey participants.

Moreover, the identification and citation of individuals in sections 7.1 and 7.2 Content analysis, is based on the data derived from the official website of the EPA New Zealand <https://www.epa.govt.nz/> . All the citations in the chapter are either collected from the evidence submitted to the board of inquiry or the BOI hearing transcripts publicly available on the EPA website. Furthermore, a referenced internet link is provided for each citation on the same page.

As the proposed infrastructure decision-making involved controversies, it was ensured that no research participant is harmed because of their views in favour or opposition of the project. Therefore, only publicly available names in the form of their submission were referred to in this thesis. Survey participants' names and organisations are kept confidential to ensure confidentiality.

## **4.5 Data Analysis**

The following methods are used for data analysis:

### **4.5.1 Document and policy analysis**

Policy and project documents were analysed to investigate the power dynamics in the case study. I analysed policies and project documents that are publicly available at the EPA and Hawke's Bay Regional Council (HBRC) websites<sup>3</sup>. Theorists in policy analysis refer to this

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<sup>3</sup> <https://www.hbrc.govt.nz/>  
<https://www.epa.govt.nz/database-search/rma-applications>

process as ‘the development and application of a variety of social-scientific insights to help resolve public problems via concrete policy interventions’ (Hajer, 2003, p. 181). Policy analysis consists of an examination of the policy contents developed in the political environment of a particular country (Hajer, 2003). Therefore, this research examines inputs made by various actors involved in the case study.

A computer-aided data analysis (CADA) programme (i.e. NVivo 11.0) was primarily used to record, store and organise the data retrieved from analysis of the documents. The software was also used as the analysis support tool. The data from the reviewed documents were loaded into NVivo. The data were then subjected to content analysis based on a coding technique. Content analysis is an approach to ‘the analysis of documents and texts that seeks to quantify content in terms of predetermined categories and in a systematic and replicable manner’ (Bryman, 2008, p. 275). In order to conduct content analysis, coding is an essential element, as it helps organise qualitative data, which is usually unstructured and difficult to deal with (Robson, 2002). A code is a symbol connected with the research question(s) assigned to part of a text to classify or categorise it. Unlike statistical analysis software such as SAS or Minitab, NVivo cannot analyse data itself, with the exception of a few simple tasks such as text search or word frequency analysis. Therefore, coded text had to be carefully reviewed and evaluated against the set of analytical criteria.

#### **(a) Analytical criteria**

To identify and formulate analytical criteria for this research, scholarly work on the effectiveness of EA in general and its role in the decision-making<sup>4</sup> process for approving infrastructure projects was reviewed. In the literature, this aspect is mainly discussed in terms of the substantive effectiveness of EA (e.g., Jay et al., 2007; Sadler, 1996; Cashmore et al., 2004). However, many scholars argue that effectiveness of an EA system and its role in the decision-making process is difficult to evaluate (Lekens, 2001; Cashmore et al., 2004, 2010; Wood, 2003; Wang et al., 2012; Retief et al., 2010). It is unlikely that a control is available against which to compare the role of EA in the decision-making process, and it is also not possible to predict the likely decision in the absence of EA. Hence, different scholars have

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<sup>4</sup> Decision-making in this document refers to the statutory decision-making process for approving proposed projects.

adopted different approaches and used different criteria to assess the role of EA in decision-making.

In his landmark research, 'International study of the effectiveness of EA', Sadler (1996) evaluated the influence of EA on the decision-making process by assessing how well the decision-makers were informed by the EA. Likewise, Leknes (2001) explored how the EA documents were used in the decision-making process for approving petroleum projects in Norway. Wang et al. (2012) used 13 indicators in their research and argued that a broader list of criteria is favoured over the limited number of criteria generally used in evaluation research, as this provides a better picture of the EA process. In a comparative review of EA systems in seven countries, Wood (2003) used 11 criteria to assess the role of EA in the decision-making process. Wood's criteria were later applied by other scholars in many different countries and contexts (e.g. Nadeem & Hameed, 2008; Panigrahi & Amirapu 2012; Makmor & Ismail, 2014). However, Fischer & Gazzola (2006) argued that most of the criteria developed for the assessment of EA and its influence on the decision-making process are based on the experiences and practices of a few countries, especially those from Europe. Hence, they believe that such criteria should be tailored to the specific system. Keeping in mind the research question for this study, a number of indicators were identified and a set of evaluation criteria was adapted to analyse the role of EA. The indicators used for examining each dimension of the EA system were further grouped into criteria clusters (Table 4.1). These indicators form the basis for the analysis in the results and discussion chapters.

The first cluster examines the legal provisions for EA in the statutory decision-making process under the New Zealand RMA (1991). Four indicators were used, covering the clarity and comprehensiveness of the legal provisions for EA. In the literature review, it was clear that implementation of the legal provisions for EA requires sufficient support from non-statutory guidance. Therefore, the guidance cluster included guidance on the terms of reference for conducting the EA process, preparing the EA report and public review of the report.

The next cluster assessed the quality and credibility of the EA process and the subsequent report prepared for the RWSS. Many scholars such as Sadler (1996) or Wood (2003) considers the level of assessment in the EA report to be the procedural effectiveness of the EA. However, following Jay et al. (2007), in this study, the level of assessment was taken as the substantive effectiveness determining the influence of EA on the decision-making process.

The literature clearly shows that the actual influence of EA on the decision-making process in terms of fostering environmental protection is difficult to evaluate. This is because a number of other factors, such as plans and regulations, are also considered alongside EA in addressing the environmental effects of a proposed development. Because of this difficulty many scholars have limited the influence of EA to ‘well-informed’ decision-making (e.g., van Doren et al., 2013; Heinma & Ponder, 2010; Wood, 1995; Sadler 1996). However, this study moves beyond the notion of well-informed decision-making and investigates how the decision-makers have incorporated the information provided to them through EA.

According to Wood (2002 p. 273) ‘EIA is not EIA without consultation and participation’. Hence, even a cursory glance into the EA literature (Roberts, 1998; Devlin & Yap, 2008; Lawrence, 2003; Morrison-Saunders & Early, 2008; O’Faircheallaigh, 2010; Glucker et al., 2013) reveals that public participation is considered an integral part of the EA process. Consultation and public participation are considered goals in themselves in project decision-making, and there is a consensus among various authors (Hartley & Wood, 2005; O’Faircheallaigh, 2010; Glucker, et al., 2013) that participation plays a vital role in effective EA. Hence, the level of public participation and consultation in conducting the EA and preparing the report was also assessed in evaluating the influence of EA on the decision-making process.

Some scholars (e.g. Bina et al., 2011; Marara et al., 2011; Nadeem & Hameed, 2008; Boyle 1998) have attributed the poor performance of EA in the decision-making process to the lack of transparency and accountability and political will. Therefore, these factors were also included in the analytical criteria.

**Table 4.1 Analytical criteria developed for the research**

Criteria Cluster	Description	Source (Reference)	Indicators <sup>5</sup> (assessment criteria)	Data Source
Legal provisions basis/	Clarity of legal provisions	Marara et al. (2011); Bina et al. (2011); Nadeem & Fischer (2011); Wood (2009); Sadler (1996)	The EA system is based on clear and specific legal provisions	Documents: RMA, Ministry for the Environment (MfE) guide to preparing basic AEE, Submissions
	A specific requirement to cover environmentally significant proposals and consideration of alternatives		The environmental and social effects of all significant actions are assessed	
	Responsibility and accountability		Alternative activities, methods and locations are considered during the assessment	
Guidance	Guidance on the application of procedures	Wang et al. (2012); Noble (2009); Wood (2003); Sadler (1996)	Terms of Reference (ToR) for conducting the EA and preparing the report	
	Extent to which the EA meets the accepted principles such as access to information		Public review of the EA report	
EA process	Technical and scientific soundness (reliability) of scoping in the EA report	Wang et al. (2012); Noble (2009); Cashmore (2004); Wood et al. (2000)	Credibility of the identification and prediction of effects	Documents: AEE, submissions, feasibility reports
	Adequate level of assessment		Alternative methods and locations are considered in conducting the EA	
Decision-making	EA ensures environmental protection	Van Doren et al., (2013); Barker & Jones (2013); Jay et al. (2007); Leknes (2001); Glasson (1999)	Findings of the EA influence the final decision (e.g. framing the conditions attached to the consent)	Documents: BOI draft decisions and comments, final decision, AEE
	Evident linkages between EA and the decision-making process		To what extent and how decision-makers incorporated the EA report as a reference document in making the decision	
Public participation and consultation	Public participation and consultation within the EA and during the decision-making process	Marara et al. (2011); O'Faircheallaigh (2010); Hartley & Wood (2005); IAIA (2006)	Consultation and participation took place in conducting the EA and after the publication of the assessment report	Documents: AEE report, submissions Interviews with submitters, planners

<sup>5</sup> These indicators form the basis for the analysis in the results and discussion chapters.

			Feedback from the submissions referring to the EA is incorporated in the decision-making process	
Accountability and transparency	Transparency in the EA process	Bina et al. (2011); Wang et al. (2012); Tennoy et al. (2006)	The EA process and the subsequent report are subjected to independent checks and verification	Documents: submissions, RMA; Interviews with EA experts, planners and an Environment Court (EC) judge (retired)
	Mechanism to ensure impartiality		The decision-making process is transparent and the various stages are made clear to all	
Political support		Cashmore (2013); Richardson (2005)	Political support is available for incorporating the findings of the EA in the decision-making process	Documents: media reports; Interviews with local politicians

## **4.6 Methodological limitations**

A single case study methodology can provide valuable insights and in-depth understanding of a particular phenomenon, however, there are some important limitations needed to be acknowledged. It is often contested that qualitative case study research is limited because it involves a specific context or unique case, making it challenging to generalise findings to broader populations or situations (Hedström, 2005). However, interpretative case studies tend to be generalisable in relation to theoretical propositions rather than populations at large, as the study aims for analytical generalisation instead of statistical generalisation. Analytical generalisation based on a single case study does not aim to represent a sample, but rather generates results that are generalisable to a conceptual framework about the phenomenon under investigation (Yin, 2014; Wiebe et al., 2010). The results of a single case study are also often contested for its validity and reliability, such concerns can be offset by retrieving data from multiple sources and through multiple methods.

To gain an in-depth understanding of the case, semi-structured interviews were initially planned as part of the research. Semi-structured interviews are preferred over standardized questionnaires as they provide flexibility and in-depth in the research and are free from rigid boundaries allowing the researcher and interviewees to explore themes as they come up (Kumar, 2014; Mason, 2002). Such flexibility works well especially in case study research, allowing the researcher to further probe the interviewee if the answer did not sufficiently address the question (Leeuw, 2008). The purpose of such interviews is gaining rich information from a detailed insight in to the research problem from the respondent's perspective (Hennink et al., 2010).

A list potential participant for the interviews, identified by the researcher, was shared with the supervisors. The potential participants included; Legal counsel and expert witnesses for applicants and submitters, Individual submitters who appeared at the hearing by the BOI, Hawke's Bay Regional Council (HBRC) elected members, HBRC planners and executive team members who participated in the hearing.

At the time of the research, RWSS was one the most politically controversial proposed infrastructure projects in the country. Looking at the contentious nature of the project, the supervisors were concerned that the potential participants may not be willing to be interviewed or openly express their views in such contentious environment. Upon deeper consultation with

the supervisors and other faculty members in the school, the researcher reached to the conclusion that interviews may not provide the required information in such contentious environment. Hence, to protect the anonymity of the research respondents it was decided that an electronic survey will be conducted instead one-on-one interviews. Moreover, submission analysis and content analysis of the BOI proceedings covered a range of concerned stakeholders and their perspectives to address the lack of interview data.

#### **4.7 Summary**

This chapter has outlined the research approach and methods adopted in this study to address the research question, aim and objectives. As this research aims to analyse how different stakeholders' views of environmental effects are valued in the statutory decision-making for large-scale infrastructure projects, a case study approach was selected to provide an in-depth understanding of the phenomenon. The combination of policy documents and an online survey allowed the collection of complementary data, with the survey being used to explore the insights obtained and questions generated from the document and content analyses.

## Chapter 5

# **Environmental decision-making in New Zealand – A critical review**

### **5.1 Introduction**

This chapter outlines the role of EA in the statutory decision-making process in New Zealand. The chapter begins with a brief note on the roots of EA in New Zealand. The next section deals with the practice of EA in its early years in New Zealand. The third section describes the major reforms that took place in the 1980s to reshape environmental management and legislation in the country. The final section explains the decision-making process under the RMA 1991 and the various amendments made to the Act over the years.

### **5.2 The origins of EA in New Zealand**

In the late 1960s, environmental awareness was increasing throughout the world, including in New Zealand. Environmental awareness was heightened by public concerns about the proposal to raise the level of Lake Manapouri in the South Island. It was proposed to raise the level of the lake by 30 m to generate electricity for an aluminium smelter. This proposal was contested and the Save Manapouri campaign was launched in 1969. This campaign was continued until 1972 when the National Party lost the general election. The Save Manapouri campaign is generally regarded as New Zealand's first national environmental campaign influencing the development of environmental policy and resource management legislation in the country (Whittle, 2013; Bain, 2008). In the following years, several other campaigns and protests were recorded, such as the 1974 Save Aramoana protest against the proposal to build a second aluminium smelter at the mouth of the Otago Harbour. Thousands of people also protested against the associated proposals to build a dam on the Clutha River at Clyde.

#### **5.2.1 The introduction of formal EA in New Zealand**

The Labour Government introduced the Environmental Protection and Enhancement Procedures (EP&EP) in 1973 to ensure a system for reviewing the EA of proposed projects and policies in the country. According to Morgan (1983), the EA systems of several countries were studied, including the US National Environmental Policy Act (NEPA) 1969 and Canadian legislation, before the formulation of New Zealand's EP&EP. The National Government

created the post of the Minister for the Environment early in 1972. In the same year, the Commission for the Environment (CfE) was established. The EP&EP became operational through a Cabinet minute in 1974, although these environmental procedures had no statutory base. These procedures were developed mainly for the assessment of central government operations and policies (Dixon, 1993; Fookes, 2000).

Two main components of the EA system are prescribed in the EP&EP. Firstly, an EIA was required before the beginning of a project. According to the procedures, assessment ‘...must begin at the inception of a proposal, when there is a real choice between various courses of action including the alternative of doing nothing’ (CfE 1973, para 3). At this stage, it required a wide-ranging review of the likely environmental consequences of the proposed actions, including the possibility of taking measures to improve the environment or minimise the damage. The purpose of this assessment was to decide whether the potential consequences of the proposed actions were significant or not. In the case of non significant possible impacts, the process of assessment would continue until the completion of the project (CfE 1973: para 3).

Secondly, if the initial assessment suggested that the potential consequences of the proposed project were significant, then a detailed Environmental Impact Report (EIR) had to be submitted to the relevant government department. The Minister for the Environment was responsible for authorising the project and for forwarding the report to the CfE for ‘auditing’. Auditing involved gathering public submissions on the report and the report being reviewed by the Commission. Finally, the Commission reported the key findings of the review and the core issues raised by the public. The EIR and the audit had to be considered by the appropriate decision-making department or the Minister, along with the original proposal, for reaching an appropriate decision (CfE, 1973).

The EA system introduced in New Zealand through the EP&EP was different in several aspects from those instituted by, for example, the NEPA in the United States. The EP&EP lacked a statutory base and provided no opportunity for public participation until the development of a formal EIR. However, the EIR was open to the public for submissions by any interested individuals or group. Despite the procedural differences, as pointed out by Morgan (1983), the conceptual basis of the EA system described in the EP&EP was quite close to the NEPA. Both the NEPA and EP&EP called for EAs at the earliest possible stage of the planning process.

Similarly, both encouraged public involvement in the decision-making process, at one phase or another.

After operating for several years, the EP&EP was criticised by many academics, developers and activists. They criticised it for overlapping and duplicating the existing planning framework, including various statutory procedures like the Water and Soil Conservation Act 1967, thus creating confusion (Mills, 1979). According to Williams (1980), the EP&EP also opened ways for vocal minority groups to interfere in planning proposals, causing delays and uncertainties (Williams, 1980). The EP&EP was also criticised by those who supported the concept of EA. The lack of a statutory basis, the discretionary nature of the EP&EP and its non-applicability to the activities of local authorities disappointed many (Lello, 1976). It was noted that no proposals with an inadequate or highly critical audit from the commission were stopped or rejected (Mills, 1979).

### **5.2.2 The National Development Act 1979**

In the late 1970s and early 1980s, the National-led government promoted an economic strategy encouraging the development of indigenous energy resources and industrial activities based on those resources. This was called the ‘Think Big’ era. To foster development of new energy infrastructure and industries, the government sought to streamline the planning process for large-scale projects. In 1979, the National Development Act (NDA) 1979 was passed, which established a ‘fast-track’ special procedure for selected projects (Palmer, 2014).

The NDA marked a significant development in EA in New Zealand. Once the government had accepted a project proposal for fast-tracking, by virtue of its national economic importance, an EIR became a statutory requirement for that project under the NDA (Morgan, 1988). Subsequently, a timeframe was established, enabling the proposals to pass through the consent process within 15 months. However, this created the opportunity for individuals and groups to challenge the EIRs of those projects in court. In response, the government amended the Act in October 1981; in the following month, the CfE released the revised EP&EP. The amendments in the Act and the changes in the EP&EP focused on reducing the minimum requirements for the contents of an impact report. Other changes to the legislation and the EP&EP aimed to minimise the opportunities for the CfE and the public to discuss wider policy content regarding the major projects (Morgan, 1983), restricting the scope of the EIR and the audit, and

minimising the opportunities for the public and government agencies to participate in the EA process. Table 5.1 provides a chronology of the evolution of EA policy in New Zealand.

#### **5.2.4 Resource Management Law Reform**

The fourth Labour Government came into power in 1984. They undertook a major review of environmental administration, drawing on the 1981 Organization for Economic Cooperation and Development (OECD) review of environmental policies in New Zealand. In its review, the OECD concluded that New Zealand's approach towards environmental management was incremental and recommended a more integrated and better coordinated approach to dealing with environmental concerns in agriculture, energy, forestry and other economic development programmes (OECD, 1981). According to Taylor (1997), these recommendations influenced the government's subsequent decisions to restructure the central and local government and overhaul the environmental laws.

The Environment Act 1986 was passed and the CfE was replaced by three new central agencies: the Ministry for the Environment (MfE), the Parliamentary Commissioner for the Environment, and the Department of Conservation (Furuseth & Cocklin 1995). In December 1987, the government announced a comprehensive review of the legislation for natural resources and initiated the Resource Management Law Reform (RMLR). Reforms in resource legislation were influenced by and linked to the concurrent local government reforms (Memon, 1993). Along with reforms in resource use law, the reorganisation of local government resulted in new structural arrangements and functions for local and regional government units (Dixon, 1993).

Modifications in the institutional arrangements brought changes in the process and practice of EA. The complexity of issues, including combined or cumulative effects and social and cultural issues, was recognized more in documentation produced during the EA process. According to Wells and Fookes (1988), less emphasis was placed on the production of formal EIRs and more attention was given to the preparation of EIAs, integrating the process and practice of EA within the existing statutory planning system. Much of this is reflected in the RMA 1991.

The political influences of the 1980s gradually changed the face of government, pushing for efficiency and accountability, while the country was moving away from an interventionist economy to a more market-led one:

The RMLR process provided an arena for contesting very different approaches to environmental management. The Treasury officials championed a market-led focus, emphasising value of market signalled cost–benefit analysis while MfE staff advocated EIA. Many of the Cabinet papers prepared by the officials had alternative recommendations. A compromise was reached in the form of the RMA provisions for an assessment of environmental effects (AEE). Treasury sought cost–benefit analysis on policy documents, as seen in Section 32 of RMA, based on ensuring overall policy framework was market sensitive. (J. McNeill, personal communication)<sup>6</sup>.

The Resource Management Bill was introduced into Parliament by the Labour Government in December 1989. There was a lengthy Select Committee process and the Bill could not pass before the 1990 general election. The newly elected National Government amended some details of the Bill (Palmer, 2016) and passed it in 1991.

Table 5.1      Timeline of changes in the agencies responsible for environmental assessment  
in New Zealand

1972	Establishment of the Minister for the Environment Establishment of the Commission for the Environment
1973	Environmental Protection and Enhancement Procedures introduced through Cabinet
1974	Environmental Protection and Enhancement Procedures became operational
1979	National Development Act Passed
1981	Environmental Protection and Enhancement Procedures were revised National Development Act amended
1986	Commission for the Environment replaced with the Ministry for the Environment and the Parliamentary Commissioner for the Environment Environment Act passed National Development Act repealed
1991	Resource Management Act passed

### 5.3 Environmental decision-making in New Zealand

Environmental decision-making for resource use and development in New Zealand is governed mostly by the RMA 1991. The RMA is a holistic and integrated piece of legislation (Memon & Perkins, 2000) that, when enacted, repealed 78 statutes and regulations, notably the Water and Soil Conservation Act 1967 and the Town and Country Planning Act 1977 (When, 2002).

<sup>6</sup> Dr Jeff McNeill was involved with the Ministry for the Environment from 1986-1990 as Policy Analyst, Investigation officer and Secretary to the Minister for Environment, Parliamentary Services.

Before the enactment of the RMA, environmental law in New Zealand consisted of numerous pieces of legislation. Activities related to natural resources were managed on a sectoral approach. Different aspects of an activity were treated under different laws. A single proposed activity would involve rules under the Town and Country Planning Act 1977, the Clean Air Act 1972, the Water and Soil Conservation Act 1967 and several other laws. It was difficult to manage all of the environmental effects of a proposed activity. Therefore, the RMA was intended to bring greater coherence and to create a better decision-making process (Memon & Perkins, 2000).

The purpose of the RMA, according to its Section 5, is to promote the sustainable management of natural and physical resources. Sustainable management in the Act is defined as:

- (2) managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –
  - (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
  - (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
  - (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

This definition of sustainable management in the RMA does not equate to sustainable development, a commonly used term in environmental planning and management. It opened a debate on the variety of practical interpretations of the purpose of the RMA. The discussion on this topic can broadly be divided into two viewpoints. One view contends that decision-makers should manage the effects to ensure the protection of an environmental bottom line, whereas resource use and development itself is essentially market-led. The protection of biophysical rather than social and economic values are thus the core activity of territorial authorities and regional councils. The Minister for the Environment when the RMA was enacted, Hon. Simon Upton, favoured this view. Sustainability, according to him, entailed ‘ensuring economic activity is sustainable in a physical and ecological sense’ (Upton 1990).

An alternative standpoint, discussed by Grundy (1994), stresses that adopting sustainability as purpose has created the need for intervention. Grundy argues that market processes often

conflict with sustainable use of resources. According to this perspective, decision-makers under the RMA need to consider biophysical, social and economic values alongside each other. However, regardless of the different interpretations of sustainability, New Zealand was one of the first countries to institutionalise sustainability in its environmental legislation.

The RMA came at a time of significant local government reforms in the country, resulting in a three-tiered structure for governance comprising the central government, regional and territorial authorities (Ericksen et al., 2003). Known for its ‘do it yourself’ approach, the administration of the resource consent application in New Zealand is principally the responsibility of territorial authorities and regional councils (Wood, 1999). Thus, a large number of small-scale proposals are dealt with by the regional councils and territorial authorities without any involvement of the central government (Schijf, 2003; Morgan 2000).

### **5.3.1 The role of central government, regional councils and territorial authorities**

The RMA 1991 provides a range of instruments from local to the national level to promote the sustainable management of physical and natural resources (Figure 5.1). At the national level, the central government provides an overall direction to regional councils and local governments to prepare plans and policy statements through national environmental standards (Sections 43, 45, 46) and national policy statements (Section 62). This also ensures the consistency of policy and plans across the country. At the regional level, a regional policy statement setting out objectives and policies for the region is prepared (Section 62) to provide the basic direction for resource management in the region. In addition, every regional council should also prepare a regional plan (Section 67) and a regional coastal plan (if required) for the region; every territorial authority (City or District Council) is required to prepare a district plan (Section 75). Regional and district plans assist local councils to implement the provisions of the Act. Thus, regional and district plans form a vital part in the management of physical and natural resources in New Zealand.

#### **National policy statements and environmental standards**

The central government may make regulations under Sections 43 and 44 of the RMA, known as National Environmental Standards (NES). The NES prescribe different technical standards, methods and requirements for environmental matters. The purpose of these standards is to minimise environmental pollution and promote clean water, air and soil. Section 45 enables the Minister for the Environment to initiate the preparation of National Policy Statements

(NPS) defining objectives and policies for matters of national significance that are relevant to the sustainable management of natural resources. The Minister can recommend NPS for different matters regarding anything which, due to its uniqueness or the irreversibility or potential magnitude or risk of its actual or potential effects, is of significance to the New Zealand environment (Section 45).

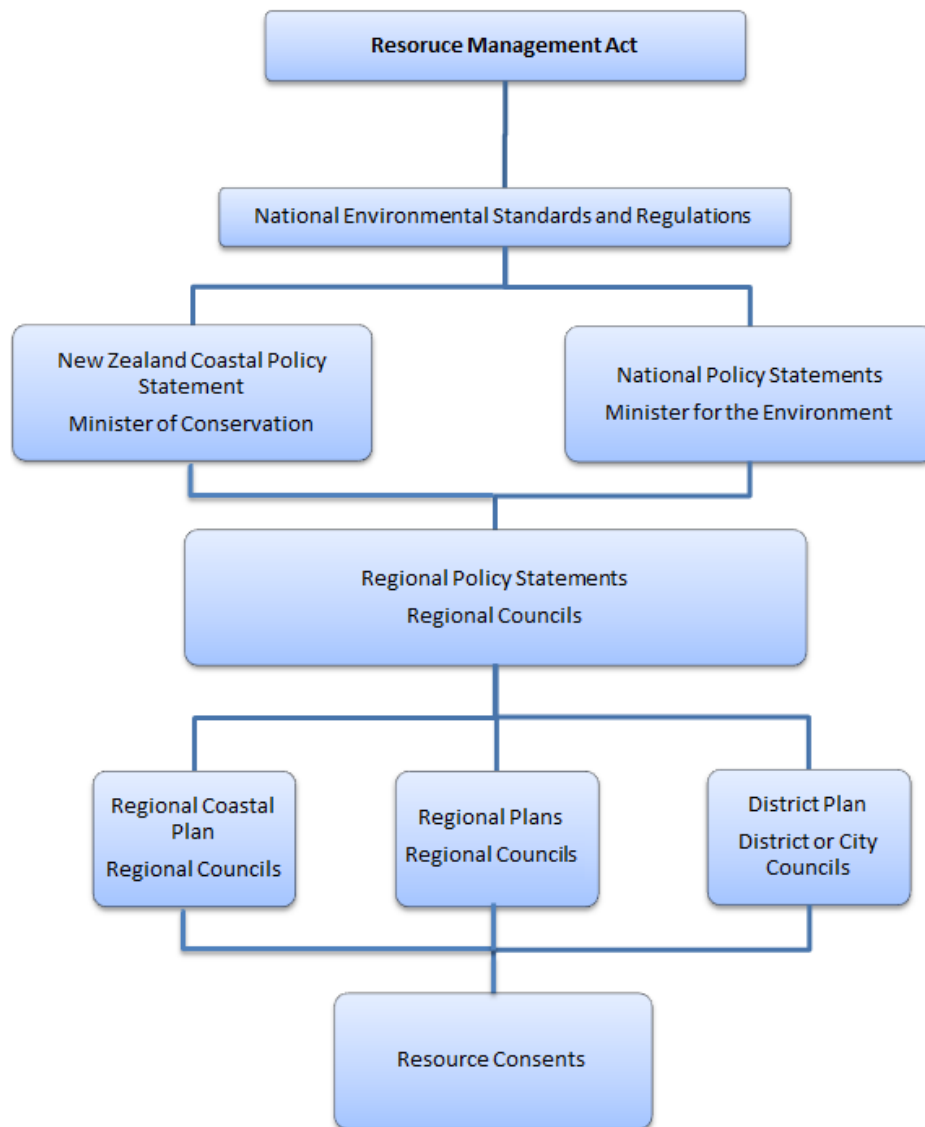


Figure 5.1 Planning framework under the RMA (source: MfE 2015)

NPS guide subsequent decision-making under the RMA at the national, regional and district levels, and can therefore significantly affect resource management practices in New Zealand. The RMA does not prescribe the content of national policy statements but states that they may incorporate the standards, requirements or recommended practices of national or international

organisations and other countries or jurisdictions, and any other written material that deals with technical matters and is too large or impractical to include in the standard (Section 46B).

### **Regional plans and policy statements**

The RMA requires every regional council to prepare a Regional Policy Statement (RPS). The purpose of these regional statements is to provide a concise overview of the resource management issues of the region and the plans and methods applied to achieve integrated sustainable management of the natural and physical resources of the region. In addition, each regional council is also required to prepare a coastal plan for all coastal areas exist in the region. Though regional councils are not required to prepare regional plans for other areas, any regional council can initiate preparation of a regional plan. The purpose of the preparation and administration of regional plans is to assist regional councils to achieve the sustainable management of environmental resources. Section 67 requires the regional plan to give effect to any NPS, regional policy statement or coastal policy statement.

Regional councils can include regional rules in regional plans to achieve their objectives and policies. Regional rules help control the use of land; the taking, use, damming and diversion of water; and discharges to the environment. Section 87 classifies activities into six primary categories: permitted, controlled, restricted discretionary, discretionary, noncomplying and prohibited (Table 5.2). These different categories determine aspects such as whether a resource consent is required before the activity is carried out, what will be considered when making a decision on a resource consent application and whether a resource consent must, may or may not be granted. Rules in regional and district plans determine which category an activity falls into.

**Table 5.2 Classification of activities under the RMA 1991**

Category	Consent criteria
Permitted	A permitted activity can be carried out without the need for a resource consent as long as it complies with any requirements, conditions and permissions specified in the Act, in any regulations and in any applicable plans or proposed plans (Section 87A).
Controlled	A resource consent is required for the activity. The consenting authority must grant a resource consent, except for subdivision consents under special circumstances. The consenting authority can impose conditions on the consent but only for matters over which the council has reserved control in the relevant plan or over which control is reserved in national environmental standards (Section 87A).
Restricted Discretionary	A restricted discretionary activity requires a resource consent before it can be carried out. The consenting authority can exercise discretion as to whether or not to grant consent and to impose conditions, but only in respect of those matters over which discretion is restricted. If consent is granted, the activity must comply with the requirements specified in the relevant plan (Section 104C).
Discretionary	The consenting authority can exercise full discretion as to whether or not to grant consent and what conditions to impose on the consent if granted (Section 104B). An activity is discretionary if the relevant plan identifies it as discretionary or if a resource consent is required for the activity but the plan fails to classify it as controlled, restricted discretionary, discretionary or noncomplying (Section 87B).
Non-Complying	A resource consent can be granted for a noncomplying activity but the applicant first needs to satisfy the consenting authority that the adverse effects of the activity on the environment will be minor or that the activity will not be contrary to the objectives of the relevant plan (Section 104D).
Prohibited	No resource consent can be sought or granted to authorise the activity (Section 87A).

## **District plans**

Each territorial authority must prepare a district plan. The purpose of the district plan is to assist the authorities in the sustainable management of physical and natural resources. Like regional plans, territorial authorities should also include district rules in district plans. In making a rule, the territorial authority may consider the actual or potential effects on the environment of an activity, particularly any adverse effects.

Similar to regional plans, territorial authorities may categorize activities as permitted, controlled, discretionary, restricted discretionary, noncomplying or prohibited, and define rules in its plans each category of activity. In making plans and policy statements, the territorial authorities are required to consider the environmental effects of making (or not making) the rule or policy statement is required (Section 32).

### **5.3.2 Role of EA in council-led conventional decision-making processes**

Under the RMA, EA applies to all developmental projects for which resource consent is required, making it a central tool in the decision-making process (Wood, 2009). However, instead of referring directly to EIA, the commonly used term for EA of projects, the RMA states that all consent applications must be accompanied by an AEE. The word ‘effects’ is used in place of ‘impacts’, according to Milne (1992), to differentiate environmental assessment from the internationally used concept of environmental impacts, which was associated with negative impacts only. Section 3 of the RMA defines an effect as:

- (a) any positive or adverse effect; and
- (b) any temporary or permanent effect; and
- (c) any past, present, or future effect; and
- (d) any cumulative effect which arises over time or in combination with other effects regardless of the scale, intensity, duration, or frequency of the effect, and also includes—
- (e) any potential effect of high probability; and
- (f) any potential effect of low probability which has a high potential impact.

The administration of resource consent applications in New Zealand is principally the responsibility of territorial authorities and regional councils (Fookes, 2000; Wood, 2009). Each resource consent application must include an AEE, with details of the actual and potential environmental effects of the activity. The RMA provides an outline for the contents of an AEE

in its Fourth Schedule (see Appendix IV) but the remaining provisions of the RMA provide an insight into the environmental assessment process in New Zealand. The assessment process is closely linked with the resource consent process. This section explains the consent application process and identifies links between it and the environmental assessment process.

The provisions for EA under the RMA seem to be more open to determination by local government policy and are less subject to intervention by the central government. Over the years, though, the MfE has produced several publications on the AEE (MfE, 1999, 2006, 2014). However, these generally focus on reviewing the requirements for an AEE and do not provide much guidance on the decision-making process.

Section 87 of the RMA defines five types of resource consents: land use consents, subdivision consents, coastal permits, water permits and discharge permits. The consenting authority in charge of an application varies depending on the type of resource consent or its significance. Territorial authorities are responsible for land use and subdivision consents; regional councils are responsible for the other consents, essentially those that deal with common-pool resources like taking water from a stream for an irrigation scheme or building a dam in a river (MfE, 2015).

According to Section 88 of the RMA, any person can apply to the relevant authority for a resource consent. However, it should be made in a prescribed form and manner. As per Subsection 88 (2)(b), an application must include an AEE to a level of detail corresponding to the scale and significance of the environmental effects of the activity. This is required in accordance with Schedule 4 of the RMA. Figure 5.2 shows the different stages and timeframes for processing a resource consent application.

As per Subsection 88(3), if an application does not include an adequate AEE, the ‘...consent authority may, within 5 working days after the application was first lodged, determine that the application is incomplete and return the application, with written reasons for the determination, to the applicant’. Once the application is accepted, the consenting authority may request further information at any time before a hearing has taken place (Section 92). However, an applicant can deny to provide further information and the request for further information cannot act as a delaying tactic in processing an application.

The RMA specifies three possible routes for a resource consent application. These include public notification, limited notification and non-notification. According to Section 95, a consenting authority should make its decision on one of these three routes within ten working days of the application lodged and execute its decision. Any resource consent application with more than minor adverse environmental effects, must be notified to the public. Public notification means that notices are published in a local newspaper and are available at the official website. These notifications should provide information about the application and where and how to find further information and make submissions. Under Section 95 of the RMA, the consenting authority may not publicly notify an application for resource consent and decide to limit notification to the people it views to be affected. In Figure 5.2, both public notification and limited notification are explained together. If these situations do not apply (i.e., when the effects are minor or less), the consenting authority may avoid notifying the application. Submissions on an application must be made within 20 working days when the application is notified (Section 97). Section 104 specifies the criteria for making decisions on resource consent applications:

when considering an application for a resource consent and any submissions received, the consent authority must...have regard to—

- a) any actual and potential effects on the environment of allowing the activity; and
- b) any relevant provisions of—
  - a. a national environmental standard
  - b. other regulations
  - c. a national policy statement
  - d. a New Zealand coastal policy statement
  - e. a regional policy statement or proposed regional policy statement:
  - f. a plan or proposed plan; and
- c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Section 104 also allows a consenting authority to disregard an adverse environmental effect of the activity when forming an opinion if a national environmental standard or the plan permits an activity with that effect. Section 108 allows a consenting authority to specify any conditions related to the approval of a resource consent. As per Section 114, a consenting authority must ensure that a notice of decision regarding an application for a resource consent is served on the applicant, those who made submissions and other people and authorities it considers

appropriate. Section 120 of the RMA allows either the applicant or any person who made a submission on the application to appeal, within 15 days after the decision is served to them, to the Environment Court against the whole or any part of a decision regarding an application for a resource consent.

