Individuals' Knowledge and Behaviour in Water Governance: An Israeli Case Study of Female Water Research and Policy Professionals

by

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A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Environmental Studies

in

Environment and Resource Studies

Waterloo, Ontario, Canada, 2016

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Many social sciences recognize tacit knowledge, including its contextual and affective sources, as instrumental to professionals' decision-making and behaviour. Utilization of individuals' tacit knowledge was an identified gap in water governance research, given its implementation challenges. Solutions proposed to improve performance focus on group dynamics and consensus making but exclude the psychological micro-perspective on how individuals biologically make decisions and the underlying variables that influence those decisions. This study drew upon environmental psychology and knowledge management literature to address the theoretical gap.

An Israeli case study enabled exploration into how water research and policy (WRP) professionals think about water and the influence that had on their professional behaviours. The study used interviewing (May-July 2012, n=24) and autoethnography as methods to collect person-focused data, which was interpreted using indicators from pro-environmental behaviour models and a thematic analysis approach. Two dominant themes emerged that influenced professional behaviour: a norm to subscribe to a water scarcity ethic and a perceived expectation to contribute to society. The themes promoted morally aligned career commitment, for which supporting literature on affective commitment demonstrates improved knowledge sharing and motivation amongst professionals. They also perpetuated a constrained national water agenda and internal value conflicts for the professionals, creating both behavioural barriers and motivators.

The paper concludes with theoretical and practical observations. It recommends Israel's WRP community would benefit from incorporating individuals' tacit knowledge in the following ways: a) to diminish entrenched decision-making; b) to improve interdisciplinary networks and training; c) to promote women managers; and d) to better harness professionals' performance potential.

Keywords: water governance, tacit knowledge, identity, professional culture, knowledge management, environmental psychology, Israel, women, water scarcity

Acknowledgements

This project would not have been possible without generous funding from SSHRC, ARCADIS, the Lebovic Foundation, and Sarah Wolfe. I am extremely grateful to have had the opportunity to do international research, letting that experience alter my worldview. Thank you Paul Kay for organizing a Canadian-Israeli water conference that served as the perfect introduction for my data collection, and for endlessly answering my questions over the years. Sarah Wolfe, you have been a very supportive and patient advisor during this process. I have great respect for both your research program and your approach to life. Thank you for your strong woman mentorship.

I'd like to give warm appreciation for Arthur and Margot Leiberman, a kind couple that welcomed me to Israel with open arms. Professor Leiberman guided my best possible understanding of Israeli cities, politics, newspapers, and was always excited to discuss cultural ideas. Getting to know Arthur and Margot was one of my most treasured memories from Israel. I'll never forget receiving dozens of meticulously clipped newspaper articles in the mail.

Thank you to Eran Feitelson, Raphael Semiat, and Brian Berkowitz for valuable guidance in recruiting female water professionals. And to Jay Kennedy for accompanying me on my pre-research trip, where we explored the trials and tribulations of Israeli transit. I appreciated the time each busy professional awarded to reflecting on my questions and the lessons I learned from them. Sarah Anderson, I'm not sure how those last two years would have gone without friendly nipping at each other's heels. It was wonderful to go through this thesis process together. You too, Meghann Kerr – accountability to the finish line!

On a personal note, I would like to thank my parents, Judy Koke and Tracy Wilkes, for supporting me through sickness and health. You have always been my strongest idols and I look forward to learning even more from you as I grow. Friends and family: I owe you for your patience with five years of evading questions about my research. Thanks for cheering me on, while giving me space. And thank you Uncle Brian for taking me in as a biologist fledgling and touring me through the environmental consulting world. You are a great mentor and friend to me.

Lastly, I'd like to thank the ERS Department for cultivating space for students to cross disciplines. Social science is my second scientific language. Learning to understand the validity and benefit of both science types is one of the most important lessons I learned from my degree.

Dedication

I dedicate this thesis to Alan Espenlaub who mentored me on listening to the hidden wavelengths in life. An explorer of the earth and the mind, in many ways I owe my budding interest in environmental psychology to you. I missed our conversations greatly during this writing process. But you would be happy to know that I persevered and eventually finished it.

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Chapter 1. Introduction

1.1 Context

Water. Everyone knows *something* about water. People bathe in it, play in it, pray with it, and socialize around it. Water cycles through people's bodies and neighbourhoods. Water maintains peoples' health and the health of the environments people rely on. Its power both frightens and inspires people.

People can learn about water, interact with water in infinite ways. Over time, experiences compile to form a relationship with water, a way of thinking about water that is unique to them. In this way, there is no universal definition for the meaning of water. Water meanings can derive from values as diverse as spirituality and economics, survival and recreation. Values underlie the ways people think about water and the ways people interact with it. But does the way people think about water influence how they care for it, their stewardship of it? Does it influence how well humans manage their water resources?

For professionals in water-related careers, management decisions vary from highly technical to highly emotional, from urgent to long-term. Effective decision-making requires localized, context-specific knowledge as well as the integration of several conflicting water values. Governing water is one of the most challenging global issues defining this century (Biswas and Tortajada 2010; Kreutzwiser and de Loë 2010; Max-Neef 2005; Pahl-Wostl, et al., 2013b).

Water's properties pose several challenges to those who govern it (Simms and de Loë 2010). For instance, water moves. Water fragments regulatory structures, intersecting administrative boundaries and creating trans-boundary water issues not simply defined. Water changes shape and location. Hydrologic systems are naturally variable; external factors like climate change, human developments and over-use exacerbate their vulnerability. Water maintains life. As a common resource essential to human and ecological health, water raises highly conflictual values and uses. Water is interdisciplinary. Integrated within almost every sector and governmental division in society, water is highly susceptible to the governing structures (Rogers and Hall 2003). Systemic failure in governing water can have wide-spread implications.

1.2 Research Purpose and Objectives

'Water governance' refers to the collective processes and institutions through which societies make decisions and actions affecting water (de Loë and Kreutzwiser 2007), but the *individual* is the formative unit of that collective decision-making process (Beratan 2007). So, if individual thought instigates collective action (Beratan 2007; Sivakumar 2011, 2014), then what do water research and policy (WRP) professionals think about water? Moreover, how does that thought influence their professional decisions and behaviours?

The purpose of this research was to use a case-study to question:

How do water research and policy (WRP) professionals think about water and what influence does it have on their professional behaviour?

To do so, I defined three main objectives:

(1) Identify knowledge sources for WRP professionals' personal and expert understandings of water;
(2) Characterize professionals' behaviours within the WRP;
(3) Identify which knowledge sources influence the determination of professional behaviours in the water research and policy (WRP) community.

Israel was an appropriate case study for these objectives, due to the country's strong reputation for innovative water management and geopolitical restrictions on water governance (see 3.2.2.1). The case focuses on a sample of female Israeli WRP professionals (section 3.2.2.2 for rationale). The study is neither a gender nor a geographic study; it is an exploration of the *professional culture* of Israel's WRP community using one demographic group as a participant group.

1.3 Rationale

As a highly complex and dynamic sector, effective decision-making is a major challenge for water governance. Decisions are frequently made during uncertain scenarios by multiple actors with conflicting perspectives. It is important to understand how professionals think about water and how that knowledge influences their professional decisions and behaviours. Defining and applying individuals' tacit knowledge can lead to more adaptive, context-specific decisions.

I defined a conceptual framework integrating research from water governance, knowledge management, and environmental psychology. Research in these fields has highlighted the need for a better understanding of individuals' knowledge and professional decision-making within water governance; however there is minimal research on individual tacit knowledge management or evidence provided from the field (Chapter Two). My thesis aimed to address those gaps. The rationale for my research question stemmed from two identified research needs: a) incorporating tacit knowledge from professionals to improve water governance performance, and b) addressing the psychological and social factors that influence professionals' behaviour.

1.3.1 Incorporating tacit knowledge

Solutions to complex environmental problems require interdisciplinary knowledge and contextual understanding (Beratan 2007; Dickson 2008; Goleman, et al., 2002). To be effective, decision makers in the water sector, therefore, need to incorporate and value all sources of knowledge, including an individual's tacit, experiential and emotional intelligence (Fazey, et al., 2006; Goleman, et al., 2002; Mandel and Pherwani 2003; Wolfe 2009). However, not all knowledge is valued equally in society.

Explicit knowledge — easily articulated, objective data and information — dominates today's knowledge economy, but "the greater part of knowledge" (Reilly 2008:704) — the embedded, personalized, tacit knowledge comprised of individual's values, beliefs, and experiences — forms the foundation for human decisions (Beratan 2007; Eraut 2000; Nordin, et al., 2008; Polyani 1966; Wolfe 2009). Identifying which knowledge types practitioners utilize is essential for understanding an individual's decision-making processes and the influence unconscious factors have on determining professional contributions.

A single "right" solution or decision does not exist for complex environmental problem (Head 2014; Olsson, et al., 2006; Renner, et al., 2013). As uncertainty increases, practitioners need to acknowledge the limitations of explicit decision-making, learning to determine the 'best' solution for a given context, with the least negative impacts (Beratan 2007; Karki, et al., 2011; Rijke, et al., 2013; Sarewitz 2004). The role tacit knowledge plays is particularly crucial in dynamic sectors, like the WRP community, where the traditional emphasis on explicit

knowledge can "limit learning and adaptation capabilities" (Al-Jayyousi 2004:166; also Alaerts 2009; Simms and de Loë 2010).

Water "governance has underutilized tacit knowledge from practitioners" (van de Meene, et al., 2011:1125). As section 2.2.6 details, this concept is an identified gap in water governance literature (Nowlan and Bakker 2010; Sivakumar 2014). The literature often "defines governance aims and behavioural expressions of values, but the values that legitimate behaviours and institutional cultures often go unattended" (Groenfeldt and Schmidt 2013:14). Seeking to understand, in depth, how people make decisions or choose behaviours is a thoroughly developed domain in psychology.

1.3.2 The need to address psycho-social impacts on behaviour

Psychologists from several disciplines have explored the relationships between a human's brain and its social-environmental contexts, seeking to understand what underpins human decisions. Neuroscience acknowledges the co-dependence between a brain and its environment (Northoff 2010). Cognitive psychology acknowledges the non-conscious processes through which human brains biologically alter behavioural patterns (Beratan 2007). Behavioural psychology acknowledges several models through which a human's knowledge and values can predict behaviour (McDonald 2014). Environmental psychologists recognize the variety of experiential and contextual factors that form an individual's environmental knowledge, values, beliefs and identity (Gifford 2014). Environmental psychology and knowledge management research addresses psycho-social impacts on behaviour in personal and professional contexts; however, collecting data on human-water relationships for professional knowledge management has only been acknowledged very recently as a gap in water governance literature (Braden, et al., 2014) (see 2.2.6).

> "The lack of studies on the interactions between human behaviour and water planning and management at all scales of water resources and human society is surprising given that human psychology drives social and economic activities, politics included, rather than the other way around" (Sivakumar 2014:201).

Water governance research needs to consider human psychology and behaviour in order to ensure effective implementation and to improve professionals' performance.

1.3.3 Rationale for an Israeli Case

Israel provides a fascinating case for water governance research, due to water's prominence in decision-making for development in a semi-arid landscape and the complicated set of underlying values and conflicts in the region. Although often considered a developed nation, Israel is a very young country and has gone through stages of rapid growth and development in its recent past. As Araral and Wang (2013:3946) explain, developing countries often experience the most acute water governance challenges "resulting from more water insecurity and more water conflicts within and between countries, particularly poor countries." These various development stages are alive in Israelis' living memories, providing a historical context for its modern WRP professional culture.

In addition to intrigue, Israel provides an established case study due to the extensive research and documentation on Israeli water policy and management. Israeli water experts express pride for their technological and sustainability achievements despite chronic water shortages, yet continue to highlight water quality issues and problems with the current water governance structure (Becker 2013; Fischhendler and Heikkila 2010; Sowers, et al., 2010; Tal 2002, 2006). The role water plays in the Israeli-Palestinian conflict is a widely published topic; although the conflict may inform my study, it is not the central focus (Brooks and Trottier 2014; Feitelson, et al., 2011). Much research has been published on Israeli beliefs and values about water in attempts to improve water conservation practices (Burmil, et al., 1999; Chenoweth, et al., 2007; Schoenfeld 2004) and to define its meaning for policy development in the region (Feitelson 2012; Feitelson, et al., 2011; Orenstein, et al., 2012).

At the 2012 Canadian-Israeli workshop 'Governing Water in Uncertainty', Israeli experts discussed a relevant research gap: Israeli professionals' perceptions of water decision-making in Israel — what is their sense of urgency and perception of actor's roles, trust and responsibilities? Academic experts identified the need to overcome the ambiguity challenges associated with knowledge integration and new knowledge processes. Communicating the need to collect this information was a call for research on how Israeli water professionals' utilize their tacit knowledge. Chapter Three includes a case study description of Israel's water sector (Section 3.2.2.1).

The case study also provides a platform to present women professionals' water knowledge due to the strong female presence in Israel's workforce (Desheh, et al., 2013) and the Country's intention to recruit women executives. Israel's government recognizes the need to include more women in decision-making, especially to comply with the UN Resolution 1325 that mandates gender equality ratios in decision-making for global trade (Desheh, et al., 2013). Research shows gender equality on executive boards positively impacts organizational culture by stimulating inclusive work environments, more teamwork, stronger social networks, and more philanthropic activity (Huse and Solberg 2006; Konrad and Dramer 2006; Mcguire 2012; Williams 2003). Israel considers its human capacity one of its most precious resources (Desheh, et al., 2013) as evidenced by the economy's entrepreneurial and innovative reputation. Therefore, low participation rates in decision-making and management equate to opportunity costs for Israel, unharnessed human capacity that could benefit WRP professional culture and decentralized water governance (Bhatia 2004; Cleaver and Hamada 2010; Mandell and Pherwani 2003). In Section 3.2.2.2 Participant Criteria, I rationalize a gendered dataset.

I do not contribute new insights to a particular issue in the Israeli water sector; Israeli experts have documented research on these topics well. I offer insight into the sector's professional culture to highlight its dominant values and objectives.

1.4 Critical Definitions

As I reviewed and integrated concepts from several disciplines, multiple terms required clarification. The following sections define the most popular terms, setting context and theoretical parameters for my study. Others are embedded within the text in Chapter Two.

1.4.1 Water Governance

The term water governance (WG) does not have one, all-encompassing definition in the literature. Definitions can be broad and vague, leaving the reader fairly unclear of what, exactly 'water governance' is. However, the concept is consistently distinguished from *water management.* Governance is the process through which water is managed (de Loë and Kreutzwiser 2007). Water *management* includes the practical measures and tools used to distribute, develop, analyse, and protect water resources (Rogers and Hall 2003). Water *governance* describes the decision-making framework for water within society; the processes

that design, implement, and ensure effective management operations (Simms and de Loë 2010).

Araral and Wang (2013) recently reviewed WG definitions and found little consensus on scope or principles. Several definitions confined water governance to the systems of decision-making and implementation, from which specific mechanisms are difficult to derive. Other definitions used various frameworks — for example, adaptive capacity, systems-based, or behavioural approaches — to focus on important elements of decision-making processes. Their review emphasized that nuanced and inclusive definitions are too general to be useful in application.

However, my research prefers a concise, yet still inclusive, flexible definition that can account for diverse values and professional behaviours: "water governance is a set of collective actions aimed towards a common goal and coordinated among diverse stakeholder groups (Weik and Larson 2012:3156)".

In the literature, WG 'regimes' are typically divided into hierarchical, market, or network-based categories, according to which institutions hold primary authority and how the responsibility lines are drawn. Hierarchical, state-led governance provides a centralized government authority with clear management laws and vertical accountability lines for enforcement (Rogers and Hall 2003; van de Meene, et al., 2011). In this single-entity decision-making, governance equates to government, which works well for industrialization and urbanizing purposes; however, market-state partnerships can provide an alternative decision-making method to stabilize an economy during rapid growth (Gleick 2000). Theoretically, market-state partnerships share responsibility and accountability for decisions, while the state remains the dominant authority (Bakker 2010). Societal dissatisfaction with market or state governance regimes often forms a third, informal but important voice — the civil society or citizenry — demanding to take part in the discussion and decision-making. This decentralized governance type creates a framework for consensus-based, socially-acceptable decisions (Rogers and Hall 2003; Simms and de Loë 2010), which are often better suited to contemporary socio-political and economic issues. As the 'decentralized WG' concept evolves, authors prefix water governance with one of multiple adjectives, such as 'delegated', 'distributed',

'decentralized', 'public', 'network-based', 'collaborative', or 'shared', further complicating its muddled definition.

In this paper, 'water governance' refers to the general process, not any specific structure or partnership stage like hierarchical, market, or decentralized. I assume that current water governance practice, regardless of its structure, is more integrated and interdisciplinary than water governance practices in the late 1900s, or that current practices are in transition while adapting to more coordinated, inclusive processes. I use specific prefixes to distinguish between governance regimes. Two additional points are important to note: decentralized water governance is still a relatively new process for WRP communities, and it is not always considered the ideal governance regime for a given scenario (Biswas and Tortajada 2010).

