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What Works Best When: the Role of Collaboration in Environmental Policy and Planning

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Abstract

Conflicting views about the use of natural resources create challenges for environmental management. Scholarly theory suggests that there are different types of policy problem, and these can be identified within a framework that considers the degree of certainty over relevant knowledge, and the degree of consensus on norms and values. By determining and understanding the nature of a policy problem, planning practitioners can choose a problem-solving strategy that is appropriate for different policy problem types. In New Zealand, one policy strategy, collaboration, is increasingly being promoted to resolve conflicts, as collaboration is seen as having more effective outcomes than existing adversarial planning processes. The aim of this research is to explore how collaboration can offer better outcomes for stakeholders involved in environmental resource conflicts, compared to conventional planning processes.

This study used Q methodology to examine and explore the scope for collaboration to address a policy problem that arose in New Zealand in 2012, namely how to reconcile the divergent views about the expansion of finfish farm development in the Marlborough Sounds. The study showed that there was a high degree of uncertainty over relevant knowledge and a lack of consensus on norms and values between stakeholders, indicating that finfish farm development in the Marlborough Sounds is an unstructured, or 'wicked' problem. The policy strategy best suited to solving this type of problem is a collaborative process that involves learning because it enables participants to identify, confront and integrate divergent viewpoints and knowledge. In doing this, participants reframe the policy problem and discover new opportunities for solving it.

In this study, the greatest degree of diversity between viewpoints on finfish farm development was between industry stakeholders and others (iwi, non-

government organisations, community members and governance and regulation representatives). The study highlights the need for the finfish farming industry to improve public understanding and gain support for its activities in order to achieve its growth and development goals. It also shows that, depending on the nature of the policy problems being addressed, collaborative planning processes could be adopted to manage conflicts about environmental resource use in settings other than freshwater in New Zealand.

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Abbreviations

BOI	Board of Inquiry
EPA	Environmental Protection Authority
EDS	Environmental Defence Society
ha	Hectare
IAP2	International Association for Public Participation
LGA	Local Government Act 2002
MBIE	Ministry of Business, Innovation and Employment
MDC	Marlborough District Council
MfE	Ministry for the Environment
MPI	Ministry for Primary Industries
MSRMP	Marlborough Sounds Resource Management Plan
NPS	National Policy Statement
NZKS	New Zealand King Salmon Company Limited
ROI	Registration of Interest
RMA	Resource Management Act 1991
RfP	Request for Proposal
s	Section (of an Act)
SOS	Save our Sounds

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1 Introduction

1.1 The New Zealand King Salmon Applications

The New Zealand aquaculture industry aims to grow its annual revenue from approximately \$400 million in 2012 to \$1 billion by 2025 (New Zealand Government, 2012). The industry sees finfish farming (predominantly salmon farming, but also other species such as hāpuku) as being a major contributor to its 2025 goal (Burrell, Meehan, & Munroe, 2006). However, expansion of the finfish industry is predicated on the availability of more farm space.

Most of New Zealand's farmed salmon is produced on seven farms in the Marlborough Sounds, all operated by New Zealand King Salmon Company Limited (NZKS). In 2012 NZKS, seeking more farm space, applied to the New Zealand Environmental Protection Authority (EPA) to change the Marlborough Sounds Resource Management Plan (MSRMP). At the same time, the company applied for resource consent for nine new salmon farms in the Marlborough Sounds. The applications were publicly notified by the EPA on 31 March 2012 (Environmental Protection Authority, 2012). Opinions expressed in the more than 1200 submissions on the applications, as well as in the media and at the subsequent Board of Inquiry (BOI) hearing reflected the divergent views of the local community about the expansion of salmon farming in the Marlborough Sounds.

In February 2013, the BOI gave permission for four of the farms and declined five of the farms (Environmental Protection Authority, 2013). The decision was appealed to the High Court by two submitters, the Environmental Defence Society (EDS) and Save Our Sounds (SOS). The High Court dismissed the appeals and both EDS and SOS subsequently sought leave to appeal to the Supreme Court, which was granted (New Zealand Supreme Court, 2014a). The appeal by EDS related to the protection of areas of outstanding natural character and landscape in the coastal environment at one site only (Papatua,

Port Gore). In contrast, SOS's appeal related to water quality at all four sites where resource consent was granted (New Zealand Supreme Court 2014b). Ultimately, the Supreme Court overturned the decision of the High Court in relation to the EDS appeal (Port Gore) and dismissed the appeal of SOS for the three remaining sites (Waitata, Richmond and Ngamahau). Consequently, of the nine sites applied for by NZKS, three were finally granted resource consent.

The public debate that ensued over NZKS's applications to develop more finfish farms in the Marlborough Sounds¹ is not uncommon in environmental management. Submissions on the NZKS applications illustrated very clearly that many people, including ordinary citizens, had a strong view on the applications and wished to participate in the decision-making process in some way. Issues raised in the submissions covered a broad range of themes including economic, environmental, cultural and social. In New Zealand, research by Banta and Gibbs (2006) shows that marine farm consent applications are frequently refused due to social factors, such as noise and visual pollution, and effects on natural character. Often, however, policy problems associated with the management of natural resources are treated as technical problems, despite evidence that they may also be socio-political problems (Susskind, 2013; Weber, Memon & Painter, 2012). There is an emerging consensus that scientific, technical solutions for complex environmental policy problems need to be considered within their social, political and economic context (Berkes, Colding & Folke, 2006), and that this requires the involvement of a wide range of people, rather than just technical experts (Susskind, 2013).

¹ The development of more finfish farms in the Marlborough Sounds' is the 'policy problem' at the centre of this study.

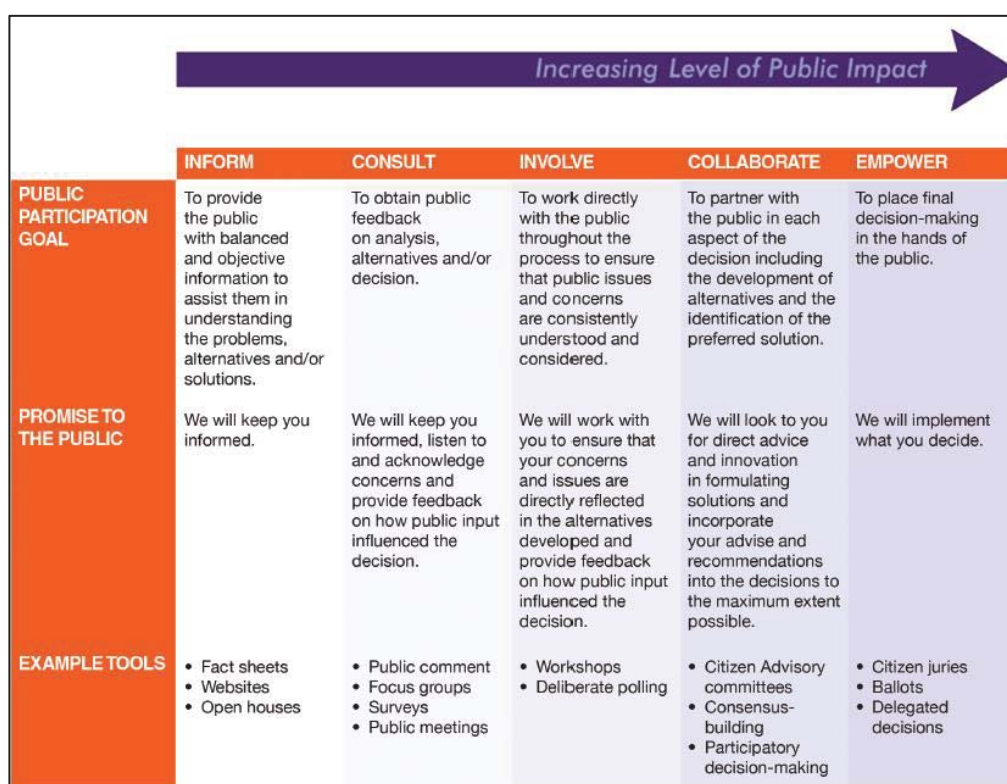
1.2 Democracy and public participation

Sorensen (2013) argues that democracy requires that those who are affected by a decision have a right to be involved in the decision-making process, and that political decisions should be made on the basis of deliberation. Democracy, according to Dryzek and Niemeyer (2008), allows for the criticism of policy proposals from a variety of directions. They argue that all relevant viewpoints must be considered, in order to avoid “group-think and the silencing of uncomfortable voices from the margins or across divides” (Dryzek and Niemeyer, 2008 p 482).

A useful framework that describes the various ways the public can participate in policy proposals is the ‘Spectrum of Public Participation’ developed by the International Association for Public Participation (IAP2) (International Association for Public Participation, 2014) after the work of Arnstein (1969). The IAP2 spectrum shows that the level of public participation with the least amount of impact on decision-making (refer to Figure 1) is informing the public, i.e. providing information to assist with the understanding of problems and solutions. The level of public participation with the most impact on decision-making is empowering, i.e. placing decision-making power in the hands of the public.

In order to move to a participatory process that has greater public impact on decision-making, governing agencies need to engage the public early in the planning cycle, i.e., in the policy drafting stage. Genuinely involving and empowering the community in decision-making processes means that governing agencies must actually be willing to divest some of their responsibilities and power to citizens. One way they might do this is to engage in more collaborative planning processes. According to the IAP2, collaboration means “to partner with the public in each aspect of the decision, including the

development of alternatives and the identification of the preferred solution” (International Association for Public Participation, 2014 n.p.).



	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision.	To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
EXAMPLE TOOLS	<ul style="list-style-type: none"> • Fact sheets • Websites • Open houses 	<ul style="list-style-type: none"> • Public comment • Focus groups • Surveys • Public meetings 	<ul style="list-style-type: none"> • Workshops • Deliberate polling 	<ul style="list-style-type: none"> • Citizen Advisory committees • Consensus-building • Participatory decision-making 	<ul style="list-style-type: none"> • Citizen juries • Ballots • Delegated decisions

Figure 1. The IAP2 spectrum showing the ways that public participation has increasing impact on decision-making, from left to right (International Association for Public Participation, 2014).

It is important to note that *collaboration* is not the same as *consultation*. The latter is defined by the IAP2 as “to obtain public feedback on analysis, alternatives and/or decisions”. This distinction is important because in New Zealand most resource management practitioners are familiar with implementing consultative processes (because they are required under the RMA and the Local Government Act 2002 (LGA)) but, arguably, are less familiar or not familiar at all, with implementing collaborative planning processes.

Both central and local government are required to consult widely when developing policy statements and plans (ss 44, 46, 46A and Schedule 1 of the

RMA). The New Zealand Court of Appeal, in a landmark case that related to the LGA, has provided clarity on what is meant by consultation and has recognised the importance of allowing the public adequate time to respond to planning proposals. According to the New Zealand Court of Appeal, consultation:

...must be allowed sufficient time, and genuine effort must be made. It is to be a reality, not a charade. To consult is not merely to tell or present. Nor, at the other extreme, is it to agree. Consultation does not necessarily involve negotiation toward an agreement, although the latter not uncommonly can follow, as the tendency in consultation is to seek at least consensus...consulting involves the statement of a proposal not yet finally decided upon, listening to what others have to say, considering their responses and then deciding what will be done. Implicit in the concept is a requirement that the party consulted will be (or will be made) adequately informed so as to be able to make intelligent and useful responses. It is also implicit that the party obliged to consult, while quite entitled to have a working plan already in mind, must keep its mind open and be ready to change and even start afresh... In some situations adequate consultation could take place in one telephone call. In other contexts it might require years of formal meetings...(New Zealand Court of Appeal, 1991 p 675).

According to Gunder and Mouat (2002, p 124), New Zealand's "theoretically consultative statutory planning processes" actually obscure a "rationality of exclusion" in the country's planning practices. They argue that while the RMA might appear to foster the rights of public participation, "it actually dissipates the ability to resist for the majority of New Zealanders when they are opposed to its community-shaping consequences" (Gunder & Mouat, 2002 p 126). They note, for example, that shortened timeframes enable institutional and corporate stakeholders to take advantage of participatory processes more readily than ordinary citizens, and that these stakeholders act in their own strategic interests to drive community change.

Collaborative governance² offers an alternative framework to the often adversarial planning approaches that are most commonly used to make decisions on environmental resource issues. According to Ansell and Gash (2007 p 544) collaboration involves public organisations engaging with citizens:

in collective decision-making processes in a formal, consensus-oriented and deliberative way, with aims to make or implement public policy or manage public programmes or assets.

An environmental resource issue that has received considerable attention in New Zealand over the past decade is management of freshwater, particularly in catchments where water takes have exceeded allocable limits and where discharge of contaminants has impacted water quality. In 2009, the National Government announced a strategy (A New Start for Fresh Water) to address problems with freshwater management (New Zealand Government, 2009), and agreed to the use of a collaborative planning process to develop shared outcomes, goals and long term strategies for improved water management. One of the strategy's key outcomes was the establishment of a collaborative, multi-stakeholder process known as the Land and Water Forum (LaWF).

The LaWF stakeholder process was modelled on the approach of Nordic countries to environmental planning problems. Salmon (2007 p 200) describes the model thus:

...all legislation and major policy initiatives are proceeded by multi-stakeholder deliberations. These are focused on a defined issue, and aim to devise a policy solution to that issue. They involve the participants in deep immersion, for prolonged periods of time (usually a year or more), in technical information and policy analysis. In all cases, the aim is to achieve

² In this thesis, the term 'collaborative governance' is used interchangeably with 'collaboration'. 'Collaborative planning processes' are processes that sit within the framework of collaborative governance.

a consensus, or where that is not possible, with dissenting participants recording their reservations...the system can best be characterised as 'collaborative governance' rather than as 'consultation'.

This model, according to Salmon, takes time but results in fewer arguments, lower process costs and better results from both an environmental and economic perspective. Outcomes of such a process might include not only the decisions about the intended state (i.e. the management objectives), but also a better understanding of how to manage divergent values under uncertainty (Berkett, Challenger, Sinner, & Tadaki, 2013).

1.3 The research question

The NZKS applications were processed under the RMA planning framework that uses consultation as its public participation tool. An alternative public participation tool, collaboration, is increasingly being implemented to manage freshwater resources in New Zealand (see, for example, Land and Water Forum, 2010). However, it is possible that collaboration could be used to manage contests over other natural resources (i.e. beyond freshwater).

The question this research seeks to address is:

How can a collaborative planning process enhance decision-making for the marine environment?

The views of key stakeholders on the NZKS applications are explored using Q methodology, a research method which incorporates elements of both qualitative and quantitative research design. By identifying areas of commonality and divergence amongst the viewpoints of stakeholders,

information can be derived on the degree of consensus around values and norms, and knowledge associated with the policy problem. From there the type of policy problem can be revealed, and recommendations can be made on the best strategy to address that problem. Specifically, these recommendations consider whether collaborative planning processes might enhance decision-making processes in the marine environment in future. Q methodology has been used to reveal subjective perspectives in relation to natural resource management in the past (e.g. Bacher, Gordo, & Mikkelsen, 2014; Barry & Proops, 1999; Bischof, 2010; Nash, 2007; Rudell, 2012; Thompson et al., 2013). According to Focht & Lawler, 2000, Q methodology is an ideal tool to reveal stakeholder perceptions in an environmental controversy, the results of which can be used to inform policy dialogue.

1.4 Key concepts

Three key concepts reoccur throughout this thesis. The first two, 'policy problem type' and 'stakeholders', are woven into academic theory that underpins collaborative governance. The last concept, 'social licence to operate', is explored in this thesis as a possible outcome of collaborative planning processes.

1.4.1 Policy problem type

Hisschemöller and Hoppe (1996) consider that policy problems are social and political constructs that encompass values as well as facts. The degree of consensus on values and the degree of certainty about relevant knowledge can result in different types of policy problem. A framework offered by Hisschemöller and Hoppe (1996) (discussed further in Chapter 3), shows four types of policy problem, that the authors refer to as: unstructured, moderately structured (means), moderately structured (ends), and structured. The risk of incorrectly determining the nature of a policy problem can mean it is tackled in an

unsatisfactory way, leading to poor policy outcomes. Hisschemöller and Hoppe (1996 p 45) advise that “problem definition is part of the policy-making process as much as policy solving”. This thesis uses an actual policy problem (finfish farm development in the Marlborough Sounds) to explore the concept that policy problem type can be matched to an effective policy strategy³. Solutions to policy problems, according to Dunn (1988), are very much a function of the type of problem under investigation.