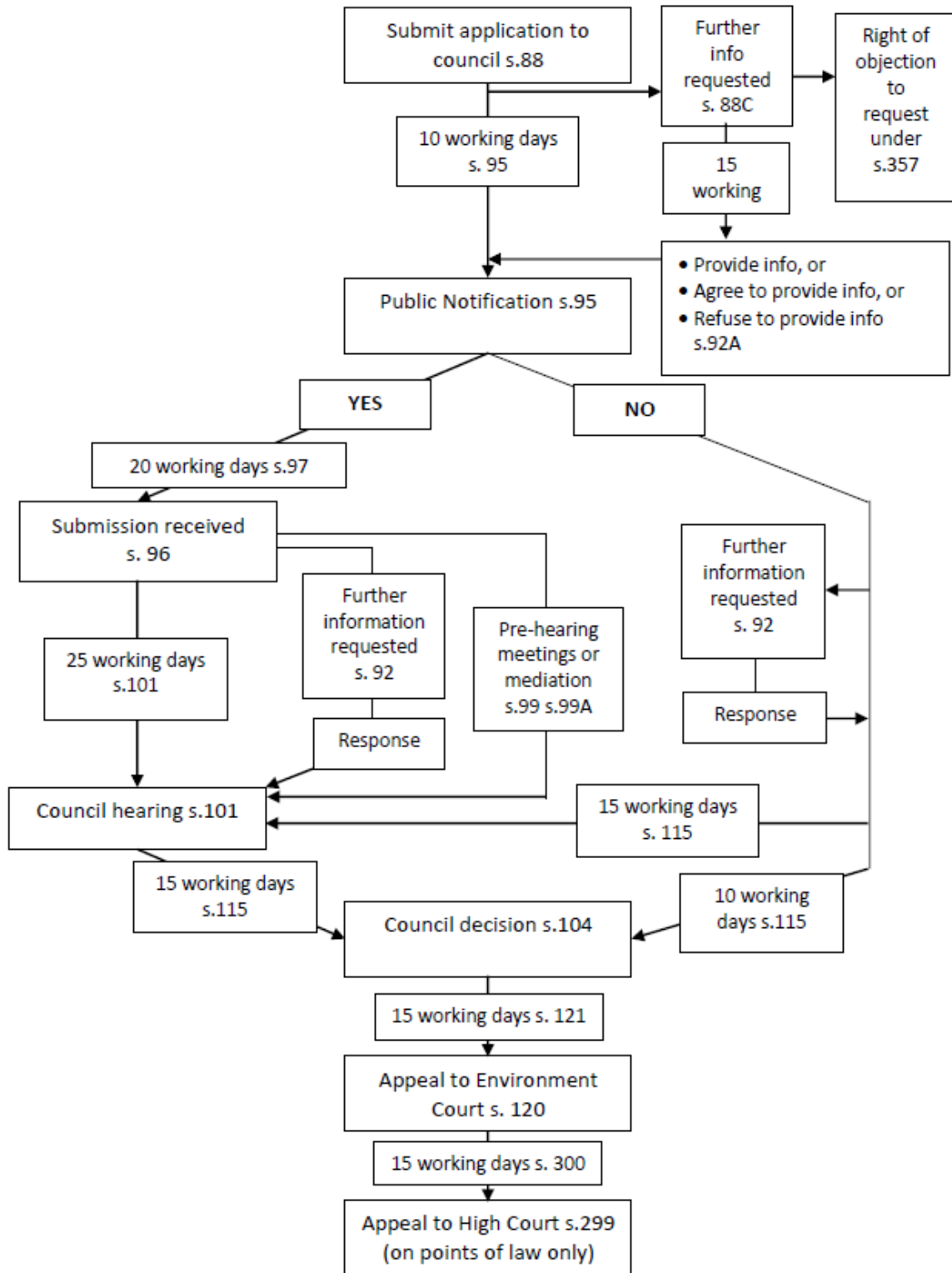


Figure 5.2: Resource consent process in New Zealand under the RMA (adapted from MfE, 2006)

### **5.3.3 Environmental Protection Authority**

The 2009 amendment to the RMA included significant changes to the institutional arrangements for making decisions on proposals of national significance, particularly the establishment of the Environmental Protection Authority (EPA). Initially, the EPA was established within the MfE to facilitate the consenting process for nationally significant proposals. The EPA has no decision-making powers and Part 6AA of the RMA explains that the administrative role of the EPA in the process is to:

- ensure that an application meets the requirements of the RMA for lodgement
- advise the Minister if the EPA consider the proposal to be nationally significant
- provide administration for the boards of inquiry
- publicly notify the proposal
- receive and process submissions etc.
- provide information to everyone involved, including hearing procedures and important dates and deadlines.

When applications are made directly to the EPA, it has the power to request further information from the applicant and to prepare or commission a report on any issue related to the consent application (Section 149(2)).

It was followed by the Environmental Protection Authority Act 2011. The Act established the EPA as a separate Crown entity. The responsibility for hazardous substances and new organisms, and the administration of the emissions trading scheme from other organisations were moved to the EPA. The Minister for the Environment's Technical Advisory Group made the following comments on the rationale for these amendments, citing 'unreasonable delays' in the processing of consents for significant projects of national importance (2009). The advisory group went on to comment that:

With the Government's commitment to increased infrastructure spending, some of these (highway projects calculated as having a high benefit-cost ratio) will very likely gain a greater priority than hitherto. It would be unfortunate if the country were to be deprived of the clear economic benefit of that completion through delays in the approval process....Despite the availability of the call-in procedure, it has been used only on a handful of occasions in the 18 year history of the Act. We are unaware as to whether this reflected a political reluctance or the shortcomings in the Act's procedures. Nevertheless, we understand that the Government is

determined to make greater use of call-ins, and we suggest a number of enhancements to the Act as it presently stands (p 35).

The EPA is governed by an independent board whose members are appointed by the Minister for the Environment. As the EPA is a Crown agent, the Minister for the Environment may direct the EPA to give effect to a government policy that relates to the entity's functions and objectives. Apart from administering proposals of national significance, the EPA has responsibility for implementing the regulatory provisions and subordinate instruments relating to the following Acts of Parliament:

- Hazardous Substances and New Organisms Act 1996
- Resource Management Act 1991
- Climate Change Response Act 2002
- Ozone Layer Protection Act 1996
- Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012
- Imports and Exports (Restrictions) Act 1988

#### **5.3.4 The Environment Court**

The Environment Court is a judicial body established under Part 11 of the RMA 1991. It hears and decides on a wide range of matters under the RMA, as well as some matters under other legislation. The Court has registries in Wellington, Auckland and Christchurch, and holds sittings throughout the country as required.

Cases in the Environment Court are usually heard *de novo*, which means that the Court considers all the relevant issues afresh. However, the Court must have regard to the decision appealed against (Section 290). When reaching a decision, the Court should have regard to the decision (usually of the local authority) that has been appealed. When reaching a decision on an appeal in relation to a proposed policy statement or plan, the Court can direct the local authority to prepare changes to the relevant planning document to address any matters identified by the Court and to submit the changes to the Court for confirmation (Section 293). Decisions may not always turn on legal issues but often on the evaluation of sustainable management outcomes depending on an assessment of facts and expert evidence. The membership of the Court reflects this role: it comprises a legally qualified environment judge,

usually sitting with two Environment Commissioners, each with professional resource management expertise.

The RMA provides for the use of mediation at any time after the lodgement of proceedings for the purpose of encouraging settlement (Section 268A). Hence, during the appeal process, considerable emphasis is placed on mediation. The majority of appeals are resolved without the need for a full appeal hearing. Mediation is a form of alternative dispute resolution. Its purpose is to clarify issues, resolve conflicts and/or reach an agreement between the parties without needing to go to court. Mediation requires the parties to work together to find solutions. Reaching an agreement requires compromise. However, if an agreement is not reached through mediation, the matter then moves on to a hearing.

As part of streamlining the consent process, amendments have also been made to limit the rights of appeal to the Environment Court. For example, appeal against the decision of a Board of Inquiry can only be made in the High Court on points of law (Section 149V, RMA). Limiting appeals to points of law prevents the appeal court from hearing or considering environmental evidence. These increasing restrictions can be seen to reflect an attitude towards public participation and the judicial process as simply impediments to development, rather than vehicles to ensure that development decisions are sustainable and meet the purpose of the Act (Palmer, 2013).

#### **5.4 Proposals of national significance**

For large-scale infrastructure projects, the RMA includes a provision for the Minister of the Environment to "call in" a proposal. These large-scale project proposals, under the RMA, are known as proposals of national significance. Section 142 of the RMA outlines a set of criteria that may be used by the Minister to decide whether a proposal is nationally significant. According to Subsection 142(3), among other things, if the proposal: "(i) has aroused widespread public concern or interest regarding its actual or likely effect on the environment (including the global environment); or... (iv) affects or is likely to affect or is relevant to New Zealand's international obligations to the global environment; or (v) results or is likely to result in or contribute to significant or irreversible changes to the environment (including the global environment); or..... (viii) will assist the Crown in fulfilling its public health, welfare, security, or safety obligations or functions", then the Minister may consider such proposals as nationally

significant. Until 2009, this section had rarely been used. However, in 2009, the National government introduced the Resource Management Reform Bill to fast-track the consent process and the Resource Management (Simplifying and Streamlining) Amendment Act passed in the same year.

Following the 2009 amendments, the Minister's powers to directly intervene in resource consent application were significantly expanded. The Minister could refer proposals of national significance to a board of inquiry appointed by the Minister or to the Environment Court (Section 142, RMA). The Minister should consult the relevant local authorities for suggestions for appointments to a board but ultimately decides who is appointed to a board of inquiry (Section 146). The Minister must consider the need for members to have knowledge and skills relating to:

- the local community,
- the RMA,
- issues relevant to the matters the board will be considering, and
- tikanga Māori.

A board of inquiry must have between three and five members, with the chair being a current, former or retired environment judge or retired High Court judge.

According to Section 149, the board of inquiry must conduct its inquiry in accordance with any terms of reference set by the Minister and carry out its duties in a timely and cost-effective manner. The board must also have regard to the Minister's reasons for calling in the matter and consider any information provided to it by the EPA. Unlike local authorities, the board of inquiry may permit cross-examination and must keep a full record of its hearings. The board of inquiry may obtain planning advice from the EPA.

## **5.5 Amendments to the RMA 1991<sup>7</sup>**

Historically, there has been strong opposition from sections of the community, particularly the business community, about the costs associated with and time consumed by resource consent applications (Palmer, 2015). The RMA was seen as complex, cumbersome and costly. In 2009, the newly elected National government introduced the Resource Management Reform Bill and

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<sup>7</sup> The RMA has recently been updated again (<http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html>). However, the research used the version prior to the 11 November 2020 amendments.

the Resource Management (Simplifying and Streamlining) Amendment Act. The 2009 amendment included significant changes to the institutional arrangements for making decisions on proposals of national significance, particularly the establishment of the EPA. Initially, the EPA was established within the MfE to facilitate the consenting process for nationally significant proposals. It was followed by the Environmental Protection Authority Act 2011, which established the EPA as a separate Crown agent. The EPA has no decision-making powers and Part 6AA of the RMA explains the administrative role of EPA in the process is to:

- ensure that an application meets the requirements of the RMA for lodgement,
- advise the Minister if the EPA considers the proposal to be nationally significant,
- provide administration for the boards of inquiry,
- publicly notify the proposal, and
- receive and process submissions etc.

Between 2009 and 2017, ministerial call-in power was exercised around 20 times<sup>8</sup>. In most cases, use of the call-in power was requested by the applicant. Only once was the application declined as being not of “national significance” and referred back to the district council. Likewise, only one application was referred to the independent Environment Court. All of the remaining proposals have been referred to boards of inquiry appointed by the Minister. This clearly indicates that decision-making under the RMA, particularly for large-scale infrastructure projects, is becoming more politicised.

Along with the expansion of ministerial power, other amendments have significantly reduced the capacity for public participation in the decision-making process under the RMA. As a result of the 2009 amendment, councils were given discretion as to whether to notify an application for resource consent for an activity publicly. Given the already low rate of actual notifications, this change was widely criticised as being unnecessary. The New Zealand Law Society (2009) raised their concerns that the amendments undermined the value of public participation, thus undermining the quality of decision-making. As part of streamlining the consent process, amendments were also made to limit the rights of appeal to the Environment Court.

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<sup>8</sup> Details of the applications considered under the “call-in” power are available on the EPA website: <https://www.epa.govt.nz/database-search/rma-applications>.

The simplification and streamlining of amendments also introduced a rigid set of timeframes for the various phases of the consent process for nationally significant proposals. The board of inquiry is required to produce the final report within nine months of the public notification of the ministerial direction (Section 149R); this time limit can only be extended by the Minister (Section 149S).

The RMA has continually been reshaped to facilitate the government in achieving its developmental goals, the natural environment in the country remains under pressure (OECD, 2017). The RMA's central purpose of "sustainable management" meaning "growth within the constraints of the environment" has yet to be achieved. The quality of rivers, streams and lakes has dramatically deteriorated in New Zealand. According to the MfE (2012), 45% of popular freshwater swimming spots have "poor" to "very poor" water quality. According to the MfE (2015), from 1990 to 2012, the estimated amount of nitrogen that leached into the soil from agriculture increased by 29%. This increase was attributed to the increase in dairy farming. Seventy-two percent of indigenous freshwater fish are at risk or threatened with extinction. Likewise, land-use changes have resulted in a substantial indigenous habitat loss. From 2002 to 2012, dairy farming areas in New Zealand increased by 28%. The extinction risk for a number of land species worsened between 2005 and 2011, including 30 plants, 11 bird, and one bat species (MfE 2015).

## **5.6 Summary**

Environmental assessment has remained a prominent component of environmental management in New Zealand over the last 50 years. Since its introduction in the country, suggestions have been made for modifying and replacing the EA system. In more recent years, because of national and international pressure, institutional arrangements have been made to better adapt EA to the statutory decision-making process. The RMA made EA central to the decision-making process. However, in achieving in their economic objectives, major elements of the RMA framework have been gradually eroded over time by the government. The ability of the central government to intervene in the decision-making process has been increased significantly. Opportunities for the public to participate in the decision-making process have been reduced. The capacity for judicial supervision by the Environment Court has been limited considerably. Hence, the RMA is tilted towards facilitating national development and securing the achievements of the government's economic policy. Therefore, it is gradually creeping

away from the principle of sustainable management through informed decision-making and moving back towards centralised planning, which the RMA was originally introduced to replace.

## Chapter 6

# **The Ruataniwha water storage scheme – Background analysis**

### **6.1 Introduction**

This chapter introduces the empirical settings for the thesis by providing the background and describing the institutional arrangements for large-scale infrastructure projects in New Zealand. The first section covers a brief overview of Hawke’s Bay and the importance of a water storage scheme for the region. The following section discusses the evolution of the RWSS and the important developments related to the project in chronological order. The potential environmental effects of the irrigation scheme are also briefly discussed. The last three sections of the chapter highlight the implementation status of the scheme.

### **6.2 The Hawke’s Bay Region – Background**

The RWSS is located in the Hawke’s Bay region of New Zealand. The region’s total land area is approximately 14,200 m<sup>2</sup> and extends from Wairoa in the north to Woodville in the south – about 193 km. The land district rarely exceeds 64 km in width and is bounded on the east by the Pacific Ocean and on the west by the Ruahine and Kaweka Ranges. The Hawke’s Bay Regional Council is responsible for environmental aspects of the region and covers the Wairoa, Hastings and Central Hawke’s Bay districts, as well as Napier city. According to the 2018 census, the total population of the region was 166,368, with about 45,000 of the population being Māori.

#### **a) Landscape and climate**

The region’s land consists mainly of hills and steep country, interspersed with flats. The Ruahine Range, the southern portion of the region’s western boundary, is part of the North Island’s main ranges. It is composed of greywacke and argillite rock. The Kaweka Range and other smaller ranges lie north of the Ruahine Range. The hills and ranges in central and northern Hawke’s Bay are made of mudstone, limestone, sandstone and argillite. The mudstone hills, which predominate, erode easily. The land between Lake Tūtira and Wairoa is particularly vulnerable to slips. The limestone ranges and hills from Havelock North southwards are harder rock. Running from Wairarapa into Hawke’s Bay is a belt of flat land made up of soft,

sedimentary rocks deposited by rivers. It is edged in by mountain ranges and hills on either side. The plains are narrow in southern Hawke's Bay but widen into the Ruataniwha and Heretaunga Plains south of Napier (Pollock 2009).

Hawke's Bay has seven major rivers (mostly fast-flowing, clean gravel) and four major lakes, as well as many minor rivers, streams, lakes and wetland systems. Groundwater, in the region, is increasingly relied upon as a dependable and safe water supply for domestic, irrigation and industrial purposes. The two major groundwater systems in the region are under the Heretaunga and Ruataniwha plains.

Hawke's Bay region has a generally dry and warm climate because it is sheltered on the west by the North Island's main mountain ranges. The region has, on average, 2,100–2,200 hours of sunshine each year. Napier holds the record for the most sunshine hours in a year for a North Island centre (2588 in 1994). In summer, the maximum daytime temperature is usually 19–24°C. In winter, which is cool but mild, the daily maximum is 10–15°C. Rainfall is highly variable, and droughts and dry spells are common in lowland Hawke's Bay. Most of the dry periods occur between October and March. However, Hawke's Bay has also experienced repeated flooding, owing to the variability in rainfall across the region and over time.

#### **b) Livestock farming**

Soils in the Hawke's Bay region, especially in the Heretaunga and Ruataniwha plains, are fertile and versatile, enabling a wide range of agricultural activities. This includes traditional livestock farming, forestry, viticulture, horticulture, fruit growing and market gardening.

Approximately 50% of the land in Hawke's Bay is used for pastoral farming, mainly sheep, beef and dairy farming, with some deer. At first, sheep were mainly farmed for their wool. Later on, when refrigeration reached the region in the 1880s, sheep could be profitably farmed for meat, and difficult hill country became productive. In the 1950s, better pasture plants, the elimination of many sheep diseases and new technology, particularly the use of aerial fertiliser sprays, resulted in higher productivity. World prices for New Zealand farm products were high enough to support investment and spending (Ministry of Agriculture and Fisheries, 1970).

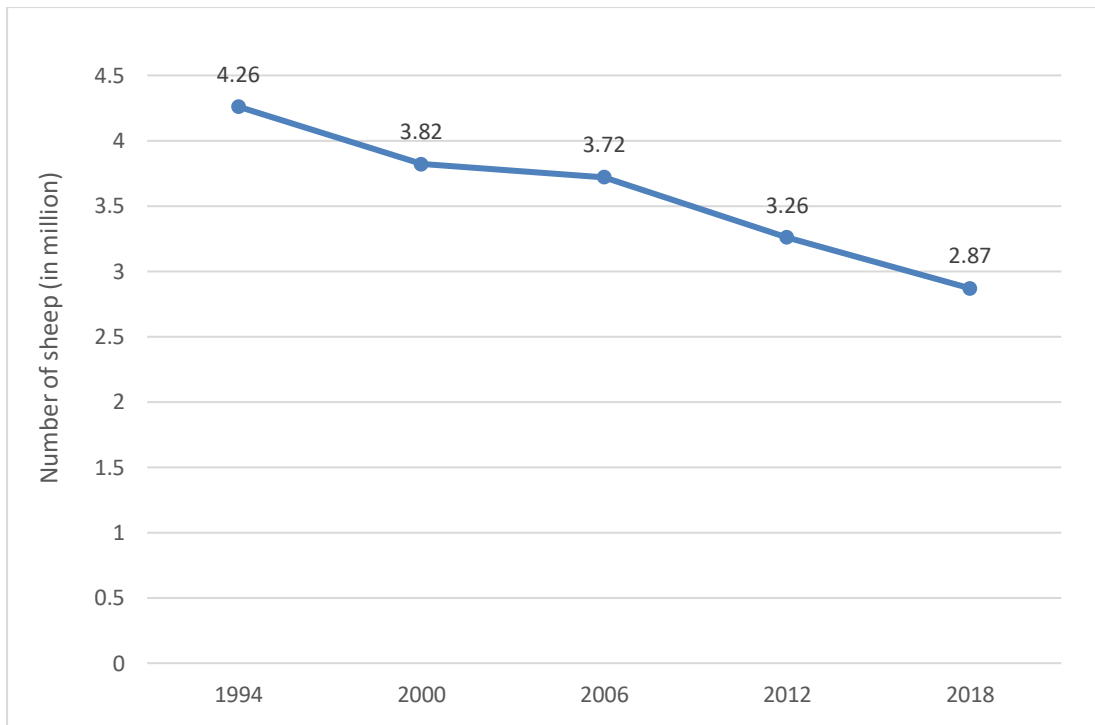


Figure 6.1: The decrease in the sheep population in the Hawke's Bay region (Source: Statistics NZ)

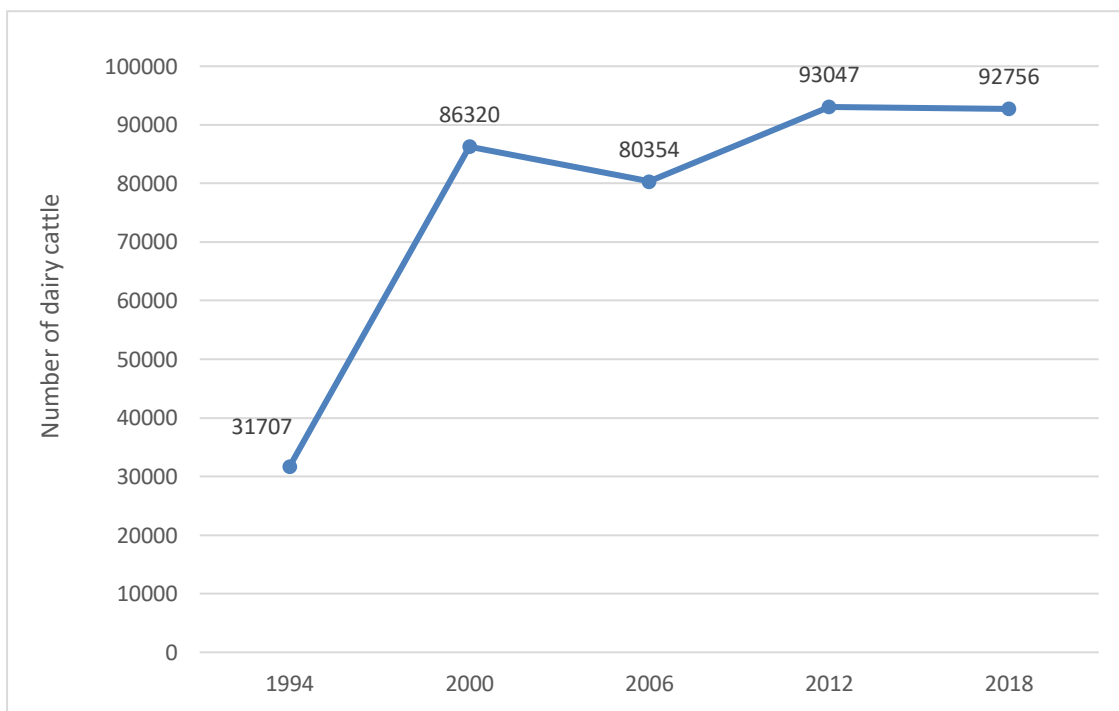


Figure 6.2: The increase in number of dairy cattle in the Hawke's Bay region (Source: Statistics NZ)

Sheep population in the region peaked in the late 1970s to early 1980s following a number of government initiatives to develop more land and intensify the land already in pasture. However,

since the mid-1990s, a decline in sheep farming and a growth in dairy farming in the region have been observed. This is mainly because of the expanding dairy industry, with regular milk pay-outs became financially more attractive than sheep farming. Thus, the total number of sheep decreased from 4.2 million in 1994 to 2.8 million in 2018, whereas the number of dairy cattle increased from 31 thousand in 1994 to over 90 thousand in 2018 (Statistics NZ, 2018).

### **c) Horticulture**

Apart from sheep and dairy farming, the region is renowned for its horticulture, with large orchards and vineyards on the plains. With the largest apple-producing and second-largest wine-growing region in the country, Hawke's Bay is marketed as the fruit bowl of New Zealand. Pipfruit and wine production are concentrated on the Heretaunga Plains and in the Ruataniwha district near Waipawa in central Hawke's Bay. The soils and climate of the Heretaunga Plains are very favourable for horticultural production.

The Ruataniwha Plains saw apple plantings expand from a very small base in the early 1980s to about 500 ha. However, during the last 20 years, there has been no significant increase in apple planting. By contrast, the Heretaunga Plains has about 5,000 ha planted in apples, with more being added every year.

Wine production grew rapidly after the Second World War, and the area planted with grapes tripled between 1945 and the late 1960s (Dowling, 1999). At this time, most of the vineyards were owned by large wine-making companies and the average size of vineyards was large compared with other grape-growing regions in the country. During the 1960s and 1970s, the local industry was characterised by bulk growing of white grapes, with an emphasis on quantity (Pollock, 2009). In the early 1980s, small-scale 'boutique' vineyards began to appear. Although large corporate growers were still present, most winegrowers in the 2000s were small and aimed to produce top-quality wine. In the 2010s, horticultural farming (particularly fruit growing) employed the largest group of people in the agricultural sector, whereas fruit and vegetable processing employed the second-largest group of people in the manufacturing sector (Pollock, 2015). With the expansion of the horticulture and dairy industries on the plains, the area of land under irrigation has also expanded, putting immense pressure on the underground water supply.

#### **d) Water scarcity and increasing demand**

Like many other parts of New Zealand, the Hawke's Bay region is increasingly becoming water-stressed. This is caused by increases in the use of irrigated agriculture and farming, as discussed in the previous paragraphs. Therefore, it is important to improve our understanding of the sustainable yield levels of key aquifers and to rationalise allocation of water as an economic commodity (OECD, 2017).

Over the years, the total land area on the Ruataniwha Plains under irrigation has increased significantly. In 1995, about 2200 ha was under irrigation; by 2009, it had increased to 6000–7000 ha. In 1990, around 3 million m<sup>3</sup> of water was extracted from the Ruataniwha aquifer pursuant to resource consents (Baalousha, 2013). While the Hawke's Bay Regional Council (HBRC) was developing the strategies that culminated in the catchment-specific plan change, it was also exploring the possibility of water storage in the Tukituki Catchment.

The Tukituki Catchment, which covers approximately 2500 km<sup>2</sup>, is one of the largest catchments in the Hawke's Bay region. The headwaters of the Tukituki River, its largest tributary the Waipawa River and some other tributaries, including the Makaroro River, are located high in the Ruahine Ranges. Other tributaries have their headwaters in the foothills. These rivers and streams cross the Ruataniwha Plains and merge into the Tukituki River east of Waipukurau. Ultimately, the Tukituki River flows into Hawke's Bay about 105 km from its source.

The Hawke's Bay region went through a series of droughts over a four-year period from 2006 to 2009. According to the then Ministry of Food and Agriculture (now known as the Ministry of Primary Industries, MPI), the negative economic impact of those droughts for the region was hundreds of millions of dollars. During droughts, low flows in the rivers within the catchment are quite common and indications suggest that climate change will result in droughts becoming more prevalent and severe in the region (Renwick, 2013), causing a further increase in the demand for irrigation water in the future.

There was widespread concern about the quality of the water in the middle and lower reaches of the Tukituki Catchment. Prolonged low flows in summer, coupled with high in-stream nutrient concentrations and high temperatures, have led to excessive growth of periphyton

(algal bloom), adversely affecting the river water quality (Maxwell, 2013). Restoration and protection of the health and wellbeing of the rivers for future generations is considered critically important. Apart from their very significant agricultural and economic value, the rivers and streams in the Tukituki Catchment provide a popular resource for swimming, fishing and other recreational activities. In 2008, the regional council reviewed its regional water strategy and determined some objectives. For example, a supply and demand framework would be used to manage freshwater allocation, especially in catchments where allocation limits had been reached. In order to meet the demand for irrigation water, it was necessary to fast-track the implementation of strategy and policy to get plan changes and approve water management projects (Tonkin & Taylor, 2013).

## **6.3 Evolution of the RWSS**

### **6.3.1 The role of the HBRC**

The HBRC is made up of nine representatives elected by the community through the local body elections held every three years. The Hawke's Bay region has five constituencies. The rural constituencies of Wairoa and Central Hawke's Bay are represented by one member each, Napier by three members, Hastings by three members and Ngaruroro by one member. Regional councils are usually responsible for environmental resource management and public transport matters. Regional councils are subject to the Local Government Act (LGA) 2002 and have a significant role under the RMA 1991, which charges them with the integrated management of the natural and physical resources of a region.

The RMA provides a range of instruments from the national to local level to promote the sustainable management of natural and physical resources (Figure 6.3). These are described in detail in Section 5.3. Briefly, the central government prepares NES and NPS, whereas regional councils prepare regional policy statements, regional plans and regional coastal plans.

### **6.3.2 The need for water storage**

Hawke's Bay's agricultural advantage lies in its temperate climate, the availability of productive land and potentially abundant water supplies. However, as mentioned in Section 6.2, the geography of the region is such that Hawke's Bay is prone to drought. Coupled with this, current water allocations exceed the existing Regional Plan's limits and these limits are inadequate to provide for native fish and trout, particularly during summer. Areas of the

Tukituki Catchment also suffer from excessive slime and algae growth, which adversely affects recreational use and fishing, particularly in the lower Tukituki River.

Given the water allocation and quality issues, there was little or no prospect of additional rural land development in the Tukituki Catchment. This constrained the potential for agricultural growth in a significant area of the region. The Tukituki Catchment has close to 80 thousand ha of irrigable land, which is the largest irrigable catchment in the Hawke's Bay region (HBRIC Ltd., 2014). The regional council was developing the strategies that culminated in the catchment specific plan change required by the RMA. At the same it was also exploring the possibility of water storage in the Tukituki Catchment for potential agricultural growth in the region under the LGA (2002). The HBRC considered that if storage was a viable alternative, it might also offer opportunities for improving in-stream values for recreation, fishing, and ecosystem health.

In developing a series of initiatives to meet the above objectives, the HBRC determined that it should initiate water storage pre-feasibility and feasibility projects in catchments where the initial evidence pointed towards the need for infrastructure solutions for water use. The RWSS was identified as one such project.

Initially assessing 18 potential dam sites and the possible alternative of on-farm storage, the HBRC decided to pursue a water storage scheme involving a dam on the Makaroro River. The RWSS involved the harvesting of water during winter or at other times of high flow and releasing flows back into the river to satisfy irrigation demand, an environmental river flow regime and electric power generation.

The need for large-scale water storage as part of the Tukituki Catchment management was initially identified in 2009. Following pre-feasibility analysis, the HBRC decided to pursue a full feasibility phase in December 2010.

### **6.3.3 Feasibility study**

The first stage of the full feasibility study involved establishing leadership and stakeholder groups. This stage of the study saw an initial water demand assessment to identify the irrigation zones to be served. An initial fatal flaw analysis to identify the costs and most economic dam sites and distribution layout was completed. Geotechnical and seismic issues reduced the number of potential dam sites and finally identified the selection of the preferred site.

The subsequent stage of the full feasibility study was initiated in January 2011. The purpose of the full feasibility study was to undertake sufficient investigation and an assessment of the effects to be able to establish the technical, commercial and environmental feasibility, and to develop a storage dam at the favoured Makaroro site and the associated supply distribution to the farm gate across the proposed irrigation zones making up the likely Ruataniwha Plains service area.

The full feasibility phase involved investigations into the technical, economic, environmental, social and cultural aspects of the RWSS. The Ruataniwha Leadership Group and the Ruataniwha Stakeholder Group were established in April 2010 to provide guidance and input throughout the process. In addition, the HBRC has engaged with a number of community and interest groups, sharing RWSS information and receiving feedback to help inform the processes over time.

Table 6.1: Evolution of the RWSS

Year	Development
2000	Future planning recognises the need to increase river flows
2006–2009	Hawke’s Bay bears brunt of several very dry summers with a drought declared in 2009
2008–2009	A reference group established by the Council looks at the Tukituki Catchment and identifies large-scale water storage as a potential solution to the issue of minimum flows
2009	On-farm storage discounted as an unaffordable option
Early 2010	The Ruataniwha Leadership Group and Ruataniwha Stakeholder Group were established to provide input and guidance to the HBRC
June 2010	The HBRC completes a pre-feasibility study into water storage
December 2010	A full feasibility study of the RWSS begins
2011	Investigations narrow the focus to one dam site on the Makaroro River
2012	Full feasibility completed; Hawke’s Bay Regional Investment Company Ltd (HBRIC) takes over the next phase

(Source: HBRC, 2013)

During the consultation process, and in a number of responses to the Tukituki Choices document canvassing different options for developing Tukituki Catchment planning, it was suggested that the environmental objectives of the RWSS could be achieved by building on-farm storage for irrigation purposes. However, the suggestion was discarded in the feasibility report of the RWSS because:

...small scale storages on individual farms are possible, but they are typically much more expensive per unit of storage volume than larger shared dam storages and are not considered viable elements of a community scheme unless there is no better alternative (BOI, Final Report and Decisions p. 346).

The RWSS was promoted by the HBRC as a long-term sustainable water storage solution. By storing winter flows, the RWSS was to contribute to higher flows during dry summers and provide a mechanism for flushing flows to help remove slime and algae from the Tukituki River. The scheme was projected to create an opportunity for farmers to have highly reliable irrigation, thus unlocking significant regional economic benefits; this is particularly important, given that Hawke's Bay's economy is largely dependent on the production of commodity products for export.

The full feasibility study resulted in a report to the HBRC in September 2012. In October 2012, the HBRC councillors voted in favour of the RWSS to move ahead to the resource consent application stage.

#### **6.3.4 Central government support for irrigation schemes**

As part of the economic growth agenda, the fifth National government (2008–2017) supported irrigation schemes throughout its tenure. In 2011, the government signalled plans to invest up to \$400 million in regional water infrastructure projects to encourage third-party capital investment. Apart from providing funds for irrigation projects through the MPI, the government also established Crown Irrigation Investment Limited (CIIL) in 2013 to support larger regional irrigation schemes. The governments' promotion of irrigation infrastructure was based on the notion that developing large-scale water storage schemes has the potential to deliver significant economic growth for primary industries and support new jobs.

According to the then Minister for Primary Industries, David Carter, taking part in developing regional-scale water infrastructure is new for private investors. Hence, it is appropriate for the

government to act as a bridging investor to ensure that the right projects can get underway. He further added:

Reliable irrigation represents a major step in unlocking economic potential for New Zealand, having our tradable sectors growing strongly and delivering on the Government's economic growth goals (Carter, 2013)

The main reason behind the Crown's investment in the construction of water storage schemes and off-farm distribution infrastructure was to speed up the progress of proposals that maximised the long-term economic growth benefits from irrigation. However, the government was promoting not only the substantial economic benefits of water storage schemes but also the purported environmental benefits of large dams. Hence, the National government advocated the view that the new water storage and distribution infrastructure would result in higher minimum river flows and reduce the pressure on groundwater aquifers. In addition, water users would also be required to comply with best environmental farm management practices (CIIL, 2013).

### **6.3.5 Financial structure for the scheme**

The RWSS's capital investment structure was expected to be a mix of public and private sources of funding. The primary funding sources included HBRIC Ltd., institutional investors, farmers and local investors, and the CIIL. The construction of the proposed dam and water distribution network was estimated to cost around \$265–275 million. Table 6.2 summarises the capital investment structure assumed in the business case report for the scheme.

As sponsor and promoter of the RWSS, the HBRC was looking to invest up to \$80 million through its investment arm, HBRIC Ltd. in the scheme. To secure institutional investors for the scheme, HBRIC Ltd. signed a memorandum of understanding with Trustpower (an electricity generator and retailer company) and the commercial arm of the South Island iwi tribe, Ngai Tahu Holdings Corporation, in September 2013. According to the memorandum, the power company and Ngai Tahu would fund around 30–40% of the initial capital cost of the scheme. After signing the memorandum, Trustpower staff were involved in different aspects of the project, including the development of a contract for the design and construction of the dam and water distribution network (Hendery, 2014).