Decentralized frameworks for water governance evolved as *processes* for multi-stakeholder decision-making that integrate social values and stabilize society as a *system*. Their incorporation into established WG frameworks is recent; the processes are still embryonic and confusing in comparison to the clear, formalized structures society is used to (Gupta, et al., 2013; Rogers and Hall 2003). Thus, decentralized governance is a still a process in development; as new challenges are resolved and solutions are evaluated the process evolves, and success is re-evaluated.

Although several WG structures and partnerships exist, researchers repeatedly stress choosing the 'best' governance approach or 'hybrid approach' most realistic and applicable for a given context (Brown, et al., 2011; Fischhendler and Heikkila 2010; Rijke, et al., 2013). Although decentralized governance efforts incorporate the ecological and social values criticized as neglected by more formal structures (Groenfeldt and Schmidt 2013), the state and private sector continue to play crucial roles. Hierarchical structures provide a much-needed certainty in administration and authority, balancing network governance's strengths of flexible implementation, innovation and adaptation. Market structures typically catalyze industry competition and encourage efficiency (van de Meene, et al., 2011).

1.4.2 Knowledge

Explicit knowledge dominates society's knowledge economy. It includes the objective, systematic, reliable evidence derived from scientific methods, the facts and data that "can

subsist without being known" (Reilly 2008:704). Empirical evidence transfers easily and is sometimes transformed from tacit knowledge (Dillon 2008). Tacit knowledge, on the other hand, is seen as the result of experience, intuition, emotional and personal skills, and embedded within an individual's worldview (Eraut 2000; Mandell and Pherwani 2003; Nordin, et al., 2008; Polyani 1966). It is important to note that knowledge is not synonymous with data and information. Information is contextualized data that becomes knowledge through an individual's interpretation, value and connection (Alearts 2009; Wolfe 2009). Therefore, knowledge differs between individuals and organizations, depending on the components of an individual's knowledge base.

I use 'knowledge' in an inclusive, contextualized manner, acknowledging that both explicit and tacit types form an individual's knowledge base. In my writing I distinguish explicit knowledge as 'expert' or 'professional' knowledge when appropriate, acknowledging the diverse disciplinary perspectives that exist within a WRP community. I refer to tacit knowledge as value-laden, unconscious, or culturally embedded. I intentionally avoided using the terms 'explicit' and 'tacit' to minimize their dichotomous categorization.

I also use the term 'professional' for its compatibility with my inclusive knowledge definition. The term 'practitioner' is more prevalent in water governance literature, but it emphasizes explicit expert knowledge.

I define 'knowledge management' (KM) as "the creation, sharing, and use of individual and collective knowledge" (Timonen and Jalonen 2008: 869); as a *process* rather than material to be manipulated. Processes involved in KM can include knowledge transfer, knowledge integration, learning and unlearning. Chen, et al. (2010:229) provide a definition of tacit knowledge in a professional context: "deeply rooted in individual cognitive processes and ingrained in routine and non-routine processes of an [individual's or] organization's unique culture and values." They go on to explain how tacit knowledge is integral in defining professional culture.

1.4.3 Action and Decision-making

Decision-making is the action element of knowledge management; it is the link that transforms a professional's knowledge into a tangible action. If knowledge prepares an

individual's evaluation and judgement schemes, then decision-making is the process of applying them to "determine the appropriate response" or select the best possible behavioural action (Reilly 2008: 703; also, Bockmann and Anthony 2002). However, other factors such as social norms, goals, and networks influence a professional's decision-making processes (Durbin 2011; Krantz, et al., 2008; MacDonald 2014). Investigating professionals' decision-making methods would help identify how their tacit knowledge is used, and why they choose among professional contributions.

I distinguish between an action (behaviours related to WG) and decision-making (the processes to determine actions). This differentiation is not crucial, as the study is neither predictive nor quantitative. However, clarification is necessary.

1.4.4 Social 'knowledge'

As knowledge is data, contextualized by an individual's values and interpretation, there are social elements of knowledge construction. I use several social and psychological terms to tease apart individuals' knowledge and behaviour. Here are three brief definitions:

Values are "personal or cultural standards that give intrinsic or extrinsic worth to subjects, objects or behaviour, and which delimit the sphere of moral consideration" (Groenfeldt and Schmidt 2013:1). Valuing water as 'waste water' or as a 'resource' creates different contextualized knowledge than valuing water as 'sacred' or as a 'recreation site'. Therefore, by attributing various value or worth, people preface their interactions with water differently. Values tend to stay static over time and difficult to change, creating a considerable effect on norms and behaviour (Steg, et al., 2014).

Norms are standards or guidelines of appropriate behaviour that are intrinsically understood by an individual. Behavioural norms can originate from internal and external values, such as self-expectations or social-, cultural expectations (Steg, et al., 2014). Norms are unwritten laws that both facilitate and constrain human behaviour (Fritsche, et al., 2010).

Culture is "a system of beliefs that are deeply embedded within the society and is reflected in the behaviours of its organizations and people" (Chen, et al., 2010:230). I followed Rubin and Rubin (2012:180) in defining professional culture as "a set of values, beliefs, and ways of interpreting the world shared by" a WRP community. Although geographic and gendered

contexts informed the analysis, the key concern was the culture of professionals' knowledge management and its influence on decision-making.

1.5 Structure of the Thesis

Chapter Two synthesizes the main conceptual overlaps between three literature bodies — water governance, knowledge management and environmental psychology — that formed my conceptual framework and guided my data analysis. The chapter provides evidence for how and why the given concepts yield incomplete or inaccessible findings for the research objectives and defines a conceptual framework for use in interpreting the case study results.

Chapter Three defines the qualitative methodology and my case-study design. It provides details on the data collection phase and characteristics of the interview sample set. Thematic data analysis was the method implemented to analyze and interpret the interview transcripts. This chapter describes how an indicator template was developed to guide that analytical process, as well as how the themes discussed in the following chapter were detected.

Chapter Four presents the results from the Israeli case study, discussing the major concepts and themes that arose during analysis. The discussion incorporates recent Israeli research that enabled understanding during theme interpretation and to improve communication of the results. The chapter ends with a synthesis section that re-integrates the case study's findings into the conceptual framework designed in Chapter Two.

Chapter Five summarizes the research project including notes on how I maintained a consistent research approach throughout the process. The chapter highlights key ideas from Chapters Two through Four and concludes with theoretical and practical recommendations.

Chapter 2. Tri-Literature Review

This chapter develops the conceptual framework used to analyze and interpret the Israeli water research and policy (WRP) data set.

In questioning individuals' knowledge and its translation into action, I could have drawn on literature from a diverse range of disciplines. For instance, 'knowledge-to-action' research has improved understanding in education practices, advertising techniques, employee productivity and health care practices. The conceptual framework developed in this chapter introduces three literature bodies — water governance (WG), knowledge management (KM), and environmental psychology (EP) — and synthesizes five areas of overlapping research.

This literature review did not survey all research topics within each literature body; the intention was to provide a synthesis of syntheses. This task was completed by comparing recently published reviews, focusing on interdisciplinary research topics, identifying research gaps, and compensating for the criticisms of one discipline with the strengths from another.

Following brief background introductions to each literature body in section 2.1, section 2.2 integrates five research topics identified as most beneficial to informing the research objectives:

2.2.1 Water Governance Transitions: *how do different WG structures change behavioural expectations of its professionals?* (From WG-KM intersection)

2.2.2 Challenges of Transdisciplinary Work: w*hat are the challenges created by the cross-discipline work setting characteristic of the WRP?* (From WG-KM intersection)

2.2.3 Affective Domains: *how can EP-KM literature inform the 'extraneous' variables that influence professional's knowledge?* (From EP-KM intersection)

2.2.4 Scientific and Societal 'Facts': h*ow can KM-WG literature inform the 'extraneous' variables that influence a professional's knowledge*? (From KM-WG intersection)

2.2.5 Pro-environmental Behaviour: w*hat can pro-environmental behaviour research provide to analyse and understand professional knowledge and behaviour in WRP?* (From EP-KM intersection)

The final section (2.3) displays how these research topics combine into a conceptual framework and gives evidence to propose a theoretically consistent methodology.

2.1 Introducing the literature

2.1.1 Water Governance

Water governance literature emerged in the past 30 years as a response to integrated water management structures and societal demands (Gleick 2000). Environmental awareness and societal dissatisfaction triggered socio-political conversations and demand-management disputes that eventually outweighed technology-based solutions, and the need to develop new institutional processes was acknowledged (Biswas and Tortajada 2010; Gleick 2000; Nowlan and Bakker 2010). "There is general agreement in the water community that IWRM (Integrated water resource management) is the only viable way forward for sustainable water use and management…although much work remains to establish effective water governance regimes that will enable IWRM to be applied" (Rogers and Hall 2003:30). This call for research spurred the proliferation of WG literature. Current reviews note that WG literature provides strong problem definition and theoretical framework development, but shows weaknesses in guiding implementation and overcoming the scientific-political divide (Araral and Wang 2013; Gupta, et al. 2013; Pahl-Wostl, et al., 2013a).

Water governance challenges and principles are well-defined in the literature (de Loë 2009). Major advancements have solidified the scientific foundations of water resources and the global hydro-cycle, environmental-economic interconnectedness, water and climate change interactions, and the co-dependence between human and environmental health (Pahl-Wostl, et al. 2013a; IPCC 2014). Awareness about the severity and urgency of global water problems fueled research that established principles and guidelines for good water governance (e.g.-Nowlan and Bakker 2010; Simms and de Loë 2010; Weik and Larson 2012). Defining 'good WG' illuminated the broad range of social and logistical challenges created by its processes. Many of these principles and challenges highlight the need for new learning and socializing methods for the actors involved, which benefits my research (see sections 2.2.1–2.2.2).

Despite extensive efforts to identify factors that contribute to or impede WG processes, the literature receives consistent criticism for being too theoretical (Van de Meene 2011; Weik and Larson 2012). Araral and Wang (2013) highlighted the need for analytical coherence, without which WG definitions yield little value. Gupta, et al., (2013:1) reiterated this sentiment describing WG literature as "often disconnected from real-life problems faced by policy-makers". Some researchers advocated a shift in the agenda's focus from problem- to solution-oriented approaches (Pahl-Wostl, et al., 2013a), and providing syntheses of the concrete 'good governance' examples from which practitioners can learn from (Biswas and Tortajada 2010).

Several researchers have attempted to guide transitions between governance regimes, providing frameworks for evaluation and successful integration of sustainability practices (Olsson, et al., 2006; Pahl-Wostl, et al., 2013b; Weik and Larson 2012). Adaptive management was a common thread in this research, which offered strategies to "detect undesirable/unexpected developments at an early stage" (Pahl-Wostl, et al., 2013a:709) and to prioritize actions regardless of uncertain contexts and knowledge. The literature on water governance transitions benefits my research by describing individual professional skills and behaviours to target for improving implementation success.

However, much debate centers around whether the process's inclusionary, sustainability-oriented focus overshadows the production of measurable environmental benefits (Biswas and Tortajada 2010; Gupta, et al., 2013; Nowlan and Bakker 2010). "The challenge remains to find a balance between a pragmatic and feasible sustainability appraisal, on the one hand, and a scientifically credible assessment with accurate data, on the other (Weik and Larson 2012:3169; also, White, et al., 2010). Policymakers note little guidance or consensus from the literature on the science-policy interface to help with this challenge (Gupta, et al., 2013).

Another criticism of WG that supports my research highlights practitioners' difficulty or even failure to adopt interdisciplinary WG approaches into practice (Biswas and Tortajada 2010; Pahl-Wostl, et al., 2013a). The call for improved multi-level interactions and coordination in implementing water governance is clear. The call supports the contention that the problem with water governance is *behavioural coordination* between actors (Simms and de Loë 2010). Water governance literature further underscores the essential role political

leadership plays in ensuring coordination and efficiency in application (Biswas and Tortajada 2010; Brown, et al., 2011). This pragmatic encouragement supports my research by acknowledging WG as inherently interdisciplinary and situated within a complicated socio-political system of interrelated factors.

Water governance literature has contributed substantially to the fundamental concepts in my theoretical framework. It recognizes the individual's role in formulating, fostering, and facilitating WG processes (section 2.2.1). It explicitly states influential factors such as power, politics, and conflict (section 2.2.4), as well as the knowledge sources that compose personal knowledge about water (section 2.2.3). Most importantly, water governance literature continues to recognize that knowledge, its various types and processes, plays a fundamental role in successful governance practices.

2.1.2 Knowledge Management

Since the late 1960s, research on knowledge management has moved through three major phases: (1) philosophy of knowledge and its management; (2) technology-based 'information management' for a competitive advantage; and most recently, (3) organizational value and use of knowledge beyond information management (Dillon 2008). Hislop (2013) summarizes the literature's evolution during the last two decades, particularly the acknowledged importance of human and social dimensions in managing knowledge — a previously neglected issue in KM. The fundamental assumption is that the nature of work in a post-industrial society emphasizes intellectual work, therefore requiring a thorough understanding of an organization's knowledge base (Hislop 2013; Schultze and Stabell 2004). By recognizing human influence on an organization's or society's 'knowledge economy', the literature supports my study's process-oriented definition of knowledge management proposed in Chapter One. Management science and decision-making science researchers criticized KM literature as a temporary research trend; however, recent reviews identified sustained and evolving interest in the subject (Hislop 2010; Sorenko, et al., 2010). Some current foci include professionals' identity and agency, innovation performance, and mobile data collection through social media. These foci highlight the literature's importance in understanding business performance in the current information and high-tech era.

A research trend that benefits my study is a recent shift in dominant theoretical perspective from objectivist to constructivist. Until the early 2000s, the dominant KM discourse utilized neo-functional perspectives for knowledge research, limiting the conversation to defining knowledge as a codified object and excluding its social and dynamic contexts (Hislop 2013; Nicolini, et al., 2003). Although this approach still exists, practice-based approaches that use situated-knowledge perspectives have gained popularity with KM researchers (Corradi, et al., 2010). The practice-based approach assumes social and cultural embeddedness in defining knowledge, emphasizing its "active and situated character" (Timonen and Jalonen 2008:871; also Nicolini, et al., 2003). Therefore, practice-based epistemologies refocus KM research from categorizing different knowledge types to considering work practices, contexts, and the co-occurrence of knowledge and action (Schultze and Stabell 2004). Recognizing individuals' knowledge as socially-constructed and dynamic offers a more holistic lens than the dichotomous tacit-explicit lens for considering the impact knowledge has on professional behaviours.

The knowledge management field receives similar criticism as the water governance field. The literature supports diverse definitions and methodological approaches, some disciplines overly emphasize economic benefit, and the field is often perceived as too theoretical for practical application within business sectors (Hislop 2013; Timonen and Jalonen 2008; Sorenko, et al., 2010). However, Schultze and Stabell (2004) highlight a gap in knowledge management literature that according to recent reviews has not thoroughly been incorporated: a dissensus-based perspective. The dominant perspectives compared above, neo-functional and practice-based, both utilize consensus-based approaches that exclude opportunities to research power, conflict, and dissent within KM processes. Section 2.2.4 elaborates on this concept.

Overall, KM concepts benefit the WG literature by defining knowledge processes such as knowledge creation, knowledge sharing, knowledge transfer and integration. Water governance literature incorporates these concepts into its principles using terms such as legitimacy, collaboration, coordination, interdisciplinary, and acknowledging knowledge's elemental role in governance processes. Overlaps between KM and environmental psychology literature consider more behavioural elements, geared towards knowledge's use and impact.

2.1.3 Environmental Psychology

Robert Gifford, a prominent EP professor in Canada, recently published a review of this literature in *Environmental Psychology Matters* (2014). He explains how environmental psychology emerged in academia roughly 50 years ago as a method to examine psychology's physical settings, contesting the assumption that behaviour occurred in vacuums. Its original focus emphasized the co-dependent relationship between human and environmental welfare, helping to inform urban and civil planning. With an increased public awareness of humans' impact on the natural environment, there have been calls to change human behaviours that are detrimental to the environment. Environmental psychology provides theoretical and practice-based research intended to improve human-environment interactions. *Journal of Environmental Psychology* submissions quadrupled between 2002 and 2012 (Gifford 2014:543) showing global acknowledgement for the discipline's essential role in sustainable development. Major behavioural topics include: climate change and human behaviour; measuring individual's nature connection; impacts place attachment have on forming identity; and strategies to promote behavioural change — 'intervention science'. Although these topics contribute to understanding environmental values, attitudes and concerns, pro-environmental behaviour (PEB) provides the most relevant research domain for my study.