1.4.2 Stakeholders

Participants in planning processes are often referred to as stakeholders. Some researchers limit stakeholders to people or groups who have the power to directly affect an organisation’s future (e.g. Eden & Ackermann, 1998), whilst other authors argue that stakeholders are a broader range of people including the “nominally powerless” (e.g. Bryson, 2004 p 22). For Innes and Booher (2010), stakeholders are not just the deal-makers and deal-breakers but also people who could benefit from, or be harmed, by any agreement. Booth (2011) considers stakeholders to be individuals or organisations with an interest in the area or issue under consideration but specifically excludes staff of public agencies. However, others (e.g. Berkett & Sinner, 2013; Cuppen, Breukers, Hisschemöller, & Bergsma, 2010; Ryan, 2001) consider staff from public agencies *are* stakeholders in collaborative processes, in that they are one, among many, participants with a specific set of interests to advocate and a varying set of skills and abilities with which to do so.

The term ‘stakeholder’ as used in this thesis refers to the people who are involved in, affected by, knowledgeable of, or have relevant expertise or experience on the issue at stake (based on the definition of Marjolein & Rijkens-Klomp, 2002). Therefore, for this research, stakeholders were considered to be

³ Policy strategy in this thesis refers to the process to address a policy problem.

participants from statutory agencies such as central and local government, scientists, tangata whenua, aquaculture industry representatives and informed members of the public.

1.4.3 Social license to operate

Social license to operate (SLO) is a concept that describes the broad acceptance of a company's⁴ activities by wider society or a local community (Prno & Slocombe, 2012; Wilburn & Wilburn, 2011). A SLO is the conditions imposed by, or on behalf of, the community that allow a company to operate. The conditions may be more demanding than those imposed by regulators and can result in companies implementing 'beyond compliance' environmental measures even when these are likely to incur significant cost (e.g. water treatment standards, see Gunningham, Kagan, & Thornton, 2004). Failure to secure a SLO can result in a company's brand being significantly (and sometimes irreparably) tarnished, leading to a decline in sales and a consumer backlash. It can also result in communities applying pressure on regulators to tighten resource consent conditions and enforce them more vigilantly. A tightening of regulatory frameworks often means additional costs for companies in order to comply with new, more stringent, rules.

According to Brooks (2014) the three key steps to securing social licence are for industry to (1) identify stakeholders, (2) communicate their intentions and actions, and (3) build relationships. Recent scholarly theory (e.g. Lansbury Hall, 2014; Leith, Ogier & Haward, 2014; Parsons and Moffat, 2014) suggests that more collaborative, deliberative approaches between industry and stakeholders are necessary to develop the criteria and conditions for a SLO. Discussing SLO for salmon-farming aquaculture, Leith, Ogier and Haward (2014 p 292) consider that collaborative approaches "may well be a fruitful avenue for better linking

⁴ SLO can also apply to an industry as a whole, rather than just one company.

science with societal values and decision-making”. Implicit in this idea is the theory that stakeholders deliberate and learn together and define ways of increasing the total benefit to all groups (Innes and Booher, 2010). Lansbury Hall (2014) demonstrates how wind farms are more acceptable to communities if stakeholder needs are identified, third parties are used to identify important local issues, genuine engagement-oriented processes are used to bring stakeholders into dialogue, and there is an ongoing evaluation framework to ascertain the status of a SLO. She concludes that the planning process design and its disciplined implementation ‘matter’ in the creation of a successful SLO.

1.5 Justification for the research

The actions to achieve the aquaculture industry’s goal of \$1 billion in annual revenue by 2025 are detailed in the New Zealand Aquaculture Strategy, which was released in 2006 (Burrell, Meehan, & Munroe, 2006). The strategy sets out a ten-point plan, one of which is to “improve public understanding and support for aquaculture” (Burrell, Meehan, & Munroe, 2006 p 13). This suggests that the industry itself understands the importance of having the public ‘on board’ if it is to realise its stated goal. Further, central and local government agencies are increasingly sending out Requests for Proposals (RfPs) and Registrations of Interest (ROIs) to science providers that recognise the importance of understanding social factors. For example, in the 2013 Science Investment Round, the Ministry of Business, Innovation and Employment (MBIE) identified as an investment priority “improving the competitive advantage of export goods and services” and noted that ways of ensuring our current primary-based production remains competitive and can grow includes “dealing effectively with cross-sector issues such as: sustainability....[and]; whole-of-system-management approaches that incorporate economic, social and environmental factors...” (Ministry of Business Innovation and Employment, 2013 p 12). The Ministry for Primary Industries (MPI) in its 2013 ROI “Social Impact Assessment of Aquaculture Activities” sought, as one of its goals, “to develop a knowledge

and evidence resource to better inform the public's understanding of the social impacts of aquaculture" (Ministry for Primary Industries, 2013 p 1).

1.6 Thesis outline

Following this introduction, Chapter 2 outlines the current RMA planning framework, within which the NZKS applications were processed. It then discusses RMA reforms since 2009, and why collaborative planning approaches are being implemented as an alternative way to deal with some planning problems. Chapter 3 reviews 'grey' and published literature on the principles of public participation, collaborative governance, collaborative planning processes, and policy problem types. Chapter 4 begins with an overview of Q methodology and then explains how the Q study (a study using Q methodology) for this thesis was undertaken, in order to address the research question. An explanation of the factor analysis that was undertaken on the Q sort data is also provided. Chapter 5 presents the findings of the data collected using the methodology outlined in Chapter 4. Chapter 6 discusses the interpretation of the results of the Q study in relation to both a traditional consultative planning approach, and a collaborative planning approach. Chapter 7 concludes with the main findings of the study and provides a series of recommendations for future research.

1.7 Conclusion

Public participation in current RMA planning processes is undertaken by consultation. However, an alternative public participation tool, collaboration, is being promoted to manage freshwater resources in New Zealand. In the marine environment, there is widespread interest and debate about finfish farm development in the Marlborough Sounds.

This thesis investigates how collaborative planning processes can enhance decision-making for the marine environment. The research question is addressed using Q methodology to identify areas of commonality and divergence amongst the viewpoints of stakeholders on finfish farm development in the Marlborough Sounds. Underpinning the research question is the theory that strategies to address policy problems are a function of the type of problem under investigation. Information from the Q study will be used to determine the degree of consensus around values and norms, and knowledge associated with the policy problem. From there the type of policy problem can be revealed, and recommendations can be made on the best strategy to address that problem.

The next chapter provides a broad overview of the background to this research.

2 Background

2.1 Introduction

Chapter 2 outlines the background to this research. First, it outlines the current RMA planning framework within which the NZKS applications were processed. The chapter then discusses the reforms of the RMA since 2009, which have resulted in the establishment of the Zealand Environmental Protection Authority (EPA) to hear ‘proposals of national significance’. It then details the background to new planning provisions that allow for collaborative processes, as an alternative to the current statutory processes to manage freshwater. Following this, the chapter discusses the reasons why the NZKS applications were considered to be of ‘national significance’ and outlines how the public could participate in the decision-making process.

2.2 The Resource Management Act 1991

Prior to the enactment of the RMA, New Zealand’s planning laws were fragmented and inefficient with single activities being managed by different agencies under a number of different Acts of Parliament (Dixon, Erickson, Crawford, & Berke, 1997; Palmer, 2013). This meant that there was no coherent and cohesive way to manage all of the environmental effects of an activity. Further, the existing laws failed to allow all relevant values to be taken into account and were seen as conflicting, overlapping and confusing to users (Randerson, 2007). Sir Geoffrey Palmer, an architect of the RMA, comments that the new law was intended to provide a comprehensive, integrated approach to the sustainable management of New Zealand’s natural and physical resources (Palmer, 2013). The purpose of the RMA, set out in s 5 of the Act, is:

to enable people and communities to provide for their social, economic and cultural well-being.

This was to be achieved by placing decision-making closest to the communities most affected by an activity and by providing greater opportunities for public participation (Palmer, 2013). The RMA largely devolved environmental decision-making to local authorities, with central government guidance and national interest to be provided through national policy statements (NPS) (Peart, 2007). At the time of its enactment, the RMA was widely regarded as being world-leading environmental legislation (Oram, 2007; Peart, 2007).

However, the RMA was also subject to criticism relating to both its effectiveness and its efficiency. With regard to the former, for example, concerns were raised about the RMA's ability to deal with a range of environmental issues including non-point source discharges, inappropriate development of coastal areas and the management of cumulative effects arising from the grant of individual resource consents (Peart, 2007; Randerson, 2007). Others considered the RMA failed to adequately address competing resource uses (Banta & Gibbs, 2006), and impeded business investment and infrastructure development (Chetwynd, 2007; Selwood, 2007).

With regard to its efficiency, Roger Kerr (of the New Zealand Business Roundtable) predicted that the RMA would lead to a "retarded economy, poor environmental decisions and dwindling options for subsequent generations" (Kerr, 2002 p 147). Other criticisms of the RMA were that some of its procedures were "elaborate and time-consuming" (Palmer, 2013 p 7), created adversarial planning processes that resulted in conflict between applicants and submitters (McGinnis & Collins, 2013), and burdened councils and ratepayers with costly plan development and implementation processes (Dormer & Payne, 2011). This view was endorsed by the Employers and Manufacturers Association (Northern), who said in 2004 that the processes for plan-making and consents under the RMA were unnecessarily complicated and led to excessive delays (see Oram, 2007).

2.3 RMA reform since 2009

Adding to these criticisms, in 2006 the NZ National Party Environment and Climate Change Spokesman, Honourable Dr Nick Smith, outlined problems with the administration of the RMA as he saw it, namely, uncertainty over outcomes, time delays and cost (Smith, 2006). According to Smith the devolution of environmental management to regional and unitary councils resulted in scarce technical expertise being duplicated around the country and a lack of consistency of standards, with many “vague and complex rules that encourage dispute” (Smith, 2006 p 30). Smith considered that some technical and regulatory functions the councils currently perform could be most efficiently and effectively undertaken at a national level by a specialist agency strong in technical expertise. Smith went on to note that many overseas countries use a dedicated Environment Protection Agency for this purpose and recommended that such an agency be set up in New Zealand.

The National Party subsequently took office in 2008, and in 2009 the Government proposed 150 amendments to simplify and streamline the RMA, i.e. to reduce costs, uncertainties and delays (New Zealand National Party, 2011). The 2009 reforms set a nine-month time limit for consenting projects of national significance through a newly established Environmental Protection Authority (EPA). The EPA undertakes functions under the Environmental Protection Authority Act 2011 and other environmental Acts (such as the RMA) to “contribute to the efficient, effective, and transparent management of New Zealand’s environment and natural and physical resources; and enables New Zealand to meet its international obligations” (Environmental Protection Authority, 2011 p 2). Specifically the EPA’s primary role is to receive and process proposals of national significance via an alternative pathway to the ‘traditional’ council and/or Environment Court process (Ministry for the Environment, 2009).

Part 6AA of the RMA sets out the provisions for dealing with proposals of national significance. Under s 142 the Minister of Conservation may call in a matter that is, or is part of, a proposal of national significance. In deciding whether a proposal is of national significance the Minister must have regard to a number of relevant factors including whether the matter has aroused widespread public concern or interest, involves significant use of natural and physical resources or is likely to affect a structure, feature, place or area of national significance.

The National Government has claimed that the EPA has processed major projects, such as the Tauhara Geothermal Power project and the Waterview Motorway Connection in 'record times' (New Zealand National Party, 2011). However, while the national consenting process was designed to provide certainty for applicants around timeframes, it has come at the expense of opportunities for public participation, with limited opportunity for consultation once an application is lodged and rights of appeal after the hearing being restricted to points of law only (Cronwright, Linzey, & Vince, 2011; Palmer, 2013). Tucker (2011 p 116), argues that the 2009 RMA amendments have "substantially eroded" the principles of public participation for 'non-experts' (i.e. submitters who have no specific area of expertise relevant to the content of their submission). The barriers to public participation in EPA processes are, according to Tucker, the size and complexity of the applications (with the subsequent volume of material to work through), the strict 9-month timeframe, the overwhelmingly formal proceedings and the priority given to expert knowledge.

The next set of amendments to the RMA involved the Resource Management Reform Bill 2013. Justifying the amendments, the then Minister for the Environment, Honourable Amy Adams, commented that the RMA had not been functioning well and the "message to investors all too often seems to be not

‘how we can help you create opportunities in our community’, but ‘if you want to come here expect a long process, plenty of hurdles and no notion of whether you will get there in the end’” (Ministry for the Environment, 2013b p 3). Adams went on to say that the planning framework results in too much cost and uncertainty with “many of the same arguments being had time and time again, consent by consent, up and down the country” (Ministry for the Environment, 2013b p 3). The purpose of the 2013 reforms was to introduce substantive, system-wide improvements to the quality of local decision-making including the streamlining of resource consent processes. However, the New Zealand Law Society raised concerns that the proposed changes to resource consent timeframes (mostly reductions) would likely result in reports and evidence to hearings committees that are “quite unsatisfactory in terms of accuracy and quality” (New Zealand Law Society, 2013 p 16) and may mean that decisions are made incorrectly, leading to affected parties resorting to costly and time-consuming appeal processes. Sir Geoffrey Palmer acknowledged that the reforms since 2009 have rationalised processes to reduce cost and increase efficiency. However, in his opinion the overall effect of the amendments has been to “subtly tilt the framework of the RMA towards the facilitation of national development in order to meet Government economic policy. Thus there has been a gradual creep away from sustainability and back towards the centralised planning that the Act was originally introduced to replace” (Palmer, 2013 p 23).

Around the same time, the Government signalled its willingness to promote collaborative processes for freshwater management, based on the recommendations of the Land and Water Forum (2012) (Ministry for the Environment, 2013a). The Government’s interest in collaborative processes was driven by intense and ongoing dispute about many aspects of freshwater management, including Water Conservation Orders, water infrastructure development, farm intensification and water quality, and the role of iwi (Land and Water Forum, 2010). Although, at the time of writing, collaborative processes for freshwater management have not been legislated, the National

Government's intention is that stakeholder groups be established to deliver consensus reports to councils on freshwater plans and policy statements. The assumption is that having difficult conversations earlier, (than in an RMA Schedule 1 process) will lead to better, more durable decisions (Ministry for the Environment, 2013b).

2.4 The New Zealand King Salmon EPA applications

The NZKS plan changes and resource consent applications were deemed to be a proposal of national significance by the Minister of Conservation Honourable Kate Wilkinson in November 2011 and were referred to a BOI for determination under s 147 of the RMA (Wilkinson, 2011). The reasons for the decision to direct the NZKS applications to a BOI included: the potential doubling of finfish sites in the Marlborough Sounds and an increase of occupation of space in the coastal marine area of approximately 206 ha; the significant nutrient discharge to the seabed and water column (from fish feed not consumed and faecal matter); the visual effects of the farms on areas identified as having important natural character and amenity value; and the proposed locations of some of the farm sites near to the habitats of species endemic to New Zealand and classified as being 'nationally endangered' (such as the Hector's Dolphin and the NZ King Shag). Other reasons given were that the proposal was likely to be significant in terms of s 8 of the RMA relating to the principles of the Treaty of Waitangi, that the proposal would have flow-on effects to other regions (such as the potential flow-on economic effects), and that the proposal would likely arouse widespread public interest or concern regarding its likely effect on the environment, given that historically there had been public interest and concern over aquaculture development in the area (Wilkinson, 2011).

The process for considering a plan change request and concurrent resource consent applications is set out in s 149P(8) to (10) of the RMA. Specifically, the BOI must firstly determine matters in relation to the plan change request before

it can consider matters in relation to concurrent resource consent applications (Eccles, 2013). The BOI must also make its decision and produce a written report within nine months of the day on which the EPA publicly notifies the proposal. The NZKS proposal was notified on Saturday 31 March and the public could make submissions on the plan change until 2 May 2012 (23 working days) (see Appendix A for a timeline of the decision-making process). The public could make further submissions on the plan change between 19 May 2012 and 1 June 2012 (10 working days). Submitters who wished to produce evidence for the hearing had from the date of notification (31 March) until 10 August 2012 to do so (95 working days). The public had the opportunity to speak, or have technical experts speak on their behalf, at the BOI hearing which commenced on 27 August 2012 and finished on 19 October 2012 (8 weeks). Opportunities for public participation after the release of the decision were limited to an appeal to the New Zealand High Court on points of law only.