Apart from the two major investors the Crown-owned company CIIL was also considered to provide funding for the scheme. As CIIL was established to make bridging investments in regional water infrastructure development, it had a range of investment requirements, which the RWSS was required to accomplish before any investment could have been agreed to. In particular, CIIL’s mandate requires it to maximise investment from other sources. Therefore, HBRIC Ltd. needed to demonstrate that alternative funding sources were not able to invest more in the scheme (RWSS Business Case Report, HBRC, 2014).

The ownership model for the scheme also provided an opportunity for private investment. For this purpose, HBRIC Ltd. released a preliminary investment memorandum seeking expressions of interest from investors in the region to participate in the scheme. Eligible investors were defined as persons who:

- had signed a water user agreement for water from the RWSS,
- were landowners within the RWSS irrigation footprint, and
- were Hawke’s Bay resident individuals or businesses.

Table 6.2: The RWSS Capital Investment Structure

<b>Financing Sources</b>	<b>Indicative Investment</b>
HBRIC Ltd.	Up to \$80 million
Institutional investors	\$90–100 million
Crown Irrigation Investments Ltd	To be decided
Tukituki Investments Limited Partners	More than \$10 million
Total funding sources	\$276 million

(Source: RWSS Business Case Report, HBRC, 2014)

Eligible investors could invest in the scheme and hold a stapled interest in the general partner of the Tukituki Investments Limited Partnership (LP). The Tukituki Investments LP would act as an investment vehicle to pool eligible investments and invest the profits of the public offer into the RWSS LP. The minimum total subscription was for \$10 million but, based on the interest of private investors, the RWSS LP would accept subscriptions in excess of this. It was

important to note that unlike a co-operative structure, investment in the RWSS was not a prerequisite for entering into a contract for taking water from the scheme.

## **6.4 The Tukituki Catchment Proposal**

The HBRC developed the Ruataniwha Scheme alongside Tukituki Plan Change 6. Plan Change 6 was a catchment-specific change to the Hawke's Bay Regional Resource Management Plan. Plan Change 6 was developed in response to the government's NPS for Freshwater Management (2011). It was perceived as a comprehensive plan for the implementation of allocation limits on surface and groundwater takes and setting nutrient levels in the catchment. Thus, the RWSS and Plan Change 6 were taken as an integrated approach to solve the problem of freshwater allocation and nutrient management in the region.

In February 2012, the HBRC established a council-controlled trading organisation called Hawke's Bay Regional Investment Company (HBRIC) Ltd. The company is wholly owned by the Council and it took over responsibility for the RWSS following the completion of the feasibility stage of the RWSS in late 2012. HBRIC Ltd. submitted applications for resource consents and a notice of requirement for the RWSS to the EPA in May 2013. Concurrently, the HBRC requested the Minister for the Environment and the Minister for Conservation to call in Tukituki Plan Change 6. Together, the RWSS and the Plan Change are referred to as the Tukituki Catchment Proposal.

### **6.4.1 The RWSS Proposal**

The Ruataniwha dam proposal involved construction, operation and maintenance of a 90-million m<sup>3</sup> reservoir and the associated irrigation system. The proposed reservoir was intended to have the capacity to irrigate 25,000 ha of land, primarily in the Ruataniwha Plains area of Central Hawke's Bay District (Figure 6.4). The proposed dam was intended to release an environmental base flow to the Makaroro River to support the Tukituki River system when the natural flows were low.

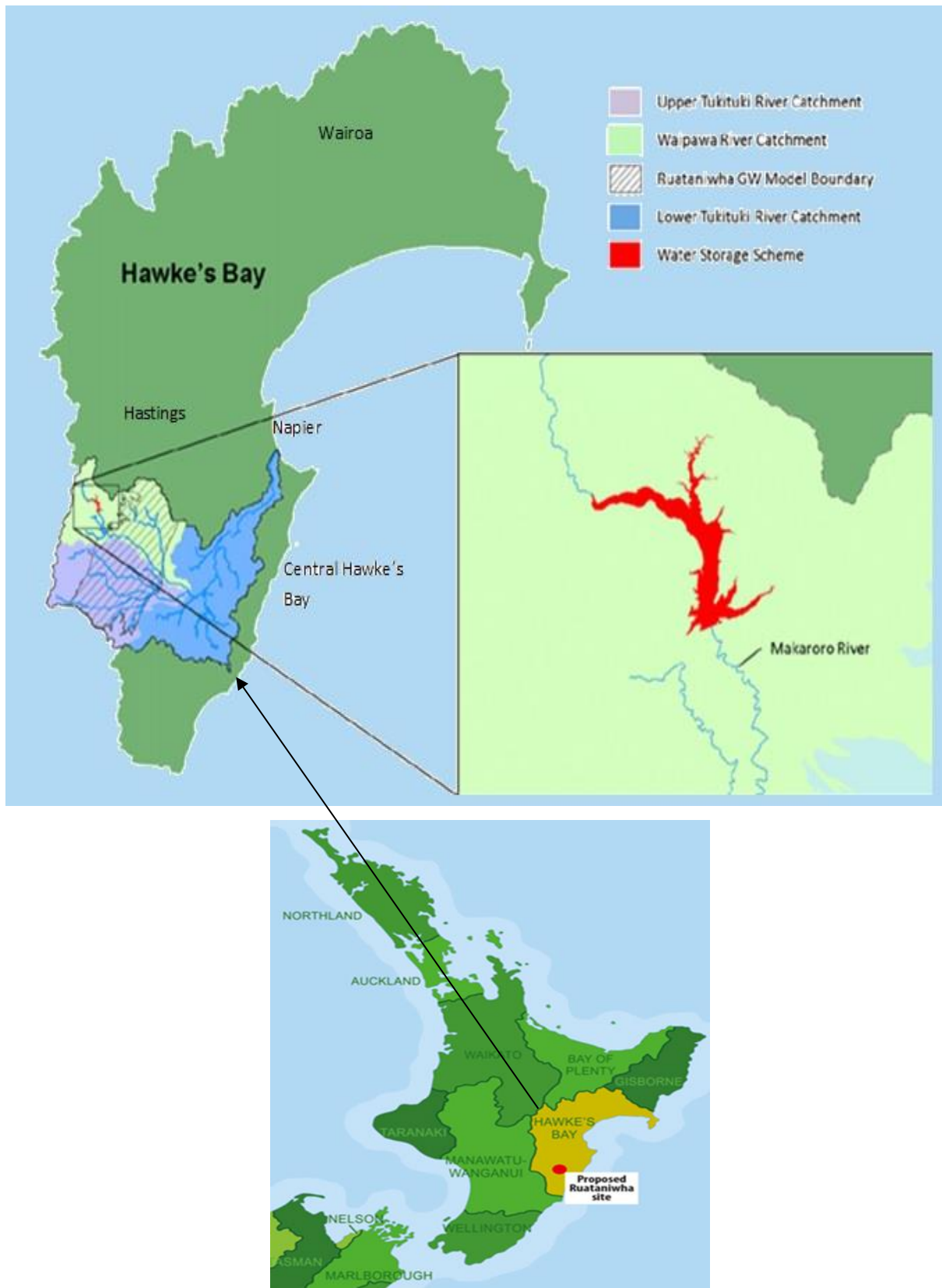


Figure 6.3: RWSS location (Source: Waldron et al., 2013)

The proposed dam would have a height of 83 m and was to be located on the upper Makaroro River in Central Hawke’s Bay. The Ruataniwha basin is located within an area subject to significant earthquake shaking and where the geological formations are susceptible to deformation during such events. As a result, a number of geological and geotechnical issues were identified during the feasibility studies that complicated the design.

The dam was assessed as being within the High Potential Impact Category (PIC) for dams as defined by the New Zealand Society on Large Dams Dam Safety Guidelines. A High PIC requires the dam to have sufficient spillway capacity to handle a flood between a 1 in 10,000 annual exceedance probability (AEP) flood and the probable maximum flood (PMF).

Following a dam type option assessment that concentrated on the dam’s ability to accommodate foundation deformation as a result of extreme seismic events, and the use of locally available construction materials, a concrete-faced rockfill dam was selected during the feasibility stage as the recommended dam type for this site. This was advanced as the “Application Design”.

Table 6.3: Key Dam characteristics

<b>Item</b>	<b>Description</b>
Dam type	Concrete-faced rockfill dam
Potential impact category	High
Spillway type	Concrete-lined primary spillway ogee weir (ungated); Unlined auxiliary spillway for the 1 in 200 AEP plus climate change or larger events
Approximate dam storage volume at full supply level	90,700,000 m <sup>3</sup>
Dam height	Approximately 83 m at the river’s deepest point
Dam crest level	475.5 m reduced level (plus 0.5 m camber)
Dam crest width	8 m
Dam crest length	505 m

(Source: Tonkin & Taylor, 2013)

The water distribution network would commence with the upstream water intake structure on the Waipawa River. This structure was to collect the flows released from the proposed dam

and distribute the water via the primary and secondary distribution systems, primarily for use within the production land use areas (Zones A to D and M) as shown in Figure 6.4. The primary distribution system was intended to provide driving pressure for the secondary distribution system where possible, although some areas would require pumping within the secondary pipeline network.

For Zones A–D, as shown in Figure 6.4, the primary distribution system’s headrace canal alignment is constrained by the geography of the area (e.g. the foothills of the Ruahine Range) and the elevation of the upstream water intake site (which acts as a control for the maximum elevation of the primary distribution system).

Following consideration of a number of options, an alignment was selected that balanced the advantage of maintaining a high elevation to reduce pumping costs, with an alignment that minimised the canal length and volume of earthworks. The water distribution network for Zone M commenced with the downstream water intake structure on the Waipawa River, located immediately upstream of the confluence of the Waipawa and Tukituki Rivers. This would collect flows released from an outfall located adjacent to the Mangaonuku Stream (within Zone A).

The secondary distribution system is a network of pipes that were generally located in road reserves where possible, with a layout aimed to provide water to within 2 km of all farm gates within the defined production land use areas.

The RWSS also included the construction of a small (6.5 MW) hydroelectric power station adjacent to the dam. Power generated is proportional to the product of the generation flow and head, the latter of which is given by the difference in water level between the reservoir and the river downstream. The height of the dam and thus the maximum generating head is more or less fixed. The energy output was thus dependent on the size of the installed plant, specifically the maximum design generation flow and, to a lesser extent, the buffering storage (0.2 m) provided within the reservoir. When the reservoir becomes full or nearly full, this buffering storage allows partial capture of small floods (which would otherwise be spilled) for generation.

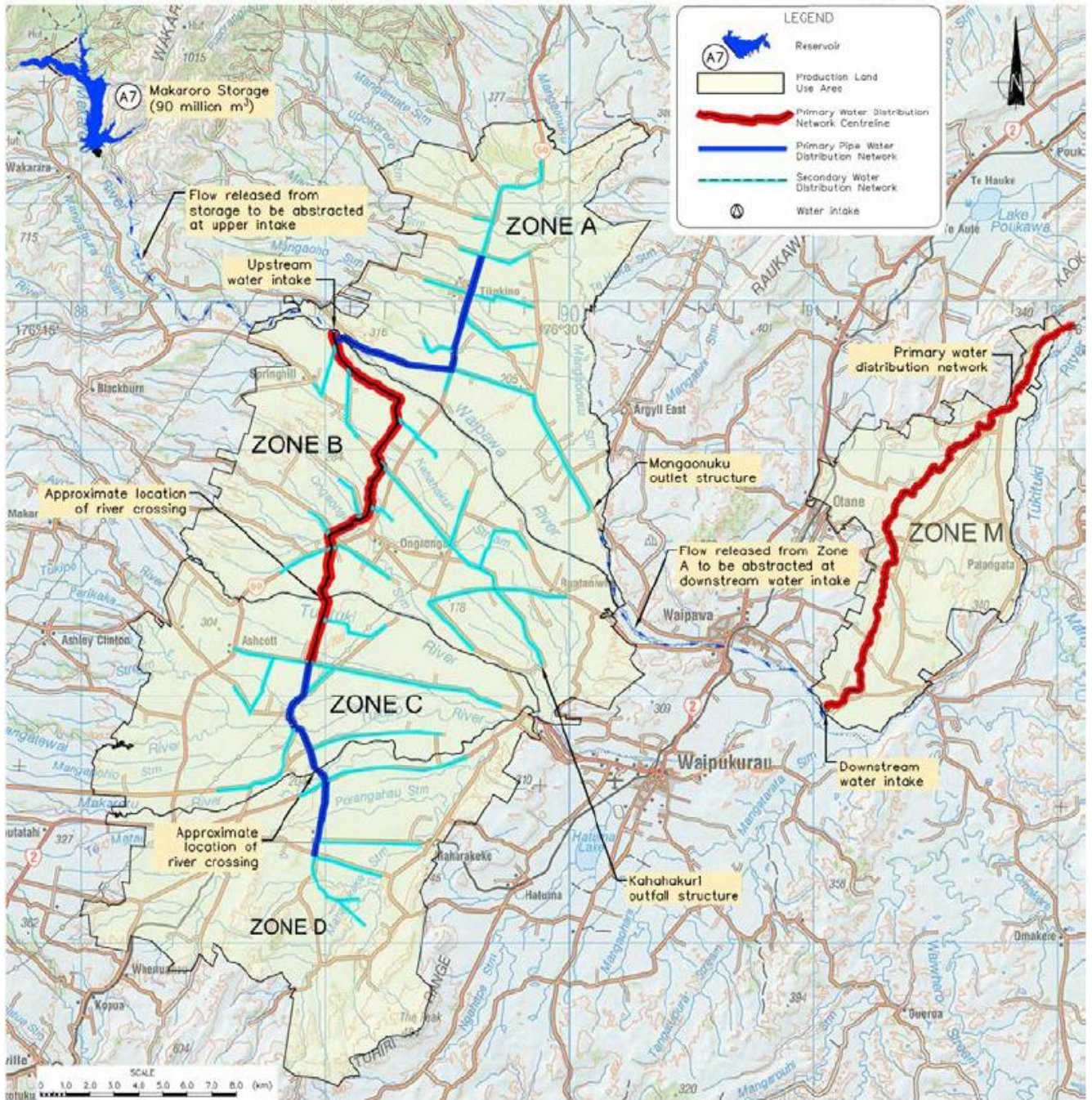


Figure 6.4: The RWSS irrigation distribution network (Source: Tonkin & Taylor 2013)

Dam building, by definition, involves in-river construction works. It is generally desirable, from a constructability point of view, to minimise the amount of work in the river while the river is flowing. To achieve this, a temporary coffer dam would have been constructed upstream of the main dam embankment and the river diverted through a cutting and diversion tunnel through the terrace on the right bank. Once built, this would enable the main dam to be constructed in the river without mobilising sediment.

The dam and distribution networks were to run remotely through telemetry, through the use of cell phones, landlines or radio-based systems. HBRIC Ltd. would determine the location of the office for remote operating systems. This would either be an integral part of the HBRC's existing Hawke's Bay office network or devolved by way of subcontract to an entity with a different regional operating location. Operations and maintenance were to be undertaken by a suitable third party under a procurement contract.

#### **6.4.2 Potential environmental effects and concerns**

As required by the RMA 1991, an AEE report was included as part of the application submitted by the applicants. The report contained details of the potential effects of the scheme on water quality, aquatic ecology and natural flow patterns, and the subsequent mitigation and management plans. However, the environmental impacts were contested by many submitters who questioned the rigour of the AEE and the appropriateness or adequacy of the proposed mitigation measures and management plans.

The effects of the proposed dam on water quality remained one of the central issues throughout the planning and decision-making process for the scheme. The permanent loss of riverine habitat from inundation by the reservoir and blockage of fish passage by the dam were among the most concerning adverse effects of the proposed scheme on the aquatic ecology. The large-scale water storage scheme was expected to have temporary effects during the construction phase but, more importantly, would have long-term effects on the water quality once the dam was operational. Regarding the effects of dam construction on water quality, there was not much concern, apart from increased sediment loads in the river, mainly at the construction site. However, the assessment of long-term effects of the scheme on water quality was strongly debated by the proponents and opponents of the scheme.

One of the most disputed factors affecting the water quality was nutrient modelling for the scheme (discussed in detail in the following chapter). The opponents of the scheme had great concerns over the reliability and accuracy of the groundwater and contaminant transport models developed for the Ruataniwha Basin. The deficiencies and limitations of Overseer, the nutrient budget model developed for the RWSS, were also revealed during the hearing by the board of inquiry.

The potential ecological effects of the construction and operation of the RWSS on terrestrial indigenous fauna and flora included the permanent loss of a variety of indigenous vegetation and a braided river system within the reservoir, dam and spillway footprint area. In addition, the dam would cause the permanent loss of a variety of feeding, roosting and breeding habitats for birds, lizards, bats and invertebrates. The terrestrial ecological assessment report submitted by the applicants to the board of inquiry also revealed the potential for disturbance of the remaining indigenous flora and fauna adjacent to the reservoir due to potential increases in the recreational use of the reservoir and its margin. These predicted environmental effects of the scheme are discussed in detail in the following chapter.

## **6.5 Institutional Framework of the RWSS**

For large-scale infrastructure projects, the RMA includes a provision for the Minister of the Environment to call in a proposal. Section 142 of the RMA outlines a set of criteria that may be used by the Minister to decide whether a proposal is nationally significant (see Section 5.4). A proposal is also deemed to be nationally significant if it affects more than one district or region.

### **6.5.1 A nationally significant proposal**

The RWSS involved significant use of natural and physical resources, resulting in a significant change to the environment. With a storage capability of 90 million m<sup>3</sup>, the proposed dam would have been the largest dam to be constructed under the RMA and the largest constructed in New Zealand for irrigation purposes. A consistent water supply for irrigation can cause the intensification of agriculture and horticulture, which would have economic, cultural, recreational and environmental effects. Likewise, Plan Change 6 would contribute to significant changes to the regional environment. Plan Change 6 set higher minimum flows and controls to limit nutrient runoff that were designed to reverse the ecological degradation that had occurred in the Tukituki River in recent decades. The proposed dam and reservoir would prevent the migration of freshwater species, resulting in a loss of river habitat for some species. They would change the sediment balance in the river by trapping larger amounts of sediment behind the dam. Six kilometres of braided river channel of the upper Makaroro River were proposed to be inundated by the reservoir, resulting in a direct loss of river habitat (Tonkin & Taylor 2013).

The Tukituki Catchment Proposal aroused widespread public interest regarding its actual or likely effects on the environment. The combined proposal was intended to address many of the ongoing issues with the river. Plan Change 6 involved methods for water and land management that were new to New Zealand and might affect its environment. Catchment-wide land use, river and groundwater modelling was a relatively new process in New Zealand and provided for integrated management of freshwater resources in the region. The concept of creating winter storage of water for summer irrigation use is not new to New Zealand but its use on the scale proposed in the RWSS is new.

The RWSS also had national significance because it would affect more than one district. The activities associated with the RWSS were located in the Central Hawke's Bay District and the Hastings District, whose councils have jurisdiction for the control of land use in their respective district. In addition, the councils noted that the application had no precedent in the Hawke's Bay region and demanded a level of logistical support and integrated decision-making that exceeded the existing capacity of both territorial authorities. As mentioned earlier, the applicant of the RWSS is a council-controlled organisation. Therefore, the Council considered that it would have been inappropriate for the HBRC to have a decision-making role.

### **6.5.2 The Board of Inquiry**

On 6 May 2013, HBRIC Ltd. submitted 17 applications for resource consents and a notice of requirement for RWSS to the EPA in May 2013. The applications for resource consent concerned the construction, operation and maintenance of the dam and related structures, water intakes and diversions, outfall structures and discharges, and mitigation and offset work. Fifteen of the resource consent applications involved the administrative jurisdiction of the regional council. One came within the jurisdiction of the Central Hawke's Bay District Council and one within the jurisdiction of Hastings District Council. The notice of requirement came within the jurisdiction of Central Hawke's Bay<sup>9</sup>.

After receiving the applications for resource consents and a notice of requirement for the RWSS, the EPA informed the Minister for the Environment and the Minister for Conservation that the applications for the RWSS lodged by HBRIC Ltd. and Plan Change 6 were parts of the

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<sup>9</sup> Under s168A of the RMA, a territorial authority may give notice of a requirement for a designation for works it wants to undertake within its own district.

same nationally significant proposal referred to as the Tukituki Catchment Proposal. The EPA also recommended that the matter be referred to a board of inquiry because RWSS:

- would be the largest irrigation project in New Zealand and was part of a proposal of national significance;
- would involve significant use of natural and physical resources;
- would result in significant change to the environment;
- would affect more than one district;
- had aroused widespread public interest regarding its actual and likely effects on the environment.

In June 2013, the Minister for the Environment and the Minister for Conservation decided that the RWSS was a proposal of national significance and referred it to a board of inquiry. The Ministers based their decision of directing the proposal to a board of inquiry on the grounds that:

1. The EPA recommended that the matter should be referred to a board of inquiry, and
2. The board of inquiry process is designed specifically to consider matters of national significance, to allow for timely, comprehensive, independent decision-making within a streamlined process (see Chapter 5).

Subsequently, the Minister for the Environment appointed the members to the board pursuant to Section 149J of the RMA.

The board of inquiry received a total of 406 submissions and the hearing took place from November 2013 to February 2014. A full record of the hearing had been preserved and the transcript is publicly available on the EPA website<sup>10</sup>. The board approved Plan Change 6 subject to certain amendments. Similarly, the board also granted resource consents for the RWSS and confirmed the notice of requirement of the scheme, again subject to conditions. However, certain environmental groups, including the national and local branches of the Royal Forest and Bird Protection Society New Zealand, Hawke's Bay and Eastern Fish and Game Councils and the Environmental Defence Society, were not satisfied with the proposed mitigation measures and an appeal was lodged in the High Court against the decision made by the board. In December 2014, the High Court, after hearing the case, referred the matter back

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<sup>10</sup> <https://www.epa.govt.nz/database-search/rma-applications/view/NSP000028>

to the board of inquiry and directed the board to devise an appropriate mechanism for managing the amount of dissolved inorganic nitrogen entering the catchment area. The board issued its final decision in June 2015.

### **6.5.3 Revocation of conservation land and the court cases**

In October 2012, an application by HBRIC Ltd. to exchange the land required for the irrigation scheme was approved by the Director General of the Department of Conservation. The decision meant that the Department of Conservation would receive approximately 170 ha of private land containing beech forest and regenerating native bush in return for 22 ha of the Ruahine Forest Park. The area of conservation park that would be inundated by the waters contained behind the storage dam was classified as a conservation park, since it was part of the former state forest park that was allocated to the Department of Conservation in 1987. It is deemed to be held for these purposes in accordance with Section 61(2) of the Conservation Act 1987.

In order for conservation park land to be available to be exchanged, it must first be declared to be held for conservation purposes under Section 7 (1) of the Conservation Act to free it from the provision constraints of Section 61 (9) of the Conservation Act 1987. Once this occurs, the land is then deemed to have been held for the purpose of a conservation park by a notice in the Gazette under Section 18 (1). Revocation of the deemed conservation park status, which involves public notification, is then necessary to enable an exchange.

Forest & Bird sought a High Court review of the Department of Conservation's decision to allow the land swap for the proposed irrigation scheme. Forest & Bird argued that the Director General erred in law in revoking the land's status, which was asserted as inconsistent with the differentiation between protected land and a stewardship area. Forest & Bird also maintained that the swap was improper, as only stewardship land can be exchanged, not conservation land. The environmental advocacy group further asserted that the land swap would set a precedent enabling any forest park land to be grabbed by developers. However, the High Court rejected the Forest & Bird appeal to overturn the Department of Conservation's land swap decision.

In March 2016, Forest & Bird again lodged an appeal against the High Court's judgment approving the Department of Conservation's decision to downgrade and swap public land in the Ruahine Forest Park. This time, Forest & Bird won its appeal against the High Court decision. A majority of the Court of Appeal ruled that the Director-General of Conservation

was not entitled to revoke the special conservation status of conservation land. The Court of Appeal directed the Director-General to cancel the land swap and reconsider the application of HBRIC Ltd. to exchange the land.

After the Court of Appeal's decision, the Department of Conservation sought leave to appeal to the Supreme Court. HBRIC Ltd. also joined the Department of Conservation in seeking the appeal. However, the Supreme Court rejected the land swap decision and affirmed the judgement of the Court of Appeal, setting aside the decision of the Director-General of Conservation revoking the conservation status of 22 ha of the Ruahine Forest Park.

#### **6.5.4 The Law Change Dilemma**

New Zealand's parliament is supreme and can override any court decision. Following the Supreme Court's ruling, the National-led government signalled its intent to over-rule the legal decision against the land swap. The then Prime Minister and the Minister for Conservation pursued a law change to allow what they believed to be a trade-up from lower-value to higher-value conservation land (Warne, 2017). The Minister for Conservation asserted that:

We will now look at changing the law to ensure we can continue to improve conservation outcomes by having the ability to make land swaps where the outcome would be a win for conservation (Barry, 2017).

In the case of the RWSS, the controversy surrounding the scheme put its feasibility into serious question, even if the law was changed. From the point of view of the National-led government, enhancing flexibility would improve overall land use efficiency. However, for the opposition, it would create a lack of clarity and certainty, and consequently grant greater ability to developers and government interests (Warne, 2017). Sir Geoffrey Palmer, a former prime minister and a lawyer, argued that if the court's decision could be over-ruled by the executive, then why did the government appear and defend itself in the court multiple times? He further asserted that the law change would be 'deeply offensive to the rule of law and a constitutional outrage' (Palmer, 2017).

The law change announcement of the National government to pursue the RWSS project was reminiscent of the Clyde Dam controversy. The National government of Robert Muldoon ignored a legal decision against the granting of water rights and passed the Clutha Development

(Clyde Dam) Empowering Act in 1982. Thousands of people at that time protested against the government's act of overruling the court's decision. Protestors also stuck a notice on the doors of the Court of Appeal in Wellington and the High Court in Christchurch. The notice read 'This Court is now obsolete, irrelevant, and just a nuisance. Accordingly, it is CLOSED until such time as people no longer expect the law to protect their rights' (Palmer, 2016).

## **6.6 Financial set-backs to the scheme**

In March 2013, Trustpower, the primary institutional investor of the irrigation scheme, pulled out of the scheme, citing low returns and concerns that farmers may take too long to sign up to take water from the project. The General Manager of the power company announced its withdrawal from the scheme stating that:

The level of return we were able to achieve in relation to those risks just wasn't enough to get it over the line.... As well as that, there was not enough certainty around the speed with which irrigators would sign up to take water from the scheme (Hawke's Bay Today, March 2014).

He further added that Trustpower was confident that when the dam was built, it would get full uptake, but the time it would require was uncertain. If it took a long time, cashflows would be delayed from an investor's perspective and therefore the overall investor return would go down. Meanwhile, HBRIC Ltd.'s chief executive informed the regional council that it would be harder to sign up users before the irrigation scheme was built. The potential users would be more likely to sign up for the water once the distribution pipes were running past their lands. However, the HBRC reaffirmed that it would not invest in the scheme until farmers signed up to take at least 40 million m<sup>3</sup> of water from the scheme.

Following Trustpower's withdrawal from the RWSS, the other key corporate investor, Ngai Tahu Holdings Corporation, also pulled out of the scheme in May 2013. The investment arm of the South Island iwi Ngai Tahu ended its memorandum of understanding with HBRIC Ltd. because the Council could not find an institutional investor to replace Trustpower. Ngai Tahu was relying on Trustpower for its technical expertise in infrastructure projects. It is also important to note that Ngai Tahu had joined an agreement with the iwi of the Hawke's Bay region, Ngati Kahungunu. According to the agreement, the South Island iwi would not invest in the scheme if the local iwi was not satisfied with the scheme. According to the Ngati Kahungunu Chairperson, Ngai Tahu was also uneasy about the deal because the water quality

standards in the proposed scheme were far lower than those of the rivers in its region in the South Island. He further added:

Initially the council had decided that no ratepayer money would be used for the scheme, but now it appears more and more ratepayer money may be required. (RNZ, 20 May 2014).

The decisions of the two institutional investors to terminate the memorandum of understanding with HBRIC Ltd. was a major financial blow to the scheme, as together the two were intending to contribute about \$100 million toward the \$265 million project (RWSS Business Case Report, HBRC 2014).

After the exit of Trustpower and Ngai Tahu from the RWSS, the HBRIC Ltd.'s chairperson informed the HBRC that the company was in discussions with other potential corporate investors and the scheme would require institutional investor and Crown support to get started (Hendery, 2014). However, the chairperson also regarded this as an opportunity for Hawke's Bay farmers and local investors to 'fill the investment gap' through a preliminary information memorandum put out by the HBRIC Ltd. He further added:

The benefit is that the withdrawal allows more local farmers and businesses to buy into the scheme and we know from history that local people driving local solutions always turn out to be the best for the community in the long run (Hendery, 2014).

## **6.7 The regional council politics regarding the RWSS**

In June 2014, the HBRC voted 5–4 in favour of investing \$80 million in the RWSS. However, the decision was made subject to a number of conditions, including farmers signing up to take at least 40 million m<sup>3</sup> of water from the irrigation scheme, securing potential institutional investors and gaining a workable environmental consent for the scheme and a viable construction contract.

Meanwhile, Councillor Rex Graham, representing the four councillors opposing the scheme, wrote to the Minister for the Environment and the Minister for Conservation that they had been side-lined in the decision-making process at the council level. The councillors also claimed that they had not any input into the council's submission to the board of inquiry. The councillors were upset that the council staff had sent the submission to the board of inquiry without it being

signed off at a council meeting. According to Councillor Rick Barker, the submission had no moral authority without being put to councillors. He said to the local media that the regional council was supposed to protect the environment and be the regulator instead of promoting a business venture that had an impact on the environment. He added:

Here, people expect the democratic institution to work and, for significant issues like this, the submission should have gone before the regional council for councillors to have a debate in public around the issues, and the nature of the response before it was sent....If the executives [council staff] make the decisions, then why do we have an election? (Hawke's Bay Today, 20 May 2014).

However, the chief executive of the council responded that the organisation was working against a tight deadline and the content of the submission to the board of inquiry had been technical in nature. During the board of inquiry process, there had been several times when technical and/or legal input was required almost on the spot; in that case, submissions were not referred to councillors. She claimed that the opposing councillors were playing 'silly politics' and making a noise to influence the board of inquiry (Hendery, 2014).

The October 2016 local government election brought a shift in the balance of power on the HBRC. Five of the nine elected councillors were either opposing or had major concerns about the scheme. The four RWSS critics were all re-elected. They were joined by a new councillor, Paul Bailey, who opposed the scheme during his election campaign. Hence, his election shifted the 5–4 majority of the council in favour of the proposed RWSS to being against. After the elections, Councillor Rex Graham was made the chairman of HBRC. Mr. Graham replaced Fenton Wilson, a strong supporter of the scheme who was in charge of the role for six years.

In December 2016, the newly elected council placed a moratorium on the controversial RWSS and commissioned an independent review of the scheme. Commissioning the review, the councillors agreed that the review would not recommend a specific outcome to the council whether to continue with, abandon or shelve the scheme. Instead, the purpose of the review was to ensure that the costs and benefits of the scheme, as well as the risks and opportunities of decisions to proceed, abandon or shelve the scheme, were clearly identified and articulated to facilitate informed decision-making. The review was conducted independently of both councillors and the RWSS developers. Nevertheless, it was led by the council's Group Manager

Strategic Development and relied on internal staff and the consultants who had previously been engaged by the regional council to provide information and advice regarding particular aspects of the RWSS.

## **6.8 The HBRC's review of the scheme**

The review was formally presented to the council on 10 May 2017. The report on the review included appendices with advice and assessments from council staff, HBRIC Ltd. management and other contracted expert advisors. The review covered five key sets of questions raised by the public: legal, financial, economic, environmental and engineering. According to the review:

The environmental management risks are the most difficult to definitively quantify due to the scale of the catchment and the scheme, the inherent uncertainties, complexities and knowledge gaps with natural and biological systems (p. 5, RWSS Review, 2017).

The two major areas of environmental concern in the review included the increase in the dissolved inorganic nitrogen (DIN) in the region once the irrigation scheme became operational and the efficacy of the proposed flushing flows.

The RWSS was required to operate and manage nitrogen loss from the farms in a manner consistent with achieving the Plan Change 6 (0.8 mg/L) DIN limit by 31 December 2030. However, RWSS consents did not require compliance with the DIN limit and there were already major exceedances of the DIN limit in the area. As the review notes:

The limit of 0.8 mg/L is currently exceeded by between 130% and the 420% at 6 monitoring sites, all within the Ruataniwha Plains area (p. 10, RWSS Review 2017).

The review suggests that a better way to achieve the DIN limits would to require both RWSS farmers and non-RWSS farmers to achieve sustained reductions in nitrogen losses. Otherwise, they claimed:

DIN limits in all Tukituki sub-catchments by 2030 are highly improbable and may even be physically impossible. It appears the Board of Inquiry may have misunderstood the requirements of the National Policy Statement on Freshwater Management in setting the DIN limit timetable of achievement by 2030 (p. 6, RWSS Review 2017).

The review was asked to address several questions about the use of flushing flows to assist the nutrient management of periphyton downstream, which is key to achieving the objectives of Plan Change 6. The RWSS would have the capacity for four flushing flows per year. The National Institute of Water and Atmospheric Research (NIWA) scientist contracted to undertake an independent peer review of the efficacy of these proposed flows concluded that “the flushing flows to move periphyton can be expected to be effective in the Makaroro and Waipawa Rivers but there is uncertainty of their efficacy in the Tukituki River”. Hence, flushing flows would have fewer efficacies than expected. Unsurprisingly, perhaps, given the method used for the review, the RWSS review report concluded:

The risks associated with the scheme have been extensively assessed and the Council can have confidence that these risks have been identified and, where possible, quantified (p. 2, RWSS Review 2017).

However, the review highlighted significant uncertainty around the mitigation of environmental risks. The extent of this uncertainty underscored the report’s conclusion that the decision was very much a matter of political judgement as opposed to being the outcome of comprehensive rational/technical assessment of the costs and benefits:

How satisfactorily these risks have been mitigated by the proposed... environmental management arrangements for the RWSS, and how reasonable it is for various risks to remain, is a matter of political judgment for the Council in determining whether or not to continue with developing the scheme (p. 2, RWSS Review 2017)

Interestingly, the environmental impacts of the construction of the dam itself were not re-assessed in the review. The review acknowledged that “constructing the dam [would] certainly involve significant modifications to the aquatic and terrestrial environment at, and surrounding, the dam site”. However, the board of inquiry’s final report expressed satisfaction with the proposed mitigation approach and thus the review did not evaluate the effectiveness of integrated mitigation and offsetting approach proposed by the developers.

## **6.9 Summary**

This chapter has provided the empirical setting for the thesis through discussing the environmental decision-making process for large-scale projects in New Zealand. Thus, it

establishes the context of the case study. The chapter also briefly described the geography and climate of Hawke's Bay and the importance of a water storage scheme for the region. The evolution of the irrigation project and important developments influencing the prospects of the scheme were also provided in chronological order. The ability for the scheme to proceed is quite uncertain in light of the Supreme Court's decision not to allow the Department of Conservation's land swap required for construction of the proposed Ruataniwha dam. In August 2017, the regional council voted unanimously to shelve the controversial irrigation scheme and focus its efforts on other priorities. Thus, from being a proponent and strong supporter of the scheme, the regional council became an opponent of the scheme. The scheme also lost its support from the central government with a change in regime as a result of the general election in September 2017. The National government kept supporting large-scale irrigation schemes throughout their tenure. However, when the Labour-led government came into power, they decided to scrap funding for new irrigation schemes. The decision represented a shift in the government priorities from the previous government. The Minister of Finance, Grant Robertson, announced this decision by stating that large-scale irrigation schemes should have economic feasibility on their own, without requiring significant public funding. He further asserted that large-scale irrigation projects could potentially cause intensive farming practices, which may contribute to adverse environmental outcomes.

## Chapter 7

# Thematic analysis of the submissions and evidences submitted to the BOI

### 7.1 Introduction

This chapter thematically examines the role of stakeholders and their key documents influencing the environmental assessment and decision-making for the Ruataniwha Water Storage Scheme (RWSS). Experts including scientists, planners, lawyers etc. were engaged both by proponents and by opponents of the project. The RWSS is one of the two parts of the Tukituki Catchment Proposal (TCP), which was referred to the Board of Inquiry by the Minister for the Environment and the Minister of Conservation in June 2013. The other part of the TCP is a catchment specific Plan Change called PC6.