An extensive literature has been developed for environmental concern and attitudes. Early criticisms suggested its extension into behavioural studies, requesting explicit social-psychological models for mapping attitude-behaviour relationships (Stern, et al., 1995). In response, "several attempts have been made to describe… the individual and social factors that influence whether a given person will tend to have concern about the environment or act in pro-environmental ways" (Gifford and Nilsson 2014:141). 'Pro-environmental behaviours' are defined as an individual's actions that consciously reduce negative environmental impacts (Kollmuss and Agyeman 2002). Several valid PEB models exist from diverse disciplinary origins; although their driving factors often conflict, they can be complementary in forming integrated models (Mcdonald 2014). The most widely used theory in water management research, the theory of planned behaviour (TPB) [Ajzen 1991], uses the assumption that intention — a person's willingness or ability to engage — precedes behaviour, and then seeks to define the influential factors that underpin the intentions (Russell and Fielding 2010). This

theory originally isolated explicit and tacit knowledge types, considering human decision-making as a rational process for selecting behaviours (McDonald 2014). However, a recent trend in PEB literature extended this theory, integrating influential factors from other models and considering knowledge types in tandem.

Several studies have integrated non-rational and external factors within PEB models in order "to address the multidimensionality of human behaviour" (McDonald 2014:279; also Duerden and Witt 2010; Gifford 2008; Hinds and Sparks 2008; Steg, et al., 2014). Therefore, pro-environmental models can consider behaviour on macro- or mesoscales and with a range in scope depending on how many indicators are included (Gifford and Nilsson 2014). Inclusive models are criticized as too broad and difficult for measuring prediction, while focused; more measurable models tend to yield partial pictures. "The price of simplicity is incompleteness, and excluded influences undoubtedly play a role" (Gifford 2014:551). This common dilemma with modeling mirrors Hislop's (2013) criticism for KM research approaches, where external factors are neglected considerations for knowledge processes. Several combinations of PEB models were extended to workplace settings, integrating concepts from KM research. The modelling provides a second major benefit to my study.

Organizations that acknowledge their contribution to environmental degradation can use PEB as an approach to improving their environmental impact by exploring employees' behaviour in the workplace. McDonald (2014) synthesized the current literature that applies general PEB models to the workplace. A number of models have been tested yielding no consensus or agreement on which behavioural determinants are strongest or most relevant within the workplace. The research acknowledged the need to consider organizational and personal factors concurrently, yet the proposed conceptual frameworks continue to neglect important factors from those two categories. McDonald's review identified the need for an integrated model of the antecedents of pro-environmental behaviour in the workplace, advocating for motivational factors as distinct from the intrapersonal, interpersonal and external factor categories. "The proposed model can provide insights into possible interventions for pro-environmental behaviour in the workplace" (McDonald 2014:296). In a WG context, it lends insight for understanding professional norms and how to target behaviour

change for governance transitions. Thus far, this research operates on an intra-organizational scale and has not been applied to inter-organizational collaborative settings.

2.1.4 Summary

The three literatures introduced have qualities, criticisms and trends in common. On a practical level, all three literatures are difficult to define and rapidly evolve. Despite being well-published, their inherent interdisciplinarity causes the disciplines to lack representation in academic institutions. For instance, Gifford (2014) highlighted the discrepancy between environmental psychology journal articles published and environmental psychology professors in psychology departments in 2012. Hislop (2013) found a similar discrepancy between knowledge management publications and 'seats' in academic institutions. They all sustain academic interest, demonstrated by the expansion of acceptable frameworks and methods. Yet, each has been reviewed recently and criticised for being too theoretical for application outside academia.

On a theoretical level, each literature recently adopted a social, humanist lens to complement its technological management lens. All three evolved to conceptualize knowledge as process-oriented and dynamic. They each validate diverse knowledge types and sources, yet struggle to integrate them. Each literature operates on a variety of scales, acknowledging the need to incorporate macro-, micro-perspectives and contextual variables as well as the challenges created by that inclusiveness. All three acknowledge the individual scale, as a component of a larger unit. These theoretical similarities form the foundation of my research program. In reviewing the literature, I identified several overlapping research domains, five of which were prioritized for supporting my conceptual framework.

2.2 Overlapping Concepts from Literatures

Over the past decade, a number of assertions regarding water governance and its implementation have emerged. While these assertions have derived from diverse disciplines, researchers have identified them as important theoretical considerations for water governance. I introduce several assertions relevant to my research question below.

2.2.1 The new importance of 'the role of the individual': distributed responsibility, knowledge and skills.

There is general agreement that decentralized governance creates an effective and resilient decision-making process for complex environmental issues, by generating a democratic, contextualized approach (Beratan 2007; Pollard, et al., 2014; Renner and Schneider 2013; Rogers and Hall 2003). Water governance literature has adopted a norm that inclusivity — of both actors and their knowledge types — improves a decision's strength, longevity and compliance (Head 2014; Nowlan and Bakker 2010; Olsson, et al., 2006; Simms and de Loë 2010; Wiek and Larson 2012; Wolfe and Hendriks 2010). Entire literature bodies exist for consensus-based decision-making, collaboration, leadership, networks and learning organizations, which detail the characteristics and roles individuals play in building social capacity. Analyzing all these concepts exceeds this Chapter's scope; however, they have been incorporated into water governance research (e.g.- Al-Jayyousi n.d.; Al-jayyousi 2004; Gonzalez, et al., 2009), and informed this section.

Decentralized water governance emphasizes an individual's role by distributing responsibility amongst the actors involved. Inherently multi-stakeholder and multi-scalar, decentralized governance increases the number of potential actors involved and the partnerships available between them[1]. This variety in partnerships creates uncertainty in defining responsibility and accountability for individuals that was not required by more linear governance regimes (Kreutzwiser and de Loë 2010; Sabatier, et al., 2005). Decentralized water governance approaches often cause "frustrat[ion for] development, but the mature nature of society demands" it (Rogers and Hall 2003:27).

The major challenge of decentralized WG is not considered to be insufficient technology or scientific knowledge; it is the behavioural coordination among actors, their knowledge and their activities (van de Meene, et al., 2011; Meijerink and Huitema 2010; Wiek and Larson, 2012). Decentralized governance processes require more interactive and interdisciplinary skills

[1] Potential 'actors' can include: individual actors (Aboriginals, citizens, future generations), research organizations, international players, industry groups (infrastructure service providers, banks), the private sector (companies and consultants) (Simms and de Loë 2010). Therefore, 'participants' or 'professionals' of WG, are not restricted to the traditional definition of 'decision-makers' regarding those with legal authority/voice (Rogers and Hall 2003).

from its professionals. Such skills are often grounded in tacit assumptions, habits and capabilities (Fraijo-sing, et al., 2010). For example, research suggests modern WG expects its professionals to:

a) Possess more flexibility and open-mindedness; ability and willingness to integrate knowledge types (Head 2014; Olsson, et al., 2006[2]).
b) Credibly represent their 'expertise'; individual onus for improving communication and relatability skills (Braden et al., 2014; Olsson, et al., 2006).
c) Self-organize, continually learns and adapt to changing conditions (Head 2014; Pahl-Wostl, et alk., 2013a).
d) Intricately understand the field and its actors; capacity to interact with multiple sectors; capitalize on networks (Meijerink and Huitema 2010; Pahl-Wostl, et al., 2013b; Olsson, et al., 2006).
e) Re-conceptualize issues and shape novel solutions (Particularly leaders) (Olsson, et al., 2006).
f) Develop commitment strategies for maintaining momentum and accountability (Meijerink and Huitema 2010; Olsson, et al., 2006).

These professional skills highlight the elemental role knowledge, particularly tacit knowledge, and its management play in securing a successful decentralized water management regime. The most successful case studies implement effective coordination mechanisms, for both participation and knowledge, and social mechanisms that foster shared vision amongst actors (Lagacè 2011; Olsson, et al., 2006; Pahl-Wostl, et al., 2013b; Renner and Schneider 2013). Actors' knowledge, therefore, creates major barriers to WG implementation. Olsson, et al., (2006:15) described changing key individuals' entrenched knowledge – opinions and values - as a critical challenge in governance transitions. Difficulty in shifting knowledge was not a new conclusion; a reiteration from 2000 states:

[2] Olsson, et al., (2006) compare five international case studies to analyze the professional behaviours required by water governance transitions. Chapter Three explains how this article helped define target behaviours for analysis (**Table 3.5**).

> "Rapid changes in water policy worldwide have not occurred [in 2000]… part of the problem lies in old thinking among [decision makers]. An ethic of sustainability will require fundamental changes in how we think about water and such changes come about slowly" (Gleick 2000:136).

If individuals' knowledge consistently impedes governance shifts, then a deeper understanding of how water professionals' think is important preparation for changing 'old thinking'. Further challenges arise for individuals' knowledge processes during collaborative work settings.

2.2.2 Challenges arise when several 'individuals' make transdisciplinary decisions together

The prevalence of multi-stakeholder, multi-disciplinary work is greater in contemporary organizations due to globalized information systems and economies (Gleick 2000; Hislop 2013; de Loë 2009). Therefore, professionals more frequently face challenges in collaborating across different disciplines. Knowledge management researchers have thoroughly considered the knowledge-based challenges surrounding transdisciplinary work requirements and sought strategies to overcome them (Lang, et al., 2012; Oborn and Dawson 2010; Renner, et al., 2014). Cross-community working groups often face more inefficiency and conflict during a given process, due to their lack of common knowledge, identity and worldview (Hislop 2013;).

Knowledge management literature recognizes professionals' 'identity' as an important challenge to address in cross-community work contexts. People can align their identity with multiple groups — personal, professional, cultural, national — from which differences in culturally embedded values and norms can create interpersonal and intrapersonal conflict (Chen, et al., 2010; Corradi, et al., 2010; van Wijk, et al., 2008). "Many [KM] researchers suggest tacit knowledge cannot be explicated but transfer is possible through socialization" (Chen, et al., 2010:229), which is why networks, trust, coalition-building, social learning practices are predominant solution strategies (Sorenko, et al., 2010).

In addition to developing mutual trust, cross-community knowledge processes utilize social interactions to cultivate understanding and tolerance for the fundamentally different "values, assumptions, and viewpoints which underpin each other's knowledge base" (Hislop 2013:184). People's ability to adapt their knowledge is another considerable challenge for cross-community work, as the process often requires significantly more time than single-discipline work. Knowledge and knowledge-based skills are intricately tied to a professional's

competence. Processes that include unlearning old ideas or adding new knowledge practices require a professional to willingly risk his or her professional confidence (Brown, et al., 2011; Hislop, et al., 2013; Majchrzak, et al., 2012; Sarewitz 2004). Collaborative knowledge production processes also place greater onus on professionals to represent their different expertises with credible and effective communication (Oborn and Dawson 2012). Identifying and confronting knowledge-related difference in cross-community contexts requires considerable trust, time, resources and continued discourse (Beratan 2007; Hislop 2013; Lang, et al., 2012; Majchrzak, et al., 2012; Renner, et al., 2014). Literature often use the political or physical management of water as a case example to advocate for transdisciplinary work.

Water governance research also acknowledges transdisciplinary knowledge production as a social learning process, framing identity and knowledge conflicts in discussions about 'networks' and 'legitimacy'. Case study analyses highlighted competing interests, divergent worldviews and "the absence of mutual trust" (Renner and Schneider 2013:239; also, Legacè 2011; Pahl-Wostl 2013b; Taylor, et al., 2012) as crucial challenges in collaborative governance. Professional networks play pivotal roles in creating common identity and vision between WG actors (Pahl-Wostl, et al., 2013b). Through trust-building and dialogue, professional networks promote information exchange and integration, from which new knowledge can form (Lagacè 2011; Nowlan and Bakker 2010; Olsson, et al., 2006). Collaborative water governance research has considered knowledge legitimacy — its production, its transfer, its collective use (Braden et al. 2014; Taylor, et al., 2013). It acknowledged the need to integrate and balance different forms of knowledge — local, scientific, Traditional First Nation — and social mechanisms to legitimize each type (Baird, et al., 2011; Gonzalez, et al., 2009; Simms and de Loë 2010). Advancing the literature on transdisciplinary solutions would benefit WG implementation and effectiveness (Head 2014; Renner and Schneider 2013).

Most of these transdisciplinary challenges involve social and psychological factors founded on implicit knowledge, yet the solutions involve explicit communication formats: individuals expressing their knowledge and socially integrating what is expressed (Braden, et al., 2014; Schultze and Stabell 2004). This macro-perspective on group dynamics and

consensus-making excludes the psychological micro-perspective on how individuals biologically make decisions or the underlying variables that influence those decisions. The following sections review research that explores ways in which individuals may not consciously control their knowledge.

2.2.3 Affective Domains: Implicit cognition as a recognized element of an individual's professional contributions

Cognitive processes transform an individual's experiences into their emotions, their beliefs, and ultimately their behaviour (Beratan 2007). Human behaviour drives the complex issues that challenge the WRP community. Yet, major decisions are based strictly on explicit knowledge. Researchers have argued that better decisions are made when tacit knowledge is employed (Brockmann and Anthony 2002; Eraut 2000; van de Meene, et al., 2011) and that using a cognition-based view of decision-making that incorporates emotions and affect can improve policy and management development (Beratan 2007; Sivkamur 2011, 2014).

Psychology and knowledge management researchers acknowledge an individual's affective domains as critical for learning and developing a professional's performance (Durbin 2011; Eraut 2000; Hislop, et al., 2013; McDonald 2014). Explicit KM requires efficient organization, administration skills, and expertise; whereas tacit KM is a professional's underlying foundation of creativity, social skills and competence. Employee-employer relations, interpersonal trust, national culture, personality, group identity are all socio-cultural factors KM literature addresses to define their influence on workers' performance (Hislop 2013). For instance, recent studies investigated the impacts tacit components such as emotions (van den Hooff, et al., 2012), trust (Holste and Fields 2010), or affective commitment (Matzler, et al., 2011) have on professionals' willingness to share knowledge. The socially intuitive, conflict mediating, and adaptive behaviours required by transdisciplinary work are founded on tacit knowledge and its management (Rogers and Hall 2003). If tacit knowledge determines an individual's skills and decision-making methods for applying their explicit knowledge, then it affects the efficiency and effectiveness of their KM, and ultimately their ability and commitment to contribute to the WRP community.

Environmental psychologists have explored the impacts individuals' affective connection to nature has on behaviour and intentions (Frantz, et al., 2005; Kashima, et al., 2014; Mayer and Frantz 2004). Hinds and Sparks (2008:112) define affective connection as "the subjective experience of an emotional attachment with the natural environment", and provide examples for how it links place-identity and empathy to pro-environmental behaviours and concern. Their findings support theoretical EP research on the importance of affective connection as a motivation for humans to engage, empathize, and identify with nature. They found a significant correlation between affective connection and environmental identity, which underscores how an individual's identity and worldview are founded on experiential, emotive knowledge sources.

Affective domains are incorporated into some water governance research, particularly with reference to water's emotive quality. Humans' affective relationship to water through language, story, place and experience, and the impact that relationship has on developing values, beliefs, motives comprise an extensive research body (Burmil, et al., 1999; Corral-Verdugo, et al., 2003; Gonzalez, et al., 2009; Hamlin 2000; Strang 2006a, 2006b; Sultana 2011; White, et al., 2010). An individual's tacit knowledge of water, their contextualized water knowledge, can stem from religious texts, outdoor experiences, the terminology used, nature connection and other sources (see section 2.2.5). However, they are personal perspectives, not applied to professionals' decision-making or governance processes.

Water's affective quality is investigated in professional WG contexts through recommendations and vulnerability. Some researchers have explored practitioners 'tacit' knowledge 'from the field' for use in informing recommendations to improve water governance (Fazey, et al., 2006; Van de Meene, et al., 2011; Wallis and Ison 2011; Wolfe and Hendricks 2011). Renner and Schneider (2013) express concern regarding the affective domain in water governance, as water's emotion-evoking quality makes the process's knowledge more vulnerable to political manipulation. For example "powerful individuals (e.g., mayors) claimed the rights to sensitive research results to secure their own positions…the media were mentioned in some cases as having sensationalized the research" (Renner and Schneider 2013:244). Affective relationships are not exclusively positive; they can be significant components of

human's coping mechanisms for fearful and threatening beliefs about nature. Due to water's obvious and urgent link to human survival, it is important to consider the influence power and conflict have on constructing water knowledge and behaviour.

2.2.4 'Facts': how power, politics, and conflict constructs knowledge

Power, politics and conflict are largely neglected factors in KM literature (Hislop 2013), even though prominent theorists in political science, philosophy and sociology (e.g., Foucault) document the role power plays in constructing knowledge and controlling behaviour (Chomsky 2003; Lukes 2005). The political decision-making processes required by water governance can be framed as a form of conflict management between its actors, "a process of adjudicating value disputes" (Sarewitz 2004:398). Powers — actors with political influence — can control a political agenda by prioritizing which values are included in the adjudication process, or by developing the 'acceptable' discourse or value system for an issue within the relevant social group (Lukes 1974). The ways in which power influences an individual's knowledge through public education, social norms, or mass media are so deeply embedded and routinized into everyday life that they often go unnoticed as an impactful element on tacit behaviour. Although a thorough discussion of power theories is outside the scope of my research, considering power and its potential influence on decision-making processes yields valuable insights for my research.