Evidence given at the BOI by a senior NZKS manager Mark Gillard, and a consultant engaged by NZKS, Bruce Cardwell (Cardwell, 2012; Gillard, 2012), details consultation that the company undertook with the public and iwi prior to notification and during the EPA process. Noting that consultation is not mandatory for private plan changes and resource consent applications under the RMA (Cardwell, 2012), and that the applications would be controversial (Gillard, 2012), the company nevertheless considered it important to fully consult on its applications and to build ongoing relationships with key stakeholders. New Zealand King Salmon engaged an independent company to identify key stakeholders in the Marlborough Sounds and wider community and a series of consultation meetings and site visits were held. Whilst stating that “NZKS took the approach of working with stakeholders on a ‘no surprises’ basis” (Cardwell, 2012 p 6), there were limitations on disclosure of certain parts of the proposal prior to lodging due to commercial risks (e.g. identification of proposed sites) (Gillard, 2012). Cardwell (2012) outlined a number of key objectives to effective and meaningful consultation as he saw it, including

providing accurate information in a timely manner, responding to concerns raised and providing summaries of technical information in lay person's language. This latter objective, he admitted, proved to be more difficult than was originally planned.

According to Eccles (2013), many lay submitters were of the view that the BOI process favoured the applicant, given the sheer volume of technical information that they were required to deal with in very short timeframes. The BOI also struggled with both the complexity and the volume of material that was presented to it (Whiting, 2013), resulting in a request to the Minister of Conservation for a time extension to produce the final decision report.

2.5 Conclusion

This chapter has outlined the background to the current statutory planning framework in New Zealand. The chapter has highlighted that opportunities for public participation were embedded in the RMA at the time it was drafted, via mandatory consultative processes. However, since its inception the RMA has been criticised on a number of fronts and this has led to a series of reforms that have resulted in a tightening of statutory timeframes and some say, an erosion of the public's opportunity to participate. At the same time, though, the Government has also proposed reform of the RMA to enable collaborative planning processes for the management of freshwater resources.

Against this backdrop, the chapter has detailed the NZKS applications to the EPA for new farm space in the Marlborough Sounds, including an explanation of why the applications were deemed to be of national significance, and how the public could participate in the process.

3 Literature review

3.1 Introduction

As discussed in Chapter 1, the purpose of this study is to investigate how collaborative planning processes can enhance decision-making for the marine environment. This chapter provides an overview of a wide range of available grey and published literature that has informed this study. Drawing from an extensive body of scholarly research, the chapter begins with a brief review of relevant literature on public participation before focusing more specifically on literature concerning collaborative planning processes. Literature on the theory of policy problem type and how this relates to public participation is also examined.

3.2 Public participation

Public participation is defined by Rowe and Frewer (2005 p 253) as “the practice of involving members of the public in the agenda-setting, decision-making, and policy-forming activities of organisations/ institutions responsible for policy development”. In contrast to the IAP2’s Spectrum of Public Participation (see Chapter 1), Rowe and Frewer (2005) make the distinction between public participation, on one hand, and public communication and consultation on the other. The distinction is made on the basis of the flow of information between participants and sponsors (refer Figure 2). Public communication, public consultation and public participation are collectively referred to by Rowe and Frewer (2005) as *public engagement*. In public communication, the sponsor⁵ provides information to the public and feedback from the public is neither required nor sought. In public consultation the public

⁵ ‘Sponsor’ is defined by Rowe and Frewer (2005 p 254) as “the party commissioning the engagement initiative, which will usually, but not always, be a governmental or regulatory agency”.

convey information to the sponsor but no formal dialogue takes place between the public and the sponsor. According to Rowe and Frewer, public participation involves the flow of information between the public and sponsors through active dialogue.

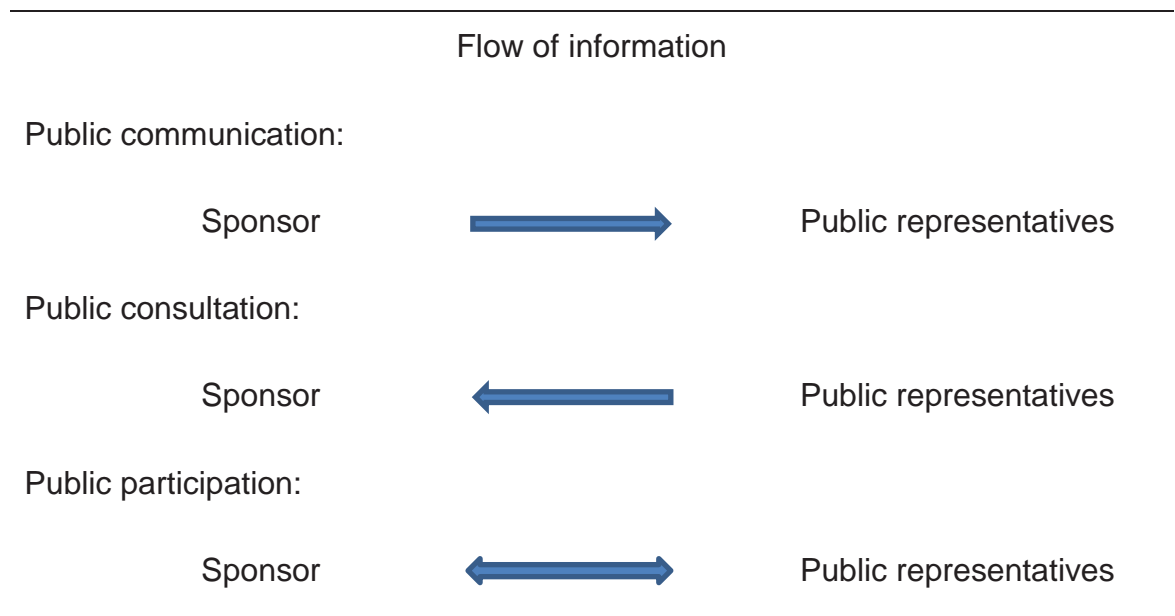


Figure 2. The three types of public engagement, according to Rowe and Frewer (2005 p 255).

Rowe and Frewer (2005) detail a variety of planning processes, techniques and instruments (which they collectively term ‘mechanisms’) that enable public participation in decision-making, and explain that different mechanisms are appropriate for different situations. They consider that the outcomes of public participation exercises are a function of “the efficiency with which full, relevant information is elicited from all appropriate sources, transferred to (and processed by) all appropriate recipients, and combined (when required) to give an aggregate/consensual response (Rowe and Frewer 2005 p 251).

Reviewing the history of public participation in planning, Lane (2005 p 286) links levels of participation with planning traditions and models, and argues that “any analysis of public participation in planning must be concerned with both formal

and informal policy-making arenas”. Contemporary-era thoughts on public participation, according to Lane, are that there is a political dimension of planning that demands an active role for the public, society is ‘atomistic’ (made up of individuals) and the interests of individuals are varied and competing. Lane concludes that participation is a fundamental element of planning and decision-making (rather than an adjunct to decision-making).

There are many accounts in published literature of the benefits of public participation. According to Rydin and Pennington (2010), for example, public participation can bridge the gap between societal values and policy, provide local knowledge that planners need to help avoid making inappropriate decisions, help to build consensus on policy decisions and build social capital. Public participation is important to confer legitimacy on policy processes (Curtin & Prellezo, 2010; Davies, Blackstock, & Rauschmayer, 2005; Roberts, 2004) and may create conditions for social learning and problem-solving capacity (Innes & Booher, 2010).

Arnstein (1969 p 216) mused that “the idea of citizen participation is a little like eating spinach, no one is against it in principle because it is good for you”. However, Arnstein cautioned that unless citizens have a genuine opportunity to affect outcomes, participation is primarily concerned with manipulation of individuals. Other researchers (e.g. Behagel & Turnhout, 2011; Cheyne & Comrie, 2002; Roberts, 2004; Rydin & Pennington, 2010) have also queried the value of public participation, often citing a gap between public participation theory and implementation in practice. Roberts (2004) provides a list of counter-arguments to the benefits of public participation that have been published in literature, including that direct citizen participation is: inefficient (too expensive, too slow), subject to domination by powerful interest groups, and unrealistic (as citizens are too busy making a living and supporting their families to be actively involved). Roberts also cites literature that argues that public participation is

disruptive (people become polarized about issues, which destroys social stability and cohesion) and even dangerous (leading to extremism).

Davies et al., (2005 p 613) note that participatory approaches “tend to reflect existing socio-political relationships, which often favour particular sections of the population” and caution that not all deliberation over discourses will lead to consensus, or a “best agreed solution”. Rydin and Pennington (2010) question whether public participation actually leads to improvement in environmental policy delivery and describe how policy processes can be captured by well-organised and informed individuals or groups who use selected or distorted data. Other researchers point out that participation is exclusive in practice: not everyone can participate and some people, especially those without the required knowledge and skills, will be left out (see, for example, Tucker, 2013; Turnhout, Bommel, & Aarts, 2010).

According to Innes and Booher (2010, p 17), “the legitimacy of public action depends significantly on the acceptability of the knowledge used for developing and justifying it”. ‘Knowledge’ ranges from the scientific and objective, to qualitative ways of knowing that focus on experiential, holistic and pragmatic understandings and meanings. Innes and Booher (2010) argue that professionals and decision-makers often tacitly use limited sources of knowledge (e.g. scientific information) without conscious recognition of the value of other forms of knowledge, such as local knowledge. The challenge for agents involved in democratic governance is to provide innovative and creative pathways to enable the public to participate in decision-making processes, thereby ensuring that alternative ways of knowing can be incorporated into public actions.

Innes and Booher (2010 p 17-18) argue that consultation with the public on a draft version of a plan that is prepared in advance by council staff (with the help of technical experts) reflects a technocratic, rational approach to decision-

making. They note that the rational planning approach involves the identification of problems and goals by bureaucrats, followed by the generation of alternatives by experts, who then evaluate these alternatives and reach conclusions about their efficacy. On the basis of this information, decision-makers then decide on policies and actions and bureaucrats implement these. In this model the public are not invited to participate in the actual process of prioritising community issues, and determining values and desired outcomes prior to the drafting of the plan. Rather, the contents of the plan are determined by decision-makers (in the New Zealand context, councillors or politicians) and bureaucrats, and the public's ability to participate in the process is limited to tokenism (see Arnstein, 1969 p 217). Cheyne and Comrie (2002 p 471), describe consultation in the New Zealand local authority setting as a "statutory right to make submissions to a local council" and acknowledge that local authorities "invariably struggle to know how to interpret the response [from submitters], particularly given the unevenness in the size and 'quality' of submissions". According to Arnstein (1969), under a consultation model there is no guarantee that the public's views will be heeded by decision-makers. In the process of drafting plans with only limited, or no, public involvement, council bureaucrats and elected representatives are effectively determining what the community values and desired outcomes are. The community is then informed about the values and desired outcomes, and offered an opportunity to comment. For some members of the public this is an unsatisfactory approach that disempowers people and leads to feelings of apathy and antagonism towards the process.

Crompton (2015) describes a controversial planning exercise concerning the development of a high-speed rail network in England (HS2 Ltd⁶) where citizens had few opportunities for open deliberation in the decision-making process. She

⁶ HS2 Ltd is a company that was set up in 2009 by the Labour Government in England to facilitate high-speed rail between London and the West-Midlands. HS2 Ltd was responsible for consultation with the public on the proposal.

notes that where dialogue did take place, it was outside of the formal consultation process, in, what she describes as an 'informal sphere'. Crompton describes how:

As public activity grew, strategies were adopted to influence the formal sphere by engaging with HS2 Ltd, for example by constructing credible alternatives and challenges around existing project plans. In this respect, the public invited HS2 Ltd to enter into negotiation and dialogue, thus raising questions about the accountability and legitimacy of the formal consultation and overall decision-making process (Crompton, 2015 p 39).

Crompton (2015) then considered how the 'formal' and 'informal' spheres of public participation related to the 'top-down' and 'bottom-up' parts of the HS2 Ltd decision-making process. She describes how, in the first instance, participation in the policy process was located in the formal sphere and was driven by the top-down mechanisms of national consultation (Figure 3).

Eventually, there was a shift towards proactive, localised public participation (bottom half of Figure 3), which preceded a shared public narrative in the informal sphere (right hand side of Figure 3). Crompton's research suggests there is a need to 'formalise the informal', i.e. to "ensure clear mechanisms that align informal participation with policy decision-making" (Crompton, 2015 p 42). The study shows that citizens can develop their own participatory mechanisms which they can use to influence a particular project.

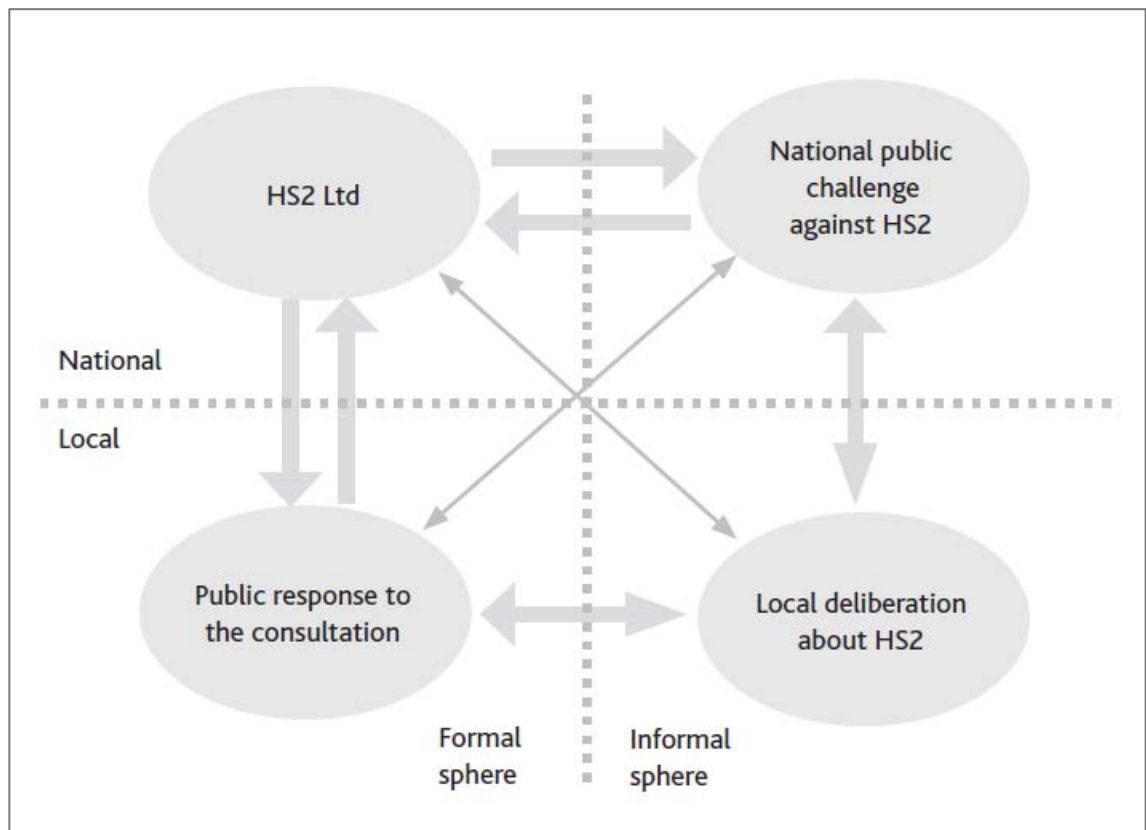


Figure 3. Multi-dimensional public participation in the HS2 decision-making process (Crompton, 2015 p 40).

In New Zealand, the Land and Water Forum (Land and Water Forum, 2010 p 48) described the characteristics of the top-down approach to decision-making as “interest-based conflict that can be litigious, costly and lead to outcomes that satisfy none of the parties”. The Forum recommended, as an alternative, a collaborative approach that would help people work towards resolution, identify innovative solutions and agree compromises. This approach, they speculated, “is a way of providing a holistic, cheaper, quicker and more inclusive outcome”. After more than a year of collaborative dialogue, the LaWF reported that:

we have shared views, received reports, listened and debated (sometimes heatedly) about what would best meet the needs of all interests and all New Zealanders. And over time, little by little, people who were accustomed to disagree found that their views were coming together. We

built understanding and trust and we developed a substantive set of high level recommendations on the way forward (Land and Water Forum, 2010 p 6).

3.3 Collaborative governance and collaborative management

Collaborative governance, according to Ansell and Gash (2007) is a response to failure of the traditional governance model, especially as the authority of 'experts' is challenged by citizens. Ansell and Gash (2007 p 544) define collaborative governance as:

A governing arrangement where one or more public agencies directly engage non-[agency] stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programmes or assets.

An important aspect of this definition is the concept of 'governance'⁷, which, according to Ansell and Gash (2007), refers to the laws and rules that pertain to the provision of public goods. In their definition of collaborative governance, public and private actors collectively make decisions on the policies that relate to the management of public goods, rather than any one individual. Ansell and Gash (2007 p 544) set out six criteria for collaborative governance:

1. the forum is initiated by public agencies or institutions
2. the participants include non-[agency] actors
3. participants are directly engaged in decision-making and are not merely consulted
4. the forum is formally organized and meets collectively

⁷ An in-depth review of literature on the concept of governance is beyond the scope of this thesis.