Data obtained through analysis of the relevant documents were coded based on the analytical criteria developed for the document analysis. The documents analysed included the applicant's AEE report, the submissions made by interested groups and individuals, the hearing transcripts and the Board of Inquiry report etc. available on the EPA and Hawke's Bay Regional Council (HBRC) websites. Before going into the details of the analysis, the following tables (7.1 and 7.2) provides an introduction to the important terms used in the documents and key expert witnesses and legal counsel representing the project proponents and opponents at the hearing for the proposed scheme respectively.

**Table 7.1:** Key terms used during the hearing for the RWSS

Overseer	Overseer is a nutrient budget model that calculates and estimates the nutrient flows in a productive farming system and estimates nutrient losses (primarily, Nitrogen and Phosphorus) on a long-term average basis (in units of kg/ha/year). It is owned and administered by the Ministry of Primary Industries, Fertiliser Association of New Zealand and AgResearch.
TRIM	Tukituki River Model. A computer model incorporating models, environmental data and GIS used to manage nutrient inputs, land use and water quality.

PC6	“Plan Change 6” or “Change 6” being the Tukituki River Catchment Plan Change. A proposed plan change, which inserts Tukituki Catchment specific objectives, policies and rules into the regional resource management plan.
Dam	The Proposed RWSS Dam (on the Makaroro River) also referred to as “the dam”, “storage dam” or “the reservoir” and includes all facets of the dam and associated structures.
IMOA	Integrated Management and Offset Approach. A report prepared by the experts and consultants hired by the developer to assess the environmental effects associated with the proposed scheme, and suggest mitigation and offset/compensation measures for the residual adverse ecological effects associated with the scheme.
Board	The Board of Inquiry concerning a proposed plan change and applications for a notice of requirement (for RWSS) and resource consents made by Hawke’s Bay Regional Council and Hawke’s Bay Regional Investment Company Limited in relation to the Tukituki Catchment Proposal.

**Table 7.2:** Key actors and their relevance to the Project

<b>Name</b>	<b>Relevance</b>
David Wheeler	Lead developer of Overseer (contaminant transport model developed for the Ruataniwha Basin) representing the applicants <sup>11</sup>
Gerry Kessels	Ecological assessment consultant representing the applicants
Gil Zemansky	GNS scientist representing the Hawke’s Bay Fish & Game Council
Husam Baalousha	HBRC principal resources modeller representing the applicants
James Rutherford	NIWA (National Institute of Water and Atmospheric Research) scientist representing the applicants
John Bright	Agricultural engineer representing the Ruataniwha Water Users’ Group and Mr Apple Ltd. (New Zealand's largest company for growing, packing, and exporting apples)

<sup>11</sup> HBRC and HBRIC Ltd.

Kate McArthur	Water quality scientist representing the Environmental Defence Society
Kelvin Lloyd	Ecologist representing the Te Taiao Hawke's Bay Environmental Forum
Marie Brown	Expert witness on biodiversity offsetting representing the Environmental Defence Society
Mike Joy	Freshwater scientist representing the Royal Forest and Bird Protection Society of NZ and other submitters
Olivier Ausseil	Freshwater scientist and consultant representing the applicants
Phillip Percy	Expert witness and planner representing the Hawke's Bay Fish & Game Council
Roger Young	Freshwater ecologist representing the applicants
Russell Death	Freshwater scientist representing the Hawke's Bay Fish & Game Council
Simon Harris	Economic consultant (Manager, Harris Consulting representing Hawkes Bay Regional Council
Stephen Daysh	HBRIC Ltd. consultant planner representing the applicants
Stuart Parsons	Environmental consultant and biological scientist representing the applicants
Sue Simmons	Legal counsel for Hawke's Bay and Eastern Fish & Game Council
Vaughan Keesing	Expert witness/ecologist representing the Applicants

**Note:** The following section summarises the documents submitted to the BOI by the relevant actors and key findings in those documents.

### **David Wheeler**

1. Overseer Nutrient budget modelling for the Tukituki as report M2 in the RWSS application suite of documents.
2. Summary of evidence presented to the Board of Inquiry for HBRIC Ltd. the applicant.
3. Statement of rebuttal evidence to address matter raised in the evidence of Fish & Game and Fonterra Co-operative Group Limited.

### **Key Findings/Observations**

- Overseer is generally recognised as the most suitable tool for predicting nutrient losses from a wide range of farm management systems. However, like all models, it is not perfect and is still evolving.
- Overseer has uncertainties in the order of plus or minus 30 percent.
- Overseer assumes that best management practices have been implemented, i.e., there is no ‘poor management’ that would result in ‘large’ discharges.

### **Gerry Kessels**

1. Evidence in chief submitted to the Board of Inquiry regarding proposed mitigation measures and offset approaches on behalf of HBRIC Ltd.
2. Terrestrial ecology study. Assessment of ecological effects of RWSS by Kessels Associates submitted with RWSS application suite of documents.
3. Statement of rebuttal evidence in response to matters raised in the evidence of Dr Kelvin Lloyd and Ms Marie Brown pertaining to terrestrial ecology and associated mitigation measures.

### **Key Findings**

- Twelve nationally classified terrestrial threatened and at risk flora and fauna species have been found within the proposed reservoir footprint.
- Overall, around 242 ha of significant habitat for at-risk and threatened terrestrial fauna and flora species would loss because of the dam and reservoir.
- The applicants IMOAs involve mitigation where possible and appropriate. Otherwise, implementation of biodiversity offsets will produce beneficial effects

over the period of the consents. In particular there would be no net loss as a result of the RWSS.

### **Gil Zemansky**

1. Statement of Evidence in Chief for Hawke's Bay Fish & Game Council submitted to the Board of Inquiry
2. Supplementary statement of evidence submitted to the Board of Inquiry addressing the reliability of TRIM model.

### **Key Findings/Observations**

- The hydrological calculations in the applicants' assessment were unreliable and that the water resources available for irrigation and environmental uses had been overestimated.
- The applicant's synthetically extended stream flow record for the Makaroro River was unreliable and likely to be significantly higher than the actual stream flow.
- The HBRC had not shown the ability to reliably produce flushing flows of the magnitude and duration to control periphyton growth.

### **Husam Baalousha**

1. Expert conferencing: 'Water science and hydrology' joint report submitted to the Board of Inquiry.
2. Statement of Evidence regarding Ruataniwha basin groundwater system and groundwater modelling.
3. Rebuttal evidence to address matters raised regarding TRIM (Tukituki River model) in the evidence in chief of Gil Zemansky (GNS scientist representing the Hawke's Bay Fish & Game Council).

### **Key Findings/Observations**

- The hydrology of the Ruataniwha Basin is complex and the modelling results are inherently uncertain.
- The "Ruataniwha groundwater model" is the outcome of a series of related models that were developed over several years. Models can be improved by collecting more data over time.
- The model provides understanding and assists with analysis of groundwater flow systems and is therefore "fit for purpose".

## **James Rutherford**

1. Statement of Evidence in Chief regarding nutrient management through TRIM modelling submitted to the Board of Inquiry on behalf of HBRC.
2. Rebuttal evidence to address matters raised regarding uncertainties in predicting nitrogen, phosphorus and periphyton concentration through TRIM.

### **Key Findings**

- Modelling results are always subject to uncertainty which needs to be considered when making management decisions.
- TRIM model can make satisfactory predictions regarding Nitrogen and Phosphorus losses from farmlands and is thus ‘fit for the purpose’

## **John Bright**

1. Statement of evidence regarding the impacts of proposed RWSS and Plan Change 6 on irrigation water supply and ground water takes submitted on behalf of the Ruataniwha Water Users Group.
2. Expert conferencing on economic impacts relating to the reliability of estimates of water demand and supply provided by the HBRC. The joint report was submitted by
  - Simon Harris: Economic consultant (Manager, Harris Consulting representing Hawkes Bay Regional Council).
  - Dr John Bright: Agriculture Engineer (Managing Director, Aqualinc Research representing Mr Apple).

### **Key Findings**

- The pattern of land surface recharge in the applicant’s model was very different from the pattern of rainfall across the Ruataniwha Plains.
- There was high degree of uncertainty in applicant’s model. Such models are relatively crude and therefore inherently limited in their approximation.
- Such uncertainties can be reduced through an adaptive management approach allowing future management to respond to increased knowledge arising from ongoing assessment and monitoring.

## **Kate McArthur**

1. Evidence in chief to provide technical advice to the BOI on water quality and aquatic ecology implications of Plan Change 6 and RWSS submitted on behalf of EDS.

2. Statement of rebuttal evidence to responds to matters raised in the evidence submitted by Dairy NZ and Fonterra Co-Operative Group regarding risks to the coastal environment and single nutrient approach

### **Key Findings**

- A single limiting-nutrient approach to managing the adverse effects of biological growths in rivers is not underpinned by sound scientific assumptions, not supported by real world evidence and carries significant risk of poor river outcomes.
- Experts have identified periods of increased risk associated with closure of the estuary mouth and subsequent increases in estuary flushing time. There is some evidence to indicate occasional eutrophic conditions or enrichment under the current state of water quality both in the estuary and within Hawke Bay.

### **Kelvin Lloyd**

1. Statement of evidence regarding ecological significance of the dam site and the potential adverse effects of the RWSS on terrestrial ecological values submitted on behalf of Te Taiao Hawke's Bay Environmental Forum.
2. Supplementary evidence regarding the deficiencies in the applicant's assessment of indigenous plant species and proposed mitigation measures.

### **Key Findings**

- The applicant's terrestrial ecological assessment of indigenous vegetation, plant species, lizards, river birds and invertebrates was incomplete and understated the importance of and adverse effects on these indigenous plants and animals.
- Individual landowners would not be able to afford necessary mitigation measures proposed in applicants IMOA (integrated management and offset approach).
- The proposed artificial roosting sites/boxes for nesting the native bats was not reliable. Clear cutting the vegetation at proposed dam site would potentially injure or kill the bats and native.

### **Marie Brown**

1. Concise Summary of Evidence regarding inadequacy of applicant's proposed mitigation measures. Evidence submitted on behalf of Environmental Defence Society.
2. Expert conferencing (terrestrial ecology, October 2013) joint report to the Board of Inquiry Submitted by;

- Marie Brown: Senior Policy Analyst (Environmental Defence Society-submitter)
- Gerry Kessels: Ecologist (Kessels Ecology Limited representing HBRIC Ltd-applicant)
- Kelvin Lloyd: Senior Ecologist & Botanist (for Te Taio Hawke's Bay Environment Forum-submitter)
- John Craig: Senior Ecologist (Green Incorporation for HBRIC Ltd - applicant)
- Stuart Parsons: Associate Professor Ecology at University of Auckland (for HBRIC Ltd - applicant)
- Vaughan Keesing: Principal Ecologist (Boffa Miskell for HBRIC Ltd-applicant)

3. Statement of supplementary evidence on behalf of Environmental Defence Society.

#### **Key Findings/Observations**

- The proposed mitigation measures lack application of a robust decision-making process in formulating appropriate offset mitigation.
- Proposed offset mitigation benefits are insufficiently secured over time, providing little confidence that the gains outlined are likely to be achieved. For example, the ability of horticulturists to afford the costs of implementing the necessary mitigations.

#### **Mike Joy**

1. Statement of evidence regarding native fish ecology and distribution and nutrient management in Tukituki catchment submitted on behalf of Royal Forest and Bird Protection Society New Zealand Incorporated.
2. Statement of evidence on behalf of Ngāti Kahungunu Iwi Incorporated.
3. Supplementary evidence on behalf of Hawke's Bay Environmental Water Group.
4. Supplementary evidence on behalf of Royal Forest and Bird Protection Society New Zealand Incorporated.

#### **Key Findings**

- There are at least 14 native fish species in the Tukituki catchment, of which 11 species are likely to be present in the Makororo River.

- The dam would have major impacts on the native fish populations as most native fish species found in the Tukituki catchment are migratory and therefore require uninterrupted passage up and downstream to maintain their distribution.
- The Tukituki River already suffers from agricultural impacts with water and habitat quality declining. The predicted increase in farming intensity through irrigation and to finance irrigation would mean worsening state of freshwaters in the Tukituki catchment.

### **Oliver Ausseil**

1. Statement of evidence in chief regarding nutrient management, RWSS flushing flows and water quality limits other than nitrogen submitted on behalf of the applicants.
2. Expert conferencing on the topics of periphyton biomass and cover limits, joint report submitted to the board of inquiry.
3. Statement of rebuttal evidence to concerns raised by various submitters regarding Trim modelling.

### **Key Findings/conclusions**

- The periphyton cover limits/targets set in Plan Change 6 are based on the New Zealand Periphyton Guidelines and are thus appropriate.
- More data are required to understand the differences in compliance with periphyton cover vs periphyton biomass limits.
- Flushing flows as proposed would provide significant environmental benefits in the river reaches downstream of the dam.
- TRIM is significantly more advanced than tools that have recently been used in similar processes, such as in the Horizons One Plan process. Hence, the model is fit for the purpose.

### **Philip Percy**

1. Statement of evidence addressing the regional aspects of the RWSS submitted on behalf of the Hawke's Bay Fish & Game Council.

### **Key Findings/Conclusions**

- The water allocation limits set in PC6 are largely fully taken up by existing consented users. If the RWSS was to take more water that will cause over allocation. However, National Policy Statement for Freshwater Management requires regional plans to avoid over allocation.

- The proposed flushing flows may be effective in the Waipawa and Makaroro Rivers however there is significant uncertainty as to their effectiveness in the Tukituki River.
- The adverse effects of periphyton accumulations need to be managed via other measures, primarily reducing nutrient concentrations.

### **Roger Young**

1. Evidence in chief on aquatic ecology and the effectiveness of the trap and transfer method for mitigating the dam's impacts on native fish.
2. Rebuttal evidence to concerns raised by various submitters regarding
  - a. Effects of reduced flows and periphyton growth on dissolved oxygen
  - b. Effects of the proposed dam on fish passage
  - c. Flushing flow effectiveness

### **Key Findings**

- Movement of fish, both upstream and downstream, past the dam will be affected by the presence of the dam.
- Trap and transfer method could be applied to mitigate this negative effect of the RWSS. However, the effectiveness of the trap and transfer plan is only expected to be low to medium for maintaining the full range of native fish species.
- The proposed flushing flows for the Makaroro and Waipawa rivers would be sufficiently large to effectively flush any periphyton accumulations from the riverbed.
- The armouring of substrate that is eventually expected in the Makaroro River downstream of the dam will progressively make the flushing flows less effective over the time.

### **Russel Death**

1. Statement of evidence in chief regarding the water quality effects due to intensification of agriculture from the RWSS submitted on behalf of Hawke's Bay Fish & Game Council.
2. Supplementary evidence on the utility and validity of TRIM model for nutrient management in Tukituki Catchment.
3. Expert conferencing joint witness statement reports on 'water science and hydrology' and 'RWSS effects on aquatic ecology'.

## **Key Findings**

- The Ruataniwha aquifers are enriched with DIN (dissolved inorganic nitrogen), because of current and past land use practices. Consequently, elevated DIN levels in surface waterbodies are observed. Allowing further intensification of land uses without rigorous limits will result in further increases in DIN (and phosphorous) levels having adverse effects on ecosystem health.
- TRIM model is not useful for managing periphyton levels in the Tukituki Catchment and thus not reliable in providing information for making resource management decisions.

## **Simon Harris**

1. Statement of evidence regarding the economic impact of different scenarios of water quantity and quality (nutrient) management in the Tukituki catchment.
2. Joint witness conferencing report on economics submitted by
  - Simon Harris: Economic consultant (Manager, Harris Consulting representing Hawkes Bay Regional Council).
  - Geoffrey Butcher: Economic consultant (Principal, Butcher Partners Ltd representing Hawkes Bay Regional Council)
  - Dr Adolf Stroombergen: (Chief Economist, Infometrics representing Mr Apple Ltd)

The experts applied different economic models to address the impacts of Plan Change 6 on apple growers and the benefits and impacts of the proposed RWSS on the Hawke's Bay economy.

## **Key Findings**

- Impact of reducing instream nitrogen concentrations (0.3 or 0.15 mg/l) for periphyton control would have severe impacts on land use in the Tukituki catchment. This would require large scale conversion of agriculture land to forestry or conservation land to achieve the reductions in nutrient losses required. This would lead to 40% to 50% reduction in operating profit after capital costs.

## **Stephen Daysh**

1. Statement of evidence in chief regarding consultation and stakeholder engagement on the RWSS as well as the credibility and reliability of the proposed integrated management and offset approach (IMOA).
2. Rebuttal evidence to address the concerns raised by EDS, Fish & Game, and others regarding the efficacy of TRIM and the proposed mitigation and offset package.

## **Key Findings**

- The Council, and subsequently HBRIC Ltd, have taken a thorough and measured approach to stakeholder engagement and consultation for the RWSS.
- Along with formalised stakeholder engagement processes, there had been sufficient information available to the broader public to understand the matters related to the proposed scheme and to make their views known, either directly to HBRC and HBRIC Ltd, or through other means such as submissions to the board of inquiry.
- The proposed IMOA had been developed through extensive technical assessments and consultation. In response to the potential environmental impacts of the project, the IMOA puts together strategies for restoring biodiversity and approaches for offsetting effects on recreation, cultural and heritage values.

## **Stuart Parsons**

1. Statement of rebuttal evidence to concerns raised by Kelvin Lloyd (Te Taiao Hawke's Bay Environmental Forum) and Marie Brown (EDS) regarding proposed mitigation measures for native bats.
2. Expert conferencing on terrestrial ecology. Joint Witness report to the board of inquiry.

## **Key Findings/conclusions**

- Artificial roosting boxes are used world-wide to effectively supplement roosting sites for bats.
- Over the course of the project, implementing the mitigation measures would serve to offset short to medium term negative effects on bats population. IMOA would bring positive impacts for bats because their habitats will be managed and the threats (predators) to them would reduce.

## 7.2 Content Analysis

The primary purpose of environmental assessment, as discussed in the previous chapters, is to provide decision-makers and stakeholders with credible information about the actual and potential environmental effects of a proposed project and the strategies to effectively manage those effects. However, like most large-scale infrastructure project proposals, concerns were raised by both the opponents and supporters of the scheme about the rigour and reliability of the environmental assessment reports. These concerns were reported both in the submissions made and evidence provided and were also raised during the hearing process for the application. The following table provides a summary (details provided in **appendix VI**) of the thematic analysis of the 420+ submissions and evidences made to the board of inquiry, the applicant's AEE report and the BOI Final report and decisions.

**Table 7.3:** Content analysis of the submission and evidences provided to BOI

Themes	Word Count	Examples
Water quality	1633	<p>Permitting contamination up to the toxicity threshold is likely to result in significant deterioration of water quality.</p> <p>Measures to improve water quality are not adequate.</p> <p>Forest and Bird is extremely concerned that land use intensification in the Tukituki catchment, above the confluence with the Waipawa River, will result in nutrient levels in excess of the proposed maximum as the dams flushing flows will have no effect on this section of the Tukituki River.</p> <p>It (the proposal) increases permitted nutrient levels to potentially harmful levels.</p>
Uncertainties about environmental effects	983	<p>There is uncertainty about how cyanobacteria (which form toxic cyanobacterial mats) respond to differing nutrient loads and nutrient ratios.</p> <p>The actual adverse effects of this proposal are not known, in particular its effect on threatened and at-risk plants, lizards and invertebrates</p>

Terrestrial ecology	898	<p>Ecological surveys indicate that the dam footprint is an important habitat for long tailed bats which are classified as nationally vulnerable to extinction.</p> <p>The preservation of the indigenous forests.....in the upper Makaroro River area is vital and every effort must be made to fully protect this area.</p>
Aquatic ecology	638	<p>The impact of the dam on aquatic ecology will be significant.</p> <p>There are seven migratory native fish species found in the vicinity of the dam. Four of these species have a threat classification of ‘declining’.</p>
Effectiveness of mitigation measures	604	<p>The various components of the scheme....do not appropriately avoid, remedy or mitigate the adverse effects of the proposal on the environment</p>
Reference to AEE	292	<p>The AEE document does not actually undertake an assessment of the actual scale and magnitude of these effects once they have been identified.</p> <p>As noted in the AEE (page 122) some species will not be able to use the still-water/ lake-like habitat of a dam.</p>

### 7.2.1 Water quality assessment

The effects of the proposed dam on water quality both upstream and downstream remained one of the central issues throughout the planning and decision-making for the dam. Such a large-scale water storage scheme will have temporary effects during the construction phase but more importantly would bring long-term effects on the water quality once the dam is operational. Regarding the effects of dam construction on water quality, there was not much concern apart from increased sediment loads in the river, mainly at the construction site. However, the assessment of long-term effects of the scheme on water quality was deeply contested among the proponents and opponents of the scheme.

One of the most disputed factors affecting the water quality was nutrient modelling for the scheme. The legal counsel for Hawke's Bay and Eastern Fish and Game Councils New Zealand, expressed concerns on the accuracy of the groundwater and contaminant transport models developed for the Ruataniwha Basin. Cross examining the developers’ expert Ms De Wit expressed her concern as:

Ms de Wit: the TRIM model I understand utilises data from the Overseer?

Dr Rutherford: That's correct.

Ms de Wit: And you state in your evidence-in-chief....Overseer has uncertainties in the order of plus or minus 30 percent?

Dr Rutherford: Yes, that's correct.

Ms de Wit: And you agree that uncertainties in input data will affect the certainty of outputs from the model?

Dr Rutherford: Yes

Ms de Wit: In the last sentence (of your evidence) you say that the TRIM model is capable of making satisfactory predictions of stream nitrogen concentrations for at 45 most location. So you agree therefore it's not capable of making satisfactory predictions of nitrogen concentrations at all locations

Dr Rutherford: I don't think I can say that.

In response, Hawke's Bay Regional Council's principal resources modeller, Dr Husam Baalousha told the board that there is no perfect model but the work they undertook is best practice and fit for the purpose. However, counsels for Mr. Apple Ltd (New Zealand largest apple supplier) and Ruataniwha Water Users Group upheld Fish and Game's stance and questioned the reliability of the models. Dr Baalousha also admits in his evidence that hydrology of the Ruataniwha Basin was complex and that modelling results are inherently uncertain.

Modelling results are always subject to uncertainty. Groundwater modelling has inherent uncertainties because of our inability to observe natural processes going on underground<sup>12</sup>.

The reliability of Overseer nutrient budget model developed for RWSS had also been challenged during the hearing by the Board. The deficiencies and limitations of Overseer were

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<sup>12</sup> Statement of evidence in chief of Dr Husam Baalousha on behalf of the applicant. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/applicants\\_evidence/Pages/Water\\_Quantity.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/applicants_evidence/Pages/Water_Quantity.aspx)

revealed when the Counsel for Fish and Game New Zealand cross examined, David Wheeler, the lead developer of Overseer.

Mr. Malone (counsel for Fish and Game NZ): Does that mean it cannot be used to estimate daily, weekly or monthly nitrogen and phosphorous losses?

Mr. Wheeler: Certainly for phosphorous, no<sup>13</sup>.

The management of nutrients for PC6 and subsequently RWSS relies on the TRIM model (Tukituki River Model) developed by National Institute for Water and Atmospheric Research (NIWA) principal scientist, Dr Kit Rutherford. The reliability of this model was questioned on several occasions during the hearing by the BOI. For example, Dr Russell Death in his evidence in-chief representing Hawke's Bay and Eastern Fish and Game Councils expressed his concerns:

...although much of the strategy of the HBRC with respect to nutrient management in the Ruataniwha scheme is based on the NIWA TRIM model, the inability of the authors to provide any measure of model accuracy, leaves me with no option but to judge the model outcomes pure speculation<sup>14</sup>.

Legal counsel for the Environmental Defence Society and Hawke's Bay Fish and Game Council also questioned the accuracy of the model. Correspondingly, Dr Rutherford accepted his low confidence in the ability of the TRIM model:

The high variability in phosphorous concentrations reduces my confidence in the ability of the TRIM Stream model to predict the effects of land use change on stream phosphorous concentrations and consequently on periphyton biomass.<sup>15</sup>

The Board thus recognised the concerns about TRIM model and also takes in to account applicant's stance of 'fit for the purpose'. However, it maintained that:

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<sup>13</sup> Tukituki Catchment Proposal Hearing Transcript, page 378. Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-3.aspx>

<sup>14</sup> Statement of evidence of Associate Professor Russell George Death On behalf of Hawke's Bay Fish and Game Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/submitters\\_evidence/Pages/Submitter\\_Evidence\\_F\\_to\\_L.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/submitters_evidence/Pages/Submitter_Evidence_F_to_L.aspx)

<sup>15</sup> Concise Summary of evidence provided by Dr James Rutherford, NIWA Principal Scientist on behalf of HBRC and HBRIC Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-6.aspx>

We agree with the reservations expressed....about the ability of TRIM to accurately predict future in-stream nutrient levels. By the same token we agree with Dr Rutherford that its use is only part of the regime proposed by HBRC for nutrient management. Having said that, the Board cannot agree with Dr Rutherford's proposition that the risk associated with any model uncertainty will be borne by the applicant (in its capacity as the applicant for the RWSS). We consider those risks would be borne by the environment and by all those who enjoy the environment. (BOI, Final Report and Decisions p. 149).

Although acknowledging the risk, the Board was satisfied that the farmers can operate in a manner consistent with the limits established for nitrogen and phosphorus in the PC6. However, as mentioned in chapter 6 (section 6.8), the 2017 RWSS review report found that meeting the DIN (dissolved inorganic nitrogen) limits in all the Tukituki sub-catchments is highly improbable and likely to be physically impossible. This shows that there was significant uncertainty in assessing the effects of the dam on the water quality. The uncertainty factor thus made the credibility of the assessment questionable. Therefore, deep contestation was observed between the experts representing both the opponents and proponents of the dam.

A number of submitters considered that the hydrological calculations in the applicants' assessment were unreliable and that the water resource available for irrigation and environmental uses had been over-estimated. Presenting evidence for Fish and Game, Dr Gilbert Zemansky, disputed the accuracy of the enhanced flow record on the Makaroro River at the Burnt Bridge (the applicant's hydrologist selected site for gauging water flow). He told the Board that the applicant's synthetically extended stream flow record for the Makaroro River is unreliable and likely to be significantly higher than the actual stream flow. Hence, it makes the viability of the scheme questionable. He added that HBRC has not shown the ability to reliably produce flushing flows of the magnitude and duration to control periphyton growth.

The legal counsel for Environmental Defence Society added that it is not clear why applicant used adult rainbow trout and the juvenile long finned eel to determine minimum flow requirement. While the torrent fish, which are flow-demanding species and have a declining conservation status throughout the Tukituki catchment, was not used to determine minimum flows. However, the applicant's freshwater expert responded that torrent fish is of a lesser concern as the productivity of that species for sustaining a fishery is not an issue.

Many submitters raised the risk of adverse environmental effects arising from intensified land use because of the availability of irrigation water. The Board in its final decision also mentioned that farming intensification is an unavoidable consequence of the RWSS. Environmental Defence Society, Fish and Game, Forest and Bird, NKII and other submitters expressed deep concern that this intensification would cause a substantial increase in nitrogen leaching which would mean that the RWSS would not promote sustainable freshwater management. However, the Board showed its content with the response from the experts representing the applicant that management of such risks is an important component of the integrated management strategy for the Tukituki catchment. The key mechanism for implementing this strategy is RWSS itself.

### **7.2.2 Uncertainties about potential and expected environmental effects**

As environmental assessment involves predicting future impacts, uncertainties are inherent in it. Hence, such uncertainties were also found in the environmental assessments of the RWSS. As discussed, earlier in the chapter, uncertainties in the various models developed for the scheme remained a major concern for most parties involved in the proposed project.

Providing evidence for Ruataniwha Water Users Group, Dr John Bright was of the view that the level of uncertainty associated with the water quality effects of the scheme is unknown. He maintained that the applicant's principal resource modeller has failed to describe interpolation methods used to develop nutrient modelling for the scheme. He further added that the pattern of land surface recharge in the applicant's model is very different to the pattern of rainfall across the Ruataniwha plains and it is not clear how factors such as topography have been accounted in the interpolation of data. Hence, the applicant's model is not capable of making satisfactory predictions on water quality and quantity effects of the scheme.

The applicant's principal modeller accepted the high degree of uncertainty in their model and added that such models are relatively crude and therefore inherently limited in approximation of the complex natural processes. Nevertheless, these uncertainties can be reduced through adaptive management approach allowing the future management to respond to increased knowledge arising from ongoing assessment and monitoring.

Apart from the modelling, the uncertainty in the implementation of mitigation measures has also been a great concern for various parties involved in the project. For example, Te Taiao Hawke's Bay Environment Forum ecologist, Dr Kelvin Lloyd, questioned the undertaking of

proposed mitigation measures for the terrestrial habitats having huge reliance on the landholder consents. Likewise, Hawke's Bay Fish and Game Council in their submission stated:

The proposed mitigation and offsetting programme which forms part of the package to avoid, remedy, and mitigate adverse effects relies on the agreement of third parties and on the use of land not part of the scheme or subject to the resource consents<sup>16</sup>.

Hence, when the implementations of the proposed mitigation measures are not guaranteed, the substantive goal of environmental assessment in aiding the decision-making process towards positive environmental outcomes cannot be achieved.

The identification and evaluation of alternative locations, activity and methods are important for ensuring the objectivity of the environmental assessment process. The aim is to ensure that the selected activity on the designated location has the minimum negative environmental effects, while meeting the identified objectives.

As an alternative to the large-scale water storage scheme a number of submitters preferred on-farm storage. However, the applicant's Water Initiative Group Manager stated in his evidence on 2<sup>nd</sup> day of the hearing:

I consider that on-farm storage does not provide a viable alternative to the proposed RWSS due to economies of scale and the significant potential additional environmental benefits of a centrally managed water storage and distribution system<sup>17</sup>.

The applicant's expert evidence further added that it would not only require a large number of on-farm dams to achieve an equivalent level of storage to that of the scheme but also the flushing flows would not be possible with on-farm storage.

Reducing the size of the proposed dam, Ngati Kahungunu Iwi Incorporated in their submission proposed a 60 million cubic metre dam. However, the Board agreed with the applicant that a smaller dam would not be feasible to irrigate the designated area.

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<sup>16</sup> Submission made by Hawke's Bay Fish and Game Council. Submission no. 242. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_H.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_H.aspx)

<sup>17</sup> Tukituki Catchment Proposal Hearing Transcript. (p. 167) Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-2.aspx>

Te Taiao Hawke's Bay Environment Forum submitted that there were inadequacies in the assessment of the alternative dam sites. Similarly, Horticulture New Zealand, in its submission criticised the inadequate assessment of the alternative water distribution routes by the applicant:

The assessment of alternatives identifies a range of distribution lines that were considered. However, other distribution and supply options that may significantly reduce the requirement for the designation have not been documented or considered in the assessment of alternatives.<sup>18</sup>

Furthermore, many submitters stated that though alternative dam locations were reasonably considered in the AEE report. However, consideration for alternative irrigation methods or activities was weak. Secondly, it has not been demonstrated that the chosen alternatives are the best one.

Still, based on another High Court decision (*Meridian Energy Limited v Central Otago District Council*<sup>19</sup>) the Board concluded that:

Consideration of alternative sites should not be pushed too far and a search for the best site is not required<sup>20</sup>.

The Board further added that the applicant has met the requirements of Schedule 4 of the RMA in considering alternative locations or methods for the exercise of the activity.

### **7.2.3 Terrestrial ecology**

A number of submitters and expert witnesses raised strong concerns about the impact of the dam and reservoir on terrestrial ecology. Not surprisingly, the applicant's terrestrial ecological assessment was also deeply contested. For example, representing Te Taiao Hawke's Bay Environment Forum, which is a network of local environmental groups, ecologist Dr Kelvin Lloyd was highly critical of the assessments that had been undertaken by the applicant. He stated before the Board that the applicant's terrestrial ecological assessment of indigenous vegetation, plant species, lizards, river birds and invertebrates is incomplete and understates

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<sup>18</sup> Submission made by Horticulture NZ. Submission no. 384. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_H.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_H.aspx)

<sup>19</sup> G Hansen, Evidence in Chief, section 7.2, page 12; and G Hansen, Tukituki Catchment Proposal Hearing Transcript, page 184.

<sup>20</sup> Board of Inquiry Final Report and Decisions. (p. 346) Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/final-report-decisions/Pages/default.aspx>

the importance of and adverse effects on these indigenous plants and animals. He stated before the Board that:

There had been a “glaring omission” to adequately address the significance of the braided river birds, the presence of short-tailed bats could not be ruled out, other species of lizards were likely to be present, and there were deficiencies in the identification of plant species (BOI, Final Report and Decisions p. 300).

Ecologist Dr Vaughan Keesing, representing the applicants, did not agree that there were any major deficiencies in the ecological assessment. Though Dr Keesing acknowledged the botanical oversights identified by Dr Lloyd but argued that within the overall context of the study those omissions were not significant.

In response to a question from the Board, the applicant’s consultant Gerry Kessels informed the Board that his greatest concern as a specialist ecologist was about the bats. However, it was his ‘*belief*’ that they would be able to move to alternative roosts as the reservoir began to fill and it is possible to create roosting sites by planting and using artificial roosting boxes. He claimed that these boxes had successfully been used in South Canterbury and Hamilton. Dr Lloyd, however, did not have the same confidence over the proposed artificial roosting boxes. He also feared that clear-cutting the trees could potentially injure or kill the bats.

Dr Lloyd was also concerned about the reliance of mitigation measures on the landowner consent. The counsel for Hawke's Bay and Eastern Fish and Game Council also supported Dr Lloyd’s stance by questioning the affordability of agriculturalists and horticulturalists to implement the necessary actions.

It is also Fish and Game submission that it is entirely unknown whether agriculturalists and horticulturalists would even be able to afford to implement the necessary mitigation.

In that respect, whether they could or not, will depend on their circumstances at that time in relation to levels of debt, national and international commodity prices, and what mitigation measures were required and what the costs of mitigation measures would be<sup>21</sup>.

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<sup>21</sup> Tukituki Catchment Proposal Hearing Transcript, page 2289 Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-18.aspx>

In response to the conflicting views on the adequacy of terrestrial ecological assessment, the Board concluded:

Deficiencies in the studies that were undertaken have been exposed; these need to be kept in perspective. Obviously, the Board cannot rule out the possibility that threatened plant, lizard or invertebrate species, which have not been identified to date, are present at the site. However, that does not suggest that the studies already undertaken are worthless (BOI, Final Report and Decisions p. 302).

Nevertheless, the Board acknowledged the uncertainty regarding the terrestrial ecological effects of the scheme and the deficiencies in the applicant's assessment reports. However, the board held that the ultimate issue is whether the adverse ecological effects, which certainly exist, can adequately be avoided, remedied or mitigated. The legal counsel for Forest and Bird Protection Society NZ Inc. also highlighted this uncertainty:

The actual adverse effects of this proposal are not known, in particular its effect on threatened and at-risk plants, lizards and invertebrates..... As a result, the actions required to avoid, remedy or mitigate those effects are also unknown<sup>22</sup>.

Giving evidence for Environmental Defence Society, Ms Marie Brown expressed her concern over the lack of details provided by the applicant in their ecological effects assessment and the manner in which the proposed mitigation measures will be implemented. She held that if the Board grant approval to the scheme then, in light of acknowledged deficiencies in the applicant's assessment, the consent holder should be required to conduct additional surveys to more precisely describe the site and its ecology prior to the commencement of the project.

#### **7.2.4 Aquatic ecology**

Permanent loss of riverine habitat from inundation by the reservoir and blockage of fish passage by the dam were among the most concerned adverse effects of the proposed scheme on the aquatic ecology. The applicant proposed a trap and transfer method for mitigating the adverse effect of dam on fish passage. However, the efficacy of the proposed trap and transfer method was challenged by many submitters. For example, Dr Mike Joy a freshwater ecologist

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<sup>22</sup> Tukituki Catchment Proposal Hearing Transcript, page 1583 Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-13.aspx>

from Massey University (currently employed at Victoria University of Wellington), appearing for Royal Forest and Bird Protection Society of NZ Inc stated in his evidence that:

There is little or no evidence of the mitigation of dam impacts on fish passage through trap and transfer maintaining upstream populations of any fish or eel species upstream<sup>23</sup>.