Sarewitz (2004) considered internal (value-based scientific orientation) and external (embeddedness within political contexts) factors that influence a scientist's disciplinary lens and the impact these lenses have on reinforcing rather than resolving environmental conflicts. He argued political stagnation on environmental controversies does not stem from insufficient scientific knowledge, but rather from the diversity of valid disciplinary lenses and the 'excess of objectivity' created. With such broad, well-developed scientific foundations on a topic, "facts can be assembled to support entirely different interpretations of what is going on and entirely different courses of action for how to address what is going on" (Sarewitz 2004:389). The scientific disunity and political conflicts that result cause uncertainty and frequently stifle meaningful change.

Uncertainty concepts are echoed in criticisms on WG literature, through discrepancy in definition, scientific approaches and implementation problems (Bakker 2010; Pahl-Wostl, et al., 2013a, 2013b). The ways in which water knowledge is framed determines the discourse on water and contributes to either political success or failure for WG (Meirjlink and Huitema 2010). For instance, unfounded claims about water scarcity and conflict — particularly phrases like "water wars" — fueled water's position in global political agendas (Biswas and Tortajada 2010). However, they have also stifled action by trapping it in a decades-long debate on whether water creates conflict or cooperation (Naff and Matson 1984; Wolf 2000; Zeitoun and Mirumachi 2008).

Sarewitz (2004) also explains how politics can disguise the influence powerful actors have on setting agendas by 'scientizing' conflictual issues. By using scientific facts and technical arguments to conceal underlying values or interests, a debate can be camouflaged as a purely objective process to be respected and given the dominance we attribute to science go uncontested. Society has an "enduring social commitment to the idea of scientific facts as detached from values" (Sarewitz 2004:397) despite immense scholarly research on situated, contextual knowledge.

Water governance literature has acknowledged science's embeddedness in politics with 'hydro-politics' (Alweshah 1992; Rodda 1995; Wolf 2007). This literature not only considered the relationship between science and politics, but also the way political actors control or manipulate scientific knowledge on water, constructing knowledge for a targeted audience to benefit their agenda (Fritsche and Hafner 2011; Renner and Schneider 2013; Zeitoun and Warner 2006). Zeitoun and Warner (2006) considered knowledge construction and its political manipulation in water governance contexts with a framework called 'hydro-hegemony'. They described how a state can securitize a water issue, controlling the public knowledge and discourse on the topic (see p. 448 for details).

Knowledge about water, particularly due to its emotive qualities, can easily be manipulated to form 'facts' and trigger social unity in believing those facts.

> "Water becomes 'securitized' when it is portrayed as an essential component of national security. It then leaves the realm of what is negotiable and subject to compromise (in-text citations). Any change in existing allocations is perceived as a threat to national security and proposals for change are portrayed as treasonous" (Brooks and Trottier 2014:214).

Brooks and Trottier explained how political control can construct a water 'fact' which then excludes the possibility for dissenting or alternative perspectives. Political control constructs a knowledge reality that is socially unacceptable to contest. A case study by Brown, et al., (2011) exemplified how political pressure can create and reinforce water 'facts'. Professionals from their case submitted to the 'fact' that their established water governance regime is static. They perceived too much professional risk in communicating dissenting perspectives, and that professional fear prevented meaningful change. Section 4.4.2 elaborates on the psychological implications perceived uncertainty creates for professionals.

Social norms, the knowledge they emerged from and the impact they have on human behaviour, are a consistent research topic in both KM and EP literature (Chen, et al., 2010; Cialdini 2003; Steg, et al., 2014). Recently, environmental psychologists have looked more deeply into the psychological impacts that threatening environmental 'facts' and media have on individual and collective behaviour (Fritsche, et al., 2010; Giannakakis and Fritsche 2011). Investigating the role of fear in fostering social unity, social norms, and behaviour is a research topic that requires concurrent consideration for internal and external knowledge influences. It is an example of research that moves beyond the assumption that knowledge translates directly into action and incorporates more psychological factors in determining behavioural decision-making.

2.2.5 Predicting pro-environmental behaviour: imperfect, well-defined models

The linear assumption that knowledge translates directly into action — to which policy, advertising and educational campaigns frequently still adhere — has become an outdated concept in behaviour research, replaced by the acknowledgement that attitudes and behaviour are very complex (Barr and Gilg 2007). As introduced in section 2.1.3, pro-environmental behaviour (PEB) models have a well-established indicator list including over 30 variables that form human knowledge and influence human behaviour (Gifford 2014). Gifford and Nilsson (2014) addressed the variability in pro-environmental behaviour; "humans are an extremely

protean species. Succinct theories and models… must include a broad range of personal and social influences" (Gifford and Nilsson 2014:141). Identifying which indicators have the strongest impact, pursuing quantitative behaviour analysis, resulted in a significant body of research and several meta-analyses.

For example, Hines et al. (1986) reviewed over 300 PEB studies, identifying six indicators with the strongest behavioural predictability: knowledge of the issues, knowledge of correlating action strategies, attitudes, commitment, locus of control and personal responsibility. Bamberg and Moser (2007) replicated the 1980s analysis, confirming these indicators as strongest for predictability, and also emphasized the importance of behavioural intention as a mediator between psycho-social influences and behaviour selection. McDonald's (2014) PEB review frames the research in a professional context, providing interdisciplinary backgrounds for each indicator (Appendix 1). Perceived behavioural control consistently ranks as one of the strongest indicators for determining behaviour (Bamberg and Moser, 2007; Gifford 2014; Hines, et al., 1986; McDonald 2014). Therefore, I discuss 'perceived behavioural control', here, as an indicator exemplar; brief definitions for other indicators are included in Chapter Three (Table 3.4).

An individual's level of perceived behavioural control rates the "extent to which individuals hold a belief that they can carry out the activity, especially logistical elements, such as time and convenience" (Barr and Gilg 2007:365). Other definitions extend the definition beyond logistics to include a sense of empowerment or self-efficacy in completing an action (Gifford 2014). In knowledge management research, perceived control can be used to incorporate contextual factors such as political constraints, mentorship, and organizational culture (Chen, et al., 2010; Graves, et al., 2013; Hislop 2013).

In a professional context, perceived behavioural control is frequently designated as an intrapersonal variable, yet its influence on extrinsic motivation is distinct and significant (McDonald 2014). Perceived behavioural control can act as a filter between attitudes and behaviour, as either a positive motivator or negative barrier. For instance, individuals with greater internal motivation were found to seek and utilize knowledge in solving environmental problems more effectively than those who relied strictly on an external locus of control

(Gifford and Nilsson 2014). Perceived control has a significant impact on how an individual commits to a given action, and also how they cope with stressful environmental knowledge. A person's perceived control over his or her self-efficacy to make a tangible impact was also framed as a "coping mechanism to perceived stress" (McDonald 2014:294). Perceived control was applied to public water conservation practices (Lam 2006), but was largely missing from water governance research.

2.2.6 Summary of overlapping concepts and research gaps

To summarize thus far, several concepts from this tri-literature synthesis define an individual's role in WG:

a) We know that the volume of knowledge incorporated into water governance practices is much greater and diverse than during the 1980s, before the 'knowledge economy' and widespread understanding of environmental complexity. The nature of contemporary work expects collaborative processes that integrate knowledge types.
b) With more actors at the table trying to form a consensus or collaborate, more challenges emerge within knowledge processes. Opportunities for conflict arise from creating commonalities and validation between different knowledge types.
c) The contextual and affective nature of knowledge is recognized in both WG and KM literature, but it has not been integrated into the science-informed political process as the social norm is to consider scientific knowledge as objective, as independent from values and interests.
d) Objectivity has political implications including both stagnation and manipulation, providing evidence for the impact knowledge has on professionals' behaviour. Additional psychological and behavioural impacts are defined for threatening environmental knowledge. However, the behavioural impact an individuals' contextual and affective knowledge has is neglected when assessing performance and implementation gaps in WG.
e) Environmental psychologists have analyzed social and psychological attitudes that couple with explicit knowledge in determining an individual's behaviour. The research explored individual's knowledge and behaviour regarding public water conservation practices. However, this research domain has not yet overlapped with professionals in WG fields.

f) The state of understanding of professional's attitudes, knowledge and behaviour with respect to water governance processes culminates in: it's complicated. There are strategies to cope with some of the above issues, but it appears that WG researchers struggle to grapple with all of these factors at once.

Two specific gaps identified by this review relate to my research objectives, rationalizing the need for a new conceptual framework: insufficient psychology research in water governance and lack of qualitative pro-environmental behaviour methods.

2.2.6.1 Insufficient research on psychology for water governance

Emerging fields such as social neuroscience and cognitive anthropology link micro- (neural circuits) and macro- (interpersonal relations) levels of individual and collective decision-making processes (Beratan 2007; Northoff 2010). This link is underdeveloped in collaborative water governance research. The literature gleans tacit insights from practitioners in the field to inform WG and policy improvements. But, it has not adequately considered professionals' psychology as a potential influential factor or procedural informant (Braden, et al., 2014; Groenfeldt and Schmidt 2013; Sivakumar 2011, 2014). Underlying the complicated set of concepts and processes involved in WG is the existence of each individual's values and behaviour. Water governance "effectiveness, therefore, requires an understanding of how actors navigate socio-cultural norms and how ecosystems are comprehended" (Groenfeldt and Schmidt 2013:2). Incorporating research on human behaviour from EP and KM can inform the performance gap that inhibits water governance implementation. Section 2.3 presents research that partially incorporates professionals' psychology into WG research.

2.2.6.2 Limited by quantitative methods: proposing PEB-WG as an interdisciplinary match

Pro-environmental behaviour literature has focused interest on validity and predictability of its quantitative models. Although these are two benefits to taking a quantitative approach, clear contradictions between measurability and completeness have been identified for PEB research (Gifford 2014 — as discussed in section 2.1.3). Quantitative assessments also restrict PEB research to highly-specific behaviours, such as personal recycling or transportation decisions, excluding the possibility to consider general behaviour patterns.

If human behaviour is so circumstantial, amoebic, and embedded in context, then perhaps quantitative studies lend only limited value to WG behavioural studies and would be better explored by qualitative analysis. Qualitative approaches provide depth and richness of insight unachievable through quantitative forms (elaborated in Chapter 3). Can PEB models be utilized in a qualitative manner, capitalizing on well-researched inclusive indicator sets to inform the psychological research need in WG literature? It appears PEB models are not utilized qualitatively and have not been applied to inter-organizational collaborative settings like a WRP community. Their focal behaviours are specific and do not consider general professional goals or outcomes. However, applying PEB indicators to a WG case may be useful for understanding professional norms and how to target behaviour change for governance transitions. Recent WG reviews recommend that researchers apply methodological tools from more diverse disciplines (Araral and Wang 2013; Gupta, et al., 2013).

2.3 Developing a Conceptual Framework

I apply pro-environmental indicators to a water governance case study that considers professionals' knowledge management (Figure 2.1**: Conceptual Framework**). Environmental psychology theories, particularly PEB, offer defined influences on behaviour. These definitions allow more clarity and nuance than the dichotomous tacit-explicit models offered through traditional KM research. Water governance literature provides a contextual setting for the research; its intersection with KM literature identified professional behaviours to target. The intersection between WG-EP marks the absence of research on professional behaviour in water governance literature, as this overlap predominantly details household conservation practices for water demand management. Figure 2.1 encapsulates my Israeli Case at the center of the integrated literature, questioning how the ways WRP professionals think about water (Obj. 1) influences (Obj. 3) their professional behaviours (Obj. 2).

Figure 2.1: Conceptual Framework. Overlapping literatures define three objectives: 1, identify attitudinal indicators of professionals' knowledge sources; 2, categorize targeted professional behaviours; 3, identify influence of knowledge sources on professional behaviour in the Israeli Case Study.

Water governance scholars have approached professionals' psychology as a research gap from different perspectives. Here are five example frameworks with similar rationale and objectives to my conceptual framework, yet still insufficient for use in answering my research question.

Table 2.1: Summary of similar research and conceptual frameworks with rationale for insufficiency

Framework	Research Focus	Insufficiency
No Framework proposed (Braden, et al. 2014)	Individuals' interdisciplinary explicit KM in WG	Excludes tacit factors and behaviour
Adaptive Management (Brown, et al., 2011; Rijke, et al., 2013)	Individuals' knowledge adaptability in WG	Excludes influence of non-professional knowledge
Water Ethics (Groenfeldt and Schmidt 2013)	Tacit knowledge and contextual variable integration for identifying compatible water governance strategies.	Operates on geographic and institutional scales; does not consider individual influence.
Systems Framework for Water Governance (Wiek and Larson 2012)	Actor-focused approach integrates tacit and cultural factors into water governance transitions.	Similar. Uses systems-science language instead of pro-environmental behaviour. A systems approach is outside scope of this thesis.
Hydro-psychology (Sivakumar 2011)	Conflict-management approach; considers bi-directional knowledge relationship between governance and professionals.	Theoretically sufficient. No methodology proposed.

Braden, et al., (2014) took an individual professional perspective to measure social and natural scientists' capabilities in conducting interdisciplinary research. The study found shared interest among all scientists for acquiring knowledge on the human dimensions of water research. Although this study focused on individuals' professional knowledge management within a WG context, it considered only explicit knowledge, excluding behavioural and psychological factors.

Some researchers interviewed individual water governance professionals to investigate the influence political and psychological factors had on their knowledge adaptability (Brown, et al., 2011; Rijke, et al., 2013). These studies integrated the politically-constructed water 'facts' concept from section 2.2.4, with professional tacit knowledge management through both cognitive and behavioural unlearning. Despite being excellent research exemplars for the interface between water governance and tacit knowledge management, they excluded the impacts of psychological influences from non-professional identities, values and norms.

In contrast, Groenfeldt and Schmidt (2013) proposed a value-based approach; the framework defined governance strategies that recognize multiple water values within a given context. They stressed the need to understand tacit values from the actors and cultures involved in water governance processes in order to select the most suitable strategies. The research thoroughly integrated tacit KM and WG concepts using value concepts from environmental psychology, such as placed-based water meanings. Although this approach incorporated all three literatures used in my framework, the authors applied it to geographic and institutional scales, not to individual professionals.

Wiek and Larson (2012) defined a similar framework to mine; their Systems Framework for Water Governance centered on actors and their activities. The researchers used a 'who, what, and why' approach to understanding water governance and in guiding WG transitions. Their framework integrated all three literatures by: detailing the actors and actions involved in WG decision-making; and defending social norms, professional cultures, and external factors as important determinants. However, the systems-based approach to studying water governance applied a larger scope and operated on more scales than my study did.

Sivakumar (2011) proposed 'Hydro-psychology' as a conceptual framework to advance water planning and management. Taking a conflict-management approach, the framework acknowledged psychology's importance within water research and decision-making. It recognized the bi-directional knowledge relationship between WG and its professionals; a decision-making context impacts how professionals think and behave while the professionals' behaviours simultaneously impact the decision-making context. This research compares to both Groenfeldt and Schmidt's (2013) value-based approach and Wiek and Larson's (2012) system-based approach in that it acknowledged psychological values are not the only relevant variables, that contextual and cultural values also influence a professional's behavioural motives. Powerful contextual indicators can include, for example: "political and religious compulsions as well as national pride" (Sivakumar 2011:730). In 2014, the author proposed a coupling between hydro-politics and hydro-psychology as a balanced perspective for internal and external influences on human behaviour within water governance (Sivakumar 2014). However, Sivakumar did not develop a methodological approach for other researchers to use.

During the literature review, I identified most closely with hydro-psychology's perspective. The bi-directional relationship between professionals' knowledge and their knowledge context mirrors my research assumption that knowledge is both constructed and realized (See 3.2). Hydro-psychology takes an individual's perspective to develop a 'hydro-psychological' profile on a given WG issue and the actions taken to resolve it. The approach requires WG researchers to consider an often intentionally overlooked research topic: human behaviour; it requires qualitative research on the sensitive factors that underlie individual professionals' behaviour — including, "most importantly, the mental and emotional state of the individual" (Sivakumar 2011:730). By explicitly acknowledging social and behavioural sciences' benefit to developing methods for water governance research, Sivakumar's (2011) framework rationalizes my application of an indicator list from environmental psychology's pro-environmental behaviour literature. Chapter Three elaborates on how common methodological practices from EP-KM and WG-KM research were combined to design a compatible research approach for my tri-disciplinary framework.

Chapter 3. Methodology and Methods

Qualitative methodologies have evolved over the past 50 years to oppose the dominant positivist approach or 'audit culture' in science; qualitative inquiry challenged the assumption that measurement provides proof (Denzin and Giardina 2015; Mansvelt and Berg 2010). In questioning foundational scientific assumptions, qualitative inquiry emphasized the human, moral, situated elements of science and developed new appropriate methods, also known as "situated interpretive practices" (Denzin and Lincoln 2014; Kerr 2011). The theoretical patterns shared by the three kinds of literature reviewed in Chapter Two – practice-based approaches to research, knowledge defines as dynamic processes, context as crucial to research and understanding – reflect the principles of qualitative inquiry. At a time when society is experiencing a critical process of questioning and legitimizing authority (Lather 2009), qualitative inquiry plays a significant role in freeing science from its rigid structure and incorporating new types of knowledge into public discourse and policy (Denzin and Giardina 2015). Qualitative methodology is appropriate for this study. If water governance requires a shift in what knowledge is valued, then we need to change *how* we value it.