5. the forum aims to make decision by consensus
6. the focus of collaboration is on public policy or public management

For Ansell and Gash (2007), collaborative governance recognises that stakeholders might often have an adversarial relationship with one another. However, ultimately the goal is to transform those relationships into more cooperative ones and to move away from 'winner-takes-all' outcomes. It is important to note that whilst the above criteria identify that participants are directly engaged in a formal decision-making process, in a collaborative governance model the ultimate authority to make a decision might still be retained by a statutory agency.

Emerson, Nabatchi, & Balogh, (2012) define collaborative governance more broadly than Ansell and Gash, as follows:

The processes and structures of public policy decision-making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could otherwise not be accomplished.

Unlike Ansell and Gash, (2007), Emerson, Nabatchi, & Balogh, (2012) do not limit collaborative governance to formal agency-initiated arrangements. This definition is supported by Berkett et al. (2013), who argue that collaborative forums can be community-driven. One such example of this in New Zealand is the Guardians of Fiordland, formed in 1995, who collaboratively developed the Fiordland Marine Conservation Strategy (see Teirney, 2003).

The term collaborative governance is sometimes used interchangeably, and erroneously, with the term collaborative management. Collaborative

management, also referred to as co-management, is defined by Borrini-Feyerabend, Farvar, Nguingiri, & Ndangang (2007 p 1) as

A situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources.

According to Tipa (2006), a number of criteria are recognised in the concept of collaborative management. Amongst these are that management includes a range of functions, powers and responsibilities and involves power-sharing between the government and the community. 'Government' can be national, regional or local and a 'community' can be defined in spatial terms e.g. by economic activity (such as dairy farmers, or shop-keepers) or membership of a specific social group. Importantly, any management decisions have to be agreed upon by stakeholders (Tipa, 2006). Gelcich et al., (2006 p 953) note that, while there is no single definition of collaborative management, the concept involves the devolution of power to local communities and "government and users cooperate as equal partners". As such, a co-management model therefore 'empowers' stakeholders and is to the right of collaboration on the IAP2 Spectrum of Public Participation (discussed in Chapter 1, see International Association for Public Participation, 2014).

In New Zealand and elsewhere (e.g. the United States, see Healey, 2006; Innes & Booher, 2010; Sabatier et al., 2005) the traditional governance model of statutory agencies is characterised by a top-down structure under the control of a management executive whose role is to plan, design and lead. Under this model, success is the attainment of goals for formal policy that is determined by the agency itself; the objective of public participation is to ensure legal conformity, to inform and educate the public and to gain public support for the agency policies (Innes & Booher, 2004; King, Feltey, & Susel, 1998). According

to Innes and Booher (2010), the traditional governance model attains its legitimacy from representative democracy, i.e. agency actions are legitimate because they flow from the direction of elected representatives, who also provide a governance oversight. In a representative democracy citizens participate by electing individuals to represent them, and subsequently have a limited role in planning decisions (see Sorensen, 2006). Those elected form an independent ruling body (such as a national or local government) to represent citizens and to make decisions on their behalf. To a large extent, the concept of representation depends upon the ability of citizens to make their wishes known to their representatives (USLegal, 2013).

According to Healey (2006), the traditional governance model is the foundation for what is known as the rational planning process. Under this process, there is a separation of objective 'facts', derived from the activity of technical analysis undertaken by experts, from 'values' which are the province of politicians representing the public interest. The rational planning process has been subjected to much critique (e.g. Davidoff, 1965; Etzioni, 1967; Lindblom, 1959). Healey (2006 p 252) also acknowledges fundamental problems with the rational planning process, which, she considers, primarily relate to "identity and ways of knowing". She explains it thus:

because values are located in people's consciousness, not floating around in the ether to be discovered by objective science, some way of bringing people into policy processes needs to be found...

In contrast to the traditional governance model, which, as discussed, is based on representative democracy, the collaborative governance model is underpinned by deliberative democracy (Innes & Booher, 2010). Under this model, actions are legitimate if all affected interests deliberate together about an issue in a non-coercive environment with valid information and reach agreement on those actions (Innes & Booher, 2010). Deliberative democracy is

concerned with enabling or creating opportunities for the public to participate in managing the environments in which they live (Dryzek & Niemeyer, 2008). Dryzek and Niemeyer (2008) argue that it is discourses, rather than people, that are central to deliberative democracy. According to Dryzek (2001, p 658) a discourse is

a shared way of comprehending the world embedded in language. In this sense a discourse will always feature particular assumptions, judgements, contentions, dispositions and capabilities...accordingly any discourse will have at its centre a storyline, which may involve opinions about both facts and values.

According to Dryzek and Niemeyer (2008), discourses regulate one's thoughts, speech and action and may embody power by recognising some interests as being more valid over others. Legitimacy in deliberative democracy is secured by the "degree that collective outcomes are responsive to the balance of competing discourses in the public sphere" (Dryzek, 2001 p 652). In the process of collaborative governance, therefore, it may be more important that all relevant discourses get represented, rather than individuals. According to Manin (1987), this gets around the problem of how to organise participation of *all* those affected by a decision.

3.4 Collaborative planning processes

In order to prioritise competing management options in a plan-making process or consideration of a resource consent application, councils and stakeholders seek information on 'values' (Berkett et al., 2013). In some cases, the requirements of the RMA or a National Policy Statement (NPS) will determine that a certain value must be maintained or provided for. For example, the 2014 NPS Freshwater has two compulsory national values that must be provided for; ecosystem health and human health for recreation (New Zealand Government,

2014). Often there is a need to achieve an overall balance amongst values or objectives and inevitably decisions about management objectives involve some determination of the relative significance or importance of different values (Gregory et al., 2012; Healey, 2010).

The limitations of conventional decision-making processes and the increasing recognition that values can be highly contextual have led many researchers to investigate deliberative methods for working with competing values (see, for example, Gregory, et al., 2012; Healey, 2006, 2010; Innes & Booher, 2010). The increasing prominence given to values is part of a wider recognition that science alone cannot answer what are fundamentally social and political questions about complex systems. It is widely considered that a paradigm of deliberative democracy and adaptive governance is gradually replacing the paradigm of 'scientific management' that has dominated natural resource management and policy for the last half-century (Brunner & Steelman, 2005; Fenemor et al., 2011; Healey, 2010; Innes & Booher, 2010). Collaborative processes, as recommended by the Land and Water Forum (2010) and proposed as part of the New Zealand Government's freshwater reforms (Ministry for the Environment, 2013a), are an example of this in New Zealand (Berkett et al., 2013).

Conditions present at the outset of collaborative processes contribute to the ultimate outcomes, such as whether or not consensus can be achieved. For example, it is unlikely that a collaborative process will be successful (and should even be attempted) if any or all of the following conditions are present (Andrew Fenemor personal communication, June 2013 in Berkett et al., 2013): insufficient time available for the process, inability to engage any of the major stakeholders in the process, lack of mandate for the process from councils, intractable levels of conflict among stakeholders and socio-ecological consequences of the problem (i.e. there is already a need for an urgent solution). Innes and Booher (2010) see no point in attempting a collaborative

process if the issues are well understood and there is considerable consensus around solutions, nor do they recommend undertaking a collaborative process if the cost of doing so is going to be more than the cost of making a mistaken decision.

However, if the conditions listed above do not prevail, collaborative processes may well offer the best approach for durable decision-making, on complex, multi-attribute problems that are of long-term social, economic and environmental importance, provided they are carefully designed from the outset (Berkett et al., 2013).

3.5 Policy problem type

Bryson et al. (2013) advise that different kinds of policy problem call for different solution responses, and they recommend that public participation processes should fit the context in which they are taking place. Lane (2005 p 297), agrees that public participation “can only be understood in terms of the decision-making context in which it is embedded”. Lane argues that the definition of the policy problem, the knowledge needed and the decision-making context determine the extent to which there can be public participation.

Hisschemöller and Hoppe (1996) describe four types of problems in policy, based on whether there is certainty about relevant knowledge and consensus on associated values. The simplest policy problems to deal with are structured problems where both a high degree of certainty about the nature of the problem and consensus on the values associated with the problem exist (Hisschemöller & Hoppe, 1996; Turnhout, Hisschemöller, & Eijsackers, 2007). Whilst structured problems can be technically complex, decision-making follows standard procedures, and generally results in a ‘rule’. Knowledge used in the decision-making process for structured problems is scientific data and experts play a dominant role in solving such problems, with little opposition (Turnhout

Hisschemöller, & Eijsackers, 2007). Examples of structured problems include building code standards and safety settings for transport vehicles. Figure 4 below shows this typology of policy problems.

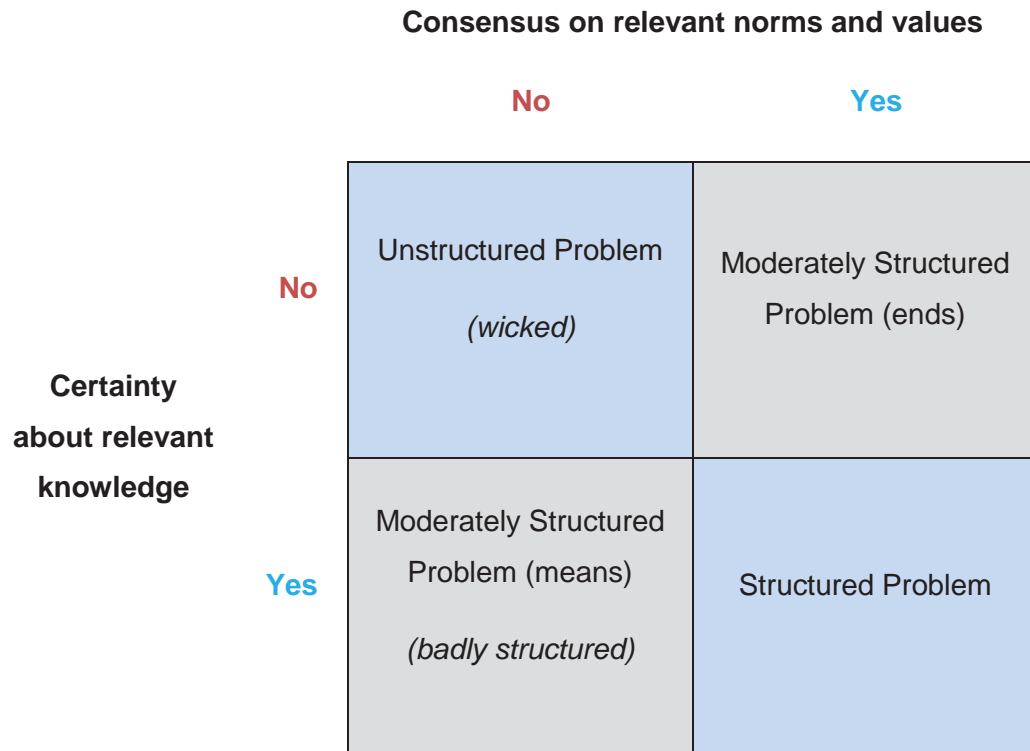


Figure 4. The four types of policy problems (Hisschemöller & Hoppe, 1996).

Problems that Hisschemöller and Hoppe (1996) refer to as ‘moderately structured problems (means)’ are reclassified as ‘badly structured’ by Turnhout, Hisschemöller, & Eijsackers (2007) and Michaels (2009). These types of problems are characterised by a high degree of certainty about the relevant knowledge, but low consensus in terms of values. Badly structured problems provide dilemmas, i.e. a decision in favour of option A comes at the expense of option B (Michaels, 2009). An example of such a problem in the New Zealand setting is the management of rivers, where water takes for irrigation and/or production lower flows which have adverse impacts on ecological values. According to Hisschemöller and Hoppe (1996), this type of problem is typically addressed by *compromise* between the conflicted parties in a policy strategy

they refer to as 'accommodation'. The characteristics of an accommodation strategy include: policy-making by elite consultation, low public participation, decision-making proceeding largely behind closed doors and a high involvement of experts who have the task of depoliticising the conflict by translating value conflict into an issue of technical complexity.

Moderately structured problems (ends) are problems where there is little certainty about knowledge but general consensus on common goals and values (Turnhout, Hisschemöller, & Eijsackers, 2008). These types of problem tend to be interest-based conflicts where the distribution of costs and benefits is debated. An example of such a problem is the location of a waste disposal site. Whilst everyone agrees there is a need for such a site, no one wants it in their back yard (Michaels, 2009). Science then becomes part of the debate, with different sides strengthening their position using scientific arguments. The strategy adopted for this problem type is *negotiation* and is characterised by: policy-making by multiple actors including organised social groups, scientific disagreement with emulates political disagreement, and broader public participation than in the case of structured problems, although mainly by established interest groups (Hisschemöller & Hoppe, 1996).

Unstructured problems are defined by Hisschemöller and Hoppe (1996) in this way:

The boundaries of the problem are diffuse, so it can hardly be separated from other problems. To address the whole problem is more than to address each of its parts... Conflicting values and facts are interwoven, and many actors become involved in the policy process. Hence these problems are to be more explicitly defined as political.

Unstructured problems, also known as wicked problems (Rittel & Webber, 1973) are common to environmental management where there is a contest for

the use of scarce natural resources. They are, by their nature, hard to define, and even harder to solve (Booth, 2011; Innes & Booher, 2010). Moreover, they tend to reoccur unless sustainable and durable decisions can be reached that reflect the competing interests and worldviews of stakeholders (Weber, Memon, & Painter, 2011). Booth (2011) argues that such problems are often place-based, which makes it necessary to address them at a local, community level. Her observation is that, when dealing with wicked problems, the *process* of planning is just as important as the *outcomes*. The process “is about building relationships between the community(s) and those who manage the resource (public agencies), as well as within communities and across agencies” (Booth, 2011 p 4). Hisschemöller and Hoppe (1996) and Turnhout, Hisschemöller, & Eijsackers, (2007) define the policy process (or strategy) as ‘learning’, which can be as unstructured as the problem itself.

Public participation is important for the resolution of unstructured or wicked problems, because these are problems that can be framed in different ways. Therefore, people with divergent perspectives, values or ‘frames’ need to be involved in problem identification and the search for solutions. Solving these types of problems, according to Hisschemöller and Hoppe (1996), requires problem identification in order to produce insights on what the problem is really about. The learning strategy is based on an assumption that “citizens are capable of rational judgement on matters they feel personally involved with” (Hisschemöller & Hoppe, 1996 p 53). Actors have almost complete equality, with people that normally relate to one another in a hierarchical manner treating one another as equals. The role of scientific experts is redefined as ‘problem signalling’ (Michaels, 2009; Turnhout, Hisschemöller, & Eijsackers, 2008), and whilst experts still participate in the policy process “the status gap between them and lay citizens is not big” (Hisschemöller & Hoppe, 1996 p 53). The learning strategy involves identifying, confronting and integrating divergent viewpoints and knowledge (Turnhout, Hisschemöller, & Eijsackers, 2007), a process Hisschemöller and Hoppe (1996) refer to as ‘social rationality’. This

enables participants to reframe the policy problem and to discover new opportunities for solving it.

3.6 Conclusion

Drawing on an extensive body of literature, evidence suggests that public participation is a fundamental element of planning and decision-making, with many identified benefits. However, some researchers have queried the value of public participation, and it is clear that there is a gap between public participation theory and implementation in practice. Consultation, for example, is seen by some researchers as a technocratic, top-down approach whereby there is no guarantee that the public's views will be heeded by decision-makers. An alternative form of public participation, collaboration, offers an approach that some suggest will lead to better decision-making outcomes. However, collaboration is not suited to every type of policy problem. The extent of public participation, and hence the use of a collaborative planning process, depend on the type of policy problem, the knowledge needed, and the decision-making context for that problem.

The next chapter outlines the research design and methods used in this study to address the question “how can a collaborative planning process enhance decision-making for the marine environment?”

4 Research design and methods

4.1 Introduction

This chapter begins by describing Q methodology, including how it is different from R methodology and where it might most appropriately be used. An explanation of why Q method was selected to address the research question is provided. The chapter then describes the components of the Q study that was undertaken for this thesis, including development of the Q set and P set, undertaking factor analysis and data interpretation. Ethical considerations for this study are also discussed.

4.2 Q methodology—origins and focus

Q methodology was introduced in a letter to *Nature* in 1935 by the psychologist and physicist William Stephenson (Brown, 1991). Stephenson rejected the notion that people's viewpoints, which are characterised by subjectivity, could not be studied scientifically and he noted that subjectivity had a structure that was *observable* and could be modelled in a systematic way (McKeown & Thomas, 2013).