Dr Joy also expressed concern over the high percentage of New Zealand's native fish species classified as threatened. Providing evidence for Hawke's Bay Environmental Water Group, he stated:

Sixty-eight percent of New Zealand's native fish are currently listed as threatened and loss of habitat and water quality impacts is a major cause of their heightened threat status. This proposed dam will be another impact on migratory fish habitat to add to this statistic<sup>24</sup>.

The legal counsel for Ngati Kahungunu Iwi Inc (NKII) also questioned the freshwater ecologist Dr Roger Young representing the applicant over the effectiveness of the trap and transfer method for mitigating dam impacts on the native fish. Dr Young rated the prospects of maintaining the full range of native fish species currently found upstream of the dam as low to medium. In the cross examination by the legal counsel for NKII, Dr Young accepted the trap and transfer method would only be effective for certain species.

MS Allan (legal counsel for NKII): So for those other three (rapidly declining fish) species are you confident that the trap and transfer method proposed here is going to adequately protect those other species?

DR Young: No I have low confidence.....<sup>25</sup>

Hence, there were concerns about the efficiency and efficacy of the proposed trap and transfer method and the BOI report states:

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<sup>23</sup> Tukituki Catchment Proposal Hearing Transcript, page 1608. Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-13.aspx>

<sup>24</sup> Statement of evidence of Dr Mike Joy on behalf of Hawke's Bay Environmental Water Group. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/submitters\\_evidence/Pages/Submitter\\_Evidence\\_F\\_to\\_L.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/evidence/submitters_evidence/Pages/Submitter_Evidence_F_to_L.aspx)

<sup>25</sup> Tukituki Catchment Proposal Hearing Transcript (p 798). Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-6.aspx>

All of this indicates to the Board that the blocking of fish passage by the dam is a serious adverse effect which could not be mitigated by the trap and transfer proposal alone. (BOI, Final Report and Decisions p. 307).

Referring to the loss of riverine habitat the Board finds that:

The creation of a 372ha reservoir will result in the loss of up to 7km of flowing water habitats..... species such as torrent fish, bluegill bully, redfin bully, Cran's bully, and dwarf galaxias are unlikely to survive in the reservoir and will be lost (BOI, Final Report and Decisions p. 308).

Hence, it was concluded that such adverse effects on aquatic ecology cannot be mitigated and thus the Integrated Mitigation and Offset Approach (IMOA) package is critical for the project. However, there were concerns from many submitters on the implementation of IMOA which will be discussed later in the chapter.

### **7.2.5 Effectiveness of proposed mitigation measures**

The proposed mitigation measures were one of the most contested aspects of the project between the developers and those opposing the scheme. Hawke's Bay and Eastern Fish and Game Council in their submission noted:

The various components of the scheme....do not appropriately avoid, remedy or mitigate the adverse effects of the proposal on the environment<sup>26</sup>.

Likewise, Horticulture New Zealand, showing dissatisfaction with the evaluation of the identified effects in the AEE report, stated:

The AEE document does not actually undertake an assessment of the actual scale and magnitude of these effects once they have been identified<sup>27</sup>.

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<sup>26</sup> Submission made by Hawke's Bay and Eastern Fish and Game Councils New Zealand. Submission no. 242. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_H.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_H.aspx)

<sup>27</sup> Submission made by Horticulture New Zealand. Submission no. 384. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_H.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_H.aspx)

Similar kinds of concerns were found in different submissions made by the opponents of the dam. For example, Royal Forest and Bird Protection Society stated in its submission to the Board:

Landscapes, biodiversity, endangered species (flora and fauna), will be affected by the proposal. Mitigation proposed does not at all cover the loss of mature Podocarp forest, native fish migration and loss of bat and NZ falcon nesting sites. The proposed conditions of the resource consents and notices of requirement, do not avoid, remedy or mitigate the adverse effects of the proposal on the environment<sup>28</sup>.

However, the Biological Scientist Dr Stuart Parsons representing the applicants defended the proposed mitigation measures for native bats. He stated on day 6 of the hearing:

I believe that if the project goes and the offset and mitigation is put in place effectively then it will be a positive outcome for the bats. The bats, it's assumed from a study in Fiordland that the long-tailed bats are undergoing about a 5 percent rate of decline because of predators and the like. That's probably accurate for what's going on here in this unmanaged situation, but predator control, the planting of the riparian strips, all of these interventions that are proposed could actually help to reverse that 5 percent rate of decline. There will be perhaps short term effects but I think over the course of the project and the mitigation and offset that it actually could be quite positive for the bats because their habitat will be managed and the threats to them will be moved<sup>29</sup>.

Counsel for Forest and Bird Protection Society questioned Dr Parsons on the effectiveness of the proposed artificial bat roost boxes to offset potential negative effects on the bats. Dr Parsons also confirmed that there is no published peer reviewed study on the use of artificial roosts in New Zealand.

MS Gepp (Counsel for Forest and Bird Protection Society): ... (any) published studies of the use of artificial roosts in New Zealand?

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<sup>28</sup> Submission made by Royal Forest and Bird Protection Society of NZ Inc. Hastings and Havelock North Branch. Submission no. 343. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_R.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_R.aspx)

<sup>29</sup> Tukituki Catchment Proposal Hearing Transcript (p 673). Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-6.aspx>

Dr Parsons: None published in peer reviewed literature, no. The evidence is from a Department of Conservation study that was carried out in Canterbury and they supplied us many years ago with a spreadsheet showing the results of their roost box monitoring scheme<sup>30</sup>.

The lack of empirical evidence to support mitigation measures raises questions about the effective implementation of proposed mitigation measures.

As is evident from the above findings, that adverse effects of the project cannot be mitigated. Therefore, an integrated mitigation and offsetting approach (IMOA) was proposed for the scheme. The applicant's expert planner described the IMOA package as the cornerstone of the RWSS proposal. Representing the applicants, terrestrial ecologist Gerry Kessels informed the Board that concept of 'no-net loss' as the ultimate goal of biodiversity offset approach is adopted in the IMOA. He added:

The concept of no-net loss is the ultimate goal of a biodiversity offset approach. No-net loss refers to the point where biodiversity gains from targeted conservation activities match biodiversity losses due to the impact of a specific development project so that there is no net reduction in the type, amount and condition (quality) of biodiversity over space and time.

However, the counsel for Environmental Defence Society was critical of the proposed IMOA package. She stated in her evidence:

The application does not demonstrate that the mitigation hierarchy has been applied. It is inevitable that the RWSS will result in significant adverse effects, many of which will be unable to be avoided or remedied, thus requiring a robust mitigation and offsetting package. However, we are concerned that mechanisms for avoiding and remedying adverse effects on biodiversity have not clearly been explored<sup>31</sup>.

Hearing the conflicting views from the representatives of applicants and opposing parties the Board acknowledged that the environmental effects of the dam could not all be mitigated and declared:

The reality is that environmental effects....of the dam and reservoir cannot all be avoided, remedied or mitigated. Therefore, offsets become an essential part of the IMOA. It involves

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<sup>30</sup> Tukituki Catchment Proposal Hearing Transcript (p 664). Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-6.aspx>

<sup>31</sup> Submission made by Environmental Defence Society. Submission no 304. Retrieved from [http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions\\_E\\_F.aspx](http://www.epa.govt.nz/Resource-management/previous/Tukituki/Submissions/Pages/Submissions_E_F.aspx)

mitigation where possible and appropriate, and, where this is not possible, for offsets which will produce beneficial effects over the period of the consents.

However, Te Taiao Hawke's Bay Environment Forum expert witness, University of Otago ecologist, Dr Lloyd was concerned about the implementation of the IMOA for terrestrial habitats due to its heavy reliance on landholder consent. Similar concerns were raised by the EDS representative:

My chief concern is the lack of detail provided by the applicant in the integrated mitigation offset approach.... particularly implementation of the IMOA. I should say that the acronym is erroneous; it should be IMAO (in my arrogant opinion) rather than IMOA<sup>32</sup>.

Hence, the document analysis shows a deep contestation over the identification and evaluation of the environmental effects and the required mitigation measures among the representatives of applicants and those opposing the scheme. The extent of this contestation creates a challenge for the decision-makers to successfully incorporate the environmental assessments in their decisions and achieve positive environmental outcomes.

### **7.3 Membership of the Board of Inquiry**

Generally, the Boards of Inquiry for nationally significant proposals have been dominated by legal experts and have not had sufficient scientific expertise. This is quite evident from observing the membership of the various Boards appointed by the Minister(s) for the Environment since 2009. The lack of freshwater science expertise in the membership of the Board of Inquiry for the Tukituki Catchment Proposal led to deficiencies in the Board's understanding of the environmental effects of the RWSS. The opponents of the scheme argued that the lack of a freshwater scientist in the Board of Inquiry influenced the outcome of the decision-making, as little understanding was shown by the Board in regard to water quality effects of the RWSS.

#### **Board of Inquiry Members**

1. The Honourable Justice Lester Chisholm (Chairperson) .....Retired high court judge.

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<sup>32</sup> Tukituki Catchment Proposal Hearing Transcript. (p. 1992) Retrieved from <http://www.epa.govt.nz/Resource-management/previous/Tukituki/Hearing/hearing-proceedings/Pages/Hearing-day-17.aspx>

2. Environment Commissioner Russell Howie (deputy chairperson) .... Civil engineer by profession before becoming independent commissioner.
3. Matthew Lawson (Member)..... specialises in Civil/Commercial Litigation, Resource Management and Local Government Law.
4. Loretta Lovell (Member)..... Certified Independent Environment Commissioner for the purposes of determining resource consents.
5. Alec Neill (Member)..... Lawyer/Former Politician.

In order to ensure rigour in any research, there should be methodological triangulation involving the collection of data through various means and from different sources (Kumar, 2014; Mertens & Ginsberg, 2009). In addition to document analysis, I also sought more in-depth data obtained through an electronic survey. The survey was comprised of two sections and containing both close and open-ended questions. The survey explores the views of planners, scientists, legal experts, those who made submissions and other stakeholders involved in the Tukituki Catchment Proposal. The following chapter qualitatively and quantitatively analyses the results of the online survey.

## Chapter 8

# Political, technocratic and social analysis of the RWSS

### 8.1 Introduction

This chapter examines the political–institutional, technical and social powers that might exist in the RWSS project. Data gathered through an online survey, published documents and submissions are analysed. The following criteria was applied for the selection of participants for the survey.

1. HBRC current (at the time of the survey) and former elected members i.e. HBRC Councillors for the periods of 2013-16 and 2016-19.
2. Experts (expert witness for proponents and opponents) appearing at the hearing by the BOI.
3. Legal counsel appearing at the hearing by the BOI.
4. HBRC planners and managers involved in the RWSS
5. Individual submitters (Who were actively involved by appearing at the BOI for TCP/RWSS)

The survey respondent remained anonymous, but they were coded as explained in table 7.1 on page 116 of the thesis.

### 8.2 Political–institutional analysis of the RWSS

This section analyses political–institutional power and influence on the development of the RWSS. The analysis covers the findings of the survey conducted with stakeholders involved in the Tukituki Catchment Proposal. The survey questionnaire was divided into two sections. The first section sought the respondents' view of the influence of different actors on the outcomes of the statutory decision-making process for large-scale infrastructure projects in New Zealand in general; the second section focused on the role of EA in the Tukituki Catchment Proposal. At the end of the survey, respondents could provide comments on the role of EA in the statutory decision-making process in general and/or in the case of the RWSS (see Appendix III). The questionnaire was sent to 165 participants in February 2018 via the Massey University-supported electronic survey software Qualtrics. The participants included expert witnesses, legal counsel, submitters, environmental consultants, HBRC staff and elected members, and HBRIC Ltd. board members. Sixty-nine (42%) responses were received by the

cut-off date (12 March 2018). Table 8.1 breaks down the responses from each of these categories.

**Table 8.1:** Questionnaires sent and responses received from each category

Category	Questionnaire Sent	Responses received	Coding
Consultant who undertook EA for the applicant	6	4	CN (1,2..)
Made a submission in support of the RWSS	34	8	SS (1,2..)
Made a submission in opposition to the RWSS		12	SO (1,2..)
Made a neutral submission in relation to the RWSS		1	SN
Appeared as a legal counsel for a project applicant or proponent at the hearing by the board of inquiry	23	3	LCS (1,2..)
Appeared as a legal counsel for a project opponent at the hearing by the board of inquiry		7	LCO (1,2..)
Appeared as an expert witness in support of the RWSS	71	5	EWS (1,2..)
Appeared as an expert witness in opposition to the RWSS		14	EWO (1,2..)
HBRC staff member	11	4	HBRC (1,2..)
HBRIC Ltd. staff/board member	7	2	HBRIC (1,2..)
HBRC current/former elected member	12	6	EM (1,2..)
EPA staff	1	1	EPA
Other		2	OT (1,2..)
Total	165	69	

Several questions in the questionnaire sought to examine the role of central and local government in large-scale infrastructure projects in general and particularly their influence on the RWSS.

### 8.2.1 Central government narrative of economic growth

As part of their economic growth agenda, the fifth National government supported irrigation schemes throughout their tenure. In 2011, the government signalled plans to invest up to \$400 million in regional water infrastructure projects to encourage third-party capital investment.

Apart from providing funds for irrigation projects through the Ministry for Primary Industries, the then National government also established CIIL in 2013 to support larger regional irrigation schemes. The government’s promotion of irrigation infrastructure was based on the notion that development of large-scale water storage schemes had the potential to deliver significant economic growth for primary industries and support new jobs. Respondents to the online survey were asked to assess the influence of the central government on the statutory decision-making process for nationally significant proposals. Figure 8.1 presents the responses to these questions.

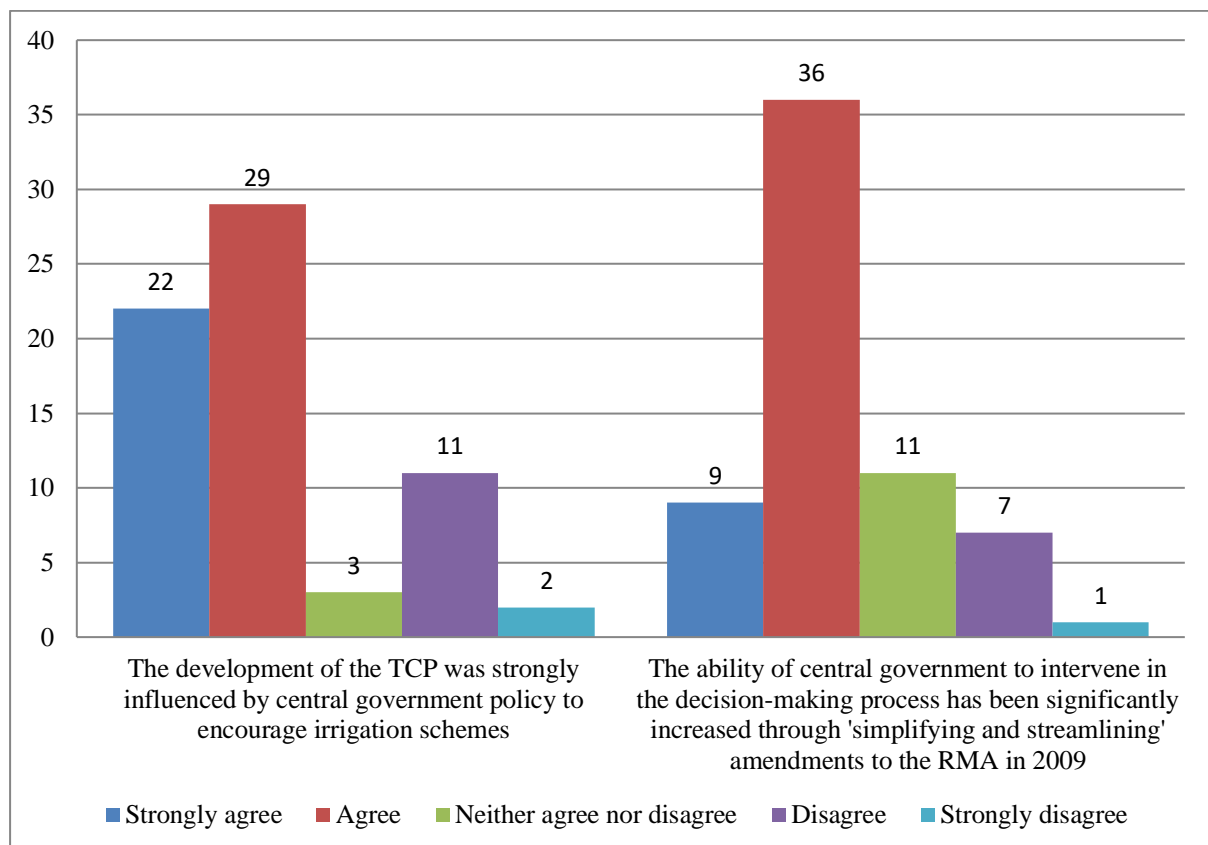


Figure 8.1: Respondents’ views on the role of central government on the decision-making process

A clear majority of the respondents, including, all of the opponents and half of the proponents of the RWSS, considered that the development of Tukituki Catchment Proposal was strongly influenced by the National government’s policy to encourage irrigation schemes.

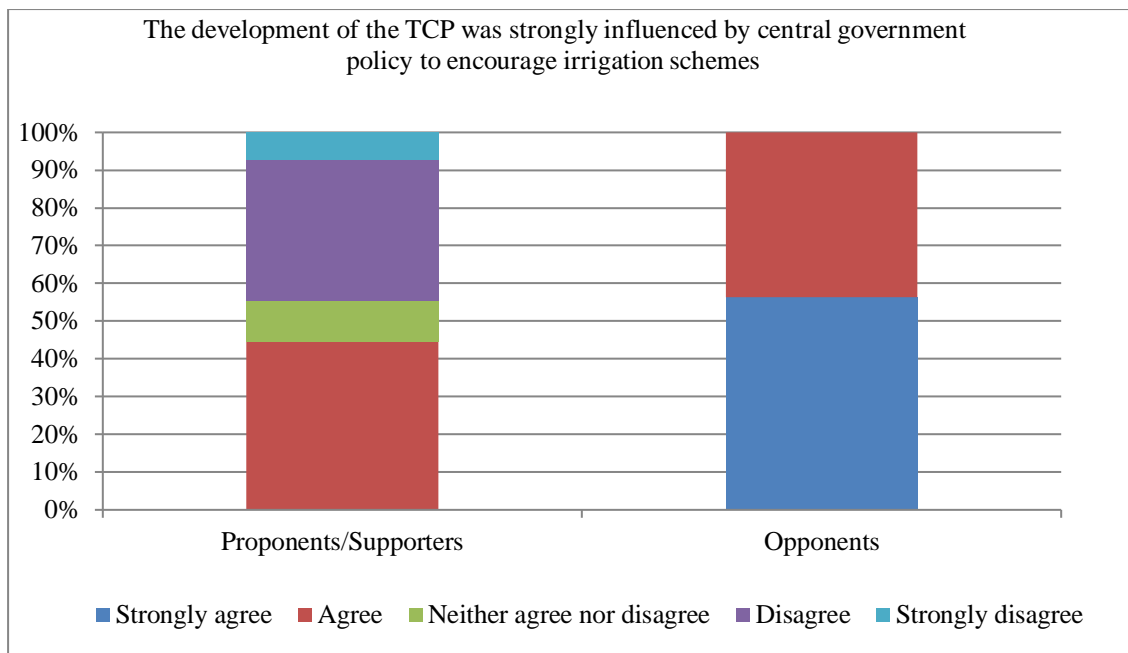


Figure 8.2: Responses of supporters and opponents

About 70% of the total respondents agreed that the ability of the central government to intervene in the decision-making process increased significantly as a result of the amendment to the RMA in 2009 aimed at simplifying and streamlining the consent process. The 2009 amendments introduced a national consenting process for nationally significant proposals to replace a local authority consent process. Proposals that were called in by the Minister for the Environment would be referred to a board of inquiry appointed by the Minister or to the Environment Court (Section 142, RMA).

Differences were apparent between the proponents and opponents of the RWSS, with more than 80% of opponents of the scheme agreeing that these reforms to the RMA increased the government's ability to intervene in the decision-making process. However, interestingly, half of the proponents of the scheme also agreed that the ability of the central government to intervene in the decision-making process had been significantly increased by simplifying and streamlining the consent process (Figures 8.2 and 8.3).

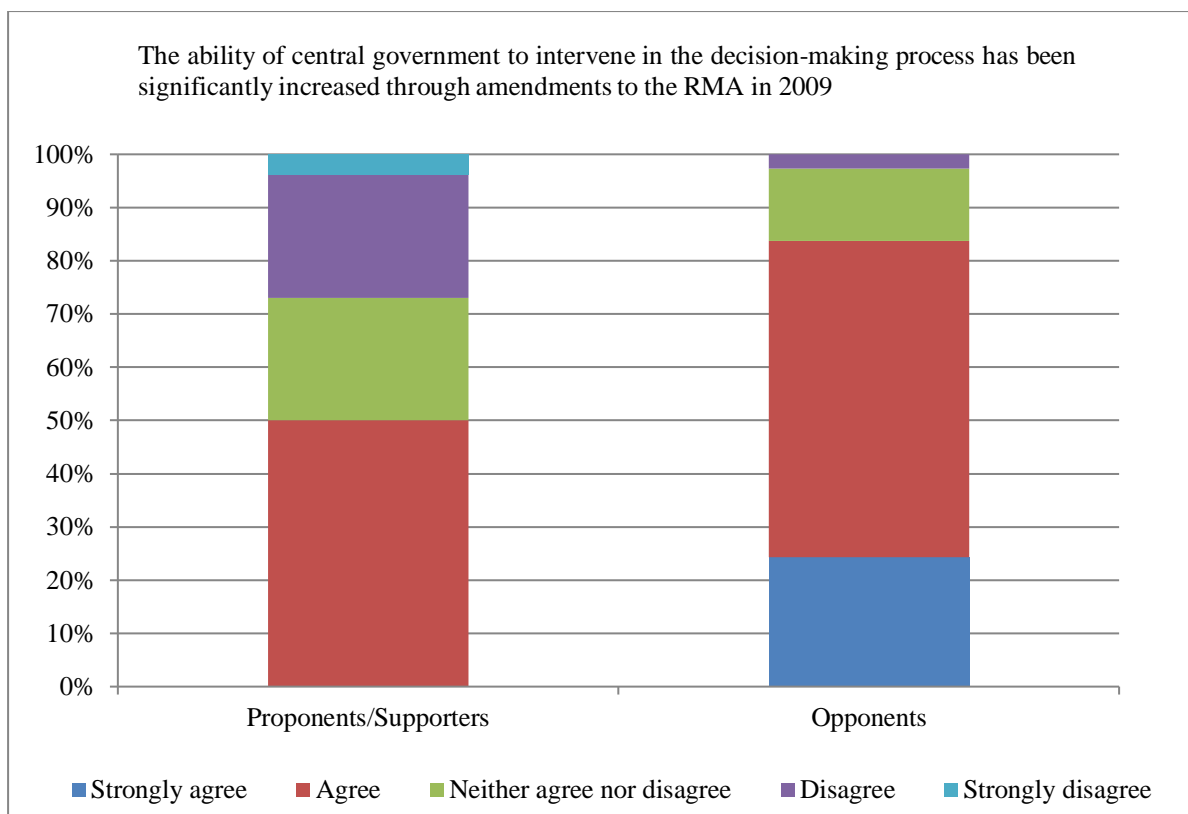


Figure 8.3: RWSS proponents' and opponents' views on the increased influence of the central government on proposed infrastructure projects

Likewise, respondents were again distinctly divided in their responses to the statement that RWSS was preferred over on-farm water storage for economic rather than environmental reasons. Although 86% of the opponents of the scheme agreed with the statement, 80% of the proponents of the scheme disagreed (Figure 8.4).

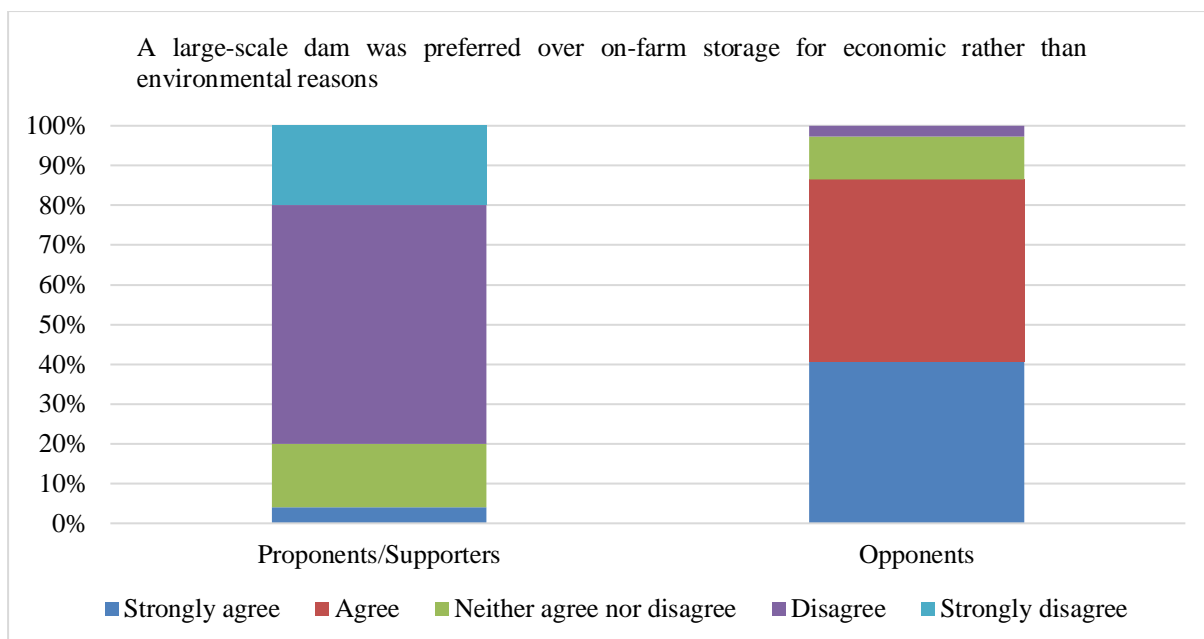


Figure 8.4: RWSS proponents’ and opponents’ views on the economic vs. environmental benefits of the scheme

This division of the respondents was also evident in their comments. An expert witness opposing the scheme argued that, in the case of the RWSS, environmental effects were compromised at the cost of economic benefits:

Section 6 RMA needs to be given greater weight. Where environmental consequences (including natural and cultural environment) are significantly adverse, as was acknowledged by all parties as being the case here, that should be the end of it - the project doesn't happen. It is where "overall judgment" matters come in to play that economic benefits can be given undue weight. In the end, Ruataniwha was about economic benefits (surprisingly, social effects weren't fully addressed and could have been as much negative as positive). In this case the economic benefits were arguable - much more so that the environmental consequences (EWO 5, survey comment, February 2018)

However, another expert witness supporting the RWSS countered the above argument and commented that RWSS had its economic as well as environmental benefits.

... the RWSS was developed as a legitimate resource management solution – to ultimately allow for higher minimum flows and all the environmental benefits that come with that it was designed as an integrated solution not solely as an economic development outcome (EWS 3, survey comment, February 2018).

Likewise, one of the consultants who undertook environmental assessment for the applicant commented:

Irrigation may not be the only use of the water stored... It may also be used to purge the Tukituki River of harmful algae in summer by releasing a short duration 'fresh' periodically to turn the river stones and slough off the algae. The RWSS was intended to... improve the water quality of the river by ensuring it doesn't peak and trough so much over the seasons of a year (CN 3, survey comment, March 2018).

However, submitters opposing the scheme disputed claims about the environmental benefits of the scheme:

The promoted environmental 'benefits' of 'environmental flows' involved large-scale expensive RWSS infrastructure and ongoing operations and maintenance that would modify the inter-related natural hydrological, geological and ecological systems within the catchment. Relying on in-river and catchment wide engineered solutions significantly adds risks for something to go wrong, potentially catastrophically (e.g. Waihi Dam in Hawkes Bay in 2016). (SO 7, survey comment, February 2018).

Another respondent refuting the promoted environmental effects of the scheme added:

From a layperson's point of view, the money some people and corporations were hoping to make was the motivation for the RWSS and the myths of environment gains etc were created as part of the bulls\*\*\* to get the general public to go along with the scam. In the case of RWSS, it is clear that an end result was pre-determined. Environmental 'benefits' to the Tukituki river were used to promote the project in the public arena at every opportunity (SO 4, survey comment, February 2018).

Mostly, the respondents agreed that central government policies are influencing the statutory decision-making process for nationally significant proposals. The survey results also indicate that the ability of the central government to intervene in the decision-making process has been greatly increased by streamlining and stratifying the consent process. Consequently, decision-making under the RMA, particularly for large-scale infrastructure projects, is becoming more politicised. However, the data also indicate that the opinions of the participants are also affected by their support for or opposition to the RWSS.

### 8.2.2 Government control over the EPA

The 2009 amendment also included the establishment of the EPA. Initially, the EPA was established within the MfE to facilitate the consenting process for nationally significant proposals. Later, the Environmental Protection Authority Act 2011 established the EPA as a separate Crown agent. About half of the total participants considered that the EPA does not operate in a manner that is sufficiently independent from the executive government. However, most of the respondents who agreed on the lack of independence of the EPA from the government were opponents of the RWSS. The proponents of the scheme were either neutral or disagreed (Figure 8.5).

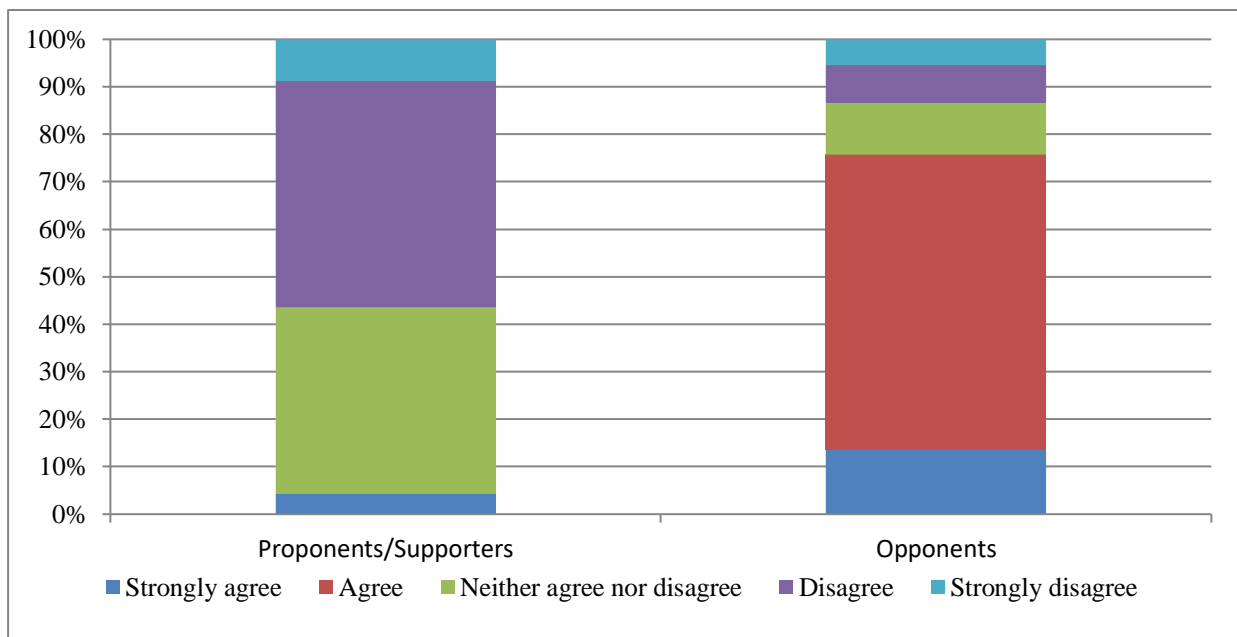


Figure 8.5: The EPA does not operate in a manner that is sufficiently independent from the executive government

There is a clear government pressure on the EPA to assist the board of inquiry in fast tracking the decision-making on infrastructure projects. This makes EPA more of a government tool, rather than an “environmental protection” authority, as its name indicates (SO 7, survey comment, February 2018)

The EPA is not an independent agency as the Minister for the Environment directly appoints its board members and can easily direct them to promote and implement Government policy (EWO 5, survey comment, February 2018).

The EPA does not seem to have a mandate of protecting the New Zealand environment, rather it looks like a mechanism to fast track developmental projects... the public needs to be ensured

that EPA does not operate as a ‘rubber stamping’ authority for the Government (SO 9, survey comment, February 2018).

However, other respondents did not have any concerns about role of the EPA in facilitating the decision-making process of nationally significant projects. An expert witness supporting the scheme commented:

As a Crown Agency, the EPA has a degree of independence, but it must give effect to the government policy when directed by the Minister in charge (EWS 3, survey comment, February 2018).

### **8.2.3 Ministerial influence over the board of inquiry for large-scale projects**

The increase in the influence of the central government on the decision-making process for large-scale projects is also evident from the high number of applications called in by the Minister since 2009. Between 2009 and 2017, the Minister for the Environment called-in around 20<sup>33</sup> proposals as nationally significant proposals and only one proposal was referred to the independent Environment Court. All of the remaining proposals were referred to boards of inquiry appointed by the Minister.

More than 80% of the total respondents agreed that the Minister for the Environment has a disproportionate influence on the appointments to the board of inquiry for nationally significant proposals. However, 90% of the proponents and half of the opponents of the RWSS rejected the idea of a public call for nominations prior to the appointments made by the Minister (Figures 8.6 and 8.7).

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<sup>33</sup> Details of the applications considered under the call-in power are available on the website of the Environmental Protection Authority: <https://www.epa.govt.nz/industry-areas/rma-proposals/completed-nationally-significant-proposals/>.

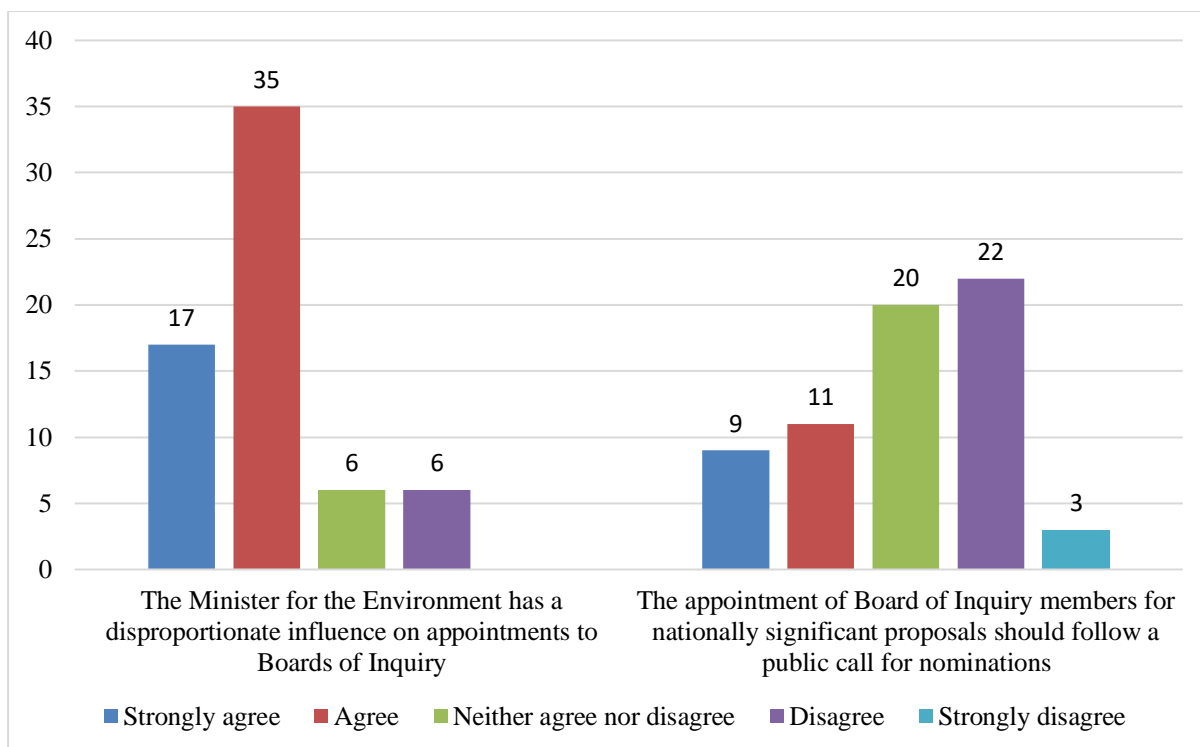


Figure 8.6: Respondent views on the Minister's role in the decision-making process

One of the respondents displaying displeasure with the role of the EPA and the Board of Inquiry in the decision-making for RWSS commented:

In my opinion, the EPA and the Government appointed BOI, in the case of the RWSS, were created to legitimise environmental destruction for private profit (SO 2, survey comment, February 2018).