3.1 Defining a Compatible Methodology

Developing a compatible methodology for my transdisciplinary conceptual framework required a critical review of disciplinary methods. Trends from this review revealed a distinction between how water governance and environmental psychology research collect and utilize individuals' tacit knowledge. Environmental psychology tends to emphasize quantitative behavioural predictions, whereas water governance prioritizes qualitative data for informing governance theory.

Many studies within the EP-KM intersection focused on environmental behaviour to evaluate a given framework's predictive value or argued for the addition of new elements to a framework. Researchers employed surveys or questionnaires to rate individuals' tacit responses for quantitative analysis (Barr and Gilg 2007; Corral-Verdugo, et al., 2003; Duerden and Witt 2010; Hinds and Sparks 2008; Mayer and Frantz 2004; Stern, et al., 1995). Some studies performed mixed methods combining qualitative interview and observation data with

quantifiable questionnaire data (Chao and Lam 2011; Duerden and Witt 2010; Egri and Herman 2000). Analyses used predetermined, rigid coding schemes and various statistical tests. Many of these EP-KM researchers designed analytical frameworks informed by pro-environmental behaviour principles (e.g., openness to change, altruism, egoism), and organized the codes according to their research objectives. Pro-environmental behaviour is a widely applied framework that has been used to study water management by predicting public conservation behaviours (Corral-Verdugo, et al., 2003; Russell and Fielding 2010).

The small body of literature combining individual tacit KM and water governance is primarily qualitative, expanding on previously defined principles and concerns. Researchers who investigated professionals in water governance implemented in-depth semi-structured or open interview methods with grounded or thematic data analysis (Braden, et al., 2014; Brown, et al., 2011; Taylor, et al., 2013; Van de Meene, et al., 2011; Wolfe 2009; Wolfe and Hendriks 2010). Some of this research, not based on environmental psychology theory, reported codes grounded in their data that mirror PEB concepts (e.g., biophysical or socio-cultural context, emotions, personal values or societal norms) but did not explicitly connect their study to environmental psychology theory.

In environmental psychology, support for case study research emerged during the theoretical debate on whether information translates into action. Case studies (e.g.- Burgess, et al., 1995; Kempton, et al., 1995) advanced EP theory by using in-depth interview data to draw connections between individuals' environmental values and those of their broader societal, political cultures. These studies recognized how quantitative polls and structured focus groups limited nuanced understanding about human behaviour; they valued the case study as a contextual approach to studying complex sets of internal and external factors that influence human environmental behaviour (Macnaghten and Urry 1998).

A case study approach to examining Israeli WG professionals validates the importance of contextual factors in the relationship between environmental attitudes and behaviour. According to Yin (2009), the case study approach is an appropriate methodological selection because my study is a contemporary, real-life phenomenon guided by theoretical schemes and cannot be controlled by the researcher. The proposed 'how-why' research question ('how' do

people think about water and 'why' does it matter?) is best suited for case study research because it is not easily answered and inappropriate for more structured, broadly focused methods (Gerring 2004; Yin 2009).

My case study design (see 3.2.2) used professionals as units of analysis, exploring one conceptual case of individuals' knowledge management in Israel's water, research and policy (WRP) community. Qualitative data were collected using semi-structured interviews and an autoethnography to maintain researcher reflexivity (Section 3.3). Thematic data analysis was then guided by a framework consistent with pro-environmental behaviour (PEB) principles and the research objectives (Section 3.4). This chapter provides theoretical and practical details about each element of the research process.

3.2 Case Study Approach

Case study methodology is a qualitative approach to conceptual development that values rich detail and meaning in describing a concept's applicability to a given context (Gerring 2004). For example, case studies typically have small sample sizes within a specified community, and their researchers seek to understand the interplay of certain interactions within that community (Baxter 2010). To gather such in-depth and holistic data, the approach utilizes intensive methods such as participant observation, focus groups, and semi- and unstructured interviews (Nightingale 2003; Yin 2009) as well as mixed-method designs (Fazey, et al., 2006b; Wallis and Ison 2011). Case study theory is founded on one important assumption: a thorough understanding of a phenomenon holds value independently and can lead to valuable discoveries (Baxter 2010).

3.2.1 Critical Analysis

Case study research often divides quantitative and qualitative researchers based on their theoretical positions and criteria for what constitutes valid research. Critics often highlight the inability of a case study to produce theoretical knowledge; that small, single cases are difficult to generalize and only useful for preliminary hypothesizing; and that researcher's preconceived bias is unavoidable (Flyvberg 2006). Unlike experimental sciences, human inquiry is perpetually changing, beginning anew; there is no rigid theory for human phenomenon that compares to the replicable results from predictive theories (Denzin and Gardina 2015;

Flyvberg 2006). Case study research provides a different benefit. Considering one phenomenon in depth can not only identify 'outliers' but can also explain why they may exist, thereby challenging a theory's boundaries (Flyvberg 2006). A single case with a small sample size may be difficult to generalize, but it can provide discoveries that influence theory development. Therefore, proponents underscore a case studies' value in producing valid, context-specific evidence (Ragin and Becker 1992; Yin 2009).

Quantitative researchers have questioned validity in case study methodology criticising it for lacking rigor (Gerring 2004; Yin 2009). A concept well-established in quantitative research, 'rigor' requires "systematic application of theory and method" (Nordin, et al., 2008:605). Rigorous research provides evidence to ensure validity and reliable results have been maintained throughout the research process (Baxter and Eyles 1997). 'Validity' and 'rigor' are widely defined and debated terms in qualitative research (Donmoyer 1996) because balancing reliable evaluation with complex, social data is a perplexing challenge. Some social scientists prefer the term 'trustworthiness' over rigor, as qualitative research is a process of identifying contextual meaning, not a formulaic revealing of 'truth' (Mansvelt and Berg 2010).

Validation becomes even more confusing in interdisciplinary research with no single set of disciplinary standards to conform to. My case study aimed to accomplish Schwandt's (1997) validity definition by assessing how credibly and accurately my writing reflects the participants' social realities. I focused on a transparent research process as well as trustworthy interpretation and communication of the case study's meaning.

A case study's validity procedures should match a researcher's paradigm assumptions (Yin 2009). My research best aligns with the 'situated-knowledge' perspective from critical research as well as the 'contextualized-understanding' paradigm from constructivist research (Creswell and Miller 2000). Researchers operating within the critical-constructivist perspective need to account for their position, their influence in shaping narrative accounts. They are active components of the research, unconsciously impacting it with their curiosity and personality (Rubin and Rubin 2012).

Although critics argued a researcher's perspective creates greater bias in case studies than other approaches, it simply requires different strategies for ensuring validity (Creswell and

Miller 2000; Gerring 2004; Yin 2009). For instance, the autoethnography method (Section 3.3.2) identifies researcher bias through self-awareness and reflection, ensuring a critical lens on methodological and contextual considerations throughout the research process (Ellis 2004). A clear researcher voice written right into the research text provides another form of credibility often missing from case studies. Robinson (2011) criticized most interview research for not reporting sufficient detail and promoted balance between methodological information and content description. Replicable research should not withhold the 'muddy' components of fieldwork from its readers; readers need to understand the problems, politics and conflicts involved in developing the research as much as the end results (Robinson 2011).

Therefore, positional statements and excerpts from a researcher's field notes build credibility in qualitative research writing by providing the reader sufficient detail. I integrated footnotes with fieldwork excerpts in Section 3.3 and Chapter Four to build credibility, but also to engage the audience in a reflective reading style that encourages new social understandings (Ruiz- Junco and Vidal-Ortiz 2011). In using two methods that value positioning (tacit knowledge) to identify and articulate tacit knowledge, the research design was compatible with my research philosophy, making it a reliable choice (Mansvelt and Berg 2010; Yin 2009).

3.2.2 Case Study Design

Robinson (2011) defined case study research in 'the real world' as either 'fixed' or 'flexible' in design, determined by how exploratory the research question is. My study required a flexible design to cultivate an understanding of the given research objectives, not to define critically the causations between pre-determined, 'fixed' variables. The flexible design inherently allows for relationships and causations that emerge during data collection and interpretation. Exploratory research requires an amoebic perspective on the researcher's behalf, organically changing the design to best suit the social context. 'Evolving sampling' is a characteristic of flexible case study designs where the initial approach is tentative, anticipating the need to change sampling strategies, clarifying research questions as the researcher's involvement with the case evolves (Robinson 2011; Rubin and Rubin 2012). Evolving sampling was a realistic and useful approach for my cross-cultural research with a language barrier. To clarify, I use 'cross-cultural' to highlight the intersection between my

culture and the Israeli case study. Section 3.3.2.2 gives examples on how flexible case study research manifested in the field.

Although flexible, this case study is also holistic in its design (Yin 2009), intended to maintain a big-picture lens in interpreting the sample's data. The case study's type is a 'set of individuals'. By controlling the criteria that qualified the 'set of individuals', the study focused on the "antecedents, contextual factors, and attitudes preceding an outcome" (Robinson 2011:138). Flexible case study designs are not typically compatible with generalizability. My study did not intend to create a representative sample of the Israeli-WRP or make generalized claims. The aim was to cultivate a rich and diverse sample to explore the research question within and to represent the sample accurately through credible description.

3.2.2.1 Israeli WRP as Case Study Selection

Israel provides a fascinating case for water governance research, due to water's prominence in decision-making for development in a semi-arid landscape and the complicated set of underlying values and conflicts in the region. Thorough research on Israeli water management is available, some of which is consolidated here to introduce governance issues relevant to the case study.

Positioned within one of the most water-stressed regions in the world, freshwater demand in Israel has exceeded natural supply for decades. Frequent droughts and population influxes exacerbate that stress. Consumption rate projections show water demand in 2030 as more than double the available natural supply (Becker 2013:5). This discrepancy, or water crisis, creates the foundation for Israeli decision-making about water. Intimately coupled with agriculture and settlement, water resource management is a focal point for research and policy in Israel.

Figure 3.1 Israeli water resources and National Carrier distribution system. Map does not include water resources created by desalination and recycling or captured in the reservoir system. (Feitelson and Rosenthal 2012).

The country's water sector has a strong reputation as a global leader in water filtration, recycling, and irrigation technologies as well as efficient management under water scarce conditions (Kislev 2013; Tal 2006). As seen in **Figure 3.1**, dominant freshwater resources include: the Jordan River, which flows into Lake Kinneret (Sea of Galilee or Lake Tiberius) along with the northern streams and springs that feed into that watershed; and five aquifers of which the Coastal and Mountain aquifers supply groundwater to the majority of Israel's population. To ensure equal water supply to all Israelis, in 1964, the government opened the National Water Carrier (NWC) distribution system. The NWC originally used Lake Kinneret as its major reservoir. However, the rapid development of large-scale seawater desalination plants continues to minimize the country's reliance on natural sources of fresh water (Feitelson and Rosenthal 2012).

Manufactured water is an essential resource for closing the gap between supply and demand in Israel. Four large-scale desalination plants along the coast produce more than 35% of Israel's drinking water, projected to be 70% by 2030 (Haaretz 2015). Advanced water filtration technologies also manufacture water from sewage and wastewater. Israel recycles

nearly 90% of its wastewater for agricultural use, the country's largest water consumer at over 50% supply (Haaretz 2015; Kislev 2011; Kislev 2013).

In addition to these supply management techniques, Israel continues several demand management strategies. Water restrictions and infrastructure upgrades maintain steady industry and domestic consumption rates. Innovative inventions such as drip irrigation and water recycling have drastically increased Israel's "crop per drop" ratio (Tal 2006:1084).

Environmental factors make water management solutions even more urgent. The Intergovernmental Panel on Climate Change (IPCC 2014) predicts increased regional vulnerability in the Middle East due to lower precipitation rates and increased evapotranspiration. These conditions amplify already severe contamination issues in surface and groundwater supplies (Issar and Livshitz 2013; Sowers, et al. 2011). Israeli experts have documented water quality problems thoroughly (Parparov, et al. 2013; Tal 2002) including suggestions for restoration programs and policy reforms (Katz and Tal 2013; Skutelsky and Perelmuter 2012). Desalination has potential to advance restoration efforts by replenishing over-extracted natural supplies (Tenne, et al. 2012). However, the rehabilitations still face several socio-political obstacles in implementation (Katz and Tal 2013).

Israel's reputation is marked by progressive 'eras' of water policy focus (Feitelson 2013). The original focus on infrastructure development and securing access to supplies gave way to — allocation regulatory needs. In the 1980s and 1990s, Israel concentrated on water quality monitoring and economic regulations. Recent policies focus on supply augmentation through wastewater recycling and desalination megaprojects (Feitelson 2013). Although experts and policy makers acknowledged the inadequacies of Israel's water governance regime for many years, major policy changes and governance reconfigurations did not occur until the effects were too obvious to ignore (Menahem and Gilad 2013). I selected an Israeli WRP professional case due to the significant water challenges the country faces, but also due to the debate about the efficacy of the country's water governance structure.

In 2007, following a multi-year drought, Israel consolidated governmental roles and responsibilities for water into one, centralized governing body: the Governmental Authority for Water and Sewage ('Water Authority') (Fischhendler and Heikkila 2010). The Water

Authority replaced a governance system that involved seven ministries where responsibilities overlapped, conflicts arose between authorities, some sectors secured preferential treatment, and decision-making was chronically short-term (Becker 2013). The restructured design improved efficiency in water management policies and minimized pressure from the powerful agricultural lobby. As an independent, government-funded agency, the Authority regulates everything related to water and sewage (Feinerman, et al. 2013). Its Council is composed of one executive chief, two publicly appointed representatives, and five ministry representatives. The Israeli parliament (the Knesset) monitors costs and the Ministry of Agriculture communicates the Council's water allocation rates to its sector (Feinerman, et al. 2013).

Israel's new WG regime has had several achievements enacting change since its inception. Due to the severity of the water crisis in 2007, immediate policy changes succeeded in preventing permanent damage to freshwater ecosystems and optimizing existing water resources (Feinerman, et al. 2013). The Water Authority also spurred several long-term reforms: rapid development of desalination mega-plants was approved; new tariff structures reduced industrial and household consumption rates by increasing prices; and, urban water and sewage management was privatized at local scales to be overseen by the Authority (Becker 2013:13). Recent assessments show that water pricing persistently reduces per-capita consumption rates in Israel (Feinerman, et al. 2013). Future priorities and objectives are detailed in the Authority's (2010) *Long-term Master Plan for the Water Economy.*

Among the many challenges Israel's Water Authority faces, Feinerman et al. (2013:285) list 'governance' as one of them; "it is necessary to organize the bodies that are active in the water economy… to work in maximum harmony". Hierarchical water governance structures often benefit the efficiency of a system, but at the expense of collaboration and the exclusion of external actors' input. Advantages and disadvantages of an integrated approach (Fischhendler and Heikkila 2010) or soft-path approach (Brooks and Trottier 2010) have been debated as means to incorporate more values than those already prioritized by the Authority. However, the Organization for Economic and Co-operation and Development's (OECD) (2012) *Report on Global Water Governance* deemed non-state actors or the formation of inclusive, decentralized WG "not applicable" to Israel's hierarchical WG structure, despite the

variety of non-state Israeli actors that contribute to the global dialogue on water. Relevant literature does not clarify whether Israel's Water Authority validates or utilizes knowledge from external water research and policy groups as 'bodies active in the water economy'. Alternative approaches, including dispersed responsibility and inclusive participation, have been proposed to overcome the government failures in Israel's water economy (Kislev 2011; Skutelsky and Perelmuter 2012; Teschner, et al., 2011).

Exacerbating these vulnerability and efficacy challenges are the complex meanings of 'water' in the Holy Land (Feitelson 2012), where spiritual and social water needs are more obvious than in other geographic regions. As a relatively young country, Israel acknowledges water uses that create indirect value such as by supporting national development goals (Becker 2013). As with most water sectors, there are many public and private values to reconcile. However, Israel's water governance requires the integration of both national and regional goals. Surrounding countries, like the Kingdom of Jordan, have even more severe water conditions than Israel does (Becker 2013). Israeli water policy needs to consider its obligation to shared resources and potential changes from peace negotiations (Feitelson and Fischhendler 2009; Feitelson, et al. 2011; Shmueli and Aviram 2013).

Decisions about water in Israel are present, current, and urgent. They require collaboration between experts in several research and policy positions, often with conflicting perspectives. With a strong reputation for water management, Israel provides an established WRP professional culture. Therefore, the target population for my Israeli WRP case study includes professionals from a variety of actor groups — private industry, research, the federal government, and non-governmental organizations — whose professional contributions influence water-related decision-making and management in Israel. The following section defines parameters for population sampling.

3.2.2.2 Participant Criteria

'WRP' professional - I define 'WRP professional' as a person who holds or is completing, at least, an undergraduate degree, or related life experience, and whose professional work engages and focuses on water issues in Israel. My sample included a variety of disciplinary backgrounds, (**Table *3.3***) with a focus related to water management, research,

or policy in Israel. Professionals were targeted from a variety of career stages and geographic locations in order to sample inclusively within the WRP community.