Q methodology combines qualitative methods to explore social discourses, that is, the views and attitudes held by people, with the statistical rigour of quantitative research analysis (Addams and Proops, 2000). Q methodology was chosen for this study because it allows the identification of the main or majority viewpoints of individual stakeholders on the policy problem of finfish farm development in the Marlborough Sounds, in an empirically observable way. An in-depth understanding of the viewpoints was necessary in order to determine the degree of consensus on norms and values, and the degree of uncertainty on relevant knowledge associated with finfish farm development. From there,

the nature of the policy problem could be considered, along with the best strategy to address that problem.

Traditional R-method approaches, such as surveys and questionnaires, query representative samples of the population. However, Q methodology enables the *identification of patterns* of viewpoints amongst individuals that can be used to better understand a policy problem. According to Watts and Stenner (2012), Q methodology factor analysis treats *persons* as its variables, with people's attributes and views being the sample or population, whereas R methodology treats attributes and views as variables and reveals differences in these variables at a population level (Watts & Stenner, 2012). A key difference in the two approaches is the number of participants that are involved. An R study is usually designed around a limited number of variables and a relatively large sample of participants, so that findings can be generalised to a much wider population of people (Watts & Stenner, 2012). However, Brown (1980 p 192) explains that Q methodology only requires:

Enough subjects [or participants] to establish the existence of a factor for purposes of comparing one factor with another. What proportion of the population belongs in one factor rather than another is a wholly different matter and one about which Q technique...is not concerned.

Although there are many rationales for the use of Q methodology, Watts and Stenner (2012)⁸ suggest there are two generic ones: the first is where an individual's viewpoint is of considerable importance on a policy problem, and the second is where the study's policy problem is "heterogeneous in nature and this heterogeneity is subsequently shown to be problematic" (Watts & Stenner, 2012 pg 176). Both of these rationales were relevant for this study.

⁸ Watts and Stenner refer to a 'subject of interest' rather than policy problem. I have kept the term policy problem here for consistency.

Another feature of Q methodology is purposive sampling (Cuppen et al., 2010). In this study, participants were purposively selected on the basis that they might be considered to be key stakeholders, and therefore could be recruited onto a collaborative stakeholder group, should one be initiated. All participants had an understanding of the policy problem and had viewpoints that, if revealed by the study, would be an effective means to provide clarity on the subject. The findings of the Q study could then be used to determine the degree of consensus on norms and values associated with the policy problem, and the level of certainty over relevant knowledge (i.e. the degree of homo- or heterogeneity of viewpoints). This information could then be used to determine the policy problem type and to make subsequent recommendations of the most appropriate strategies to solve the problem.

4.3 Q methodology—an overview

The first step in a Q study is to formulate a research question. Following on from this, the next step is to identify and define the concourse. The concourse comprises the raw materials for the Q study and is a set of interrelated statements about the subject of interest (Robbins & Krueger, 2000). Brown (1991 p 3) defines the concourse as the “flow of communicability surrounding any topic”. Davis and Michelle (2011 p 566) refer to it as “all that can be said about a situation, event or phenomenon”. The concourse can be made up of statements generated from documents, surveys and interviews, but might also include images such as photographs⁹.

Once the concourse has been identified and defined, the next step is to select the Q sample (Brown, 1991; Steelman & Maguire, 1999), which is a collection of statements from the concourse that represent the range of values and opinions

⁹ For an example of Q method using images see Fairweather & Swaffield, 2002.

held by individuals. After the Q sample is selected, participants in the study are then asked to complete a Q sorting exercise. Participants in a Q study are referred to as the P sample (Davies et al., 2005). In Q methodology the participants are purposively selected to represent the diversity of opinions on the subject of interest and the number of participants involved is typically no more than 50 (Brown, 1980). As stated above, the participants themselves are *variables* in the study and are selected because their viewpoints matter in relation to the policy problem (Watts & Stenner, 2012).

The Q sorting exercise can be undertaken manually, or electronically using a computer programme such as FlashQ (Hoodenpyle, 2006). In either case the process is essentially the same. Firstly, participants take the Q sample statements and divide them into three groups (those they most agree with, those they least agree with and those they are neutral about). Next, participants rank-order the Q sample statements, which involves ordering the statements according to conditions of instruction prepared by the researcher. Following the Q sorting exercise the data generated is subjected to three statistical procedures (Addams, 2000):

1. Calculation of a correlation matrix
2. Extraction and rotation of significant factors
3. The generation of a set of factor scores (called Z-scores) for each factor

These statistical processes are generally performed using a software package such as PQ Method (Schmolck, 2012).

The correlation matrix represents the level of agreement or disagreement between the individual Q sorts, i.e. it is the degree of similarity between the points of view of the participants in the study (van Exel & De Graaf, 2005). Once the correlation matrix is calculated the data is condensed to identify factors. The factors represent 'clusters of subjectivity', i.e. a population of similar viewpoints

on a particular subject (van Exel & De Graaf, 2005). Generally, people with similar views on the subject of interest will share the same factors – these people are said to be significantly loaded on a factor – whilst those who load negatively on the same factor hold opposing views (Addams, 2000). However, according to Brown, (1991 p 15) the factors that are extracted first in factor analysis are of “little immediate interest and only provide the raw materials for further probing [the] subjective relationships from vantage points that might interest us”. This further probing is called factor rotation and involves taking the unrotated factor loadings and using them as coordinates to map the relative positions (or viewpoints) of all the Q sorts in the study (Watts & Stenner, 2012). As Watts and Stenner (2012 p 142) state:

Factor rotation identifies any Q sorts whose position and viewpoint closely approximate that of a particular factor. These Q sorts can be used to derive a sound and representative estimate of that factor’s viewpoint and the estimate can, in turn, be used to support a meaningful factor interpretation.

Interpretation of factors is possible once factor exemplars are merged to form a single ‘typical’ Q sort for each factor (called a factor array). Factor interpretation is “a careful and holistic inspection of the patterning of items in the factor array” (Stenner, Cooper, & Skevington, 2003 p 2165) and results in a picture of the perspectives, or discourses, that exist in relation to the topic of interest.

4.4 Study details

4.4.1 The concourse

The concourse for this study was based on submissions that were lodged with the EPA between 31 March and 2 May 2012 on the NZKS plan change and resource consent applications. The total number of submissions lodged over

this period was 1,271. The submissions were publicly available and able to be downloaded from the EPA website.

4.4.2 Selecting the Q sample

Q statements were generated from submissions that were randomly selected using the Excel 'Randbetween' function for random numbers. The collection of statements ceased once further analysis of submissions no longer revealed any new values and opinions, indicating a saturation point had been reached. Therefore, from the full concourse of 1271 submissions, a total of 163 submissions was analysed (i.e. 12.8%). Q statements were selected to represent a wide range of perspectives on salmon farming in the Marlborough Sounds and were organised into themes in an Excel spreadsheet. Initially, the themes within the concourse material were identified using the summary of submissions document supplied by the EPA (Environmental Protection Authority, 2014). Later, the themes were amalgamated and simplified to a total of five: ecological, economic, sustainability¹⁰, amenity/recreation and natural character, and planning framework and EPA process. Statements from the concourse that would make up the Q sample were then purposively selected using a structured sampling technique (McKeown & Thomas, 1988; Watts & Stenner, 2012). This was done by printing and cutting out all the statements that had been collected, and then sorting them into the five main themes. Eight statements were selected for each of the five main themes, resulting in a total of 40 statements. Statements that might be considered to be positive with regards to finfish farming were balanced against those that might be considered to be negative.

Once selected, the statements were modified, if necessary, to correct grammatical errors and to ensure they were all in the same tense. Other than

¹⁰ Statements were classified into the 'sustainability' theme if they referred to environmental sustainability, sustainable production of food, or economic sustainability.

these slight amendments, however, the statements were left 'intact'. Finally statements were assigned, randomly, a number between one and 40. The Q sample statements by theme are shown in Appendix B.

4.4.3 Ethical considerations

The Massey University 'Code of Ethical Conduct for Research, Teaching and Evaluations Involving Human Participants' (Massey University, 2013) was used as a guide for identifying ethical considerations. The key considerations in this study were informed consent, voluntary participation, freedom from harm and conflict of role. Prior to contacting potential participants, information sheets and consent forms were prepared and these were submitted to the Massey University Human Ethics Committee along with a low risk notification. Acknowledgement of the documentation was received from Massey University on 19 December 2013 (Appendix C). Participation was voluntary and all participants received the information sheet and consent forms.

4.4.4 Selecting the P sample

As explained above, a Q study does not require a large number of participants, only that the participants themselves are likely to represent a range of viewpoints. Based on this, participants for this study were selected from six different groups of people that could be expected to have diverse views on finfish farming (approximately three per group). The groups were: Environmental Non-Government Organisation (ENGO), Aquaculture Industry (AI), Tangata Whenua (TW), Government and Regulation (G&R), Science Provider (SP), and Informed Community Member (ICM). Information sheets and consent forms were emailed to 17 potential participants. Of this number 13 people agreed to be part of the Q study and returned signed consent forms. Participants were assigned an identification number to protect their privacy.

4.4.5 The Q sort

A pilot of the Q sort was undertaken to test the amount of time it took to complete the Q sort, the clarity of instruction and the validity of statements. Participants in the pilot study encountered no difficulty with undertaking the tasks required of them and therefore no changes were made to the instructions or the statements.

Participants undertook the Q sort manually using pre-prepared cards, instructions for sorting (Appendix D) and a sorting grid (Appendix E). The Q sorts were completed between April and July 2014. Participants were asked to sort the Q sample statements depending on the extent to which they agreed with each statement.

The sorting grid followed a normal distribution (Danielson, Webler, & Tuler, 2010). However, the scale (from -5 to +5) was relative rather than absolute, meaning that even if a participant agreed with *all* of the statements they would still need to determine those statements they *most* agreed with, and those that they *least* agreed with. Some participants preferred not to follow the normal distribution of the sorting grid exactly, i.e. they wished to put more (or fewer) statements in a column than the grid allowed for. Advice obtained from experienced Q methodology practitioners on the Q methodology listserv¹¹ indicated this would not compromise the study outcomes.

4.4.6 Interviews

Semi-structured, recorded, interviews were conducted with some participants following the conclusion of the Q sort in order to help interpret the results (see Appendix F for the interview questions). In some cases it was not necessary to

¹¹ Q-METHOD@LISTSERV.KENT.EDU

interview participants if they had provided a lot of comment throughout the Q sorting process.

4.4.7 Factor analysis

The 13 Q sorts were loaded into the PQ Method software (version 2.35) for factor analysis. A correlation matrix of the sorts was generated, and the matrix was then subjected to Centroid analysis. Applying the ‘general rule of thumb’ of 6-8 participants per factor (Watts and Stenner 2012) would suggest only two factors should be extracted. However, the programme was asked to extract four factors based on the common standard for *r* exploratory factor analysis of three to five variables (in this case, participants) per factor (see McCallum, Hughey, & Rixecker, 2007). The decision to extract four factors also reflected the researcher’s view that the debate over finfish farming is not a bipolar debate, i.e. there were likely to be more than two distinct viewpoints in the data.

The unrotated factors were then rotated using Varimax rotation to more evenly distribute factor weightings between the first idealised Q sort and subsequent factors (Huggins, 2014). Extracted and retained factors had an eigenvalue of greater than 1.0 in accordance with the Kaiser-Guttman criterion (see Watts & Stenner, 2012). Retained factors also accounted for “as much of the variability in the original correlation matrix as possible” (Brown, 1980 p 209). Q sorts that defined a particular factor were automatically flagged by PQMethod (Schmolck, 2012).

4.4.8 Interpretation

Following rotation the statements that correlated strongly for each factor were examined for patterns that would help to explain the viewpoint captured by that factor and shared by the significantly loading participants. Interview material was also used to help explain perspective and context.

4.5 Conclusion

This chapter has described the research design and methods used for this study. Q methodology was selected as an appropriate way to address the research question because it enables the identification of individual viewpoints in an empirically observable way. Q is particularly useful where an individual's viewpoint is important to the policy problem and where the policy problem is likely to be heterogeneous in nature. Scholarly literature identifies that collaborative planning is best suited to particular problem-types that are characterised by this heterogeneity (i.e. lack of consensus on values and knowledge). The intention of the research design was to identify what type of policy problem the development of finfish farming in the Marlborough Sounds is, in order to draw conclusions as to whether and how collaborative planning can enhance decision-making for the marine environment. The chapter has outlined how the Q study was conducted for this thesis.

5 Results

5.1 Introduction

This purpose of this chapter is to present the results of the data analysis. The findings of the unrotated factor analysis are presented, followed by the results of the Varimax rotation. Distinguishing and consensus statements are identified that reveal the aspects of the policy problem that participants least agreed with, and most agreed with, respectively. The results reveal that participants fell into three distinct 'factors' (perspectives). The chapter concludes with a discussion of the characteristics or viewpoints of these factors.

5.2 Factor analysis

The correlation matrix (see Table 1 below) shows the relationship between all the Q sorts in the study. Q sorts are highly correlated where participants have sorted the Q-set statements into similar configurations, or conversely, lowly or zero correlated where there is little agreement in configuration. In this study, for example, sort 1 had the strongest relationship with sort 7 (0.61) and sort 12 was most strongly correlated with sort 13 (0.70). Some sorts had no relationship with each other i.e. a correlation of zero (e.g. sort 3 and 5), whilst other sorts had a negative association with each other (e.g. 1 and 5). Sorts were significantly correlated ($p < 0.01$) if they were ± 0.72 , according to the formula $2.58 \times (1/\sqrt{\text{No. of Q sorts}})$ (Watts & Stenner, 2012). The correlation matrix, according to Watts and Stenner (2012) represents 100% of the variability in the study, and is the site from which the study factors emerge.

Table 1. Correlation of Q sorts.

Sort	1	2	3	4	5	6	7	8	9	10	11	12	13
1	100	21	43	5	-22	59	61	-2	60	55	52	-37	-23
2	21	100	40	45	35	-2	29	35	4	-7	11	12	25
3	43	40	100	46	0	48	61	15	38	42	60	-27	-22
4	5	45	46	100	50	-20	21	40	-4	-9	10	27	29
5	-22	35	0	50	100	-39	-16	38	-41	-45	-22	49	65
6	59	-2	48	-20	-39	100	46	-27	66	61	49	-53	-48
7	61	29	61	21	-16	46	100	17	64	68	48	-41	-29
8	-2	35	15	40	38	-27	17	100	-19	-35	-2	34	30
9	60	4	38	-4	-41	66	64	-19	100	71	51	-66	-50
10	55	-7	42	-9	-45	61	68	-35	71	100	54	-68	-58
11	52	11	60	10	-22	49	48	-2	51	54	100	-25	-33
12	-37	12	-27	27	49	-53	-41	34	-66	-68	-25	100	70
13	-23	25	-22	29	65	-48	-29	30	-50	-58	-33	70	100

5.3 Factor rotation

Varimax rotation revealed three factors with an eigenvalue¹² of greater than 1.0 (Table 2). The three factors accounted for 59% of the study variation. Table 2 also shows the Q sorts that were generated automatically by PQMethod as defining a particular factor, i.e. as closely approximating, exemplifying or defining the viewpoint of a particular factor (Watts & Stenner, 2012). Defining sorts with values greater than 0.6116 were all significant to $p < 0.05$. There

¹² An eigenvalue is indicative of a factor's statistical strength and is calculated by summing the squared loadings of all the Q sorts on a particular factor. According to Watts and Stenner (2012 p 105) eigenvalues less than 1.00 are often taken as a cut-off for the extraction and retention of factors.

were 6 defining sorts for Factor 1, 5 defining sorts for Factor 2 and 2 defining sorts for Factor 3. The average reliability coefficient for all factors was 0.8. The composite reliability for Factors 1, 2 and 3 was 0.960, 0.952 and 0.889 respectively. Factor 1 was represented by participants across all of the stakeholder classifications, whilst Factor 2 was represented mostly by aquaculture industry stakeholders and governance and regulation stakeholders. The defining sorts for Factor 3 were represented by a governance and regulation stakeholder, and an environmental non-government organisation stakeholder.

Table 2. Rotated factor matrix and defining sorts (indicated by an asterix *). Classification classes (SP) science provider, G&R (governance and regulation) AI (aquaculture industry), ENGO (environmental non-government organization), TW (tangata whenua).