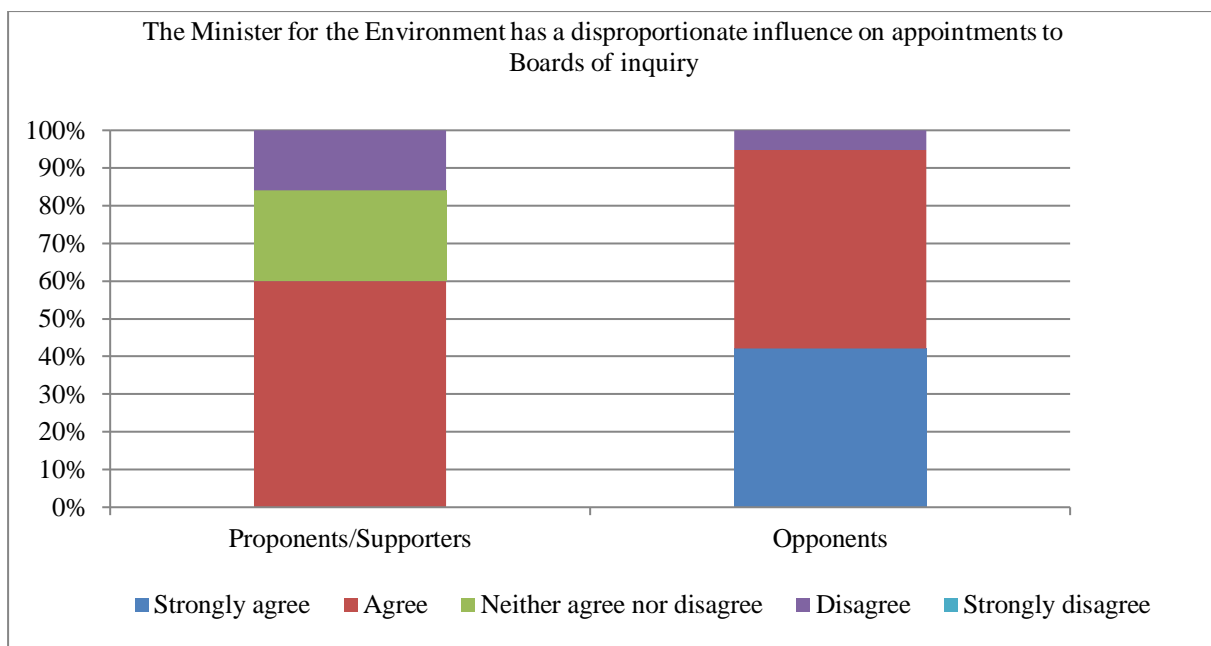


Figure 8.7: Proponents' and opponents' views on the influence of the Minister for the Environment over the board of inquiry

A little more than half (52%) of the total participants agreed that the lack of freshwater science expertise in the membership of the board of inquiry for the Tukituki Catchment Proposal led to deficiencies in the board's understanding of the environmental effects of the RWSS. Not only opponents but also about 30% of the proponents of the RWSS felt the need for a freshwater scientist on the board of inquiry (LCO 5, survey comment, March 2018).

A legal counsel representing the project opponents at the hearing by the board of inquiry raised concerns over the board's understanding of the environmental effects of the RWSS. The counsel stated:

The lack of an ecologist or freshwater scientist in the RWSS case definitely influenced the outcome. The most damning aspect of the whole RWSS case was that the Board found that an instream limit of 0.8 mg/L DIN was required to safeguard ecosystem health, but then decided that it wasn't required to be satisfied that the RWSS would be able to achieve that (reconvened decision after HC appeal). This is a major shortcoming in our approach to consenting activities under s104 where they will have a cumulative impact that would breach an in stream limit (LCO 5, survey comment, March 2018).

An expert witness opposing the scheme also pointed out the board’s lack of understanding of the effects of the scheme on the water quality. The expert stated:

The BOI decision in regard to natural character and ecology was indeed weak and biased towards the need for the (central government backed) large-scale water storage option, even though the proposed dam was an in-river option on a braided river system; a internationally rare habitat. I believe the BOI should not have considered the degree of visibility of the dam area in weighing up preservation and protection of natural character. While there was extensive emphasis on downstream water quality during the hearing very little understanding by the BOI was shown in regard to water quality (EWO 1 survey comment, February 2018).

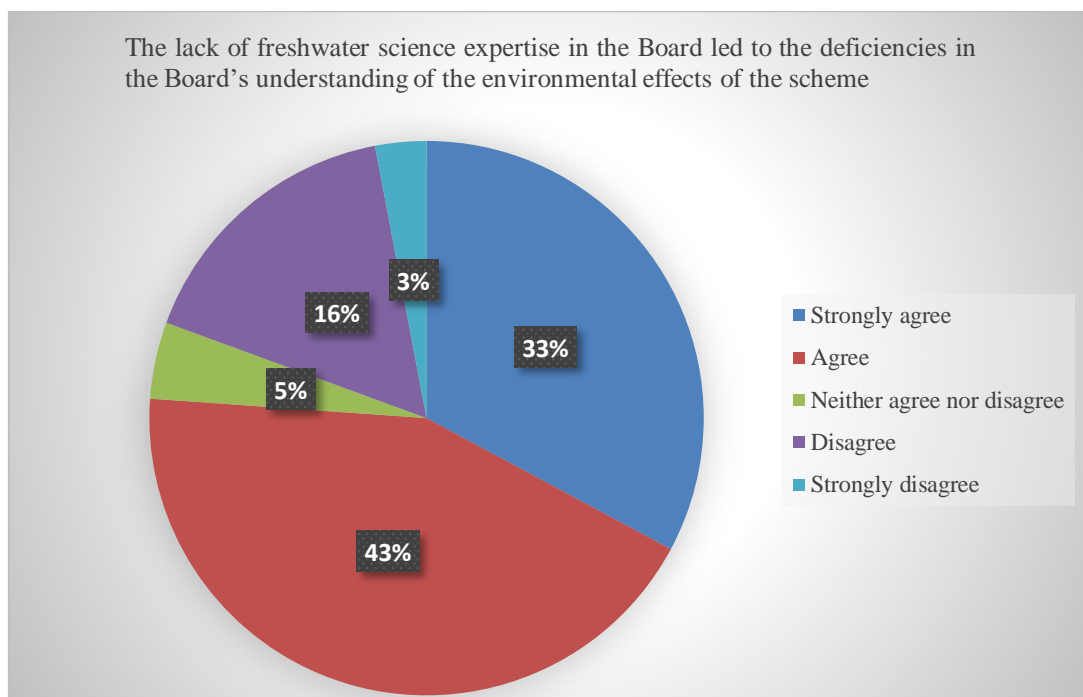


Figure 8.8: Respondents’ views on the lack of freshwater science expertise in the Board of Inquiry

The deficiency in the board’s understanding of freshwater science was also indicated in the 2017 independent review of the RWSS commissioned by the HBRC. In its final report and decisions, the board was satisfied that the farmers could operate in a manner consistent with the limits established for nitrogen and phosphorus in Plan Change 6. However, the report found that meeting the DIN limits in all the Tukituki subcatchments was highly improbable and likely to be physically impossible. The review further added:

It appears the Board of Inquiry may have misunderstood the requirements of the National Policy Statement on Freshwater Management in setting the DIN limit timetable of achievement by 2030 (RWSS review, p. 6).<sup>34</sup>

### 8.2.4 The HBRC’s conflicting role as an applicant in the scheme

The RMA devolves much responsibility to the local government for environmental management. However, conflict of interest problems can arise when a regional council seeks to promote developmental projects. Hence, a vast majority of both proponents (79%) and opponents (95%) agreed that regional councils must not compromise the exercise of their environmental regulatory function when they are involved in developmental projects. However, although most of the opponents (90%) agreed that the HBRC should not have been an applicant in the Tukituki Catchment proposal, the proponents (85%) did not see any conflict of interest issues (Figures 8.9 and 8.10).

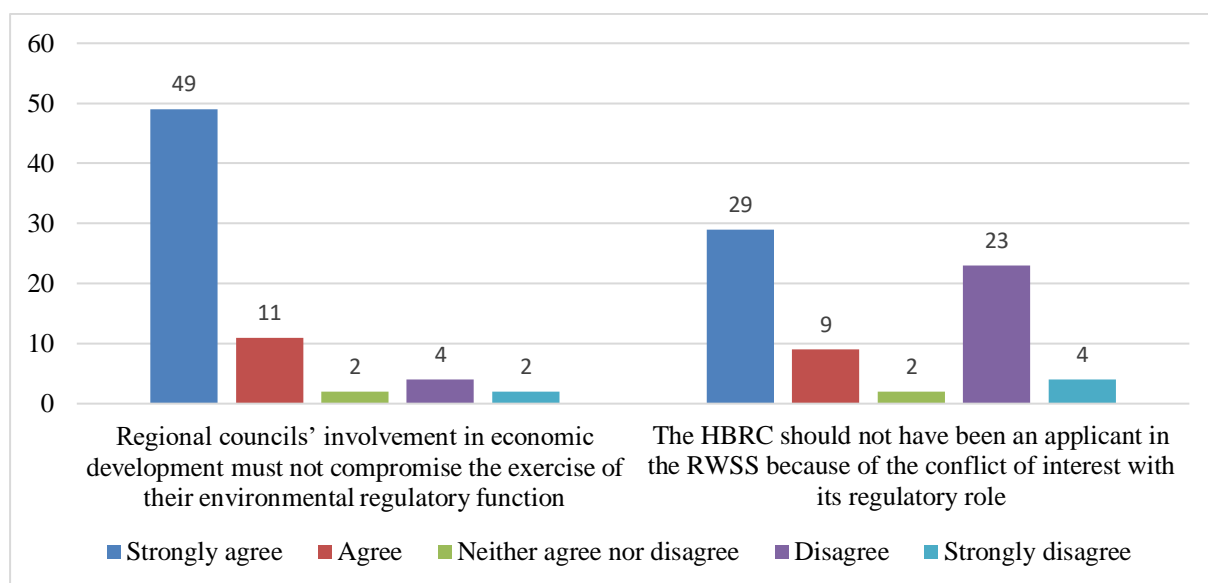


Figure 8.9: Respondents’ views on the regional council’s involvement in developmental projects

Strong arguments both in favour of and against the role of the HBRC in the Tukituki Catchment proposal were found in the comments of the respondents. One of the submitters opposing the RWSS commented:

<sup>34</sup> Hawkes Bay Regional Council. (2017). Ruataniwha Water Storage Scheme Review Report No. WI17-01 HBRC Publication No. 4924. Retrieved from <http://www.hbrc.govt.nz/assets/Document-Library/RWSS-Reports/RWSS-Review-Report-5May2017-final.pdf>

It's been a scary experience to attempt to confront the malfeasance in office that I observed in this RWSS process. HBRC being the applicant, and HBRC Councillors sitting on both bodies on this project was a serious conflict of interest that was challenged but ignored by government regulators (SO 8, survey comment, February 2018).

An expert witness opposing the RWSS held that as an applicant in the Tukituki Catchment proposal, the regional council had compromised its responsibilities as an environmental regulator.

The Regional Council operated with a major conflict of interest as the advocate–applicant with regulatory responsibilities. I remained unconvinced that HBRC would have managed its role in being both the developer carrying out design, construction, operation and monitoring and the regulator of the RWSS. It was the regulatory responsibilities to protect environmental quality that got the short end of the stick (EWO 12, survey comment, March 2018).

Likewise, another respondent who made a submission to the board of inquiry argued that instead of being an applicant in the Tukituki Catchment proposal, the regional council should have assessed the RWSS application, and further stated that:

Plan Change 6 was developed with a 'bias to build' the RWSS.....HBRC, with the mandate to be the region's environmental regulator, there was a fundamental conflict for HBRC/HBRIC to be the Developer and Applicant for the RWSS. HBRC is the primary holder of the Tukituki catchment and associated coastline environmental knowledge and should have been the party assessing the RWSS Application and the proposed Conditions (SO 1, survey comment, February 2018).

Creating HBRIC to be the RWSS developer created a significant conflict of interest and caused significant community mistrust during and after the EPA hearing. The conflict of interest and trust divided the HB community (SO 1, survey comment, February 2018).

Another resident of Hawke's Bay shared similar sentiments of mistrust regarding the council because of its conflicting role in the scheme:

The wound that HBRC created on our community by creating HBRIC and by not serving the community with a regulatory role will take years to heal (SO 7 survey comment, February 2018).

However, refuting the above argument, another submitter commented that by advocating for the Tukituki Catchment proposal, the regional council did not conflict its regulatory function:

the "Tukituki Catchment Proposal" referring to the Regional Plan provisions (objectives, policies and rules for water quality and quantity in the Tukituki River catchment) Such provisions managing the natural resource of freshwater is exactly what a regional council is supposed to do under the RMA and the NPS-FM..... The RMA section 5 tasks councils with achieving "sustainable management" which includes enabling people and communities to provide for their economic, social and cultural wellbeing, as well as safeguarding and managing environmental effects. A proposal which is intended to manage water in a way that provides for use, and also looks after the environment, is well within regional councils' regulatory functions (SS 4, survey comment, February 2018).

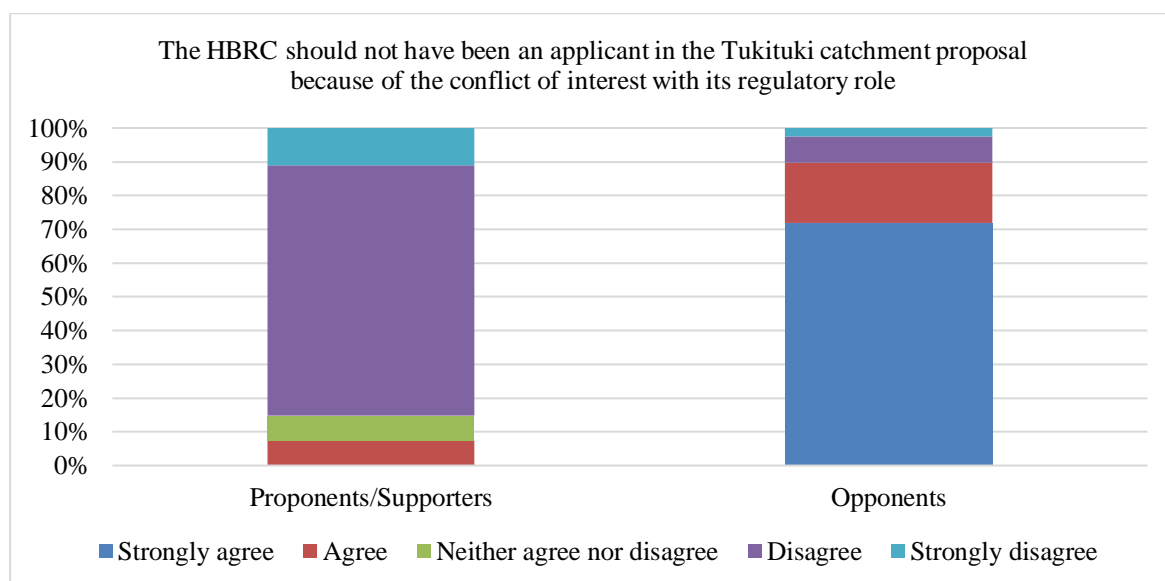


Figure 8.10: Proponents' and opponents' views on the council's role as the applicant

Arguments were presented both in favour of and against the role of the regional council in the case of the Tukituki Catchment proposal. However, the National government policy of intensifying agriculture, coupled with the conflict of interest issues in the regional councils, raised further concerns about the transparency in and political manipulation of the decision-making process.

### 8.2.5 Board of inquiry process

This section examines the respondents' views on the board of inquiry process for nationally significant proposals. A number of questions in the questionnaire sought to ascertain how different stakeholders' views of environmental effects are valued in the decision-making process for large-scale infrastructure projects (Figure 8.11).

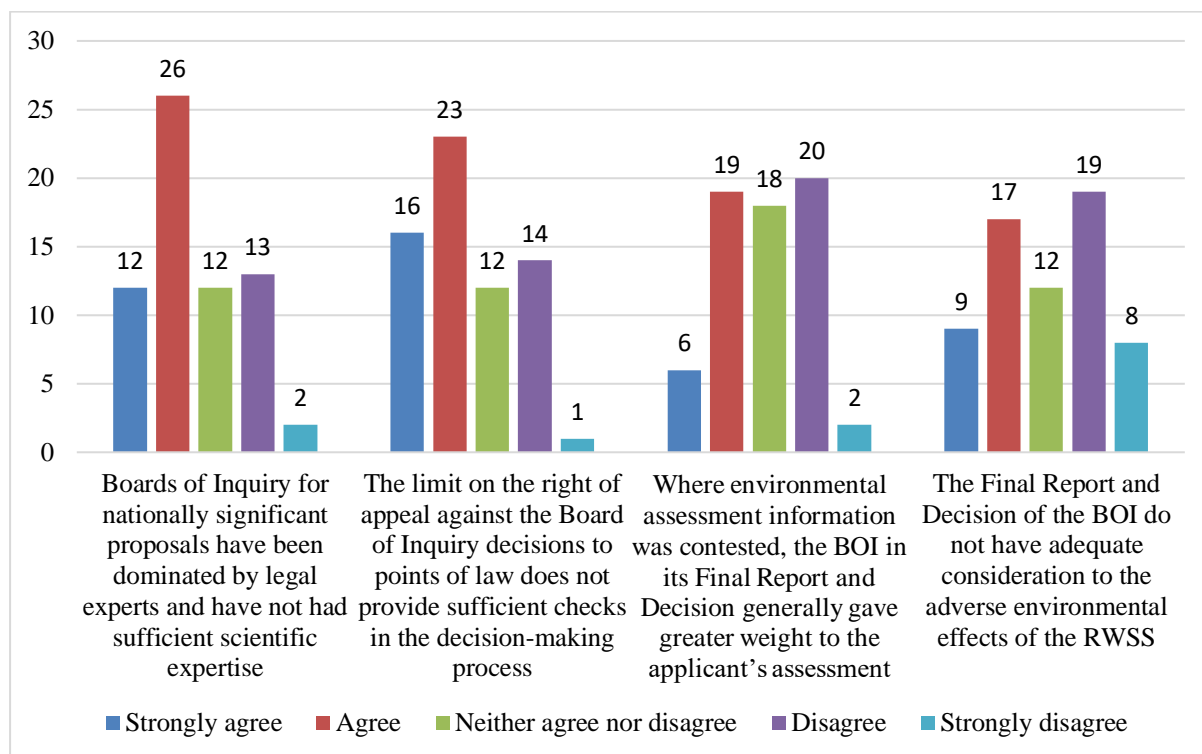


Figure 8.11: Respondents' views on the board of inquiry process for nationally significant proposals

Both proponents (51%) and opponents (62%) agreed that boards of inquiry for nationally significant proposals are dominated by legal experts with insufficient scientific expertise. Likewise, a good percentage of participants (75% of opponents and 35% of proponents) agreed that the limit on the right of appeal against the board of inquiry's decisions to points of law does not provide sufficient checks in the decision-making process.

Proponents and opponents widely differed in their response to the statement that in the case of the Tukituki Catchment proposal, the board of inquiry gave greater weight to the applicant's assessment. Nearly three-quarters (73%) of the proponents disagreed; 63% of the opponents

agreed. One of the expert witnesses opposing the scheme discussed this point in detail in their comment:

The BOI did not call on the experts who carried the assessment work to the witness stand in the hearing but instead considered the brief and partial summations of recommendations from another consultant. No independent seismologist, hydrogeological, geotechnical or structural engineer were called in as expert witness to assess for risks associated with the dam and reservoir operation and their environmental effects. The applicant's experts will not be independent. The applicant's mitigation for the effects of the dam on supply and transport of gravel to the coast was highly questionable. The BOI did not seek evidence from independent experts (EWO 2 survey comment, February 2018).

Some of the survey respondents were also concerned that the environmental effects of the dam on the reservoir water quality were not adequately deliberated during the hearing by the board of inquiry. For example, an expert witness opposing the scheme made the following comment:

While river water quality was given significant emphasis throughout the hearing the limnology (reservoir water quality) in regard to the types of dam construction and associated works or through the operations of a reservoir; the outlet structure and aerator, and any failure thereof and the potential effects downstream, was not. What was recommended by limnologists was not written into the Conditions e.g. no downstream monitoring of reservoir water quality and the effectiveness of the aerator and outlet flow regime to prevent anoxic water (EWO 11, survey comment, March 2018).

Likewise, another respondent added:

The EPA process did not require the limnology experts who carried the assessment work to take the witness stand in the hearing. Instead, the BOI heard the brief and partial summations as recommendations from Dr Olivier Ausseil of Aquanet Consulting Ltd and used this in their consideration for their Decision (SO 7, survey comment, February 2018).

However, the legal counsel for the project's proponents had a different argument:

In terms of the consideration of evidence, it is for the Board to weigh the competing evidence. Where there is competing expert evidence, it is open to the board to prefer the evidence from

certain experts over others. However, in this case on key ecological aspects the evidence of the experts for some of the opponents was preferred (LCS 2, survey comment, February 2018).

### 8.3 Social analysis of the RWSS

#### 8.3.1 Public participation in the planning process

Public participation has remained a fundamental aspect of the decision-making process, under the RMA and its predecessors. However, amendments to the RMA since 2009 have made some significant changes that represent a shift in policy and apparently create barriers to effective participation by the public. The survey results show this perception. For example, both the opponents (86%) and proponents (51%) agreed that the short timelines for the submitters to prepare and submit their case to a board of inquiry marginalised the submitters' role in the consent process for nationally significant proposals. The tight 9-month timeframe for the board of inquiry process and the volume of material produced by the applicants further constrained the submitters' ability to participate effectively in the decision-making process (Figure 8.12).

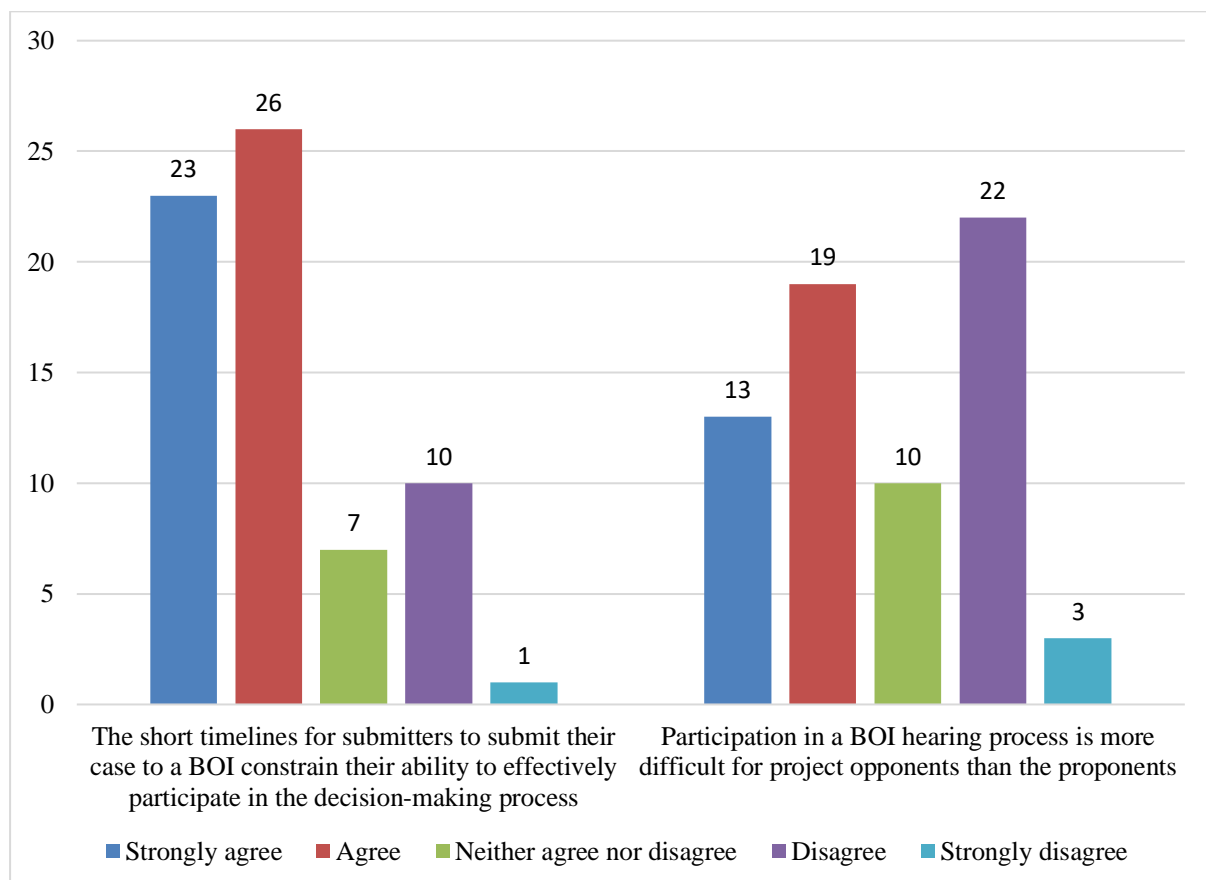


Figure 8.12: Respondents' views on hurdles to public participation in the decision-making process

The lack of effective public participation in the case of the RWSS was described by a submitter as:

The process around the RWSS was a box ticking exercise and at no stage entered into consultation. It was an adversarial process that denied people true engagement when we all live on the earth (SO 7, survey comment, February 2018).

Another submitter added:

The timeframe for submission on the scheme was appallingly short contrary to a good-faith treatment of directly and indirectly affected communities and individuals. The board of inquiry process for the Ruataniwha scheme was such that no person with an average education and average financial circumstances can realistically participate in it. It is quite hard only to read and understand the application and related documents in the submission period (SO 2, survey comment, February 2018).

The survey respondents were found to be divided in their views that participation in a board of inquiry process is more difficult for project opponents than for the project's applicants and their supporters. An expert witness supporting the scheme stated:

I have been involved in Board of Inquiry processes for the applicant, for submitters in support and for submitters in opposition. The process is a gruelling one for all parties. However, it is most gruelling for the applicant, as they have to defend attacks or criticisms from all sides, whereas submitters will generally take a narrower approach and focus on certain key aspects (EWS 3, survey comment, February 2018).

However, an expert witness stated his dissatisfaction with the expert witness conferencing:

In the case of the Ruataniwha proposal there was a very little time during caucusing for experts to meaningfully explore the separate issues, i.e. leaching rates, effects on the estuary, freshwater ecology, as there was no breakout into individual teams of experts by discipline. No resources provided, i.e. a scribe, for noting down where agreement was made, in general the expert witness conferencing was a shambles (EWO 2, survey comment, February 2018).

Some of the survey respondents also recorded their disappointment with the consultation process. One of the respondents who made a submission to the board of inquiry against the scheme commented:

There was an attempt to come to some agreement about many of the contentious environmental issues raised by the RWSS via the Ruataniwha Water Users Group (RWUG) consultation. These concerns were ignored by the applicant, so the 'environmental' lobby declined to endorse the findings of the RWUG. The path to the RWSS was determined not by logic but by the arrogance of the applicants (SO 4, survey comment, February 2018).

In summary, a common concern in many submitter's responses to the survey was the limited timeframe made available to the public to make an appropriate submission. The limited timeframe, coupled with the unsatisfactory consultation processes, had a strong impact on the fundamental principle of public involvement in the resource management and decision-making processes that have underpinned the RMA (1991) since its inception.

### **8.3.2 Power of the applicants and environmental groups**

In the survey, a set of questions sought to examine the role of the applicants in the statutory decision-making process for large-scale projects. Participants were asked to assess the influence of the applicants' AEE on the outcomes of nationally significant proposals in general and with regard to the RWSS. Every application for resource consent must include an AEE with details of the actual and potential environmental effects of the activity on the environment (Section 88, RMA). The RMA provides an outline for the contents of an AEE in its Fourth Schedule. Approximately 60% of all respondents believed that the project applicant had a disproportionate influence in determining the scope of the effects considered in the AEE. Differences in the responses from the proponents and opponents were again evident. Figure 8.13 presents the responses to several statements about the influence of the applicants on the EA. One of the submitters opposing the RWSS commented in their response to the survey that:

If private large-scale development companies' environmental assessments are as biased/bought and simplistic as HBRIC's assessment of the RWSS was (then) New Zealand's environmental assessments are a farce. Perhaps all large-scale EA's are similarly inadequate and skewed but we have less public access to their flaws since they are created by private companies (SO 1, survey comment, February 2018).

Referring to the influence of applicants on the assessment of potential environmental effects of the scheme, one of the scheme opponents stated:

The EPA hearing process was arduous with HBRIC withholding and manipulating the use of information on the minimum reservoir water level. I became aware how this lack of transparency and knowledge affected their experts assessed seismic stability, slope stability, shore erosion, limnology, ecological, amenity (dust), recreational, and landscape effects. My ineffectiveness to bring this to the BOI attention took an enormous toll on me (SO 9, survey comment, February 2018).

However, countering this argument, a lawyer for the project's proponents maintained that the applicants are only required to fulfil the RMA requirements when preparing the AEE:

It is important to remember that the AEE prepared by the applicant was done so under the requirements of the RMA. Therefore, what it contained and whether it was sufficient and fit for purpose can and (one assumes) was assessed against the RMA requirements (LCS 1, survey comment, February 2018).

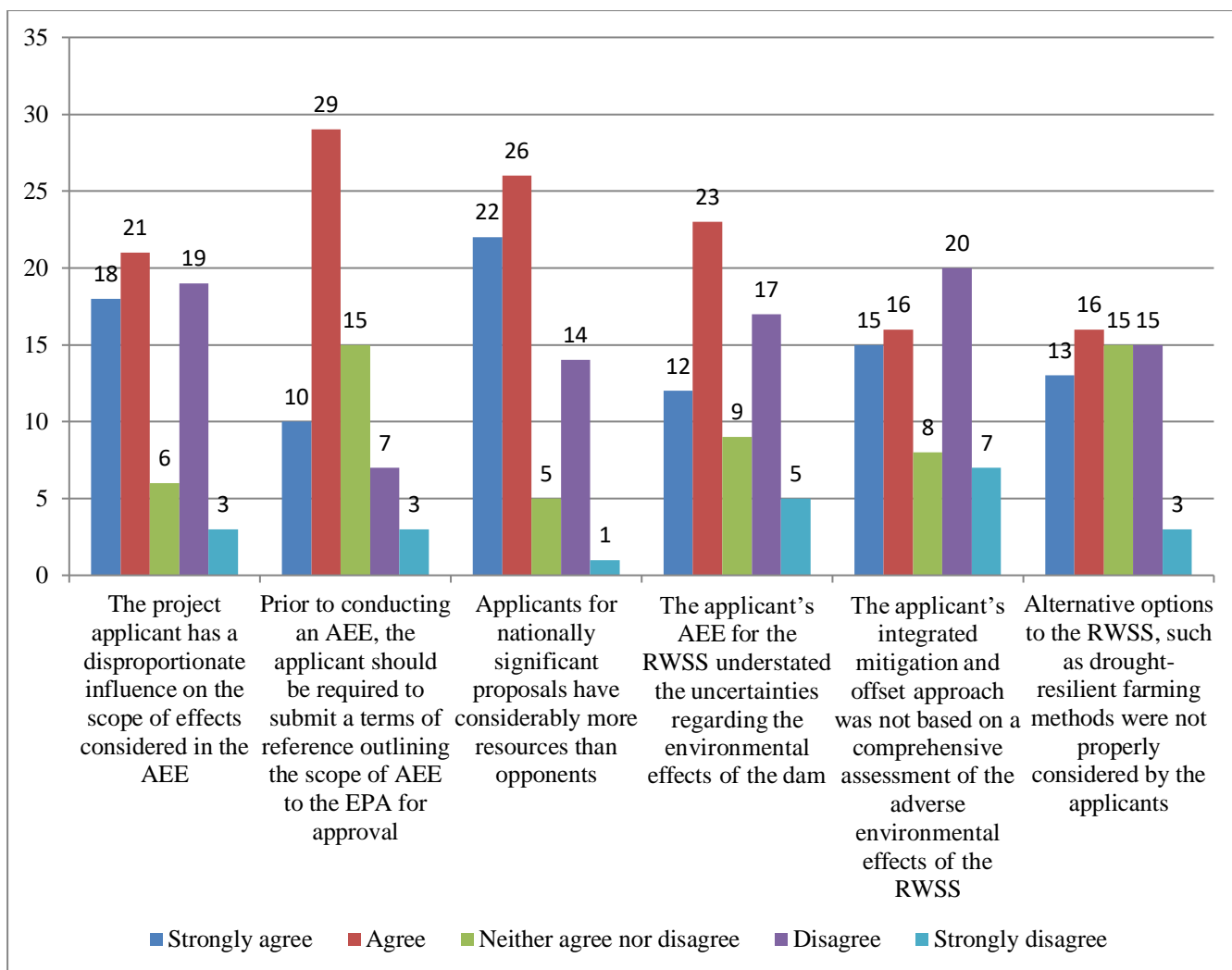


Figure 8.13: Respondents' views on the influence of the applicant on the decision-making process

Referring to the carbon footprint of the RWSS, another submitter commented that:

The massive carbon footprint of project construction was not considered as part of 'scope', yet it could be argued that the construction & operation, of dam presented the largest carbon footprint of any infrastructure project in NZ (SO 5, survey comment, February 2018).

An expert witness opposing the scheme shared their experience of the board of inquiry as:

I put forward supplementary evidence to address potential landscape effects however the applicant's legal (expert) request this evidence not to be heard was accepted by the BOI (EWO 5, survey comment, March 2018).

Attacking pro-environmental groups, an expert witness supporting the scheme commented that:

The act of completing an AEE will never please all aspects of the community – especially given the rise of the dedicated environmental advocates who have become very monocular in their view and intent (EWS 4, survey comment, February 2018).

Proponents and opponents of the scheme clearly differed in their views of the influence of the applicants on the scope of the AEE.

However, not only most of the opponents but a substantial number of (44%) of the proponents also agreed that the applicants should submit terms of reference outlining the scope of AEE to the EPA before conducting the actual EA and preparing the AEE report. Similarly, 43% of the proponents and more than 90% of the opponents agreed that the applicants for nationally significant proposals have considerably more resources than opponents. One of the respondents who made a submission to the board of inquiry asserted:

One of the significant problems with Applicant consultants/experts was the "agency capture syndrome". There was too much "me too" evidence from the experts because they earned monies from the HBRC on other matters and wrote their expert briefs from the Applicants point of view SO 5, survey comment, February 2018).

The supporters and opponents of the scheme were again found to be divided in their views on the robustness of the applicant's AEE and proposed mitigation measures. Although 53% of the total respondents agreed that the applicant's AEE understated the uncertainties regarding the environmental effects of the dam, most of these were the opponents. Seventy percent of the supporters of the RWSS did not agree that the environmental effects were understated in the AEE. Referring to the alternative options to the irrigation scheme, a proponent of the dam commented that:

over 100 years farmers in the catchment have actually been farming to be drought resilient, precisely because there is not much water available and we have dry summers, with resulting low or uncertain yields of food. We do not live in medieval times where a natural event such as drought wipes out crops and causes widespread famine. This is the 21<sup>st</sup> century now, we have the technology to deal with this type of problem... why not store in times of plenty (winter) so we can use it in times of scarcity (summer)? (OT 2, survey comment, February 2018).