I chose the term 'professional' over 'practitioner' for an inclusive knowledge context. Although more frequently used in water governance literature, 'practitioner' emphasizes expertise in a given practice and does not provide space for a humanist, tacit knowledge lens. In Chapter Four I write 'professional' and 'participant' interchangeably though 'professional' was used to underscore professional culture concepts.

'Israeli' — as an immigrant country, Israeli citizenship is diverse. I acknowledged the varieties of Israeli identity that derive from birth locations, religious perspectives, or years spent in the country, but also needed to define 'Israeli' for maintaining an accurate sample set. For this reason, I defined an 'Israeli' professional as someone who has remained or intended to stay in Israel for the majority of his or her career. Each participant informally self-identified as an Israeli-born, Israeli-immigrant, or Arab-Israeli during the interview process, stating in some way that they were committed to the professional culture in Israel.

'Woman'- This criterion exemplifies my study's original intention to give voice to marginalized knowledge within water research and policy communities. Research shows that decision-making is higher quality and more effective with diversity, including gender diversity (Blomquist 2009; Huse and Solberg 2006; Konrad and Dramer 2006; Mcguire 2012; Williams 2003). Yet, water governance and management organizations remain male-dominated worldwide (Cleaver and Hamada 2010; Harris 2009; O'Reilly, et al., 2009; Zwarteveen et al., 2010). Women professionals' tacit knowledge is poorly researched within water governance literature (Wolfe 2014), despite the known benefits women executives provide to organizational culture (Mcguire 2012; Williams 2003). Most gendered water research focuses on the relationship women have with water and water-related community activities, as well as their exclusion from local policy development (O'Reilly, et al., 2009; Shyamala and Rao 2002; Vera 2005), or the effect poor water management has on female livelihood (Bhatia 2004; Coles and Wallis 2005; Sultana 2011).

A recent Israeli census report on women in management (Desheh, et al., 2013) further rationalizes a gendered dataset. According to this report, Israeli culture supports women

workers, as evidenced by even gender ratios in the workforce (47% women in 2013). Yet, women seldom advance to senior management and decision-making levels. In the 2013 women held less than one-third of the public senior management positions, less than one-fifth of board member positions, and only two percent of top executive, chairperson positions. Theoretically, Israel intends to balance gender equality in decision-making, but in practice the numbers of women decision-makers are not rising (Desheh, et al., 2013). Thus, Israel's gender discrepancy in management isolates women from participating on steering committees that define visions for an industry and set strategies for implementing them.

Given the literature on how women managers benefit social performance at institutions and Israel's proposed recruitment for women managers, a gendered dataset was appropriate for this case study focused on Israeli professional behaviour and tacit knowledge. Enabling the less-dominant sex to voice their perspective provides an opportunity to inform and potentially improve the WRP community's organizational culture.

It is important to clarify that this case study was not a geographic, demographic or a gender study. Although these contexts informed the analysis, the phenomenon in question was the *professional culture* of Israel's WRP community.

This study received full ethics clearance from the University of Waterloo's Office of Research and Ethics (ORE # 17782) before collecting data in Israel.

3.3 Data Collection

Qualitative methods were employed to gather and validate empirical data from Israel: a literature review (Chapter 2), semi-structured interviews (n=24), and a personal autoethnography. The following sections provide a rationale for their use and details on implementation.

3.3.1 Interviews

Multiple methods can be used in a qualitative case-study approach; however, research exploring individuals' value systems and contextual knowledge depends on the intimate exchange of personal information. Due to the complex nature of the research question, semi-structured, in-depth interviews were the principal data collection method. In-depth interviews reveal a diversity of opinions and context for behaviours that other methods may not uncover

(Brisbois and de Loë 2015; Dunn 2010; van de Meene, et al., 2011; Taylor, et al. 2013), creating a rich description and opportunity to highlight nuance. Partially life-history focused, this method elicited the participant's first-hand knowledge of the water sector and identified elements of their "place-based lives and memories" (George and Stratford 2010:141).

Multiple interviews per participant are perceived to be valuable for life-history research exploring environmental beliefs and values (Burgess, et al., 1988; Chenoweth, et al., 2007; Fazey, et al., 2006b). The repetition allows for an improved relationship and more time to reflect and elaborate (George and Stratford 2010). Although multiple interviews would have been ideal, this case study was limited by a finite data collection period and professional interview settings. Therefore, my research design required one interview with each participant, compensating for the brevity with an active, responsive interviewing style (Rubin and Rubin 2012). Good, responsive interviewing requires the same characteristics in a researcher as case study research: a curious, inquisitive mind; critical, active listening skills; flexibility and adaptability (Dunn 2010; Rubin and Rubin 2012; Yin 2009). Having well-developed interpersonal skills and basic intuition allows a researcher to conduct an interview as a thought-provoking, casual conversation. The responsive researcher arrives prepared with main questions and themes for impromptu follow-up questions but permits the combination of the two people's personalities to dictate the interviewing style. Adapting to the comforts of the interviewee, this gentle and respectful approach performs well in cross-cultural settings, as it requires the researcher to be self-critical of their cultural perspective and knowledge base (Rubin and Rubin 2012). Similar studies (Gonzalez, et al., 2009; Kothari, et al., 2011; van de Meene, et al., 2011) found this interviewing model helped to put the participants at ease, expressing their memories, beliefs, and tacit knowledge. Combining thoughtfully-worded main questions and the responsive style etiquette, my interviews persuaded detailed stories from the participants, despite only meeting once. Autoethnography supplemented cultural understanding through observations on Israeli social realities.

3.3.2 Autoethnography

Autoethnography evolved as a tool for researchers to critically analyze their experience within a social context. Developed from anthropology, sociology and psychology,

autoethnography uses "the personal to investigate the social" (Ruiz-Junco and Vidal-Ortiz 2011:193). When used as a positioning statement, an autoethnography should write the researcher into the literature and research, explaining one with the other. The method creates a descriptive and interpretive self-narrative that can include elements of life-story, case study, oral history and experience (Denzin 2014). Autoethnographic statements displaying first-hand cultural observations and experience can be useful in defending case study research to a broad audience (Ellis 2004).

At first the method over-emphasized the 'auto-', and the need for researchers to be reflexive and aware of their situated study (Hayano 1979). Critics of this self-narrative method discount its use in academic research as "'dramatic', 'poetic'… 'postmodern excess and narcissistic" (Ruiz-Junco and Vidal-Ortiz 2011:193; also, Burrawoy 1991). Autoethnography faced similar criticism to case studies concerning researcher bias, lack of applicability to theory development, and generalizability (Tolich 2010). Yet, enthusiasm for autoethnography in some disciplines — sociology, health care, gender studies, communications — spurred theoretical growth and provocative, novel research (e.g.- Ellis 1999; Holbrook 2005; Liggins, et al., 2013; Manolas, et al., 2013). For instance, Nightingale (2003) advocated for mixed methods within feminist geography to critically assess knowledge sources:

> "When different kinds of knowledges are taken seriously and all are critically interrogated, richer results are generated, new interpretations emerge and the supremacy of any one kind of knowledge is challenged" (Nightingale 2003:86).

As introduced above, my study aimed to value tacit knowledge within an academic audience that typically over-looks and undervalues its use. "Ignored at a great price" (Kerr 2011:91), tacit and experiential knowledge can be perceived as marginalized within society's explicit, information-based knowledge economy (Puusa and Eerikainen 2010). Meant to give voice to marginalized or novel beliefs, autoethnographies can unmask social science from imposed scientific frameworks, providing an alternative to conventional frameworks that keep knowledge compartmentalized (Denzin 2014; Ruiz-Junco and Vidal-Ortiz 2011). Decision-making based on tacit knowledge does not fit easily within policy or management structures in water governance; it would require a reconsideration of this knowledge type's value. Kerr (2011:102) reiterated such revaluation in defending autobiographical work: "postmodern

theories have begun denying the self's existence altogether...[yet] experience has intellectual consequences." By valuing the researcher's position in explaining the phenomenon in question, the autoethnographic method holds a similar and compatible principle to the purpose of this study.

3.3.2.1 Autoethnography Design

By focusing on the self, Israeli and WRP cultures, and the application of the interviews, my autoethnography reflects my socio-cultural experiences during field research. I used six questions to self-impose cultural understanding, adapted from Van Maanen's (1988) methodological descriptions of ethnography:

a) What is the relationship between Israeli culture and my behaviour?
b) What can I learn from my fieldwork observations participating in related activities?
c) What is the relationship between my research questions, me, and the participants including the differences in power between peer and up-interview settings?
d) If or how do I influence the research process by being reflexive and aware of my insider (female water professional)/ outsider (non-Israeli) positions?
e) How does my understanding of the potential audience change over time as my research within the international WRP context develops?
f) How do I think it is best to represent the women's stories I hear?

The writing remained uncensored, including the excerpts in this paper. The process highlighted how my understanding changed over time and provided critically-reflexive, personal anecdotes to provoke conversation during interviews. he method proved advantageous in creating nuanced observations on social realities, but it also had its disadvantages. Autoethnography arose as a purely humanist approach, as opposed to interviews that were originally positivist (O'Byrne 2007); their combination challenged the results writing process.

3.3.3 Interview Sampling and Design

Both formal and informal approaches to snowball sampling identified potential interview participants. Academic informants visited during a pre-research trip (December 2011) nominated WRP professionals for an initial correspondent list. Recruiting interviewees from

academic and NGO communities was possible through online investigation, but identifying private and public participants required a meeting with the Research and Development Director at the Israeli Consulate in Toronto. This appointment was successful in connecting me with a point-source for industry and governmental professionals in the Israeli WRP. Informal snowball sampling occurred at the Canada-Israel Water Governance Workshop (Hebrew University, May 2012). Altogether I contacted 45 potential interviewees and conducted 28 interviews, of which 24 meet the proposed participant criterion: Israeli women WRP professionals from a diverse range of WRP sectors, career stages, and geographic locations in Israel (

Table **3.2** for recruitment details).

This intentional variety was designed to minimize disciplinary or demographic bias, yielding data from a mix of professional and personal backgrounds (Egri and Herman 2000; van de Meene, et al., 2011). The researcher also acknowledged the potential for 'clone perspective' bias in recruiting only through informant's recommendations (Krueger 1994) and avoided interviewing direct subordinates or pupils of established professionals. Due to Israel's leadership in water filtration and desalination technologies, engineers or professionals originally trained in engineering comprised the largest disciplinary group (see Table 3.3) and were therefore limited near the end of data collection. Each participant (n=24) received an information letter about the research study with their recruitment email, and signed an anonymity agreement at the start of the interview.

A semi-structured, responsive interview style suited the flexible research design, allowing time to build comfortability, a relationship with each participant and encourage reflection on water memories and beliefs (Dunn 2010; Egri and Herman 2000). Each interview, ranging between forty minutes and three hours, used the same five-question guide (see Appendix 2) to facilitate discussion. Table 3.1 summarizes this interview guide:

Table 3.1: Interview Question Set for Sampling Women Professionals in Israel's Water Research and Policy Community (May-July 2012)

#	Question with facilitating comments	Related objective
1	**How did you come to choose this career?** - Mentors? [*Yoetz Eeshi*] - Settled or still establishing? Transition: Have you always lived in _____?	Obj. 1 – career-related values, experiences, beliefs
2	**What do you remember about water from your childhood?** - How did you learn about water growing up? - What is the source [*makor*] of your deepest connection [*yachas*] to water?	Obj. 1 – water knowledge sources, beliefs, experiences
3	**What do you value** [*erech*] **most about your job? What are you proud of**? - Elaborate: how keep connected and motivated? - Substitute 'accomplishments' for 'proud'	Obj. 1 & 2 –WRP career values, professional behaviours
4	**Tell me about your *Tikvah, Shifah* [ambition]. What do you hope to achieve in your field?**	Obj. 1 & 2 –WRP career values and intended actions
5	Having reflected and shared those memories, you obviously have considerable knowledge about [_____]. ***Mah hayeeta matzee'ah lamatchil ba'tchum?* [What advice would you give to a new WRP professional in Israel?]**	Obj. 1 –career-related values, experiences, beliefs

Each interview sought to ask all five questions, adapting the ordering according to the natural conversational flow. Available information about a participant was gathered before their interview for use in triggering specific professional examples and to minimizing the time spent on describing explicit career development steps in question one.

Inquiring about water memories in question two required the most active participation on my behalf; I probed for ways professionals learned about water in and out of school, family or Shabbat memories around water, influential books or songs or religious texts. For some women reflections on water flowed easily. With others recalling felt strained beyond the first preliminary comments (section 4.2.1.1). Provoking reflection on an individual's "deepest

connection to water" was both the most difficult question to explain in a professional setting, and also the most successful in eliciting personal, earnest responses[3].

Question three, regarding accomplishments, was often met with humility or bashfulness. I frequently rephrased the question to circumvent the word 'proud'. Participants often initiated their responses with personal and family-related achievements. However, the final question provided an indirect, second change to display professional pride. Originally, question five intended to offer recognition to the participant for their commitment to the field, but also gratitude for the time spent reflecting during the interview.

For professionals who identified as Israeli immigrants, I evolved the question set to ask for comparisons between Israel and their country of origin, highlighting water practices that were different or surprising. Interview notes only included major ideas and helpful

[3] **On Beckoning Tacit Responses**

May 29th, 2012– I'm nervous about breaking the professional barrier during interviews and evoking personal reflection. Some participants were defensive about this during pre-research, while others embraced it naturally. I'll need to remain casual and warm during the introduction and opening; show that I've done research about their professional focus and something personal if possible. The challenge is to differentiate my interview style from participants' previous interview experiences. My professional questions are not topical relating to their jobs, they're personal.

I have prepared remarks to maximize participant's comfortability and minimize my own power, but understand that the most important element is my ability to listen. Devault (1990) referred to listening as an analytical method, reminding researchers to listen particularly to inarticulate quotes and that which was left unsaid. I need to remember to host myself for these interviews so that my concentration can be active on many levels. I need to sustain my intuition and compassion for the participants. This is how the relationship between myself, my questions and the participants will be most familiar, and beneficial.

June 21st, 2012–I had the most incredible interview. Everything just came together: a willing participant; I know my questions inside and out, have them translated to Hebrew and can adapt them to the language ability of the participant. We met after work, away from work, at a casual setting with coffee. And this woman just completely opened up to me. It felt so good to be able to give her the space to speak openly, to reiterate the concepts she was trying to convey and provide recognition for her initiative/effort. Beckoning tacit responses seems to depend on creating a safe space for each woman to communicate openly. Acknowledging the women's voices with worth.

July 13th, 2012–I received several positive comments about the strategies I used to personalize interviews before, during and afterwards. People generally did not understand the concept at the beginning of the interview, but during or afterwards expressed interest in the topic. Many people said they enjoyed our time together. That they realized new things or thought about old memories differently and were interested to see where my research went. This remark was the most blatant:

> [Me: What would you say is your deepest connection to water? What is your Yachas?]
> [Participant] *Today I like water chemistry and…it's purely chemical. But water has all these feelings around it – you're right. It's a very deep and emotional subject. If you ask any Israeli in the city they will have something to say about water; I'm not sure it would be the same. I find your research very interesting, now that I think about it. A very good one (P14, iv).*

Participants' surprise makes me feel confident about the quality of (tacit) data I collected because they are recognizing underlying values that typically go unnoticed.

information, as each was audio-recorded by consent. I took particular note of uncomfortable or emotive body language and gestures. These notes helped to signal tacit importance for concepts as they arose during analysis.

3.3.4 Sampling Results

I conducted interviews between May and July 2012[4]. This section briefly tabulates the sampling results, and then discusses field limitations and validity measures applied during data collection.

Table **3.2** details the participant recruitment process providing reasoning for the total sample size: twenty four women Israeli WRP professionals. Twenty five to thirty participants was the targeted sample size for the study. Small samples typically suffice for case study research, due to their focus on understanding the intricate interactions between variables (Baxter 2010; Yin 2009). This seemingly small sample size produced a disproportionate volume and depth of data. Other than gendered and 'WRP' professional participant criteria the sample maintained broad boundaries.

Participants were interviewed in thirteen locations across Israel, including all ages and stages of career development, and diverse contribution types to Israel's WRP. Table 3.3

[4]**Data Collection Complete.**
July 19th, 2012— Today I finished my data collection phase. Twenty eight interviews in 2.5 months does not sound like a lot, but each one was well executed, completed tidily, reflected upon methodologically, and compiled to improve the next. I did what I said I would do: I represented a range of career stages all four sectors of the WRP, the entire country geographically, different ethnic groups, and I kept an autoethnography the whole time.

I reminded myself to keep flexible and patient amidst multiple scheduling conflicts and transportation hiccups. This is difficult when you are such a low priority to your participants. I had to diligently push and continually target the individuals I wanted to interview. While at the same time not irritate them with too much frivolous communication. Twice I conducted impromptu interviews the day-of because it was the only day they were free. Five interviewees changed their scheduled timing or date the day-of, either an hour or no time in advance. Many women I met brought their baby, child, sick grandson, or needed to leave early because of child-related obligations. I had to provide the ultimate amount of flexibility and in doing so, I limited myself to one interview a day or two maximum.