		Factor		
Stakeholder				
Sort	Classification	1	2	3
1	SP	0.7111*	0.1249	0.1918
2	SP	0.193	0.5552*	0.1309
3	G&R	0.3729	0.3148	0.6787*
4	G&R	0.0274	0.6083*	0.2718
5	AI	-0.3774	0.6792*	0.0321
6	G&R	0.7003*	-0.2881	0.2822
7	ENGO	0.7483*	0.27	0.2126
8	G&R	-0.0648	0.5443*	-0.0365
9	ENGO	0.8291*	-0.1922	0.1334
10	TW	0.7618*	-0.358	0.3184
11	ENGO	0.4985	0.0033	0.5307*
12	AI	-0.6134*	0.4962	-0.1113
13	AI	-0.4965	0.6116*	-0.0934
Eigenvalues		4.01874	2.491836	1.137557
% Variance		31	19	9

5.4 Factor scores

The factor scores (z-scores) and corresponding ranks for each statement in Factor 1, Factor 2 and Factor 3 are shown in Table 3. This table indicates how a particular statement has been ranked or valued by each of the study factors. The highest ranked statement is that with the highest positive z-score, the next highest ranked statement is that with the second highest positive z-score and so

on. So statement 1, 'claims about the economic benefits of finfish farm development are misleading', is ranked 8th by Factor 1 participants, but 31st and 22nd by Factor 2 and 3 participants, respectively. Statement 24, 'the sacrifice of a relatively small area of seabed is an acceptable price to pay for the social and economic benefits to be gained from finfish farms' is ranked highly by Factor 2 participants (1st), however Factor 1 and 3 participants rank the statement at 32nd and 31st, respectively. These results illustrate a lack of consensus on values and norms, and a lack of certainty on technical knowledge (e.g. economic benefits).

Table 3. The factor scores (z-scores) and corresponding ranks for each statement in Factor 1, Factor 2 and Factor 3.

Sort	Statement	F1Z	F1Rank	F2Z	F2Rank	F3Z	F3Rank
1	Claims about the economic benefits of finfish farm development are misleading	0.88	8	-0.87	31	-0.06	22
2	I have confidence in relevant Government legislation to protect all aspects of the environment	-1.31	35	0.51	14	-1.62	38
3	We need to put finfish farms in place to help stop our children leaving our country because there are no jobs	-1.66	39	-0.46	27	-1.29	36
4	Using wild fish to grow farmed fish is not sustainable	0.9	5	-0.36	26	-1.44	37
5	Local properties are greatly affected by finfish farming's visual impact, noise and other pollution (e.g. boats and other related activities on and around the farms)	0.77	12	-0.1	22	0.75	10
6	The financial advantages of finfish development should not take precedent over the long term environmental destruction of the Marlborough Sounds	2.14	1	0.48	17	1.35	5
7	I would like to see independently reviewed evidence that the marine farming applications achieve sustainable management	1.38	2	0.54	13	0.93	8
8	To oppose marine farms on the basis that a Plan should not be subject to review and amendment seems illogical and potentially counterproductive as latest knowledge and learnings would never be incorporated	0.14	21	1.6	2	0.18	16
9	Finfish farms are a blot on the natural beauty of the Marlborough Sounds	0.58	16	-1.52	36	0.21	15
10	I am sure that scientists will be required to monitor the finfish farm sites (as part of any consent) and if there are any problems they will be rectified	-0.26	25	0.47	18	-0.63	32
11	The impact of finfish farms on the environment is minimal	-1.57	37	0.49	16	-2.01	40

Sort	Statement	F1Z	F1Rank	F2Z	F2Rank	F3Z	F3Rank
12	Nominated sites are well suited for finfish farming activities and environmental interactions can be well managed to support a sustainable operation	-0.75	31	1.25	5	-0.51	31
13	I am opposed to private plan changes on the grounds that prohibited aquaculture zones were decided after a long public consultation process	0.8	11	-1.34	35	-0.03	20
14	New Zealand is a country of primary producers and we need to stay as a leading player in any food producing field we are good at	0.03	22	0.33	20	0.63	11
15	The Marlborough Sounds is an area of outstanding landscape and natural character	1.19	3	0.64	11	2.04	1
16	We need to develop the finfish industry to meet the ever growing world demand for sustainable food products	-1.54	36	0.29	21	0.39	12
17	Finfish farms are very much a part of the Marlborough Sounds environment	-0.58	28	1.46	4	-0.15	23
18	Regardless of what percentage of a company is held by whom, the reality is that increasing finfish farm development will result in greater export earnings for NZ and more direct jobs for the Marlborough, Nelson and Tasman regions	-0.33	27	1.53	3	1.08	7
19	Finfish farms allow NZ people to manage and use their natural resources in a way that enables communities to provide for their social, economic and cultural well-being	-0.74	30	0.81	8	-0.66	33
20	I believe the EPA Board of Inquiry should only deal with facts as presented by marine farm applicants	-1.09	33	-0.82	30	-2.01	40
21	Further development of finfish farms will reduce the options available for recreational boating	0.15	20	-0.87	32	0.06	19
22	Finfish farms attract sharks and seals that increase risk to recreational swimmers and divers	-0.24	24	-0.6	28	-1.29	36
23	Nutrients from excess feeding and fish faeces will pollute the environment in, around and down current of the finfish farms	0.89	7	0.56	12	0.9	9

Sort	Statement	F1Z	F1Rank	F2Z	F2Rank	F3Z	F3Rank
24	The sacrifice of a relatively small area of seabed is an acceptable price to pay for the social and economic benefits to be gained from finfish farms	-0.77	32	1.63	1	-0.51	31
25	There is an enormous disparity in resources available to a marine farm applicant compared with the lack of funding available to the public to protect the status quo	0.84	10	-0.31	25	1.62	3
26	There are limited opportunities for locals who are directly affected to be part of the workforce	0.64	15	-0.64	29	-0.21	24
27	Finfish farm development threatens the habitat of endangered species like the King Shag	0.56	17	-0.88	33	-0.06	22
28	The presence of finfish farms would not detract from the enjoyment people get from boating and fishing in the Marlborough Sounds	-1.31	34	0.99	7	0.09	18
29	The main people who gain are the shareholders of finfish companies, a significant number of whom reside overseas	0.9	6	-1.56	37	-0.3	26
30	Finfish farms kill sea life within the area they are placed	0.38	19	-0.18	23	1.59	4
31	The King Shag is able to fly and will fish in other areas	-0.69	29	0.38	19	0.21	15
32	Finfish farming in the Marlborough Sounds has low environmental impact and provides great economic and social benefit	-1.62	38	1.16	6	-0.36	28
33	The finfish industry in the Marlborough Sounds has demonstrated, over many years, their ability to farm sustainably	-2	40	0.51	15	-1.08	34
34	The EPA BOI is the correct authority to hear marine farm applications deemed to be of national significance and make the decision on the scientific evidence presented by submitters	-0.31	26	0.7	10	-0.24	25
35	The Marlborough Sounds should be left as is for future generations to enjoy	0.38	18	-1.59	38	-0.48	29
36	There is a lack of baseline studies and of reliable assessment of effects of discharges (from finfish farms)	0.75	13	-0.26	24	0.24	13

Sort	Statement	F1Z	F1Rank	F2Z	F2Rank	F3Z	F3Rank
37	Local councils should hear and determine finfish farm applications deemed to be of national significance rather than appointed bodies from outside the district	-0.11	23	-1.87	40	-0.33	27
38	Finfish farms are not environmentally sustainable because the environment in, around and down current of the farms is negatively affected	0.85	9	-1.79	39	0.09	18
39	I have concerns about the rushed process through the EPA	0.64	14	-1.06	34	1.77	2
40	Finfish farms have adverse visual effects on areas with outstanding landscape and natural character	1.1	4	0.75	9	1.17	6

The standard error of Factors 1, 2 and 3 was 0.2, 0.218 and 0.333 respectively. The correlation between the factor z-scores is shown in Table 4. Factor 1 was most highly correlated with Factor 3 whilst Factor 2 had very little in common with either Factor 1 or 3. (*i.e.* there was no statistically significant correlation between Factor 2 and either Factor 1 or 3).

Table 4. Correlations between factor scores.

Factor	1	2	3
1	1	-0.3481	0.6114
2	-0.3481	1	0.0806
3	0.6114	0.0806	1

Distinguishing statements for the three factors are shown in Tables 5, 6 and 7. Consensus statements (*i.e.* those that do not distinguish between any pair of factors) are shown in Table 8. All listed statements are non-significant at $P > .01$; asterisk (*) non-significant at $P > .05$.

Analysis of distinguishing statements provided evidence that social factors are often implicitly, but not always, intertwined with environmental matters. For example, statement 4 ‘using wild fish to grow farmed fish is not sustainable’ was a distinguishing statement (with significance at $P < .01$) for all three factors. Factor 1 participants one strongly agreed with this statement (factor Q sort value of 4) whilst participants from Factor 2 and Factor 3 slightly disagreed (-1) and strongly disagreed (-4) respectively. In contrast, participants in all three factors agreed that finfish farms do ‘have adverse visual effects on areas with outstanding landscape and natural character’.

Interview data was valuable for interpreting factors and added richness to the contextual understanding of participants' Q sorting choices. Taking statement 4 again as an example, a Factor 1 participant described her views in this way:

Killing a huge amount of small [wild] fish that a lot of other species rely on to live, to feed salmon which is becoming a very expensive product...I mean we never eat salmon, we can't afford salmon...if you think about it, it's not a staple diet for a lot of families in New Zealand, so you are turning a cheap fish to catch into a really expensive one that only the richer people can eat.

In contrast, a Factor 2 participant considered the same statement in the following way:

The reality is that there is increasing pressure to use other food sources other than wild fish...using wild fish is unsustainable because the conversion factor is way too high.

This example shows that both participants agreed that using wild fish to farm finfish is unsustainable, but for different reasons. The implications of this sort of knowledge are discussed further in Chapter 6.

Table 5. Distinguishing statements for Factor 1. Both Factor Q sort value (Q-SV) and the z-score (Z) are shown. ($P < .05$; an asterisk (*) indicates significance at $P < .01$).

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
6 The financial advantages of finfish development should not take precedent over the long term environmental destruction of the Marlborough Sounds	5	2.14	1	0.48	4	1.35
4 Using wild fish to grow farmed fish is not sustainable	4	0.90*	-1	-0.36	-4	-1.44
29 The main people who gain are the shareholders of finfish companies, a significant number of whom reside overseas	3	0.90*	-4	-1.56	-1	-0.3
1 Claims about the economic benefits of finfish farm development are misleading	3	0.88	-2	-0.87	0	-0.06
25 There is an enormous disparity in resources available to a marine farm applicant compared with the lack of funding available to the public to protect the status quo	2	0.84	-1	-0.31	4	1.62
13 I am opposed to private plan changes on the grounds that prohibited aquaculture zones were decided after a long public consultation process	2	0.8	-3	-1.34	0	-0.03
39 I have concerns about the rushed process through the EPA	1	0.64*	-3	-1.06	5	1.77
26 There are limited opportunities for locals who are directly affected to be part of the workforce	1	0.64	-2	-0.64	-1	-0.21
35 The Marlborough Sounds should be left as is for future generations to enjoy	0	0.38	-4	-1.59	-2	-0.48
18 Regardless of what percentage of a company is held by whom, the reality is that increasing finfish farm production will result in greater export earnings for NZ and more direct jobs for the Marlborough, Nelson and Tasman regions	-1	-0.33*	4	1.53	3	1.08
31 The King Shag is able to fly and will fish in other areas	-2	-0.69	0	0.38	1	0.21

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
28 The presence of finfish farms would not detract from the enjoyment people get from boating and fishing in the Marlborough Sounds	-3	-1.31*	3	0.99	0	0.09
16 We need to develop the finfish industry to meet the ever growing world demand for sustainable food products	-4	-1.54*	0	0.29	2	0.39
32 Finfish farming in the Marlborough Sounds has low environmental impact and provides great economic and social benefit	-4	-1.62*	3	1.16	-1	-0.36
33 The finfish industry in the Marlborough Sounds has demonstrated, over many years, their ability to farm sustainably	-5	-2.00	1	0.51	-3	-1.08

Table 6. Distinguishing statements for Factor 2. Both Factor Q sort value (Q-SV) and the z-score (Z) are shown. (P<.05; an asterisk (*) indicates significance at P<.01).

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
24 The sacrifice of a relatively small area of seabed is an acceptable price to pay for the social and economic benefits to be gained from finfish farms	-2	-0.77	5	1.63*	-2	-0.51
8 To oppose marine farms on the basis that a Plan should not be subject to review and amendment seems illogical and potentially counter-productive as latest knowledge and learnings would never be incorporated	0	0.14	5	1.60*	1	0.18
17 Finfish farms are very much a part of the Marlborough Sounds environment	-1	-0.58	4	1.46*	0	-0.15
12 Nominated sites are well suited for finfish farming activities and environmental interactions can be well managed to support a sustainable operation	-2	-0.75	4	1.25*	-2	-0.51
32 Finfish farming in the Marlborough Sounds has low environmental impact and provides great economic and social benefit	-4	-1.62	3	1.16*	-1	-0.36
28 The presence of finfish farms would not detract from the enjoyment people get from boating and fishing in the Marlborough Sounds	-3	-1.31	3	0.99	0	0.09
19 Finfish farms allow NZ people to manage and use their natural resources in a way that enables communities to provide for their social, economic and cultural well-being	-2	-0.74	3	0.81*	-3	-0.66
34 The EPA BOI is the correct authority to hear marine farm applications deemed to be of national significance and make the decision on the scientific evidence presented by submitters	-1	-0.31	2	0.7	-1	-0.24
2 I have confidence in relevant Government legislation to protect all aspects of the environment	-3	-1.31	1	0.51*	-4	-1.62

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
33 The finfish industry in the Marlborough Sounds has demonstrated, over many years, their ability to farm sustainably	-5	-2	1	0.51*	-3	-1.08
11 The impact of finfish farms on the environment is minimal	-4	-1.57	1	0.49*	-5	-2.01
6 The financial advantages of finfish development should not take precedent over the long term environmental destruction of the Marlborough Sounds	5	2.14	1	0.48	4	1.35
10 I am sure that scientists will be required to monitor the finfish farm sites (as part of any consent) and if there are problems they will be rectified	-1	-0.26	0	0.47	-2	-0.63
5 Local properties are greatly affected by finfish farming's visual impact, noise and other pollution (e.g. boats and other related activities on and around the farms)	2	0.77	0	-0.1	2	0.75
25 There is an enormous disparity in resources available to a marine farm applicant compared with the lack of funding available to the public to protect the status quo	2	0.84	-1	-0.31*	4	1.62
4 Using wild fish to grow farmed fish is not sustainable	4	0.9	-1	-0.36*	-4	-1.44
3 We need to put finfish farms in place to help stop our children leaving our country because there are no jobs	-5	-1.66	-1	-0.46	-4	-1.29
1 Claims about the economic benefits of finfish farm development are misleading	3	0.88	-2	-0.87	0	-0.06
21 Further development of finfish farms will reduce the options available for recreational boating	0	0.15	-2	-0.87	0	0.06
27 Finfish farm development threatens the habitat of endangered species like the King Shag	1	0.56	-3	-0.88	0	-0.06
39 I have concerns about the rushed process through the EPA	1	0.64	-3	-1.06*	5	1.77

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
13 I am opposed to private plan changes on the grounds that prohibited aquaculture zones were decided after a long public consultation process	2	0.8	-3	-1.34*	0	-0.03
9 Finfish farms are a blot on the natural beauty of the Marlborough Sounds	1	0.58	-4	-1.52*	1	0.21
29 The main people who gain are the shareholders of finfish companies, a significant number of whom reside overseas	3	0.9	-4	-1.56*	-1	-0.3
35 The Marlborough Sounds should be left as is for future generations to enjoy	0	0.38	-4	-1.59*	-2	-0.48
38 Finfish farms are not environmentally sustainable because the environment in, around and down current of the farms is negatively affected	2	0.85	-5	-1.79*	0	0.09
37 Local councils should hear and determine finfish farm applications deemed to be of national significance rather than appointed bodies from outside the district	0	-0.11	-5	-1.87*	-1	-0.33

Table 7. Distinguishing statements for Factor 3. Both Factor Q sort value (Q-SV) and the z-score (Z) are shown. (P<.05; an asterisk (*) indicates significance at P<.01).