### **8.3.3 Barriers to the participation of non-experts (lay people) in the hearing process**

In the online survey, about 80% of the opponents and more than 30% of the proponents of the RWSS agreed that streamlining the consent process has made it difficult for non-expert submitters to participate effectively in the decision-making process. Referring to the board of inquiry process for the Tukituki Catchment proposal, one of the submitters commented:

It was incredibly difficult for lay people to understand, assess the validity of and interpret the implications of the huge volume of expert reports and evidence presented without assistance. This itself disenfranchised some people from having any input (SO 6, survey comment, February 2018).

The formality of the board of inquiry process and the requirement of legal experts added further barriers to non-expert participation. One of survey respondents commented.

Both Plan Change 6 and the RWSS proposal provided an overwhelming number of issues for opposing submitters who had limited or no resources available. Most submitters could not afford to employ legal representation or ‘experts’ (SO 3 survey comment, February 2018).

Referring to the issue of the non-affordability of legal experts, another respondent added:

I considered the Decision regarding 6(a) to be flawed but without legal representation and resources, I could not take this any further. For example, I do not consider it appropriate to use the degree of visibility<sup>35</sup> in weighing up preservation and protection of natural character for rivers and their margins. Would natural character of a remote tributary in Fiordland not be worth preservation? (SO 8, survey comment, February 2018).

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<sup>35</sup> The survey respondent is referring to paragraph 1068 of the board’s decision, where the board justifies the location of the dam site on the Makaroro River on the grounds that “The benefit of this location is that it is on a relatively remote tributary and largely removed from public view.”

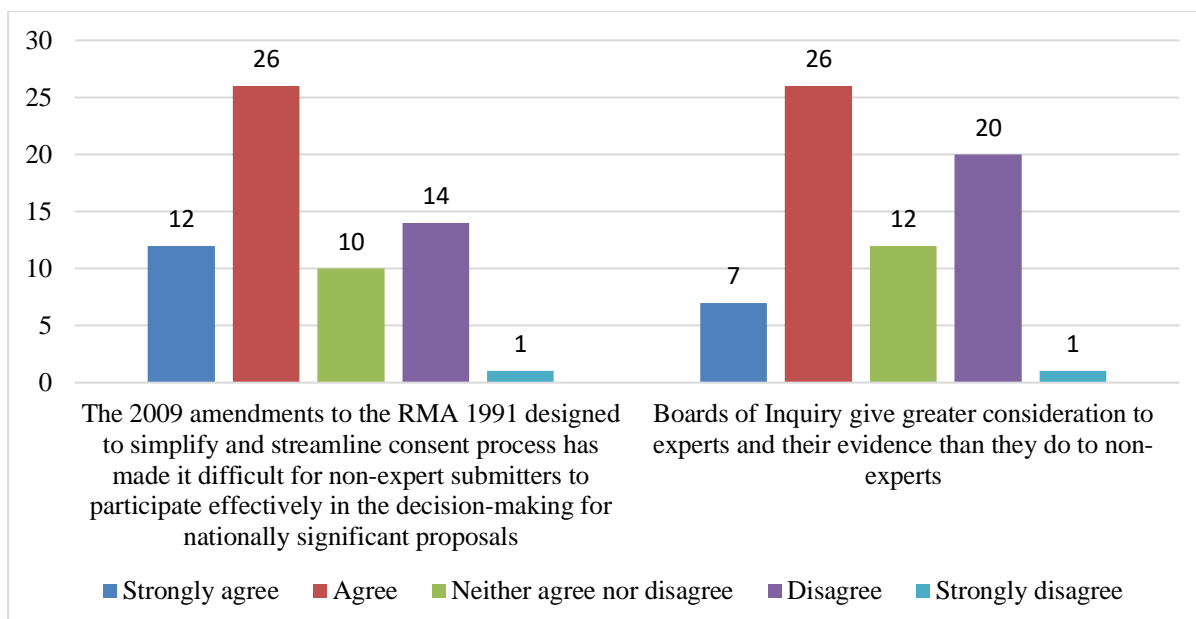


Figure 8.14: Expert vs. non-expert participation in the board of inquiry process

The struggle of participating in the decision-making process without having resources was highlighted by another non-expert submitter as:

I did not have a lawyer to represent me or the advice of a planner, and this was a significant limitation to my effectiveness (SO 11, survey comment, March 2018).

In short, many non-expert submitters mentioned the difficulty of making a submission because of the complexity and amount of information in the application and the lack of organised information that was easily understandable by the common people. Such factors constrained the submitters' ability to participate effectively in the RWSS decision-making process. The research also revealed other difficulties hindering submitters from participating in the board of inquiry process. For example, the EPA did not post the details of the submitters on the website. This meant that submitters did not have easy access to information to find out how to contact others with similar interests if they wished to make a joint case.

Respondents were again found to be divided on the statement that boards of inquiry give greater consideration to the experts as compare to the non-experts (Figure 8.14). The legal counsel for the project's proponents defended the boards' practice of preferring experts to non-experts. They commented that:

There is naturally an imbalance in resources as between lay submitters and professional applicants. The RMA processes ought to be expert evidence based, as it is expert evidence that will tell us whether a proposal is appropriate in environmental terms. The tendency to treat experts as biased because they are employed by one party is completely inappropriate and it is this tendency that will lead to unfortunate outcomes (LCS 2, survey comment, February 2018).

Likewise, another survey respondent supporting the scheme added:

Established principles require expert evidence to be preferred over opinions expressed by non-experts – that is not unique to boards of inquiry, or to this particular board (EWS 4, survey comment, February 2018).

## **8.4 Summary**

This chapter presented the findings demonstrating the political–institutional, technocratic and social power involved in the RWSS project. The chapter clearly shows the role of technocrats in evaluating the potential impact of the project on water quality and ecology and possible measures for mitigation. The survey data clearly indicate the opinions of the stakeholders in the large-scale infrastructure project. The key points on which most of the respondents agreed can be summarised as follows:

- The RMA 1991 devolved much responsibility to the local government for environmental management; however, planning and decision-making for large-scale projects are becoming more centralised, which the Act was originally introduced to address.
- The so-called nationally significant proposals are strongly influenced by the Minister for the Environment.
- The regional council's involvement as a developer in the developmental project raised serious conflict of interest problems.
- The tight timeframe for the board of inquiry process limited the ability of the affected communities and the general public to participate effectively in the decision-making process.
- The formality of the board of inquiry process and the requirement of legal experts add further barriers to non-expert participation.

- In order to have a robust EA of large-scale infrastructure projects, the applicant should be required to submit terms of reference outlining the scope of the AEE to the EPA for referral.
- The members of the boards of inquiry for nationally significant proposals should have sufficient scientific expertise relevant to the nature of a proposed project.

The next chapter discusses the findings and draws a conclusion.

## Chapter 9

# Discussion and Conclusion

### 9.1 Introduction

This chapter discusses the key findings presented in the previous chapters to answer the research question proposed in Chapter 1 “How do power dynamics enable or constrain stakeholders’ influence on the environmental assessment and decision-making for large-scale infrastructure projects?” The following section discusses the efficacy of EA for large-scale infrastructure projects. The remaining sections of the chapter discuss how political, technical and social power shapes the outcomes of a decision-making process for infrastructure projects in New Zealand.

### 9.2 Efficacy of EA

The rationale for EA, as perceived by its supporters, is to ensure informed and environmentally sound decision-making (van Doren et al., 2013; Jay et al., 2007; Cashmore et al., 2004). Therefore, the EA develops credible information about the actual and potential environmental effects of a proposed project and proposes strategies to manage them effectively (Lees et al., 2016; Tajima & Fischer, 2013; Cashmore et al., 2008). In the context of New Zealand, EA takes the form of the AEE that every application for the resource consents must include under the RMA 1991. An AEE covers the details of the actual and potential environmental effects of the activity on the environment (Section 88, RMA). Being an integral part of the consent application, the AEE is a key source of information about environmental effects. In nationally significant proposals in particular, it is arguably the main source of information on such effects available to the decision-makers. The RMA provides an outline of the contents of an AEE in its Fourth Schedule. Over the years, the MfE has produced several publications that provide guidance on preparing an AEE (MfE 1999; MfE 2006; MfE 2014).

In spite of these resources, the Fourth Schedule is too broad and unspecific. It can be used as a checklist without giving due consideration to the substance and quality of the AEE report. The broadness of the Fourth Schedule has made the EA process rely heavily on environmental practitioners and consultants to narrow the focus to important issues and make the details appropriate to the scale and nature of the project. Therefore, the project applicants can have a

disproportionate influence on the scope of effects considered in an AEE. In other words, the applicants set the scope of AEE, which does not require consent from the relevant local authority or the EPA. Thus, applicants can avoid including or downplay the information on the environmental effects in the AEE that might lead to adverse outcomes for their application.

In the case of the RWSS, many submitters raised questions about the rigour and reliability of the AEE report submitted as part of the RWSS resource consent application. The documentary analysis highlighted significant deficiencies in nutrient modelling, addressing risk and uncertainty, and assessing the alternatives and practicability of proposed mitigation measures. A sharp debate took place regarding the identification and evaluation of the environmental effects and the proposed mitigation measures between the representatives of applicants and those opposing the scheme.

The results of the online survey also confirmed the divided opinions of the proponents and opponents on the robustness of the applicant's AEE. Most of the scheme's opponents held that the applicant's integrated mitigation and offset approach was not based on a comprehensive assessment and that the environmental effects were understated in the AEE. However, most of the scheme's supporters differed from the opponents in their views and maintained that the applicants simply needed to adhere to the RMA requirements when preparing the AEE.

The extent of this controversy over the identification and evaluation of the environmental effects and the required mitigation measures created a challenge for the decision-makers to successfully incorporate the findings of the EA in their decisions and achieve positive environmental outcomes. The decision-making process and the final decisions will be more reflective of individual judgements than of a rational assessment of the cost and benefits of the proposed projects.

Because the applicants are dominant stakeholders and have more resources than the opponents, the applicants' AEE can determine the outcomes of nationally significant proposals, whereas the views on the environmental effects of the other stakeholders are marginalised in the statutory decision-making process. Most of the respondents to the survey supported the notion that the applicants for nationally significant proposals should be required to submit terms of reference outlining the scope of AEE to the EPA for approval. Approval of the scope of effects considered in an AEE from the EPA will not only decrease the applicant's influence on the

outcomes of the consenting process but will also ensure that robust information on the environmental effects is available to the decision-makers and other stakeholders.

However, it is also important to note that the applicant's AEE is not the only document influencing the board of inquiry on the matters related to the environmental aspects of a proposed project. The board also considers a number of other relevant documents before reaching a conclusion.

The Board must consider any information provided to it by the EPA under section 149G. This includes the AEE, the section 149G reports provided by the applicant, the submissions and the Key Issue Reports provided by [Central Hawke's Bay District Council] and HBRC. The Board has considered this information (BOI 2014, Final Report and Decisions p. 370).

This discussion challenges the value of an AEE in making environmentally sound decisions in the early stage of infrastructure projects. Therefore, the literature that highlighted the role of EA in providing evidence for decisions needs to be considered alongside other pieces of evidence.

### **9.3 Types and dynamics of power in decision making**

It may be argued that the primary purpose of EA is to evaluate the environmental effects of a proposed development. If the decision-makers then choose to disregard the EA's findings, this may be regarded as unfortunate but irrelevant to the EA process itself. However, the ultimate purpose of EA is not just to assess the impacts of proposed plans and actions; it is to improve the quality of decisions by ensuring that environmental considerations are explicitly addressed in the decision-making process. To achieve this, the first step suggested here is to involve different stakeholders, including environmental groups and the affected communities, in the EA of the proposed projects as early as possible. This will also minimise the power imbalances created by social order. The findings suggest that it is too late to allow the public to comment on the social and environmental effects of the project once the assessment reports have been finalised and submitted along with the consent application. When the representatives of public and environmental groups are not involved in deciding the scope of the AEE, there is an increased danger that organisational politics and vested interests will prevail over the public interest. The following sections explain these aspects in detail.

### **9.3.1 Political power in infrastructure decisions**

Infrastructure requirements are usually represented as neutral and objective needs of the time and place (Benitez et al., 2010). In reality, infrastructure development is essentially a political act of creation (Flyvbjerg, 2005). Any infrastructure investment brings benefits to some groups and costs to other groups (Flyvbjerg et al., 2003; Hall, 1982; Meerow, 2000). Therefore, infrastructure investment is a political choice backed by social values and expert analysis (Lipponen et al., 2017) In other words, infrastructure development decisions manifest socially induced political power. The political nature of decision-making applies to every category of infrastructure investment, from repair and maintenance to reconstruction and new constructions. In fact, the scale, location and design of an infrastructure project represents the economic, social and political power in society.

This thesis finds that the development of the Tukituki Catchment proposal was strongly influenced by the then National government's policy to promote large-scale irrigation schemes. This project represents a physical manifestation of their political narrative of economic growth. The analysis shows that the large-scale irrigation scheme was preferred over on-farm water storage for economic reasons rather than current agricultural demands. In the other hand, Section 6 of the RMA (which ensures the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna) needed to be given greater weight. The environmental consequences of the proposed project were significantly adverse, which was acknowledged by all the parties. However, the "overall judgement" meant that the economic benefits were given undue weight to serve the government's political agenda.

The research shows that investment in large-scale infrastructure projects requires a robust assessment of the short-term and long-term effects of the proposal. It is also important to consider alternative infrastructure schemes across a wide range of undefined future demands and requirements. This will provide comprehensive information to the decision-makers to help them make an informed decision. There is no doubt that the available information about the predicted impacts of the RWSS on the environment was highly contentious. However, the methodologies adopted and the assumptions made in the assessment of alternative options were highly contestable as well. Therefore, conflicting interests, varying opinions and ever-changing values create space for politicians to influence infrastructure decisions.

The entire process of infrastructure development, from proposal to implementation, takes years or sometime decades. Therefore, most large-scale projects, like the RWSS, are confronted with changes in political regimes and shifts in the balance of power at national, regional and local levels. These complexities increase because of the geographic extent of large-scale projects as well. Therefore, the longer the execution time of a project and the more jurisdictions it covers, the more political hurdles it has to overcome. Some projects are so politically driven that they are used as part of the stakes during elections and in the formation of alliances and coalitions. This does not happen only at the central or national level, but also in regional and local politics. The findings in the previous chapters show that the proposed RWSS became an object of a similar kind of politics on the national and regional levels.

The local government elections in 2016 brought a shift in the balance of power in the HBRC. The election shifted the 5–4 majority of the HBRC in favour of the proposed RWSS to being against it. In August 2017, the regional council voted unanimously to shelve the controversial irrigation scheme. Thus, from being a proponent and strong supporter of the scheme, the regional council became an opponent of the scheme. The scheme also lost its support from the central government with a change in regime as a result of the general elections in September 2017, as described in Chapter 6.

### **9.3.2 Technocratic power in infrastructure decisions**

The research finds that countries with a liberal democracy like New Zealand also give the technological or scientific experts a privilege in the planning process. This practice of giving the technocratic experts a privileged position is well established in RWSS decisions and is extended to legal experts as well. Although, the belief that ‘experts know best’ has been losing credibility and explicit support for technocratic authority remains rare, what is more commonly observed is support for privileging the voice of technological experts in political decision-making.

Environment-related planning practices emphasise scientifically generated and expert knowledge (e.g. Turnpenny et al., 2008). However, in order to be valid as ‘useable knowledge’ (Haas, 2004), scientific information needs to be regarded as accessible, relevant and produced in conditions free from the influence of non-scientific interests. However, this was not the case in the RWSS, where the scientific information was barely understandable by the common public.

The literature shows that the major claim for scientific knowledge is its impartiality and freedom from misrepresentation (Lacey, 2004). However, the analysis of the RWSS shows that how this knowledge is perceived, valued and reported is also important. The scientific knowledge is abstract and represents the applicants' perspective rather than providing a holistic view of the project.

Technocratic power is inversely proportional to democratic ways of decision-making (Fischer, 1990; Burnham 1942). The more the environmental decisions are made by experts, whether exclusively or partly, the less opening there will be for important concerns to be heard and valid alternatives to be considered. The scientific model of EA is based on conventional philosophical traditions that view science as an entirely rational process of objective enquiry. This approach gives science a commanding position, with experts playing a major role in finding the facts and producing the evidence. Thus regulatory science becomes a domain of its own, equipped with problem-solving instruments such as environmental impact assessments and cost-benefit analyses (Mol, 2001). This superior position of scientific evidence has been institutionalised in RWSS planning and decision-making through a linear model of knowledge transfer, from the scientific experts to the policy-makers. Such heavily technocratic practices, which are mainly based on scientific evidence and technical expertise, need to be questioned rather than considered as key to environmental progress.

This ever-growing importance of scientific evidence in planning has an effect on the power relationships within society. Science creates systemic biases through its definition of knowledge in scientific terms. It controls participation in policy debates by privileging a particular way of knowing. There is no doubt that the different assessment processes applied in policy debates superficially appear to offer new opportunities for public participation. However, the scientific nature of the techniques adopted in the process establishes who is qualified to know and can contribute, and who is not (Hobart, 1993). Speaking the language of science and the jargon of particular fields of science has become an essential credential for participation in RWSS debates. This research finds that the actors who wanted to participate in the process of the RWSS had to have the ability to understand and communicate a particular scientific type of knowledge. This itself is a very important act of power, as it devalues lay knowledge, and hence the citizenship, of large parts of society (Visvanathan, 1997). It also

promotes the scientification of society (Cashmore et al., 2008) through reinforcing the social authority of scientific institutions.

Scientific predictions constitute much of the basis for EA, and uncertainty is considered to be an unavoidable aspect of predictions. This uncertainty in the environmental consequences of the proposed RWSS plans further justified the powerful position of expert knowledge and technocratic logic in the decision-making process. In such circumstances, policy-making tends to be highly technical, relying heavily on experts to develop scientific models and prepare policy decisions. Coping with uncertainties in EAs is not only a question of prediction accuracy but also of presentation and communication throughout the decision-making process.

As discussed earlier, the RWSS was a politically influenced project and therefore application or misapplication of integrated models for predicting the environmental effects became more crucial. A number of authors reporting on the environmental impact assessments of large-scale infrastructure projects have found that prediction claims often appear to be much more certain than warranted (for example, Lees et al., 2016; Tennoy et al., 2006). If the decision-makers are not made aware of the likely impacts hidden in this uncertainty, they will not be able to react to such impacts by preventing, modifying or monitoring the activity.

Enríquez-de-Salamanca (2018) and Tennoy et al. (2006) argued that in an AEE of infrastructure projects, scientific models are readily manipulated and misrepresented by experts and consultants representing the project's proponents. In the case of the RWSS, the research found significant deficiencies in water contaminant modelling, addressing risk and uncertainty, and the practicability of the proposed mitigation measures. However, such deficiencies were undervalued when a greater technocratic influence predicted and evaluated the environmental impacts of the infrastructure project.

It has always been difficult for non-experts to participate effectively in the decision-making processes. Streamlining the consent process under the RMA reforms has made it even more difficult for non-expert submitters to participate in the board of inquiry process. It is incredibly hard for lay people to understand, assess the validity and interpret the implications of the huge volume of expert reports and evidence presented without assistance. In addition, the formality of the board of inquiry process and the requirement to have legal experts add further barriers to non-expert participation. Therefore, it is fair to say that technocratic power in the hands of

experts marginalises non-expert participant from having an input in the planning process of large infrastructure projects in New Zealand.

### **9.3.3 Social power in infrastructure decisions**

Apart from the political influence and technocratic power, infrastructure projects also attract a wide range of potential proponents and opponents. Proponents may include private investors, farmers, planners, neighbourhood groups, unions and lobby groups like the construction or manufacturing industries. Some groups combine their efforts into coalitions that push for or against the projects. These actors directly and indirectly influence the planning and decision-making process and are usually regarded together as interest groups. The central idea of interest groups is to curve the decisions in their favour by organising like-minded individuals and groups, and providing information to the decision-makers at every stage of a proposed project.

Project opponents are another set of interest groups. Opposition groups, in the case of the proposed infrastructure projects, usually include environmental groups, neighbourhood associations and other NGOs working for civil or human rights. Project opposition may be directed at the type of project, the chosen alternative and the project's social or environmental impacts. The motivation to oppose a project can range from personal interests (e.g. 'not in my backyard' concerns) to public interests, such as environmental concerns. Altshuler & Luberoff (2003) identified local and neighbourhood opposition to projects as an important factor in decision-making. No matter how broad the pro-project coalition is, 'proposals rarely proceeded to implementation if they imposed more than trivial costs on neighbourhoods or the natural environment' (Altshuler and Luberoff, 2003, p. 258).

In the case of the RWSS, at least initially, there was considerable local support for the scheme because of the promoted economic benefits for the region. However, environmental groups, including the national and local branches of the Forest and Bird Protection Society, the Fish and Game Councils and the Environmental Defence Society, were constantly lobbying against the scheme because of its adverse environmental effects. The court reviews presented by the environmental lobby groups, first for nutrient management and then against the Department of Conservation's decision to allow the inundation of conservation land, resulted in inevitable doubt regarding the future of the project. Gradually, the project also lost its support among local communities. Local communities also became opposed to the scheme because of the lack

of proper consultation and the uncertain economic and social outcomes. Consequently, major investors started pulling out of the scheme.

Public participation in environmental decision-making is often considered as a requirement for the democratic legitimacy of decisions, as well as providing an important opportunity to improve quality and effectiveness of those decisions (Glucker et al., 2013). People should have the right to be informed and participate in shaping decisions that will affect their present and future. Many authors argue that such participation is repeatedly controlled by applying technocratic methods of assessing the cost and benefits of proposed developments (O’Faircheallaigh, 2010). The belief that the public lacks expertise and does not understand the science further constrains the opportunities for the public to participate in the decision-making processes. Even in countries like New Zealand where the legislation embeds enforceable rights to participate, the wider legal and policy context often limits public concerns from being considered in the decision-making process, as mentioned in earlier chapters. This tended to frustrate the ability of the public to influence the RWSS decisions. The research finds that these tensions make the notion of public participation vague and pose challenges to its meaningful practice.

Public engagement can also serve as a mechanism for involving the affected stakeholders (Awakul & Ogunlana, 2002). This process can build relationships and a sense of ownership in the proposed development and thus may increase acceptance of the infrastructure decisions (Devlin & Yap 2008 2008; Lawrence 2003). The research finds that public consultation has remained a fundamental aspect of the decision-making process under the RMA and its predecessors. However, the national consenting process managed by the EPA and decided by a board of inquiry represent a change in policy that creates barriers to effective participation and consultation. The study revealed that non-expert submitters to the board of inquiry for the Tukituki Catchment proposal experienced significantly greater barriers to participation in the consenting process. It was incredibly difficult for lay people to understand, assess the validity and interpret the implications of the expert reports and evidence presented without assistance. This alone marginalised non-experts from having any input.

The tight nine-month timeframe for the board of inquiry to complete the process and make the decisions, coupled with the volume of material produced by the applicants, further constrained the submitters’ ability to participate effectively in the decision-making process. The short

timelines for submitters to prepare and submit their case to the board of inquiry further undermined their right to meaningful participation in the consent process. The analysis of the board of inquiry's final report and decisions, the hearing transcripts and the results of the online survey also revealed that the board gave greater consideration to experts and their evidence than the non-experts' submissions and representations. However, the RWSS supporters held that it is fairly rational for any board of inquiry to put more weight on expert evidence than non-expert input, as established principles require expert evidence to be preferred over non-expert opinions.

The formality of the consenting process and the domination of legal experts added further barriers to non-expert participation. Many submitters lack the resources to afford a lawyer to represent them or to seek the advice of a planner. This can be regarded as a significant limitation to the effectiveness of non-expert submitters, marginalising their views of the environmental effects of the proposal. The research also revealed other difficulties for submitters wishing to participate in the board of inquiry process. The EPA did not post the details of submitters on the website. This meant that submitters did not have easy access to the information needed to find out how to contact others with similar interests in the proposal, if they wished to make a joint case.

The lack of a robust participatory approach in infrastructure development can harm a proposed development in many ways. For example, it diminishes the quality of the decision-making process that underpins the selection of a particular project. Secondly, the lack of public acceptance of a proposed project can lead to policy risk and uncertainty. This, in turn, affects the willingness of the private sector to invest in such projects (Coelho et al., 2014). The lack of certainty and public acceptance of the project were major reasons why the two major private investors in the RWSS, Trustpower and Iwi Ngai Tahu Corporations, had to pull out of the scheme. The decision of the two private investors to terminate the memorandum of understanding with HBRIC Ltd. caused major financial damage to the scheme because, together, the two were intending to contribute about \$100 million toward the \$265 million project (RWSS Business Case Report, HBRC, 2014).

To facilitate constructive public engagement, it is important to involve the affected groups in the development of the evidence that is used to inform infrastructure planning and decision-making. This is important, firstly, because credible analysis requires a comprehensive

understanding of public preferences regarding the trade-offs implicit in alternative options for resource development. Secondly, the methods and assumptions that underpin technical analysis need to be extensively discussed with the interested parties, as part of the deliberative process. Otherwise, conflicting views about data collection methods, analysis and future predictions are more likely to become polarised, which, as a result, will undermine the quality of the decisions.

In summary, the research finds that effective community involvement could have improved decisions related to the RWSS. It could deliver better outcomes. The entire process of public participation, the stages when people should become involved and how the information is shared all need to be investigated to give more social power to the public in infrastructure project decisions.

#### **9.4 The value of the theoretical framework**

This thesis shows that the widespread adoption of EA (or AEE in the case of New Zealand), does not necessarily ensure its successful implementation in safeguarding the environment by informing project decision-making. Thought, the immediate purpose of EA is to inform the decision-makers, but as explained in section 9.3 the ultimate goal is to safeguard the environment by mitigating negative environmental effects when permitting infrastructure projects. A recurrent debate in EA research has been whether EA is an objective scientific tool that is or can be separated from power and politics, or whether EA is inherently political in nature and should be conceived of as such. The framework developed on the theory of power argues that power cannot be somehow removed from EA and decision-making. There is no possibility of creating a power-free environmental assessment process, where issues of power are handled in formal political processes. A variety of stakeholders are involved in any infrastructure project, including the proponents of a proposed project, environmental consultants, political parties, government officials, environmental and other interest groups, and the affected public. These different stakeholders are inescapably enmeshed in power relations. Perhaps power can be mediated, but it is always there and it always influences the outcomes of EA. Power clearly needs to be considered, in theory and in practice, in order to better understand the practice and potential of EA.

This suggests that policy-makers and those interested in improving the EA process need to look beyond the internal workings of EA if they want to see substantial changes regarding the

participation and the role of stakeholders in the decision-making process. This finding supports other studies (Runhaar and Harts 2015; O’Faircheallaigh 2010) suggesting that researchers and practitioners need to examine the external institutional and political structures in order to consider the effectiveness of EA. This thesis proposes that enhancing the impact of EA in safeguarding the environment requires much more than policy tweaks and improving best practice. The EA process is not isolated from the larger institutional and socio-political structures; if we do not understand how these structures influence EA processes, we run the risk of advancing policy changes that simply may not work. The rational perspective on decision-making has considerable value for EA-based decision-making: it can lead to effective processes and offer clear direction for decision-making (Niekerk 2000). Hence, from its inception, EA has been associated with a rationalistic way of planning. However, a rational procedure will not automatically lead to a rational choice because of multiple objectives, imperfect information and the fact that people do not always behave as assumed in rational models. Thus, not being able to create ideal rational scientific or communicative processes means that we need to work with an understanding of power and contested rationalities.

Nonetheless, EA approaches are still predominantly tailored from the rational perspective, despite the recognition in recent literature of the relevance of a wider range of decision theories. At this stage, some studies have applied different theories to rationalise the use of EA (see, for example, Bartlett & Kurian, 1999; Richardson, 2005; Weston, 2010). However, gaps between EA theory and practice are evident and there are significant opportunities to build EA theories and link them to power analysis of the decision-making process. EA research should continue to incorporate decision theories from other disciplines in order to provide alternatives to the rational decision perspective that is currently dominant and thus develop a more sophisticated understanding of environmental decision-making. Along with theoretical advancements, empirical case studies with different organisational and political structures could perhaps help us have a better understanding of the complex realities of power and politics in the decision-making process. It may then become possible to better theorise the circumstances in which the effectiveness of impact assessment tools in influencing decision-making can be substantially enhanced.

## **9.5 Lessons from the decision-making process for the RWSS**

The New Zealand system of environmental decision-making makes an interesting and relevant object of study. Spearheaded by the Resource Management Act (RMA) 1991, environmental legislation in the country was hailed at the time of inception as innovative and cutting-edge, making environmental assessment an integral part of the planning and project approval process (Ericksen, 2003; Morgan 2000). Such integration has received increased attention internationally (Petts 2001; Dixon 1993), because, at least in theory, it encourages the integration of environmental concerns into every step of the process, from assessing the alternatives to making the decisions and setting the conditions if the approval is granted. Comparative research on environmental assessment, conducted in the past, reveals that the use of environmental effects information is more prominent in resource consent decision-making in New Zealand than in other countries (See, for example, Hapuarachchi, 2014; Wood 2009; Makmor & Ismail, 2014). However, findings from the current study indicate that environmental concerns are still not optimally incorporated in the statutory decision-making system to ensure that environmentally sound decisions are made regarding proposed infrastructure projects.

Under the RMA, each resource consent application must include an Assessment of Environmental Effects (AEE) with details of actual and potential environmental effects of the activity on the environment (Section 88, RMA). The RMA provides an outline of the AEE contents in its Fourth Schedule. However, the fourth schedule is very broad, and the project applicants determine the scope of effects considered in an AEE. These indications clearly suggest that decision-making under the RMA, particularly for nationally significant proposals, is increasingly politicised with greater influence from central government and project applicants on the outcomes of the national consenting process, thus marginalising other stakeholders.

As environmental assessments are part of a broader decision-making process that has distributional impacts, they are intrinsically political. But a disadvantage of the dominance of the technocratic approach is that it can overshadow the political realities of environmental decision-making. This not only hinders research into the social and political aspects of environmental assessment but more importantly, hinders a closer integration of the environmental assessment with the political decision-making process. Nonetheless, the

research findings suggest that in order to enhance environmental assessment effectiveness it should be closely adapted to the processes it seeks to influence.

While effective community involvement has the capacity to improve decisions and deliver better outcomes, poorly conducted public engagement can cause more harm than good. Effective and meaningful community involvement in resource development and decision-making remains an elusive goal despite the continues rhetorical commitment by the policy makers (Mees & Dodson 2007). The whole process of public participation, including decisions about who participates and at what stage, how information is shared with the participants, and how the process is organised, all seem to influence the quality of project decisions and their implementation.

## 9.6 Conclusion

This thesis aims to identify how power dynamics enable or constrain stakeholders' influence on assessments of the environmental impact and decision-making to permit large-scale infrastructure projects. This aim is achieved by answering the research question "How do power dynamics enable or constrain stakeholders' influence on the environmental assessment and decision-making for large-scale infrastructure projects?" This research developed a theoretical framework on the theory of power and extended its boundaries to political, technical and social power to answer the research question. By using the RWSS as a case study, the research concludes that power dynamics develop stakeholders' influence on the decision-making process. More specifically, the research draws the following conclusions:

- **Political power** lies in the increasing influence of the central government in general and the Minister for the Environment, particularly regarding large-scale infrastructure. The 2009 amendments to the RMA introduced a national consenting process for nationally significant proposals to replace a local authority consenting process. Proposals that are called in by the Minister for the Environment are referred to a board of inquiry appointed by the Minister or referred to the Environment Court (Section 142, RMA). The research indicates that the ability of the central government to intervene in the decision-making process has been significantly increased as a result of the 2009 amendments. The increase in the influence of the central government over the decision-making process for large-scale projects is also evident from the high number of applications called in by the Minister since 2009. Between 2009 and 2017, the

ministerial call-in power has been exercised 22 times. In most cases, the use of the call-in power was requested by the applicant. Only once was the application declined as being not of national significance and referred back to the district council. Likewise, only one application was referred to an independent Environment Court. All of the remaining proposals were referred to boards of inquiry appointed by the Minister. The research results also indicate that the Minister for the Environment has a disproportionate influence on appointments to the boards of inquiry for nationally significant proposals. As part of the economic growth agenda, the Fifth National government supported irrigation schemes throughout their tenure. The proposed RWSS was considered as part of the National government's policy to encourage larger regional irrigation schemes.

- ***Technocratic power*** lies in the hand of 'experts' and their technical details such as water contaminant modelling, addressing risk and uncertainty, and the practicability of the proposed mitigation measures in the RWSS project. This scientific information increased the technocratic influence over predictions of the environmental impacts of the infrastructure project. As EA involves predictions, uncertainties are inherent. The sophistication with which the concept of uncertainty is discussed in the literature is not reflected in the case study. Although the applicants preferred to downplay the uncertainties in their information, the lack of sound information did not seem to paralyse the decision-making process. Nevertheless, uncertainty requires recognition and careful treatment in assessment reports for it to be adequately addressed in decision-making. Therefore, we need to understand the practice of how uncertainties are considered in EA, and the procedures in place to deal with them, before current uncertainty communication practices can be improved. With potentially limited environmental baseline data and correspondingly greater uncertainties, this need may become more urgent in the future as a result of increasing pressures for resource development and demands for more rapid assessment and project approvals.
- ***The social power*** of the general public and community groups was lacking in the RWSS because of the technical and legal nature of the information and process. In order to enhance the credibility of EA as a decision-support tool, this thesis argues that prior to conducting a formal EA, the applicant should be required to obtain approval for the

scope of effects considered in the EA from the relevant authority. Though scoping is not mandatory under New Zealand's RMA 1991, it can offer a significant opportunity to determine what information needs to be provided to the decision-makers to ensure that environmental concerns are properly addressed in the decisions. Wide participation in the scoping process involving different stakeholders, including the local community, enhances the effectiveness of the EA report submitted to the decision-making body.

Overall, the research concludes that the complexity of the political, technocratic and social dynamics of power hinders the effectiveness of EA in achieving its intended goal of safeguarding the environment through informed decision-making for permitting infrastructure projects.

### **9.7 Contribution of the thesis**

Worldwide, EA is taken to be an objective or rational scientific tool to support informed planning and decision-making for infrastructure projects. However, the thesis argues that as decision-making process involves the redistribution of resources, EAs are inherently political, entangled in power relations. Stakeholders involved in the assessment process use technical and socio-political power to influence infrastructure decisions to benefit from the outcome. Taking the RWSS as a case study, the thesis highlights that infrastructure projects do not exist objectively free of context, but rather represent a downstream consequence of political choices. The scale, location and design of what political regimes promote are manifestations of the economic, social and political power configurations in society. The study finds that in response to the uncertain and complex nature of environmental predictions and scientific models, EAs often yield to political considerations assisted by technical experts. Holding a privileged position, technocratic experts, including scientists and planners involved in the decision-making process, typically adopt traditional positions that undervalue the adverse potential environmental effects and overstate the expected socio-economic benefits generated by proposed projects. Furthermore, the formality of the process typically adopted for considering proposals for large-scale infrastructure projects inherently constrains non-expert participation. Speaking the language of science and understanding the jargon used in various fields of science has become an essential credential for participating in environmental decision-making and is disadvantageous to common public. The privileging of voices that can articulate their positions in this science-framed regime limits the contribution of individuals and groups in defining their

future. In short, this thesis contributes to understanding this power analysis gap in EA scholarship.

## **9.8 Future Research**

The study of environmental decision-making is a multilayered evolving field that explores how power relations influence environmental policies, plans, and outcomes. Taking the New Zealand's largest proposed irrigation scheme in the context, the current research helped to understand how different stakeholders uses political, technocratic and social power to influence environmental decisions and whose voices are heard or marginalised in the subsequent infrastructure outcomes.