On any given day I contacted 4-5 new professionals, researched organizations to find more, called offices to collect contact information, worked to confirm dates with several agreed professionals, researched interviewees for the next day, followed up with previous ones, organized transportation to and from the current interview, orientated through new cities arriving at their offices on time, and took care of myself in the mean-time.

I was more concerned with quality than quantity. I am very happy with the quality of the data. I asked the interviewees difficult, personal questions requiring me to build a personal relationship adequate enough to elicit reflection to me, as a stranger, within an hour- not an easy task. There were recurring themes that emerged from the interviews that I was able to ask about further in later ones. I discussed some of them with Arthur and am looking forward to starting my data analysis (after a little break).

categorizes the participants into self-identified disciplinary and cultural sectors to display the sample's diversity.

Table 3.2: Interview recruitment process during data collection in Israel, 2012.

	Sample	Failure Rate	Reasoning for Disqualification
Contacted	45	8- no response	
Agreed	37	5- no confirmation	Agreed, never confirmed a date.
Confirmed	32	4- scheduling conflicts	Confirmed, never conducted.
Conducted	28	4- did not qualify	Two disqualified for not self-identifying as 'WRP'. One disqualified for not self-identifying as 'Israeli'. One disqualified for poor audio.
Total Size	**24**		

Table 3.3: Israeli WRP Sample Diversity, representation of different actor groups with ratios that compare the professionals' original training in either natural science and engineering or social sciences. Israeli self-identification is also represented.

Actor groups	**Partic-ipant #**	**Disciplinary ratios Per actor group** (technical : social)		**Israeli Self-identification**	**Partic-ipant #**
Industry	6	6 : 0		Israeli-native	17
Government	4	2 : 2		Arab-Israeli	1
NGO	6	1 : 5		Immigrant	6
Academia/Research	8	5 : 3		**Total Participants**	**=24**
Total Participants	**=24**	**14 : 10**			

Table Table ***3.3*** displays the sample's disciplinary diversity with a 14:10 technical: social science ratio for participants' professional backgrounds. Technical, scientific orientations included: chemistry, agriculture, hydrology, climate science, biology, and engineering - most prevalent at eight engineer participants. Social scientific orientations stemmed from urban planning, economics, education, human geography, community development, and political science - most prevalent at three policy participants. I refrained from sampling engineers after a certain point of data collection to ensure diversity, but the prevalence is representative of how strong Israel's water technology and engineering industry is.

3.3.4.1 Cross-cultural adaptations and field limitations

I prepared for as many cross-cultural limitations and fieldwork complications as possible in advance and kept a methodological field journal to identify adaptations during the process.

The biggest consideration for cross-cultural differences was the potential effect of a language barrier. The dominant languages in Israel are Hebrew and Arabic, as well as the languages from immigrant sub-populations. Conducting interviews in English limited cultural understanding, as language is "constitutive of social life" (Mansvelt and Berg 2010:339). Without understanding Hebrew, I acknowledged my partial cultural embeddedness and the power participants would hold over me in conveying cultural meaning.

Although during the interviews, speaking in English placed me in power over an interviewee with a different fluency level. I judged the language barrier's effect as only minimal to moderate because each participant in pre-research spoke English. However, to minimize a language barrier I sought advice from Arthur Lieberman, Israeli professor emeritus at the University of Haifa, who helped with Hebrew translations. We identified the English words (e.g. 'mentor', 'ambition') most in need of translation in my question set and he explained several cultural phrases used by the interviewees[5].

[5] **English-Hebrew Interviews—managing cross-cultural interviews**
May 29th, 2012–I fear not being able to capture the most important concepts between languages or having the participants feel unable to express themselves adequately in English. So, I'll make sure to start each interview by stating:

> "I want to thank you in advance for speaking in English with me today. I'm slowly picking up some Hebrew words, but if at any point during a story today there's a Hebrew word that isn't quite matched by English, please feel free to use your language. One of the members on my committee speaks fluent Hebrew".

Concept Translations: (Arthur Lieberman)

1. Connection (relationship, *yahas*), attitude, *hashkafah;* worldview, *hashkafat olam*
2. Influence (noun – *hashpa'ah*), (verb-*lehashpi'a)*
3. Value - *erech*
4. Accomplishment – *hasagim (hay-sa-geem)*
5. Hopes - *tikvah*
6. What would you advise to a beginner in the field? *Mah hayeeta matzee'ah lamatchil ba'tchum?*

June 13th, 2012: After two weeks interviewing, I find that addressing speaking in English up-front helps to even the playing field and power relations between myself and the participant. So far they have responded well and appreciated my attempts at Hebrew words.

A semi-structured, responsive interview design was necessary for adapting interview questions to match the English level of the participant, minimizing any potential power relationships, and maximizing their comfort (Dowling 2010; Karanasios 2008).

Flexibility is necessary for organizing and delivering interviews during cross-cultural fieldwork (Burgess 1982; Robinson 2011). I prepared to conduct telephone interviews with verbal consent if necessary and to contact an audience larger than the anticipated participant sample size (Chenoweth, et al., 2007; Brisbois and de Loë 2015; Karanasios 2008). One interview required the use of Skype to connect, due to several scheduling conflicts. The professionals were extremely busy; the interviewees rescheduled or changed location with last-minute plans an average of 3-4 times each, requiring my humility, clear communication, and consistent adaptability.

Other adaptations arose during data collection. For example, an unforeseen cultural conflict eliminated a data collection method. Originally, two small Israeli focus groups were proposed to supplement and validate the interview data. Small focus groups are well suited for this research as the specialized audience can be more comfortable in a group setting and cover the material in greater detail (Krueger 1994). Each focus group was designed to gather 5-6 students and young professionals in the WRP community for 90 minutes to discuss a condensed version of the interview question set. However, the Israeli school year structure has students on 'summer holiday' from August to September, returning in October. Therefore, the recruitment period for these focus groups overlapped with the June-July student exam and end-of-term period in Israel and students were not available. The response rate was very low, and those who did respond were only available after my data collection was complete. I decided to eliminate the method and to prioritize a high-quality interview sample instead, even though this change meant a loss of some data validity.

The data collection time frame also coincided with an international conference on sustainability (RIO 2012), which some participants attended or followed. This conference may have influenced the frequency that "sustainability" as a catchphrase arose in interviews. However, it is consistent with the state of 'sustainability' focus conveyed by Israeli

environmental literature and the country's sustainability updates in response to gaining OECD status (OECD 2011; Shoenfeld 2004; Tal 2006; Teschner 2012).

The final limitation, having a female sample, was both practical and theoretical. On a practical recruitment level, women were harder to find. Women hold less than one-third of public decision-making and management positions in Israel (Desheh et al., 2013) and women are not represented equally in male-dominated WRP communities (Cleaver and Hamada 2010; Harris 2009; O'Reilly, *et al.,* 2009; Zwarteveen, et al., 2010). I interviewed select male WRP professionals during the pre-research trip to cultivate a sufficient contact list to enable only interviewing women. Snowballing recruitment followed easily from the first interviews as the women participants knew other women WRP professionals through informal women-to-women networks and mentorships.

I acknowledge outright that including the word 'women' in the title of my recruitment email influenced some participants' willingness to accept my interview request. To minimize this potential bias, I clarified the difference between having a gendered dataset and my research being a gender study. I also used this statement to refrain from asking leading questions when the participants rose gendered topics. However, the fact that including 'women' successfully recruited participants, signals it as a relatable issue. That said, not all participants discussed gender-related topics, and one requested being disassociated with gender topics in my discussion as she'd never experienced gender-related difficulties in her career.

Theoretically, women are known to resist or incorrectly answer questions related to their ambitions and accomplishments (Fels 2004; Stacey 1988). Women tend to qualify their accomplishments based on social relationships — pride for their children or supporting their

husband — rather than individual achievements (Devault 1990). I explored and experimented ways to overcome participants' hesitation to this question[6].

Cross-cultural researchers are frequently perceived as ignorant or as 'outsiders', potentially critical of the country's culture (Karanasios 2008; Rubin and Rubin 2012; Stewart, et al., 2007). The benefit of having an 'outsider' perspective was something that that took time for me to understand fully. As a researcher, I wanted to maintain a level of objectivity or, at least, awareness of my subjectivity during my fieldwork, yet the learning curve involved with submersing myself in a new culture meant my perspective and corresponding behaviour changed daily. I was also acutely aware of how people interacted with me as a visitor, and how

[6] **On Interviewing Women- predictions and observations on method**

Predicted: **May 27th, 2012:** Today I learned the first adjective used to rate a woman's femininity in Psychology tests is *yielding.* For men it's *self-reliant*, but women get *yielding*. Yielding and soft-spoken and respectful to other's needs, compassionate, shy, and affectionate - all adjectives that relate women to other humans, no qualities of independence or personal ability. And these qualifying terms have been used for decades (Fels 2004). I write about this because it explains the social phenomenon I've been trying to put words to, where women hesitate to disclose their achievements and display pride. I am familiar with this phenomenon from my experience working with women groups in the past.

I am concerned that women will be bashful and refrain from fully voicing their accomplishments and goals. Although, Israel has a blunt, outspoken culture. I will need to watch for this and assess it as the interviews unfold. Be conscious of it relative to age and position. Whether less established, younger women are more hesitant to self-praise. In my interviews, I want my questions to support the topics women raise, provide space for courage of voice, and recognize the women not only for their accomplishments, but for their time spent reflecting. I will need to remain conscious of feminized talk, the over-emphasis of human relationships, especially in response to the 'proud' question and make sure to probe women's' responses beyond children and family.

Devault (1990) explained the benefits of women-to-woman interviews, arguing they evoke more intentional listening and a fuller experiential account than mixed gender interviews. I don't know if I will experience "woman talk", or female comradery, with the participants. Will it influence my interviews that I am a young woman?

Experienced: **June 13th, 2012:** From the few male interviews I have conducted, I notice a difference in atmosphere when interviewing women. I feel more comfortable asking the personal questions about relationship to water to a woman. I'm not sure if it's because the questions seem feminine or unimportant in relation to the profession questions; I don't think my question set is feminized. But interviewing men feels more formal. I feel younger, less on even-planes than in some of my female interviews.

In some interviews women hyper-fixated on parenthood and relations as their achievements, but could indulge me with more professional detail when I pressed further. On three occasions I refocused conversations from ranting 'woman-talk' topics. For the most part, as long as I was clear about my sample, woman-to-woman interviewing was a non-issue. In fact, the absence of power dynamics between the interviewee and I seemed to benefit the quality of conversation and disclosure.

Many women did struggle to answer about their accomplishments or what they were proud of—as if pride was a negative trait. Several qualified their statements or self-consciously apologized afterwards. However, being given the space and assurance to reflect on their accomplishments was ultimately appreciated and utilized. It felt good to provide that recognition and interest. Professionals responded positively to it.

that may have influenced how Israelis spoke to me and how participants answered my questions. The following excerpt from my autoethnography provides a short explanation[7].

Keeping an autoethnography helped me identify multiple viewpoints in the culture I was experiencing and prepared me to interpret a dense data set.

3.3.5 Summary

This case study design incorporates in-depth interviews and researcher reflexivity into an Israeli case study on WRP professionals' knowledge management. Implementing flexible and adaptive methods benefited the research by minimizing the barriers of cross-cultural fieldwork and eliciting information that is otherwise not easily articulated. Face-to-face interviews were more personal and trustworthy than telephone or internet interviews; therefore, more effective for this case study. Heavily structured methods like questionnaires or surveys, would not collect sufficient richness of results, or provide adequate respect for the knowledge participants shared. Even though the research design was intensive and expensive, it was the most realistic and feasible methods combination to achieve depth and meaning in collecting 'Israeli voices on water'. Ultimately, I conducted twenty-eight interviews in two and a half months, of which twenty-four qualified for analysis.

3.4 Thematic Data Analysis

Thematic analysis often referred to vaguely as 'qualitative analysis', has been widely used and poorly defined in social research (Braun and Clarke 2006). Historically, the term described general forms of inductive, emergent analyses that extrapolate macro-level themes from groups

[7] **The benefit of my Israeli Ignorance**

Interviewee: *What brought you to Israel?*

Me: *Your reputation in water management and by how varied your beautiful landscapes are.*

Interviewee: *Are you Jewish?*

Me*: No.*

Interviewee: *Then what are you doing here?*

At first, I was put-off by these exchanges—an obstacle that preluded almost every interview. It felt like a validation process I needed to fail before continuing on with our conversation. But now, I am thankful to be an 'outsider'. I think not being religious has allowed people to speak freely about 'hot' topics, if they so choose, without worrying that they'd offend me or that I'd judge them. And I haven't struggled with any deeply-internalized conflict between my heritage and my worldview, like I've discussed with other researchers I've met. Ultimately, being an 'outsider' was a benefit. I think I was able to remain more open and neutral during the interview process, displaying my Israeli ignorance.

of micro-level concepts. Some critics (Ryan and Bernard 2000) claim thematic analysis is only a technique applied to already established methods, such as grounded theory, discourse analysis, or interpretive phenomenological analysis (IPA). Others (Henwood and Pidgeon 2003) equate it with 'grounded theory (-lite)' — a smaller scale application of grounded theory more suited to thesis-sized projects. Braun and Clarke (2006) defend thematic analysis as an independent method, with defined principles and phases.

Thematic analysis's benefit lies in its theoretical flexibility. Unlike grounded theory or IPA, thematic analysis has no prescribed theoretical framework (Braun and Clarke 2006). It can be applied within a realist or a constructionist framework, as long as the researcher clearly defines the study's theoretical position. Therefore, the method can both reflect and dissect reality (Braun and Clarke 2006). This section provides a rationale for selecting the thematic data analysis method and details how the analytical design contributes to each research objective.

3.4.1 Critical analysis and rationale for compatibility

Grounded and thematic analysis are similar methods because they both aim to balance inductive data analysis with researcher interpretation. The grounded theory approach provides both a methodology and a method (Henwood and Pidgeon 2003); whereas the case study approach provides a methodology with the opportunity to select appropriate methods (Yin 2009). I questioned whether my study was grounded during the research process, but with close consideration, determined thematic analysis was the appropriate method for four reasons.

Firstly, thematic analysis presented the necessary structure to examine the intersection of all three literatures that grounded theory lacked. Grounded theory is founded on a 'purely inductive' design, where the researcher collects data without exposure to the relevant literature in advance. This progression ensures the themes emerge as truly grounded in the data, rather than influenced by literature (Henwood and Pidgeon 2003). Thematic data analysis enables researchers to use either data-driven or theory-driven concepts to guide the process of identifying themes (Robinson 2011; e.g.- Kohlitz and Smith 2015). I was already becoming familiar with the literature from my conceptual framework prior to collecting data and had an idea of preliminary codes I would use before collection started.

Secondly, my research was exploratory, in need of a tool–thematic analysis–for forming conceptually-informed interpretations of the data (Manolas, et al., 2013). The case study was not designed to theorize or make generalizations. Therefore, flexible case study designs and thematic analysis are well-suited, as neither are strong methodological selections for generalizable results (Robinson 2011; Henwood and Pidgeon 2003).

Thirdly, as discussed in Chapter Two, my theoretical position straddles a critical-constructionist perspective. The theoretical freedom offered by thematic analysis allows for a contextualized final result.

Finally, thematic analysis is accessible to and recommended for new qualitative researchers (Robinson 2011). Utilizing literature-based concepts (a coding template) was better suited to me as a qualitative researcher unfamiliar with Israeli culture. It helped me to understand how concepts and themes came together during the analytical process. Concepts, typically nouns and ideas, identified types of water knowledge and professional contributions because concepts frequently identify attitudes or values, the principles that underlie action (Rubin and Rubin 2012). Alternatively, themes yield explanation for relationships between concepts and any causal effects (Stewart, et al., 2007). Thematic analysis often generates breadth rather than depth in results formulation. The process requires substantial results summarizations, typically in visual displays, and a constant closeness between the researcher and data (Robinson 2011). It also requires the researcher to acknowledge his or her role in selecting and reporting themes (Braun and Clarke 2006). These principles were compatible with the interview and autoethnography methods as well as the flexible case study design.

3.4.2 Analytical Framework Design

Having familiarized with the data through manual transcription, I developed a literature-based template to guide my preliminary interpretations and accommodate for the diversity and variety of participant perspectives. Consistent with the conceptual framework defined in Chapter Two, this analytical framework distilled eleven attitudinal indicators from pro-environmental behaviour literature for use in addressing influence on behaviour.

3.4.2.1 Objective 1 — Identify knowledge sources underpinning professional's understandings of water

Two studies were selected for their approach in analyzing attitudes and affect (Barr and Gilg 2007; Hinds and Sparks 2008). Both studies expand upon the theory of planned behaviour (Ajzen 1991), using Likert-style questionnaires to quantify the importance of given values to their participants and the predictability of defined personal environmental behaviours. Barr and Gilg (2007) focus on a holistic, interdisciplinary understanding of behaviour from a socio-psychological approach. Hinds and Sparks (2008) test the assumption that emotional connection to nature is a significant factor in predicting personal pro-environmental behaviours.