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
15 The Marlborough Sounds is an area of outstanding landscape and natural character	4	1.19	2	0.64	5	2.04
39 I have concerns about the rushed process through the EPA	1	0.64	-3	-1.06	5	1.77*
25 There is an enormous disparity in resources available to a marine farm applicant compared with the lack of funding available to the public to protect the status quo	2	0.84	-1	-0.31	4	1.62
30 Finfish farms kill sea life within the area they are placed	0	0.38	0	-0.18	4	1.59*
6 The financial advantages of finfish development should not take precedent over the long term environmental destruction of the Marlborough Sounds	5	2.14	1	0.48	4	1.35
28 The presence of finfish farms would not detract from the enjoyment people get from boating and fishing in the Marlborough Sounds	-3	-1.31	3	0.99	0	0.09
13 I am opposed to private plan changes on the grounds that prohibited aquaculture zones were decided after a long public consultation process	2	0.8	-3	-1.34	0	-0.03
1 Claims about the economic benefits of finfish farm development are misleading	3	0.88	-2	-0.87	0	-0.06
29 The main people who gain are the shareholders of finfish companies, a significant number of whom reside overseas	3	0.9	-4	-1.56	-1	-0.30*
32 Finfish farming in the Marlborough Sounds has low environmental impact and provides great economic and social benefit	-4	-1.62	3	1.16	-1	-0.36*
35 The Marlborough Sounds should be left as is for future generations to enjoy	0	0.38	-4	-1.59	-2	-0.48

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
33 The finfish industry in the Marlborough Sounds has demonstrated, over many years, their ability to farm sustainably	-5	-2	1	0.51	-3	-1.08
4 Using wild fish to grow farmed fish is not sustainable	4	0.9	-1	-0.36	-4	-1.44*
20 I believe the EPA Board of Inquiry should only deal with the facts as presented by the marine farm applicants	-3	-1.09	-2	-0.82	-5	-2.01

Table 8. Consensus statements.

Statement	F1Q-SV	F1Z	F2Q-SV	F2Z	F3Q-SV	F3Z
14* New Zealand is a country of primary producers and we need to stay as a leading player in any food producing field we are good at.	0	0.03	0	0.33	2	0.63
23* Nutrients from excess feeding and fish faeces will pollute the environment in, around and down current of the finfish farms	3	0.89	2	0.56	2	0.9
40* Finfish farms have adverse visual effects on areas with outstanding landscape and natural character.	4	1.1	2	0.75	3	1.17

5.5 Factor Interpretation

5.5.1 Factor 1

Economics

Participants who loaded significantly on Factor 1 strongly believe that financial advantages of finfish farm development should not take precedence over the long term destruction of the Marlborough Sounds (5, 6)¹³. Factor 1 participants also consider that claims about the economic benefits of finfish farming are misleading (3, 1) and that the main people who benefit from finfish farms are foreign shareholders of finfish farm companies (3, 29). They do not believe that finfish farming provides great social and economic benefit (-4, 32).

Sustainability

Factor 1 participants strongly disagree that finfish farming has low environmental impact (-4, 32), that the industry has demonstrated its ability to farm sustainably (-5, 33), and that finfish farming is needed to meet growing world demand for sustainable food products (-4, 16). They strongly agree that using wild fish to grow farmed fish is not sustainable (4, 4).

Planning

With regard to finfish farm plan change and consent applications, Factor 1 participants are somewhat concerned about EPA timeframes (1, 39) and are likely to oppose the idea of private plan changes on the grounds that plans are established after long public consultation processes (2, 13). Participants in this group also think that there is a disparity in resources available to marine farm

¹³ The first figure in each bracket represents the factor Q sort value and the second figure is the Q sort statement number, so in this example, statement 6 has a Factor 1 Q sort value of +5. The Q sort value is the position each statement would occupy on the sorting grid for a complete, idealised, Q sort for each factor.

applicants compared to the public who might be trying to protect the *status quo* (2, 25).

Amenity and recreation

Factor 1 participants do not agree that the presence of finfish farms would detract from the enjoyment that people get from boating and fishing in the Marlborough Sounds (-3, 28).

5.5.2 Factor 2

Economics

Factor 2 participants strongly agreed that the sacrifice of a small area of seabed is an acceptable price to pay for the economic and social benefits of finfish farming (5, 24). They believe that the farms allow New Zealanders to use natural resources in a way that enables them to provide for their economic, social and cultural well-being (3, 19). Participants sharing this perspective also strongly reject the notion that the main people who gain from finfish farming are the foreign shareholders of finfish companies (-4, 29) and they disagree somewhat that claims about the economic benefits of finfish farm development are misleading (-2, 1). They also strongly disagree that the statement that the Marlborough Sounds should be left as is for future generations to enjoy (-4, 35).

Sustainability

Factor 2 participants strongly rejected claims that finfish farms are not environmentally sustainable (-5, 38), and they believe that finfish farms can be operated sustainably if sites are carefully selected and farms are well managed (4, 12). People expressing this perspective tend to agree somewhat that the finfish industry in the Marlborough Sounds has, over many years, demonstrated its ability to farm sustainably (1, 33). They also tend to disagree somewhat with the statement that using wild fish to grow farmed fish is not sustainable (-1, 4).

Planning

Factor 2 participants appear to be unconcerned about EPA timeframes (-3, 39) and tend to disagree somewhat that there is a disparity in resources available to marine farm applicants compared to the public to protect the status quo (-1, 25). They strongly disagree that local councils should hear finfish farm applications deemed to be of national significance (-5, 37) and consider the EPA BOI is the correct authority to hear finfish farm applications deemed to be of national significance (2, 34). Factor 2 participants disagree that private plan change applications should not be allowed on the grounds that prohibited aquaculture zones were decided after long public consultation processes (-3 13) and strongly agree (5, 8) that plans should be subject to review and amendment in order to incorporate latest knowledge and learnings.

Amenity and recreation

People with this perspective consider finfish farms are very much a part of the Marlborough Sounds environment (4, 17) and they strongly disagree that the farms are a blot on the natural beauty of the Marlborough Sounds (-4, 9). They also disagree that development of finfish farms in the area will reduce options for recreational boating (-2, 21) and believe that the presence of farms would not detract from the enjoyment that people get from boating and fishing in the area (3, 28). Participants with this perspective are neutral on whether local properties are greatly affected the visual impact, noise and other pollution associated with finfish farms (0, 5).

5.5.3 Factor 3

Economics

In common with Factor 1 participants, Factor 3 participants share the view that the financial advantages of finfish development should not take precedence over the long term destruction of the Marlborough Sounds (4, 6). Factor 3 participants are neutral about whether the economic claims of finfish farm

development are misleading (0, 1), in contrast with Factor 1 participants who agree with the statement, (3, 1) and Factor 2 participants who do not (-2, 1). Factor 3 participants also tend to disagree somewhat with the notion that the main people who gain from finfish farms are foreign based shareholders (-1, 29), in contrast to Factor 1 (3, 29) and Factor 2 participants (-4, 29).

Sustainability

Factor 3 participants strongly disagree with the statement that using wild fish to grow farmed fish is not sustainable (-4, 4). However, they share the view of Factor 1 participants (-5, 33) that the finfish industry in the Marlborough Sounds has not demonstrated its ability to farm sustainably (-3, 33). In contrast to Factor 1 and 2 participants, they strongly agree that finfish farms kill sea life within the area that they are placed (4, 30).

Planning

Participants in Factor 3 are also characterised as having strong concerns about the rushed decision-making process through the EPA (5, 39) and the disparity in resources available to marine farm applicants compared with the lack of funding available to the public to protect the status quo (4, 25). They also strongly reject the idea that EPA BOIs should only deal with facts as presented by marine farm applicants (-5, 20). However, in contrast to the views of participants in Factor 1 (2, 13) and Factor 2 (-3, 13), Factor 3 participants are neutral about whether private plan changes should be opposed on the grounds that prohibited aquaculture zones were decided after a long public consultation process (0, 13).

Amenity and recreation

Factor 3 participants consider the Marlborough Sounds to an area of outstanding landscape and natural character (5, 15), and are non-committal on

whether finfish farms would detract from the enjoyment people get from boating and fishing in the area (0, 28).

5.5.4 Consensus statements

There were only three consensus statements across all three factors. Participants in all factors were relatively neutral on the statement that New Zealand is a country of primary producers and needs to stay as a leading player in any food producing field it is good at (14). Participants across all factors moderately agreed that nutrients from excess feeding and fish faeces will pollute the environment in, around and down current of the finfish farms (23) and that finfish farms have adverse visual effects on areas with outstanding landscape and natural character (40).

5.6 Conclusion

This chapter has presented the results of the Q study undertaken for this thesis. The results showed that there were three distinct perspectives on finfish farm development in the Marlborough Sounds amongst the participants in the study. A number of distinguishing and consensus statements were identified that reveal the aspects of the policy problem that participants least agreed with, and most agreed with, respectively. The results illustrate there is a lack of consensus on values and norms, and a lack of certainty on technical knowledge (e.g. economic benefits) associated with finfish farm development in the Marlborough Sounds. The next chapter discusses these results within the context of the literature review presented in Chapter 3, and considers the implications of the results with regard to the research question, i.e. how can a collaborative planning process enhance decision-making for the marine environment?

6 Discussion

6.1 Introduction

This study was prompted by a desire to understand how best to manage conflict over natural resources. As outlined in Chapter 1, the purpose of this study was to examine how a collaborative planning process can enhance decision-making for the marine environment. Chapter 3 reviewed literature which highlights the importance of using decision-making processes that are best suited to the type of policy problem needing to be resolved. The chapter showed how public participation, in its various forms, is part of the decision-making process and can also be tailored to the type of policy problem under consideration.

This chapter discusses the results of a Q study undertaken to examine the views on finfish farm development in the Marlborough Sounds. The Q study indicates that the applications by NZKS constitute a particular type of policy problem, one that is defined as unstructured, using the typology developed by Hisschemöller and Hoppe (1996). The findings of the Q study are considered in the context of public participation in marine planning processes. Finally, the chapter concludes with recommendations for further research.

6.2 Q study

The Q study has shown that key stakeholders had three distinct perspectives on finfish farm development in the Marlborough Sounds. This confirms that the issue was framed in different ways by different players. The scholarly literature discussed in Chapter 3 indicates that understanding this framing, and the intensity of the held views, is likely to be an important factor in determining how best to manage the policy problem. There was strong disagreement between the Factor 2 participants on the one hand, and the Factor 1 and 3 participants on the other. Closer analysis shows that the perspectives of Factor 2 participants are shared by stakeholders who work directly for, or are closely

aligned with, the aquaculture industry itself. This suggests there is a divergence of views between the industry, on one hand, and other key stakeholders, on the other, that could in turn reflect a lack of support more broadly for the goals of the finfish farming industry. In contrast, Factor 1 and 3 perspectives were quite strongly correlated with one another and there are some areas of consensus across all three factors that could be useful 'common ground' to initiate stakeholder discussion (Bacher et al., 2014) if a collaborative decision-making process was adopted.

Finally, the results of the study explicitly outline areas that are the most contested between the stakeholders, as well as those where there is consensus of opinion. The example of statement 4, discussed in Chapter 5, shows how environmental decision-makers might need to consider different management approaches to address the same policy problem. In order to do this, however, there needs to be a great deal of insight and understanding into both the nature of the policy problem and the preferred solutions. The question is whether this insight and understanding can be gained from public participation mechanisms that underpin the current RMA planning framework (i.e. consultation through submissions and presentation of evidence at hearings). This is discussed in more depth below.

6.3 Finfish farm development as a policy problem type

The variables in Hisschemöller and Hoppe's policy problem typology (1996) (refer Chapter 3) relate to certainty over knowledge and consensus on goals and values. The findings of the Q study indicate that there was low certainty over knowledge for many participants, (for example, knowledge relating to economic benefits of finfish farm development), and low consensus between many of the participants on goals and values (see Chapter 5). Using the policy problem typology, this would suggest that the policy problem at the centre of this study is essentially unstructured, or wicked. Therefore, the policy problem is

controversial and complex, and unlike structured or moderately structured problems is unlikely to be resolved by a policy strategy where “one group of people is seen as qualified to make policy decisions [technical experts], whereas another larger group of ‘lay citizens’...is regarded as unqualified and therefore *de facto* excluded from participation” (Hisschemöller & Hoppe, 1996 p 46). Using a policy strategy like this might result in a *decision*, but will fail to build relationships between lay citizens and the industry (see Booth, 2011; Brooks, 2014; Fudge, Lewis, & Anderson, 2012; Mazur & Curtis, 2008). In turn, the failure to build these relationships is likely to inhibit the development of an industry SLO, as the policy process itself is flawed.

6.4 The policy process for an unstructured, wicked problem

There is much published research to suggest that the best way to address unstructured, wicked problems is through a process of learning (e.g. Hisschemöller & Hoppe, 1996; Michaels, 2009; Turnhout, Hisschemöller, & Eijsackers, 2007). Learning can occur at every stage of the policy process (Gregory et al., 2012) and involves understanding both facts and values. According to Gregory et al. (2012) there are a number of conditions that are necessary for learning to occur. The first of these is meaningful participation, which is not, according to Gregory et al. (2012, p 251):

...having experts denote key aspects of the problem from their perspective, and then conducting analysis to address these issues, [this] provides neither learning nor participation on the part of the other stakeholders – nor does simply asking participants to voice their goals through small group or town hall meetings and then creating long lists of issues which are passed along to managers.

Rather, meaningful participation is a deliberative process that involves dialogue, questioning and self-reflection to understand what really matters, and what

doesn't. Another aspect of learning, according to Gregory et al. (2012) is to allow emotions to be expressed, recognising that the expression of diverse viewpoints might bring up difficult feelings and controversial moral and ethical concerns. Further, learning is enabled when policy processes explicitly permit mistakes to be made (such as in modelling alternative outcomes) and where iteration (repeated testing of alternatives) is encouraged.

The challenge for policy planners working on a wicked policy problem, such as finfish farm development in the Marlborough Sounds, is to identify the best form of public participation that will enable learning. Consultation, defined in Chapter 3 as, "obtaining public feedback on analysis, alternatives and/or decisions" (International Association for Public Participation, 2013 n.p.), is unlikely to meet the conditions necessary for learning, and yet this is the form of public participation that underpins New Zealand's primary planning statute, the RMA. Generally, in a consultative planning process, the public are denied the opportunity to reframe policy problems and to identify, confront and integrate divergent viewpoints and knowledge in a deliberative way. By failing to enable what Hisschemöller and Hoppe (1996) refer to as *social rationality*, conventional RMA policy processes, that might be perfectly sound in terms of consultation, may actually make a policy problem such as this ultimately harder to resolve.

Collaboration, that is, "to partner with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution" (International Association for Public Participation, 2014), would seem to be the point at which the conditions for learning become fulfilled. Returning to the definition of Ansell and Gash (2007 p 544) outlined in Chapter 3, stakeholders in a collaborative process "engage in a collective decision-making in a formal, consensus-oriented and deliberative way". The engagement process itself, if carefully designed, enables stakeholders to learn about values and facts (Gregory, et al., 2012), and to consider preferred actions. However, as Gregory notes (2012 p 249), learning itself is not a fundamental objective; it is

“a means to an end – the end being better performance on the specified set of fundamental objectives”. Further, making political decisions on the basis of deliberation, with stakeholders who are affected by those decisions, ultimately fulfils the principles of democracy (Sorensen, 2013).

6.5 Is collaboration the answer?

This study has shown that collaborative planning processes could potentially enhance decision-making outcomes for policy problems in the marine environment. This finding is based on the theory that some policy problems in the marine environment can be classified as unstructured or wicked. Further, that those types of problem are best resolved by decision-making processes that provide the necessary conditions for learning, and finally, that the public participation tool that allows for the conditions of learning is collaboration.

However, there are a number of barriers to collaborative planning processes that might prevent their success. One of these barriers is the RMA itself, particularly the tight planning process timeframes and the underlying principles of who is affected (and who is not) (refer Chapter 3 Gunder and Mouat’s (2002 p 124) ‘rationality of exclusion’ and Tucker’s comments (2011 p 116), that the 2009 RMA amendments have “substantially eroded” the principles of public participation for ‘non-experts’). The number of submissions on the NZKS applications illustrated very clearly that many people, including lay citizens, had a strong view on the applications and wished to participate in the decision-making process in some way. While it is not likely that every submitter would wish to, or could participate in a collaborative planning process, some submitters have been willing to engage in collaborative discussions with NZKS and MDC on environmental monitoring of finfish farms since the 2012 BOI hearing (N. Keeley, personal communication, 10 September 2014) Further, Marlborough Marine Futures, a community group supported by MDC, has recently formed a stakeholder working party to enable collaborative community

participation in the management of the Marlborough Sounds marine environment (Marlborough Marine Futures, 2014).

In both of these cases, the discussions have occurred in the ‘informal sphere’ described by Crompton (2015) and outside any formal RMA process. More research is required, pending the outcomes of collaborative processes already underway in freshwater management, as to how collaboration, as a tool for public participation, can be incorporated into the formal RMA planning framework. A particular challenge is how to incorporate the informal, deliberative conversations that take place at a local level within formal, national-level decision-making, such as an EPA BOI process. Research is also needed on how to meaningfully engage the public early in the planning cycle, i.e., in the policy drafting stage and how to provide opportunities for learning at every stage of the decision-making process.