Climate Change may cause resource availability, such as reduction in agriculture lands and water scarcity and can impact power relations at national and local levels. Climate change can disproportionately affect marginalized communities (Vij et al., 2023) despite these communities' lower contributions to carbon emissions. This inequality manifests ongoing power imbalances, where the actions of more politically and economically powerful actors have more significant environmental impacts that are felt most intensely by those with minimum power and resources (Bhave et al., 2016; IPCC, 2022). Power dynamics and intersectionality interact in environmental decision-making in complex ways, influencing how environmental policies are constructed, implemented, and experienced by different groups. This thesis highlights the barriers to public participation, particularly the so-called non-experts or local communities, in the infrastructure decision-making processes. Future research could examine how these communities and groups can be enabled effectively to participate in environmental decisions. Therefore, future research assesses the role of intersectionality in environmental decision-making. Intersectionality refers to the social categorizations such as class, race, gender, and other forms of identity and how they overlap and intersect (Amorim-Maia, et al., 2022; Collins & Bilge, 2020). A future study would explore how Māori intersects with power dynamics in infrastructure governance. The study could also be helpful in understanding how the indigenous Māori knowledge and voices can be incorporated into the planning and decision-making for infrastructure projects. The newly elected National-led government has already passed a bill to repeal RMA replacements in December 2023. It will be interesting to examine whether or not the new RMA reforms incorporate Māori knowledge and practices in environmental governance to strengthen social or people power when making decisions for future infrastructure projects.

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# Appendix I

## Ethics Approval



Weqas Ali <[REDACTED]>

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### Human Ethics Notification - 4000018883

1 message

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**humanethics@massey.ac.nz** <humanethics@massey.ac.nz> Wed, Feb 21, 2018 at 6:50 PM  
To: A.Lindsay@massey.ac.nz, Syed.Ali.4@uni.massey.ac.nz, C.M.Cheyne@massey.ac.nz, G.A.Banks@massey.ac.nz,  
K.E.Rountree@massey.ac.nz  
Cc: M.E.Thomas@massey.ac.nz

HoU Review Group  
Prof Glenn Banks  
Prof Kathryn Rountree

Ethics Notification Number: 4000018883  
Title: The role of environmental assessment in statutory decision-making for large-scale infrastructure projects in New Zealand. A case study of Ruataniwha Water Storage Scheme

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our system which is reported in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

If situations subsequently occur which cause you to reconsider your ethical analysis, please log on to <http://rims.massey.ac.nz> and register the changes in order that they be assessed as safe to proceed.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:

"This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Dr Brian Finch, Director (Research Ethics), email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz). "

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish require evidence of committee approval (with an approval number), you will have to complete the application form again answering yes to the publication question to provide more information to go before one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

You are reminded that staff researchers and supervisors are fully responsible for ensuring that the information in the low risk notification has met the requirements and guidelines for submission of a low risk notification.

If you wish to print an official copy of this letter, please login to the RIMS system, and under the Reporting section, View Reports you will find a link to run the LR Report.

Yours sincerely

Dr Brian Finch  
Chair, Human Ethics Chairs' Committee and  
Director (Research Ethics)

## Appendix II

# Participants Information Sheet

Kia ora

My name is Weqas Ali. I would like to extend an invitation to you to participate in a brief survey. This survey is part of my doctoral research on the role of environmental assessment in large-scale infrastructure projects in New Zealand. The aim of this research is to find out how stakeholders' views of environmental effects shape decision-makings. The Ruataniwha Water Storage Scheme (RWSS) that was part of the Tukituki Catchment Proposal provides a case study for this research.

This survey seeks the views of planners, scientists, legal experts, those who made submissions and other stakeholders involved in the Tukituki Catchment Proposal. I hope to obtain a wide range of views on the effectiveness of environmental assessment in the statutory decision-making process for large-scale infrastructure projects in New Zealand.

### **Participation**

Your participation in the survey is entirely voluntary, but please be assured I am very grateful for your participation as it will help in understanding different viewpoints on this issue.

### **Duration**

The survey will take about **15 minutes** to complete.

### **Anonymity**

The participants will remain anonymous as names and email addresses are detached from the responses. Anonymised data will be stored in a password-protected computer.

Please contact me or my supervisor if you have any concerns or queries.

Weqas Ali

[REDACTED]

School of People, Environment and Planning  
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School of People, Environment and Planning  
Massey University

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Dr Brian Finch, Director (Research Ethics), email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz).

## Appendix III

### Online Survey

#### Default Question Block

1. Which of the following **best** describes your involvement with the planning and decision-making in relation to the Tukituki Catchment Proposal?
  - Consultant who undertook environmental assessment for applicant
  - Made a submission in support of the Ruataniwha Water Storage Scheme (RWSS)
  - Made a submission in opposition to the RWSS
  - Made a neutral submission in relation to the RWSS
  - Appeared as a legal counsel for project Applicant/proponent at the hearing by the Board of Inquiry
  - Appeared as a legal counsel for project opponent at the hearing by the Board of Inquiry
  - Appeared as an expert witness in support of the Ruataniwha Water Storage Scheme (RWSS)
  - Appeared as an expert witness in opposition to the Ruataniwha Water Storage Scheme (RWSS)
  - Hawke's Bay Regional Council staff member
  - Hawke's Bay Regional Investment Company staff/board member
  - Hawke's Bay Regional Council current/former elected member
  - EPA staff
  - Other (please specify)

#### Block 1

Please choose the option that best describes the extent to which you agree or disagree with the following statements. Until the survey is complete, you can move between pages to change your responses by clicking the arrows at the bottom of each page.

**The following statements are about your overall view of the environmental assessment of large-scale infrastructure projects in New Zealand, in general.**

2. The project applicant has a disproportionate influence on the scope of effects considered in the Assessment of Environmental Effects (AEE) required by the Resource Management Act (RMA) 1991
  - Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
3. Applicants for nationally significant proposals have considerably more resources than

opponents

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

4. The ability of central government to intervene in the decision-making process has been significantly increased through the ‘simplification and streamlining’ amendments to the RMA in 2009

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

5. The Minister for the Environment has a disproportionate influence on appointments to Boards of Inquiry

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

6. Boards of Inquiry give greater consideration to experts and their evidence than they do to non-experts

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

7. The Environmental Protection Authority (EPA) does not operate in a manner that is sufficiently independent from executive government in undertaking its environmental regulatory function

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

8. Participation in a Board of Inquiry hearing process is more onerous for project opponents than it is for project proponents

- Strongly agree
- Agree

- Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
9. Boards of Inquiry for nationally significant proposals have been dominated by legal experts and have not had sufficient scientific expertise
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
10. The short timelines for submitters to prepare and submit their case to a Board of Inquiry constrain submitters' ability to effectively participate in the decision-making process
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
11. The appointment of Board of Inquiry members for nationally significant proposals should follow a public call for nominations
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
12. Regional councils' involvement in economic development must not compromise the exercise of their environmental regulatory function
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
13. Prior to conducting an AEE, the applicant should be required to submit a terms of reference outlining the scope of AEE to the EPA for approval
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know

14. The 2009 amendments to the RMA 1991 designed to simplify and streamline the consent process have made it difficult for non-expert submitters to participate effectively in the decision-making for nationally significant proposals
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
15. The limit on the right of appeal against the Board of Inquiry decisions to points of law does not provide sufficient checks in the decision-making process
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know

## **Block 2**

**The following statements are specifically about the role of environmental assessment in the Tukituki Catchment Proposal.**

16. The Hawke's Bay Regional Council should not have been an applicant in the Tukituki catchment proposal because of the conflict of interest with its regulatory role
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
17. The development of the Tukituki Catchment Proposal was strongly influenced by central government policy to encourage water storage for irrigation
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
18. The lack of freshwater science expertise in the membership of the Board of Inquiry for the Tukituki Catchment Proposal hampered the Board's understanding of the environmental effects of the RWSS
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree

- Strongly disagree
  - Do not know
19. Where environmental assessment information was contested, the Board of Inquiry in its Final Report and Decision generally gave greater weight to the applicant's assessment
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
20. A large-scale dam was preferred over on-farm water storage for economic rather than environmental reasons
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
21. The applicant's AEE for the RWSS understated the uncertainties regarding the environmental effects of the dam
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
22. Alternative options to the RWSS, such as drought-resilient farming methods were not properly considered by the applicants
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
23. The applicant's integrated mitigation and offset approach was not based on a comprehensive assessment of the adverse environmental effects of the RWSS
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
  - Do not know
24. The Final Report and Decision of the Board of Inquiry (BOI) do not give adequate consideration to the adverse environmental effects of the RWSS

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Do not know

Please add any further comments you wish to make about your experience of environmental assessment in statutory decision-making in general and/or in relation to the selected case (the Ruataniwha Water Storage Scheme).

## Appendix IV

### Schedule 4 of the Resource Management Act 1991

#### *Assessment of environmental effects*

##### **6 Information required in assessment of environmental effects**

(1) An assessment of the activity's effects on the environment must include the following information:

(a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:

(b) an assessment of the actual or potential effect on the environment of the activity:

(c) if the activity includes the use of hazardous installations, an assessment of any risks to the environment that are likely to arise from such use:

(d) if the activity includes the discharge of any contaminant, a description of—

(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(ii) any possible alternative methods of discharge, including discharge into any other receiving environment:

(e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:

(f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:

(g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:

(h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

(2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

(3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—

(a) oblige the applicant to consult any person; or

(b) create any ground for expecting that the applicant will consult any person.

##### **7 Matters that must be addressed by assessment of environmental effects**

(1) An assessment of the activity's effects on the environment must address the following matters:

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:

(b) any physical effect on the locality, including any landscape and visual effects:

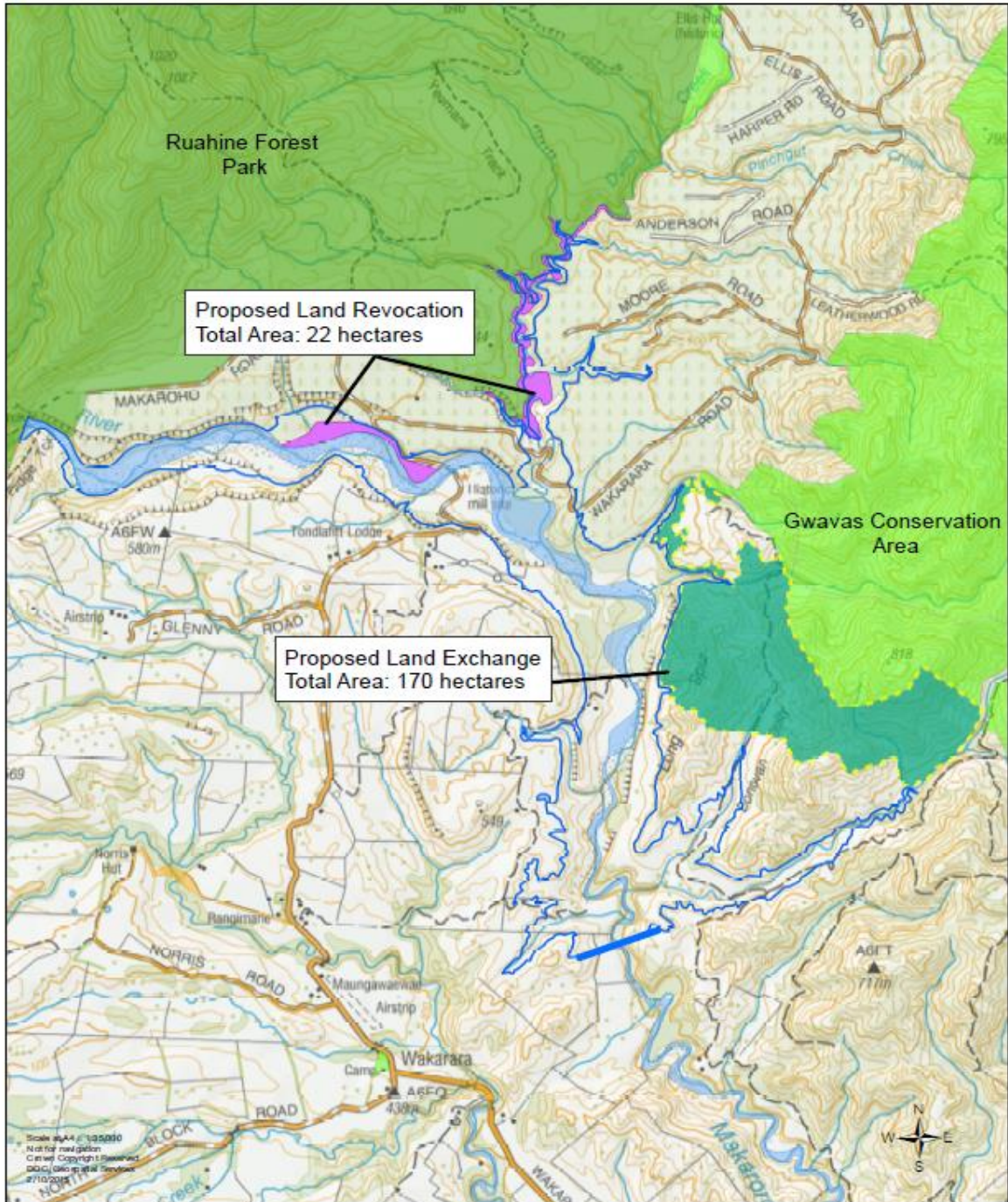
(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:

- (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:
- (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:
- (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or hazardous installations.

(2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

# Appendix V

## Land Exchange Map (Source: Department of Conservation)



### Ruahine Forest Park Land Revocation and Exchange

0 1 2 Kilometres

#### Legend

-  Indicative Dam Crest
-  Reservoir Footprint
-  Smedley Exchange Block
-  Ruahine Forest Park Revocation Land



Department of  
Conservation  
*Te Papa Atawhai*  
[newzealand.govt.nz](http://newzealand.govt.nz)

## Appendix VI

### Thematic Analysis of the General Submissions made to the board of inquiry for Tukituki catchment proposal

S.NO	Submitter	Position on RWSS			Major concerns raised						
		Oppose	Support	Neutral	Water Quality	Water Quantity	Aquatic ecology	Terrestrial ecology	Effectiveness of mitigation measures	Uncertainties about env. affects	EIA/AEE
001	Aitken-J	✓				7				4	1
002	Association-of-Biological-Farmers	✓			3	2		2	4	3	
003	Awassi-NZ-Land-Holdings-Ltd	✓				2		1		2	1
004	Bayliss-Kathryn			✓	6	5	27	9	3	4	1
006	Bel-Group	✓									
007	Belford-Tom		✓		7	5	4	1	1	6	2
008	Bradley-Sam	✓								1	1
009	Buchanan-Trust-No.2	✓				1		2	3	5	

010	Buchanan-William	✓				7		4	4	4	1	
011	Central-Hawkes-Bay-District-Council	✓			27	8	10	3	4	8	5	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>	
012	Chapman-Group-Ltd-Takapau	✓				7		9	2	5		
013	Church-Wayne	✓			12	17	9	5	11	15	6	
014	Clearview-Partnership	✓			7	4	4	3	3	5		
015	Cooper-Del-Este-Ltd-	✓				1			1	1		
016	Dacre-Farm-Family-Trust	✓				5		15		4		
017	Dairy-NZ		✓		25	24	26	33	26	12	3	
018	Dakins-Richard		✓		1	5		2		2		
020	Hawkes-Bay-Federated-Farmers			✓	35	23	18		27	10	9	

021	Fertiliser-Association-of-NZ-Inc		✓		23	18	3		15	4	6
022	Fonterra-Co-Operative-Group-Limited		✓		20	17	4		18	2	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
023	Royal-Forest-and-Bird-Society-Central-Hawkes-Bay-Branch			✓	5	12		1	3	2	2
024	Royal-Forest-and-Bird-Society-Hastings-Havelock-North-Branch	✓			26	24	12	17	4		
025	Franklin-Paul		✓			4					
026	Glendinning-Claire	✓				3		5	4	3	
027	Gunson-Jamie	✓				19		9	4	7	3
028	Harker-Jeremy		✓			3	1	8		2	

029	Hastings-District-Council			✓	11	23	5	18	4	25	3
030	Hawkes-Bay-District-Health-Board	✓			29	23	11	8	6	18	1
031	Hawkes-Bay-Deer-Farmers-Association	✓						1			
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
032	Hawkes-Bay-Environmental-Water-Group	✓			35	17	20	17	7	8	8
033	Hawkes-Bay-Farm-Forestry-Association			✓			2		4	2	
034	Hawkes-Bay-Fish-and-Game-Council-and-Eastern-Fish-and-Game-Council	✓			31	25	18	12	17	13	7
035	Hawkes-Bay-Regional-Council	✓			34	27		16	3		
036	Hawkes-Bay-Winegrowers-Association-Incorporated		✓			39		2	3	2	
037	Heinz-Watties-Limited	✓			3	37		15	5	1	

038	Holden-Duncan	✓				4	2			2	
040	Ingleton-Farms-Ltd	✓			27	14	9	19	8	2	
041	Irrigation-New-Zealand		✓		11	18		8	5		11
042	J-M-Bostock-Ltd		✓			4		2		4	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
043	Johnston-Rawiri	✓				4	3	1		1	
044	Katoa-Farm-Ltd		✓		1	3		1		1	
045	Kelly-Terry	✓			17	13	6	9	7	1	
046	King-Justin	✓			1	7	2	3	2	5	
047	King-Philip-George	✓			2	6	3	5	3	2	
048	Lawson-Richard	✓			1	8					
049	McCain-Foods-NZ-Limited	✓						4			

050	Mr-Apple-New-Zealand-Ltd			✓	9	11		13		2	
051	Ngati-Kahungunu-Iwi-Incorporated			✓	3	34	12	5	6	13	3
052	Nochi-Trust-102983	✓							1	3	
053	NZ-Anglican-Church-Pension-Board	✓			2	1		26	5	3	1
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
054	Pain-Gerard		✓		4		2		2	3	
055	Papawai-Partnership	✓				12		6		8	
056	Pedersen-Catherine	✓			5		1		8	2	
057	Perthshire-Farms-Land-Co-Ltd	✓				9		5	5	6	
058	Plantation-Road-Dairies-Ltd	✓			1	13		7	2	8	2
059	Purunui-Farm-Trust	✓				5		2	3	4	

060	Riverside-Trust-No-2			✓		3						
061	Ritchie-Hugh		✓			4			5			
062	Ruataniwha-Water-Users-Group		✓			3		6	2			1
063	Schaw-Partnership			✓		2			2			
064	Silver-Fern-Farms		✓		7	18	4	4	8	15		13
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>	
065	Stockade-Pastoral-Farms-Limited	✓				3				2		
066	Te-Taiao-Hawkes-Bay-Environment-Forum			✓	15	20	13	7	3	5		1
067	Te-Taiwhenua-o-Heretaunga	✓			14	23	18	15	5	15		
068	Te-Tai-Whenua-o-Tamatea	✓				3				2		
069	Tichinin-Phyllis	✓			10	12	9	5	5	3		2

070	TrustPower-Ltd			✓	12	17		8	3	4	
071	Tuturo-Farm-Ltd	✓				4					
072	Twigg-Samuel			✓						1	
073	Ward-Tony-Byron	✓			2		2	2		4	
074	Wellington-Hawkes-Bay-Conservation-Board			✓	9	20	8	3	14	7	2
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
075	Wilson-Gerald-and-Thomas			✓		7		4		5	
076	Wilson-James-Gregory	✓			1	5		2	2	3	
077	Worsnop-Bruce-M	✓								1	
078	Tod-Peter	✓				2		1		2	
079	De-Lautour-Hamish	✓				3		2			

080	White-John	✓				16	1		2	1	1
081	Dowley-A	✓			4	12		2	9	5	1
082	Harper-George	✓			4	12		2	9	5	1
083	MB-de-Lautour-Enterprises		✓		12	15	1	5	8	6	1
084	Hatfield-Claire		✓		3	6			5	9	
085	Horlor-Murray		✓								
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
086	Bayliss-Kathryn	✓					6	15		8	
087	Dunningham-Jeremy	✓				6	3	5	7	13	4
088	Tully-Adrienne	✓			3	4	2	2	7	5	
089	Bailey-Paul	✓									
091	Skins-Ian			✓							

094	Hutt-Valley-Tramping-Club-Inc		✓			4	1	12	15	1	
095	Cole-Peter	✓									
096	Kloss-Robb	✓									
097	Butler-Kerry	✓									
098	Tukituki-Awa-Ltd-and-Others	✓				3			2		
099	Bennett-Quentin	✓				2	3		1	2	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
100	Bayliss-Ian-and-Liz	✓			3	11	2	6		2	5
101	East-Tony		✓								
102	Pan-Pac-Forest-Products-Ltd			✓				16		5	1
103	McCoy-James	✓									
104	Ngahere-Station-Ltd		✓								

105	Federated-Mountain-Clubs-of-NZ-Inc			✓		4	2	11	2	2	
106	Meyer-Peter	✓									
107	LINZ-Holdings-Limited-as-trustee-of-the-Nochi-Trust			✓							
108	McIntosh-Ian	✓									
109	Hawkes-Bay-Environmental-Water-Group	✓			18	9	5	3	15	13	7
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
111	McCavana-Bryan	✓			1	7	6	4		2	
112	McQueen-Amelia	✓			6	2	3	5	1	4	2
113	Cranwell-David	✓			8	4		13	2	6	1
114	Lowe-Brian	✓									
115	Hunter-Robert			✓							

116	Graham-June	✓								1	4	
117	Hume-Nick		✓									
118	Arden-Properties-Ltd-Tukituki-Ltd	✓			12	7	6	7		11	12	
119	Butler-Brendan	✓			7	6	14	12		8	10	
120	Fern-Paula	✓										
121	Pain-Gerard	✓				7	9	8		4	15	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>	
122	Heretaunga-Tramping-Club-Inc			✓				1		2	3	
123	Lyford-Susan	✓			1	1		2		1	14	
124	Mills-Judith	✓				3	1	4		5	9	1
125	Hamilton-Edward	✓										
126	Mohi-Rose	✓										

127	Hale-William	✓									
128	Wuts-John	✓									
129	Crowe-Horwath-Hawkes-Bay		✓								
130	Lambert-Charles		✓								
131	Ryan-Linda	✓									
132	Simmonds-Lee	✓									
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
133	de-Courcy-Lys-Howard	✓									
134	Ritchie-Ian	✓			2	8	1	4	1	7	2
135	Magill-Robert	✓						1		3	
136	Dallimore-Larry	✓				7	2		1	9	1
137	Schillinger-Catherine	✓									

138	Stabler-Daniel	✓			9	4	3	5	1	17	
139	Kersley-Margaret	✓									
140	Baird-Sharleen	✓			12	3	7	3	6	11	4
141	Cairns-Ian	✓			1	2		3			1
142	Christie-Grenville	✓				7		2		8	2
143	Skudder-Eric-and-Jackie	✓									
144	Hamilton-John			✓				2		5	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
145	Royal-Forest-and-Bird-Napier-Branch		✓		4	1	4	15	3	23	
147	Te-Hau-Pa-Whare	✓									
148	Mills-Jessica	✓									2
149	Marfell-Sue		✓								

150	Heperi-Joanne	✓								1	
151	Hawkes-Bay-Regional-Council			✓							
152	Keane-Catherine	✓						1		2	
153	Turner-Mike		✓		1				1		
154	Short-Simone		✓								
155	Ewen-Tim		✓								
156	Smith-Megan	✓						2		4	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
157	Yensen-Helen	✓				4	2	3		7	
158	Denyer-Karen	✓									
160	Astill-Rachel	✓								6	
161	Holman-Richard	✓						1		1	

162	Langereis-Alicia	✓								2	
163	Gibbs-Ryan	✓								1	
164	Claudatos-Sandra	✓						4		3	
165	Mills-Murray	✓						2		5	1
167	Verhoeven-Ellen	✓								2	
168	Hunt-Robbie			✓							
169	Reid-Kathleen	✓								2	
170	Fennessy-Brian	✓								1	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
171	John-Susan	✓									1
172	Barrow-John			✓							
173	Indevin-Estate-Ltd			✓		15		4	2	1	

174	Pendle-Hill-Stn-Ltd	✓				4			1		
175	Treadwell-Nicola	✓									
176	Kuperus-Wendy	✓			1					2	
177	Upton-Matthew	✓			1					2	
178	Hirst-Fleur	✓			3		1			2	
179	McGregor-Bruce	✓									
180	Diederichsen-Rebecca	✓			1					2	
181	Sims-Samuel	✓			1			2		3	
182	Williams-Andrew	✓			1					2	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
183	Atkinson-Nicola-	✓			2		2			2	
184	Chappell-Esta	✓			1		2	1		2	

185	Nichols-Steven	✓			2					2	
186	Smith-Gilbert		✓			1		1			
187	Scott-Adele	✓			1		2	1		2	
188	Campbell-John		✓		1		2				
189	Eyles-Garth	✓			1	3		7	1	2	
190	Jones-John	✓								2	
191	Johnson-Robert	✓								4	
192	Keedwell-Rachel	✓			1	1				4	
193	Foote-Kyleisha	✓			1					2	
194	Talbot-Jones-J	✓					1	1		2	
		<b>Oppose</b>	<b>Support</b>	<b>Neutral</b>	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
195	Strickland-William	✓				2		3			

196	Waimarama-Marae-on-behalf-of-Nga-Hapu-o-Waimarama	✓						4	6	9	
197	-Mawson-Patrick		✓			1				3	
198	Groenveld-Arie	✓			1		1			1	
199	Johnson-Anthony	✓								2	
200	McCool-Robyn	✓				1	2			3	
201	Brannigan Maree	✓			2	2			1		
202	Jedburgh Farm Partnership	✓			2	3			1		
203	Langham Julie	✓			2	3			1		
204	Hills Gordon	✓			2	3			1		
205	Hylton Slater Leo	✓			2	3			1		
206	James Mathew	✓			2	3			1		

207	Howe Rochelle	✓			2	3			1		
208	Tonkin Jonathan	✓			2	3			1		
209	Dacre Farm Family	✓			2	3			1		
210	Sell Penelope	✓			2	3			1		
211	Leeves Tom	✓			2	3			1		
212	Lawrence Mark	✓			2	3			1		
213	Tod Peter		✓		2	3			1		
214	Cheyne Christine		✓		6	4			4	3	6
215	Tichinin Phyllis		✓		14	3	3	2	4	1	3
216	Baker Jenny			✓	5	4	4	3	2		5
217	Kittow Allen	✓			2	3			1		
218	Beckett Jamie	✓			2	3			1		

219	Beckett Lara	✓			2	3			1		
220	C G Jaqi	✓			2	3			1		
221	N Z Transport Agency			✓	2	3			1		
222	Cook Wendy	✓			2	3			1		
223	Hart Debbie	✓									
224	Cairns Ian		✓		2				1		
225	Skelton Adrian	✓									
226	Thompson Barry	✓									
227	Devereux Lynette	✓									
228	Tomoana Joy	✓									
229	Longshaw Janette	✓									
230	Makara Farm		✓		3	2	2	2			1

231	Hay Rose	✓			2		1				
231	Tod Peter		✓								
232	Hope Filipa	✓									
233	Johnston Rawiri			✓			1	1			
234	Central Hawkes Bay Branch of Forests and Birds Society	✓			7	1	5	3	1		2
235	Ryan Richard	✓									
236	Singleon Sarah	✓									
237	NZ Federation of Freshwater Anglers Inc				3	1	3				
238	Manawatu Tramping and Skiing Club			✓							
239	White John				3	4	2				6
240	Frater Thomas Gregory		✓			1	2	2			

241	Oherihy Patricia	✓									
242	Hawkes Bay Fish and Game Council and Eastern Fish and Game Council		✓		18	7	23	8		2	3
243	Transparent Hawkes Bay Inc	✓									
244	Waugh Lynn	✓									
245	Waite Michael	✓									
246	Stream	✓									
247	Armitage Rebecca	✓									
248	Gwynn Robin	✓									
249	Ryan Chris	✓					3	5			
250	New-Zealand Walking Access Commission										

251	Elliott Pauline	✓									
252	Operation Patiki	✓					2				
254	WOW-Walking-on-Water-Inc			✓			1				
255	Howard-Estate-Advisory-Board						1				
256	Central-Hawkes-Bay-District-Council		✓								
257	Trustpower-Limited										
258	Napier-Tramping-Club			✓							
259	Robson-Angus	✓			10	1	4	1			
260	Rose-Megan	✓									
261	Boonen-Roy	✓									
262	Raill-Michelle	✓									

263	Hawkes-Bay-Fruitgrowers-Association-Inc		✓		1						
264	Burne-Philippa	✓									
265	Dewes-Sarah	✓									
266	Tinholt-John	✓									
267	Addavale-Produce-Ltd	✓									
268	Burton-Gwynffryn	✓									
269	Fonterra-Co-Operative-Group-Limited										2
271	Cotterill-Vanessa	✓									
272	Pearce-Gareth		✓								
273	Raikes-Peter-and-Caroline		✓								
274	The-Steyning		✓		2	1					1
275	Morgan-K	✓					1				1

276	Flemming-Ian	✓									
277	Horsley-Peter	✓									
278	Johnson-Elizabeth	✓									
279	Innes-Cameron	✓									
280	Werrey-David	✓									
281	Kane-Patrick	✓				1	1				2
282	McGaffin-Ashley	✓									
283	Ruataniwha-Water-Users-Group		✓		4						
284	Riden-Don	✓			1						1
285	Phillips-Louise			✓			1				
286	Sheep-and-Cattle-Growers-Collective		✓		4						1
288	Murrell-Anita	✓									

289	Ballance-Agri-Nutrients-Limited		✓		3						
290	Foley-Chris		✓								
291	Hawkes-Bay-Regional-Council		✓								2
292	Gwynn-Margaret	✓				2					1
293	Leckinger-Richard	✓									
294	Blake-Phil	✓									
295	Craig-Preston-Trust			✓	1						3
296	Drayton-Walter	✓									
297	Gifford-Andrew	✓			2		1				1
298	Harvey-Kathleen	✓									
299	Ward-Tony	✓									
300	Gunson-Rick		✓								

301	Forest-Gate		✓								
302	Millstream-Gardens	✓									
303	Warren-Christine	✓									1
304	Environmental-Defence-Society-Inc		✓		10	1	1				6
305	Peez-Barrie	✓									
306	Butler-Farming-CHB		✓								
307	Papawai-Partnership		✓								
308	Dakins-Richard	✓									
309	Hawkes-Bay-Vegetable-Growers-Assn-Inc										
310	Wood-Gary	✓									
311	Tait-Jamieson-Steve			✓							

313	Finlay-Graham-and-Judith	✓									
314	Maloney-Patrick	✓			2			1			2
315	Warren-Mary-Ellen	✓									
316	Knobloch-Mike		✓								1
317	Gerard-Land-Design		✓		4						6
318	Roberts-Girvan	✓									5
319	Stoddart-Lyn		✓								
320	Sileni-Estates		✓		1						
321	Cammock-Murray	✓									
322	Donnelly-James	✓									
323	Maclean-Peter	✓									
324	Stuart-Michael	✓									5

325	McDonald-Robert	✓									
326	Spall-Jim		✓								1
327	Waugh-David	✓									5
328	Sisson-Elizabeth	✓									
329	McDonald-Faye	✓									5
330	David-Phillips-Limited		✓								
331	Tomoana-Hawea	✓									1
332	TeWhaiti-Ngapuoterangi-Hohepa-Koro	✓									
333	Mannering-Family-Trust		✓								
334	Plesner-Marek	✓									
335	Chambers-Brian	✓			1						2
336	King-Suzanne	✓									

337	King-Bryan	✓									
338	Plesner-Elaine	✓									
339	Allison-Sally	✓									
340	Northcroft-Leigh	✓									
341	Brownrigg-Agriculture-Group-Ltd	✓			2						
342	Paku-Pohatu	✓					2				1
343	Royal-Forest-and-Bird-Protection-Society-of-NZ-Inc-Hastings-and-Havelock-North-Branch	✓			3		2	1			1
344	Hawkes-Bay-Regional-Investment-Company-Limited		✓								
345	Director-General-of-Conservation			✓							
346	Hair-Angela	✓					1				

347	Hawkes-Bay-Branch-of-the-New-Zealand-Deer-Farmers-Association				12	1	1	1			4
348	Wilson-Andrew	✓									
349	Millington-Sarah	✓			1		1				
350	Rockel-Martin		✓								
351	Harding-Family-Trust										
352	Ravendown-Fertiliser-Co-operative-Ltd		✓		4						1
353	Riden-Colin	✓			1						
354	Federated-Farmers-of-New-Zealand		✓		6	2					
355	Fertiliser-Association-of-New-Zealand		✓		2						2
356	Ministry-for-Primary-Industries		✓		4						
357	Ngai-Te-Upokoiri-ki-Omoahu-Marae	✓			1						

358	NZ-Pork-Industry	✓									
359	Ngati-Kahungunu-Iwi-Incorporated		✓		9	6	1				3
360	Nilon-Bruce			✓							1
361	Parks-Peak-Station		✓								
362	Sage-Eugenie	✓			1	1					
363	Sustaining-Hawkes-Bay-Trust	✓					1	1			2
364	Te-Roopu-Kaitiaki-o-Te-Wai-Maori	✓					2				1
365	Ingleton-Farms-Limited		✓		1	4					1
366	Winstone-Aggregates			✓			1				1
367	Riverfield-Holdings-Ltd										
368	GR-Smith-Family-Trust		✓								

369	Tangiara-Pauline										
370	Hastings-District-Council										
371	Pedersen-Catherine	✓									
372	Transpower-New-Zealand-Limited	✓									
373	Bell-Martin-Louise	✓									
374	Te-Taiao-Hawkes-Bay-Environment-Forum	✓			4	3	2				
375	Bel-Group-Limited		✓		1	1					
376	Mr-Apple-New-Zealand-Limited	✓									
377	Te-Tai-Whenua-o-Tamatea		✓								
378	DairyNZ		✓		2	1					1
379	Ngati-Hawea-ki-Matahiwi-Ngati-Kautere-Ngati-Hawea						1				

380	Charteris-Grant-and-Sally				1						
381	Kelly-Terry	✓			3		1				
382	Heinz-Watties-Limited										
383	JM-Bostock-Ltd				1	1					
384	Horticulture-New-Zealand-and-other-parties				2	1	1				1
385	Beef-and-Lamb-New-Zealand										
386	Roundaway-Station										
387	Hawkes-Bay-Winegrowers-Association-Inc										
388	Hughes-Jack										
389	Hunter-James				3						
390	Firstlight-Venison-NZ-Ltd		✓								

391	Perley-Christopher	✓									
392	Dodds-William	✓									
393	Silver-Fern-Farms-Limited		✓								
394	Irrigation-New-Zealand		✓								
395	Waipatu-Marae-Ngati-Hawea-Ngati-Hori-Ngati-Hinemoa										
396	The-Council-of-Outdoor-Recreation-Associations										
397	Perthshire-Farms-Land-Co-Ltd	✓									
398	Dearing-Jan										
FS001	HB-Environmental-Water-Group	✓									
FS002	Waimarama-Marae-on-behalf-of-Nga-Hapu-o-Waimarama	✓			2	1					1

FS003	Ngati-Kahungunu-Iwi-Incorporated-NKII		✓		10	1					
FS004	Environmental-Defence-Society-Inc	✓									
FS005	Mills-Judith		✓								
FS006	Ingleton-Farms-Ltd										
FS007	Sustaining-Hawkes-Bay-Trust		✓								
FS008	Gifford-Andrew		✓								
FS009	Te-Taiao-HB-Environment-Forum		✓								
FS010	Fonterra-Co-Operative-Group-Limited	✓									
FS011	TrustPower-Limited	✓									
FS012	Silver-Fern-Farms-Limited		✓								
FS013	Mr-Apple-New-Zealand-Limited										

FS014	BEL-Group-Limited		✓								
FS015	Ruataniwha-Water-Users-Group		✓		1	1					
FS016	Rose-Megan	✓									
FS017	Mangaroa-Marae										
FS018	Royal-NZ-Forest-and-Bird-Protection-Society-Inc-Hastings-and-Havelock-North-Branch		✓								
FS019	Hastings-District-Council	✓									
FS020	DairyNZ	✓									
FS021	Horticulture-NZ-and-Others	✓									
FS022	Federated-Farmers-of-New-Zealand		✓		2						

	<b>Major concerns raised</b>						
	<b>Water Quality</b>	<b>Water Quantity</b>	<b>Aquatic ecology</b>	<b>Terrestrial ecology</b>	<b>Effectiveness of mitigation measures</b>	<b>Uncertainties about env. affects</b>	<b>EIA/IEE</b>
RWSS Part C Assessment Environmental Effects) HBRIC (May 2013)	65	02	16	12	14	06	19
Final Report and Decisions Volume 1-3 Report 18 June	186	38	28	29	10	15	08