An added benefit of meaningful, deliberative participation might be an improved SLO for industry (see Chapter 1), as a deliberative process must inevitably involve the steps identified by Brooks (2014) as being important for social licence. That is, key stakeholders need to be identified, stakeholders (including industry) must be willing to communicate their intentions and actions, and trusting relationships are required to be built. Lansbury Hall (2014) shows how, once local concerns with a proposal are identified, stakeholders and industry can formulate a structured and cooperative SLO model to reduce potential adverse effects, share financial benefits equitably and build local trust and understanding. Lansbury Hall’s model is based on similar work undertaken by Mason et al., (2010) on social acceptability of seafloor mining in Australia.

7 Conclusion

Conflict over the use of natural resources is common to environmental management. Planners are often concerned with how best to solve policy problems in such a way that satisfactory outcomes can be achieved for all. As discussed in Chapter 3, there are different types of policy problem, and by determining and understanding these, planning practitioners can choose a problem-solving strategy that is appropriate for each of the problem types. Research theory also suggests that public participation tools can be tailored to different types of policy problem. Collaborative approaches are being implemented in freshwater policy settings in New Zealand and may be useful for other areas of natural resource management, such as those in biodiversity protection and marine and coastal settings.

This study used Q methodology to examine a policy problem that arose in New Zealand in 2012; that of finfish farm development in the Marlborough Sounds. By determining what type of policy problem finfish farm development is, it has been possible to make recommendations on planning processes that might lead to better outcomes for stakeholders. The study showed that there was a high degree of uncertainty over relevant knowledge and a lack of consensus on norms and values between stakeholders. The policy-type framework of Hisschemöller and Hoppe (1996) indicates that finfish farm development in the Marlborough Sounds is an unstructured, or wicked problem. Collaboration is recommended for policy problems that are unstructured, or wicked, because it is deliberative, that is, it enables participants to identify, confront and integrate divergent viewpoints and knowledge. In doing this, participants reframe the policy problem and discover new opportunities for solving it. As such, collaborative planning processes provide the mechanism for social learning to occur.

In this study, the greatest degree of diversity between viewpoints on finfish farm development was between industry stakeholders and others (iwi, non-

government organisations, community members and governance and regulation representatives). The study reiterates the view of the industry itself; that in order to reach its growth and development goals, it will need to improve public understanding and support of its activities. Public participation, through informal and formal collaborative planning processes, could contribute also to the objectives outlined in the New Zealand Aquaculture Strategy, specifically to improve public understanding and support for aquaculture (Burrell et al., 2006). Ultimately, such support will be necessary if the industry is to reach its goal of \$1 billion in annual revenue by 2025.

However, collaborative planning processes must be carefully designed and facilitated in order to provide and maintain a deliberative, learning environment. A sponsor-driven, top-down planning process branded as 'collaborative' when it is, in fact, merely window-dressed public consultation is unlikely to result in satisfactory outcomes. Participants in such processes may become disillusioned to the extent that they refuse to engage further in the process, and sponsors could be left with a messy, time-wasting, expensive failure.

To enable successful collaborative outcomes, planners and policy makers in New Zealand require more guidance from central government and research providers on how to create and maintain successful deliberative forums. Such knowledge can come in part from the observation, evaluation and documentation of processes within New Zealand and overseas. Further research is necessary on many aspects of collaborative planning in the New Zealand setting, such as: how to recruit stakeholders so that the processes are seen as legitimate, who should sponsor and/or facilitate such processes (and who shouldn't), how different community perspectives can be better integrated into planning practices, the role and integration of science in collaborative processes and the benchmarks for success. Ultimately such research will lead to better planning practice, especially in the context of decision-making for unstructured, wicked environmental policy problems.

8 References

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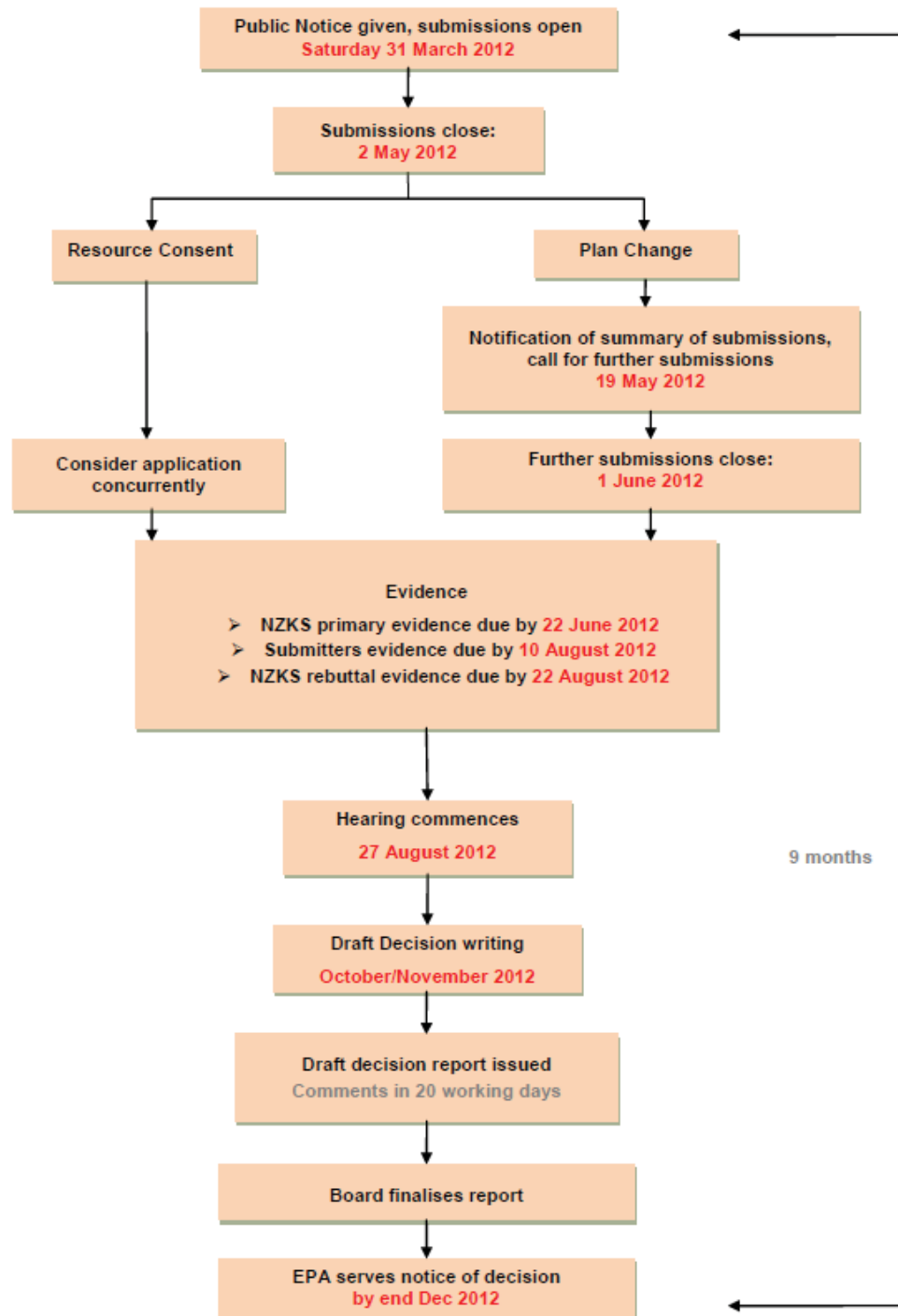
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APPENDIX A

Timeline for NZKS plan change and resource consent applications

NZ King Salmon Proposal -
Timeline for proposal as at 1 August 2012



APPENDIX B

Q sample statements by theme

Environmental	Economic	Sustainability	Amenity/Recreation and Natural Character	Planning Framework and EPA Process
Finfish farm development threatens the habitat of endangered species like the King Shag.	Claims about the economic benefits of finfish farm development are misleading.	Using wild fish to grow farmed fish is not sustainable.	Finfish farms attract sharks and seals that increase risk to recreational swimmers and divers.	Local councils should hear and determine finfish farm applications deemed to be of national significance rather than appointed bodies from outside the district.
27	1	4	22	37
There is a lack of baseline studies and of reliable assessment of effects of the discharges (from fin-fish farms).	The main people who gain are the shareholders of finfish companies, a significant number of whom reside overseas.	The Marlborough Sounds should be left as is for our future generations to enjoy.	Further development of finfish farms will reduce the options available for recreational boating.	I am opposed to private plan changes on the grounds that prohibited aquaculture zones were decided after a long public consultation process.
36	29	35	21	13
Nutrients from excess feeding and fish faeces, and chemicals will pollute the environment in, around and down current of the finfish farms.	There are limited opportunities for locals who are directly affected to be part of the workforce.	Finfish farms are not environmentally sustainable because the environment in, around and down current of the farms is negatively affected.	Finfish farms have adverse visual effects on areas with outstanding landscape and natural character.	There is an enormous disparity in resources available to a marine farm applicant compared with the lack of funding available to the public to protect the status quo.
23	26	38	40	25

Environmental	Economic	Sustainability	Amenity/Recreation and Natural Character	Planning Framework and EPA Process
Finfish farms kill sea life within the area they are placed.	The financial advantages of finfish development should not take precedent over the long term environmental destruction of the Marlborough Sounds.	I would like to see independently reviewed evidence that the marine farming applications achieve sustainable management.	The Marlborough Sounds is an area of outstanding landscape and natural character.	I have concerns about the rushed process through the EPA.
30	6	7	15	39
The King Shag is able to fly and will fish in other areas.	New Zealand is a country of primary producers and we need to stay as a leading player in any food producing field we are good at.	Nominated sites are well suited for finfish farming activities and environmental interactions can be well managed to support a sustainable operation.	Fin fish farms are a blot on the natural beauty of the Marlborough Sounds.	I have confidence in relevant Government legislation to protect all aspects of the environment.
31	14	12	9	2
I am sure that scientists will be required to monitor the finfish farm sites (as part of any consent) and if there are any problems they will be rectified.	Finfish farming in the Marlborough Sounds has low environmental impact and provides great economic and social benefit.	We need to develop the finfish industry to meet the ever growing world demand for sustainable food products.	Local properties are greatly affected by finfish farming's visual impact, noise and other pollution (e.g. boats and other related activities on and around the farms).	I believe the EPA Board of Inquiry should only deal with the facts as presented by marine farm applicants.
10	32	16	5	20

Environmental	Economic	Sustainability	Amenity/Recreation and Natural Character	Planning Framework and EPA Process
The sacrifice of a relatively small area of the sea bed is an acceptable price to pay for the social and economic benefits to be gained from finfish farms.	We need to put finfish farms in place to help stop our children leaving our country because there are no jobs.	Finfish farms allow New Zealand people to manage and use their natural resources in a way that enables communities to provide for their social, economic and cultural well-being.	The presence of finfish farms would not detract from the enjoyment people get from boating and fishing in the Marlborough Sounds.	To oppose marine farm applications on the basis that a Plan should not be subject to review and amendment seems illogical and potentially counterproductive as latest knowledge and learnings would never be incorporated.
24	3	19	28	8
The impact of finfish farms on the environment is minimal.	Regardless of what percentage of a company is held by whom, the reality is that increasing finfish production will result in greater export earnings for New Zealand and more direct jobs in the Marlborough, Nelson and Tasman regions.	The finfish industry in the Marlborough Sounds has demonstrated, over many years, their ability to farm sustainably.	Finfish farms are very much a part of the Marlborough Sounds environment.	The EPA Board of Inquiry is the correct authority to hear marine farm applications deemed to be of national significance and make a decision on the scientific evidence presented by submitters.
11	18	33	17	34

APPENDIX C

Massey University acknowledgement letter low-risk notification



MASSEY UNIVERSITY
ALBANY

19 December 2013

Natasha Berkett
School of People, Environment & Planning
Manawatu Campus

Dear Natasha

Re: Salmon farm expansion in the Marlborough Sounds: an analysis of the views of submitters on a controversial plan change application.

Thank you for your Low Risk Notification which was received on 29 November 2013.

Your project has been recorded on the Low Risk Database which is reported in the Annual Report of the Massey University Human Ethics Committees.

The low risk notification for this project is valid for a maximum of three years.

Please notify me if situations subsequently occur which cause you to reconsider your initial ethical analysis that it is safe to proceed without approval by one of the University's Human Ethics Committees.

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 above are responsible for the ethical conduct of this research."

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor John O'Neill, Director (Research Ethics), telephone 06 350 5249, e-mail humanethics@massey.ac.nz."

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to provide a full application to 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.

Yours sincerely

John G O'Neill (Professor)
**Chair, Human Ethics Chairs' Committee and
Director (Research Ethics)**

cc Dr C Cheyne
School of People, Environment & Planning
Manawatu campus

Dr A Ryan HOS
School of People, Environment & Planning
Manawatu campus

Massey University Human Ethics Committee
Accredited by the Health Research Council

APPENDIX D

Instructions for the card sorting exercise

Thank you for volunteering to participate in this exercise. Please fill in the following details.

Date:	Time:
Name:	Participant Code:

Now, carefully read through each step of the instructions before beginning.

1. The exercise is part of my Master thesis and is about finfish farm development in the Marlborough Sounds. I am interested in your opinions, beliefs, perceptions and awareness towards finfish farm development in the Marlborough Sounds.
2. Locate the cards and the score sheet that has been provided to you. Lay the score sheet out in front of you. The cards each contain a statement about finfish farm development in the Marlborough Sounds and a number. The numbers on the cards (from 1 to 40) have been assigned randomly and are only relevant for recording your response.
3. The question I would like you to answer is **'to what extent do you agree with the following statements'?**
4. Read all 40 statements carefully and separate them into three piles. On your right hand side put the statements that you definitely AGREE with. On your left hand side put the statements that you definitely DISAGREE with. In front of you, put statements that you feel INDIFFERENT, or UNSURE about, or leave you with MIXED FEELINGS. Just to be clear, there is no right or wrong way to sort the cards - just be faithful to your own point of view. Also, there are no limits to the number of statements that can be placed in any of the three piles. When you have finished this step please check that the number of cards in the three piles adds up to a total of 40 statements.
5. Take the cards from the AGREE pile and re-read them. Select the two statements that you most agree with and write the card numbers in the two

boxes under the '+5' column on the score card (it does not matter which one goes on top or below). Keep these two statements handy, as I will ask you some questions about them later. From the remaining cards in the AGREE pile, select the next three statements that you most agree with and write the card numbers in the three boxes under '+4' column on the score card. Follow this procedure for all of the cards from the AGREE pile.

6. Now, take the cards from the DISAGREE pile and re-read them. Select the two statements that you disagree with the most and write the card numbers in the two boxes under '-5' column on the score card (it does not matter which one goes on top or below). Keep these two statements handy, as I will ask you some questions about them later. From the remaining cards in the DISAGREE pile, select the next three statements that you most disagree with and write the card numbers in the three boxes under '-4' column on the score card. Follow this procedure for all of the cards from the DISAGREE pile.
7. Finally, take the remaining cards from the pile in front of you (the INDIFFERENT / UNSURE / MIXED FEELINGS pile) and read through them again. Arrange all the statements in the remaining open boxes on the score sheet as they fit your level of agreement or disagreement. Keep these statements handy, as I will ask you some questions about them later.
8. When you have written the numbers of all the cards on the score sheet please go over your distribution once again and erase and rewrite card numbers if you so desire (or use the second score sheet you have been provided with).
9. Once you have completed this exercise we will proceed to the short interview.

Thank-you!

APPENDIX E

Q sorting grid

Score Sheet

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
2										2
	3	3						3	3	
			4				4			
				5		5				
					6					

APPENDIX F

Interview questions

Date:α	Start Time:.....Finish Time:α	α
Interviewee:α	Participant Code:α	α
Organisation:α	Position:α	α

¶

1.→ Please explain why you agree the most with the statements you placed in the +5 column.¶

¶

2.→ Please explain why you disagree the most with the statements you placed in the -5 column.¶

¶

3.→ Are there any statements towards the middle of the distribution that have personal meaning and/or significance for you?¶

¶

4.→ Are there any statements that you felt you didn't really understand?¶

¶

5.→ Are there any issues that do not have statements and seem to have been omitted from the ranking exercise? If so, what might those statements be, and where would you place them on the sort card?¶

¶

6.→ In what way would you describe yourself as a stakeholder in finfish farming?¶

¶

¶

Thank-you¶