Both studies use similar attitudinal indicators and were combined into an analytical template of preliminary codes to guide identifying knowledge sources for this objective. For example, 'social influence', 'self-presentation', 'specific attitudinal constructs' (Barr and Gilg 2007) were combined into a single indicator entitled 'cultural norms' (Hinds and Sparks 2008). Barr and Gilg's coding template lacked an emotive indicator included in other pro-environmental behaviour studies (Franz, et. al., 2005; Kashima, et. al., 2014). Therefore, Hinds and Sparks' (2008) 'affective connection' indicator was included. Refer to Table 3.4 for indicator descriptions. For supplementary definitions refer to Gifford (2014).

Table 3.4: Indicator Template for Thematic Data Analysis. Indicator codes are grouped into Contextual, social and psychological categories, described using examples from Barr and Gilg (2007) and Hinds and Sparks (2008).

	Attitudinal Indicator (code)	**Definition and Defining Examples**
Contextual	**Geographic**	Childhood location and memories Exposure to nature/ water Travel, education, family
	Structural	Provisions that impact behaviour Pricing structures Infrastructure change
Social	**Altruistic**	Pro-social, communitarian values
	Egoistic	Self-preservation Personal-wealth, progress
	Openness to change	National, institutional, individual tolerance to change, liberalism
	Conservative to change	Need to maintain traditional status quo Uncertainty avoidance
	Limit to growth	Belief in demand management or sustainability
	Faith in growth	Belief in technological advancements or growth
	Cultural Norms	Social influence, self-presentation to behave to norm. Specific attitudinal constructs (in Israel) Friends, relatives, influential mechanisms encouraging behaviour
Psychological	**Environmental Identity**	Empathy for the environment Sense of self with nature Threat, environmental concern, sad when destroyed Environmental rights and services acknowledged
	Environmental Beliefs	Explicit conceptualizations of 'environment' Threatening, inconvenient Moral beliefs Promotes environmental awareness
	Personal Responsibility	Intrinsic motives Satisfaction in helping environment Attributed to self for addressing env problems
	Affective Connection	Dependence on (nature/water) for: - Sense of connection, relation - Lowers stress, comfort in nature - Happiness, safety, Emotive comments, actions
	Perceived behavioural control	Enabling or constricting logistics Belief in information accuracy and authorities Response efficacy, belief in tangible impact

3.4.2.2 Objective 2 — Classify professional contributions as specified behaviours

Water governance and knowledge management processes have become more decentralized during the information and technology era, as discussed in Chapter Two. Both kinds of literature emphasized the individual's role in ensuring that knowledge processes succeed in meeting their objectives. Overlapping principles from current water governance and knowledge management literature identified four needed behaviours for individual WRP professionals: to commit to a career in WRP, to promote novelty, to collaborate between disciplines, and to mobilize others. Supported by the interview questions and environmental behaviour research, these four categories were further defined as the following behavioural codes:

Table 3.5: Professional behaviours targeted for 'good' water governance with definitions adapted from: Olsson, et al., 2006:14.

Professional Behaviours (*Code)* and Definitions	**Benefit to 'good' WG**
1. **Commitment** (*"Career")* Decision to pursue, maintain and expand a career in the water research and policy (WRP) community. Supporting others in WRP careers through networking, recruitment, mentorship and training.	Legitimacy Accountability Knowledge evaluation
2. **Promote novelty** (*'Institutionalize' or 'Reconceptualize')* Institutionalizing new approaches or reconceptualising water issues. To diversify actor's perspectives and available solutions; to integrate new knowledge including social, experiential and cultural sources.	Openness, transparency Inclusiveness, consensus Knowledge creation and integration
3. **Collaborate** (*'Span Scales'*) Evidenced ability to span the scales of governance; to facilitate collaboration between sectors; to participate in interdisciplinary projects.	All principles, valuing: Collective intelligence Knowledge types Multiple solutions
4**. Mobilize others** (*'Mobilize', 'Partner'*) Initiate partnerships or mobilize support for change; ability to recognize opportunity and implement a vision.	Efficiency, effectiveness knowledge transfer Social coordination and training mechanisms

During the coding process, 'behaviours' constituted past and present professional contributions or decisions. 'Intended behaviours' encompassed contributions and decisions proposed for the future. The 'intended behaviour' category was included to acknowledge establishing professionals' contributions and capture commitment levels in established professionals' decisions. 'Intended behaviours' should not be confused with Barr and Gilg's

(2007) “behavioural intention” category which was used to *quantify* a participant’s likelihood of a given behaviour.

These behaviour codes were less specific than typical behaviours included in pro-environmental studies because my study performed a qualitative application of the typically quantitative method. Having general behaviours was more appropriate for this qualitative study.

3.4.2.3 Thematic Coding Process

Due to the cross-cultural, bilingual interviews and the participant diversity within the sample set, manual coding more adequately retained the participants’ meaning than analytical software would. Computer programs aided in word-processing and data management but could not code inclusively enough to identify underlying, hidden forms of knowledge. Having collected, summarized, and transcribed the interviews, my familiarity with the data was advantageous for identifying tacit knowledge and behavioural patterns during coding.

I printed and manually coded the interview transcripts using the indicator template and behaviour list to maintain consistency. Inclusive coding helps to retain meaning while searching for themes (Manolas, et al., 2013; van de Meene, et al., 2011). I used four additional codes to prevent losing data during the process: 1) ‘miscellaneous’ for participant responses that did not align specifically with an indicator; 2) ‘gender’ for representing gender-related topics raised by the participants; 3) ‘advice’ for professional responses that did not align with a behaviour; and 4) ‘IL-WRP’ for explicit information about Israeli water, research and policy topics.

Once complete, excerpts from the transcripts were arranged by code (behaviour, indicator, extra) in a spreadsheet. I noted page numbers and participant number (P1-P24) for each entry. Multi-coded excerpts were entered under each code, and their co-occurrences recorded to retain patterns and relationships between codes. When behavioural statements included obvious reference to an indicator, I recorded that cross-reference. As thematic data analysis is a non-linear process, preliminary concepts and connections emerged during data entry. I revisited early entries upon completion to ensure consistent coding between transcripts.

I summarized each indicator and behaviour into results tables to address objectives 1, 2 and to prepare for interpreting 'influence' (Obj. 3). I identified dominant concepts by their consistency in the sample and weighted them by conveyed importance–participants' sense of urgency and emotive responses–when applicable. The concepts were then transferred to index cards to enable a tactile clustering process. Rearranging concept groups underscored the links between professionals' attitudinal and behavioural values, and enabled me to interpret two dominant themes. The thematic analysis method defines themes as meaningful groups of concepts, yet distinctly separate and independent from each other (Braun and Clarke 2006). The two themes presented in Section 4.3 adhere to this definition. My two themes incorporated some of the same concepts, but operate as two individual ideas. The following section details how my analytical process maintained validity and trustworthiness.

3.4.2.4 Objective 3 — interpret the influence indicators have on behaviours

Four strategies were used to interpret the results, identifying the most interesting, relevant and credible themes: 1) co-occurrence patterning, 2) searching for disconfirming evidence, 3) a literature review, and 4) participant checking.

Sets of co-occurring concepts were grouped to look for patterns and identify importance. Contingency analysis is commonly "applied to social groups with common ideological commitments" (Krippendorff 2013:203). Contingency analysis assumes that concepts cluster into association networks, so "co-occurrences in text indicate association in mind or cultural practices" (Krippendorff 2013:205). Co-occurrence shows relationships between the codes referred to as 'contiguity' in thematic analysis (Denzin and Lincoln 2014; Manolas, et al., 2013). Clustering the co-occurring codes formed conceptual wholes, identifying which themes held the most meaning (Braun and Clarke 2006). Therefore, co-occurrence patterning was appropriate for exploring the relationships among attitudinal concepts and between attitudinal and behavioural concepts. This strategy identified which themes were most prominent in defining tacit components of Israel's WRP professional culture.

I revisited the data to test the dominant themes by looking for opposing evidence. Searching for disconfirming evidence within the data increases the credibility of interpretation and helps communicate complex meaning without creating obvious silences (Nightingale 2003). Less

formulaic than triangulation processes, searching for disconfirming evidence is better suited for thematic data analysis as it prioritizes commonalities over comparisons (Braun and Clarke 2006). Divided sample sets helped to identify opposing evidence, particularly due to the sample's designed diversity (Rubin and Rubin 2010). Considering patterns among Israeli natives and Israeli immigrants, or technologically-trained WRP professionals and socially-trained WRP professionals, justified the thematic relations. I was careful to state when participants opposed major concepts or themes.

Since all knowledge is situated and partial to context (Harraway 1991), my analysis needed to account for the partiality of the knowledge collected during brief, single interviews. I reviewed Israeli water literature as a validation strategy to assess whether the contextualized findings were consistent with recent research. Engaging with the literature at this thematic analysis stage was appropriate for the study's inductive design (Braun and Clarke 2006). The literature review sensitized me to subtleties in the results but did not skew the data collection (Tuckett 2005).

Participant validation is an important strategy in qualitative research for ensuring an accurate portrayal of a participant's socially-constructed reality (Creswell and Miller 2000). I neither became truly embedded within Israeli society during the ten week research period nor met with participants frequently enough to ensure corroboration. Therefore, the major themes and quotes applicable to each participant were returned via email (Appendix 3) to the participants for their input on interpretation. I designed these brief emails as opposed to attaching entire transcripts to adapt to the participants' time-restrictions. It was selected as an approach to ensure a better response rate. Eight participants responded to the request for quotation permission and provided comments or concerns regarding interpretation. Five quotes were updated, removed, or reconsidered for context due to these concerns. One participant requested their full transcript for review.

3.4.2.5 Analysis and Interpretation Summary

Thematic data analysis was the best method for interpreting this case study's data. The most significant themes, discussed in Chapter Four, are accompanied by reasoning for their selection and a brief description of their emergence during the analysis process. By providing

a summarized figure with all of the sample's evidence (Appendix 4), addressing contradictory evidence, and discussing only the most significant aspects of the case, this study fulfills Yin's (2009) requirements for 'quality' case study analysis.

3.5 Notes on qualitative writing

Writing a gripping account of a phenomenon and its methodological process is a major challenge in communicating case study results. Through conducting meticulous research, careful referencing, and addressing limitations, I provide accurate findings. Combining both the interview log and autoethnography prepared me to write the participant's voices with clear transparency, aware of "what effects [the] writing may have… and who may want to engage with it" (Mansvelt and Berg 2010:348). Interpretation and communication quality should be determined by whether the readers gain experiential understanding of the phenomenon after exposed to the narrative account (Ellis 2004).

The writing in Chapter Four does not provide frequency counts or participant percentages for each result. Qualitative researchers often include ratios to support their findings (van de Meene, et al., 2011; Taylor, et al., 2013; Wolfe and Hendriks 2011). However, there are four reasons why I opposed the numerical approach.

Creating 'counts' of tacit 'evidence' would have mismatched the research intention and approach. Instead, I developed credibility by pairing research tools that utilized tacit knowledge to a research purpose that valued tacit knowledge. The data I analyzed was empirical material; I coded for personal, experiential, value-based knowledge that was typically sub-surface to the text. In order to tease apart such invisible concepts, I drew upon my emotional intelligence. Combining autoethnography, responsive interviewing, and thematic analysis enabled me to do so.

Secondly, to achieve my definition of validity, my writing needed to maintain accountability to the participants' voices (Dowling 2010; Ellis 2004). Assigning percentages to tacit results felt like an imposing, subjective estimation process. Knowledge and identity are partial and situated (Haraway 1991; Nightingale 2003; Northoff 2010); different topics arose with participants at various times during the interviews. Attributing numerical value to the concepts identified as most urgent and consistent would have imposed my interpretation onto

the empirical material instead of letting the material stand for itself (Baxter and Eyles 1997). That process would discount case study methodology in awarding inherent value to a phenomenon (Baxter 2010; Yin 2009).

I opposed frequency counts in the text for they distract from meaning-making. The purpose of my writing was to lead the reader in understanding concepts, in realizing integrations among concepts. Result ratios distract readers from focusing on the participants' messages and meaning I conveyed (Fetterman 2010; Mansvelt and Berg 2010).

Lastly, the purpose of this study was to consider diversity, not magnitude. The frequency of each concept was not what mattered to the research objectives. My purpose was to consider diverse knowledge types, their interactions, and their influence on behaviour. Since the participants were all active WRP community members, then how they each conceptualize water and conceptualize their professional culture matters regardless of how diverse those conceptualizations are. What mattered was understanding how the professionals think about water and what influence it had on their contributions.

Chapter 4. Knowledge, identity and behaviour in Israel's water research and policy community

4.1 Introduction

As stated in Chapter One, three objectives were defined to investigate the research question. These objectives were to: (1) identify knowledge sources for WRP professionals' personal and expert understandings of water; (2) characterize professionals' behaviours within the WRP; and (3) identify which knowledge sources influence the determination of professional behaviours in the water research and policy (WRP) community.

The Substantive Results (Section 4.2), provides details to fulfill the first two objectives. Section 4.3 presents two dominant themes that arose during analysis to address the final objective. Objective three combines the first two, requiring a more integrated writing format. Concepts may read repetitively through this chapter as several intertwined during the interpretive process. Section 4.4 incorporates the themes into concepts from the conceptual framework (Chapter Two) to define new, interesting ideas and provoke further questions.

The confluence of voices in this chapter requires format clarity to help the reader distinguish whose voice they are reading. The participants' voices, embedded in the text with direct quotes, are indicated by italics and parenthetic participant references (e.g., P9, v). Expert voices, direct quotations from supporting literature, share the same font text as my professional diction. Finally, my past voice captured during field research is embedded within footnotes. These autoethnographic excerpts provide rich context to themes as they develop. Appendix Four contains an autoethnographic compilation regarding the development of my positionality, the relationships between myself, the research, and Israeli culture.

This chapter was written with a very intentional style. Qualitative writing enabled the revaluation of tacit knowledge by allowing the participants' voices to take precedence and develop meaning. I particularly emphasized the underlying values and experiences from the messages each woman chose to convey. I wrote 'professional' and 'participant' interchangeably throughout the text but used 'professional' to underscore concepts about Israel's WRP professional culture. Participant numbers were included when discussing a

divided sample set, but as defended in Chapter Three, numeric labels were not provided as validation for the concepts or themes.

With my writing, I pose a challenge to my readers. I acknowledge that you, my reader, likely originate from traditional positivist research; that the absence of frequency counts might make you uncomfortable. The discomfort felt from wanting numerical proof highlights the underlying tacit assumptions of your scientific orientation. The hesitance you might feel in accepting the writing without numerical proof exemplifies the psychological, tacit implications of unlearning, of collaboration, of knowledge integration (O'Byrne 2007); it exemplifies the very essence of my thesis. Therefore, I challenge readers to suspend their expert mind and allow themselves to "settle in for a longer process of shaping meaning" (Devault 1990:3). Consider the diversity of people involved in water governance in Israel; my research offers a window into professionals' worldviews that may challenge the reader's own perspective on or interactions with water. This chapter offers the opportunity to contemplate and derive meaning from the confluence of worldviews, an opportunity to let tacit and explicit concepts hold value in and of themselves.

4.2 Substantive Results

In psychology, there is general agreement that a person's behaviour is preceded by their intention — their willingness and capacity to carry out behaviour — and filtered by several influential factors. In Chapter Two I outlined how complicated human behaviour can be; underlying influences are interconnected and often compounding or conflictual. Human behaviour challenges qualitative writers to report interconnected results in a linear fashion. To address this incompatibility, I compiled the results into a diagram (Appendix Five) and elaborated with a logical progression of conceptual results text.

In Section 2.2.5, I introduced McDonald's (2014) behavioural model for pro-environmental behaviours at work. Seen in Appendix One, this figure provides one example configuration for how different knowledge sources, or 'attitudinal factors' in environmental psychology, piece together to form a mutual influence on behaviour. The diagram in Appendix Five adapts McDonald's model to display the case study's complete interconnected results. It demonstrates how many factors converge to form influence on professionals' thinking and

behaviour. Addressing the first objective, I considered the various knowledge sources that influenced each professional and then looked for patterns across the sample set.

4.2.1 Attitudinal Concepts

Several knowledge sources raised awareness about water issues for Israel's WRP professionals. However, the awareness and beliefs created by their expert, environmental knowledge was only one influential source. Attitudinal concepts expressed in interviews were not explicitly environmental or water-related. Professionals identified several identity facets; different lenses through which they considered their professional behaviours. Two of the five facets were forms of environmental identity, but the majority were forms of social identity and citizenships. The analysis also highlighted political phrases such as: "peace-building", "approaches to resolution", "positive socio-political impact", or "protracted conflict". This was not intentional or prescribed. The purpose was not to over-emphasize politics as an influence on professionals' behaviour. It does, however, reflect the omnipresent political tension in Israel.

Professionals conceptualized water with a broad range of attitudes. During coding, the most prominent attitudinal indicators were altruism, cultural norms, personal responsibility and perceived behavioural control. These codes were often difficult to discern or differentiate and required intensive listening and attention to subtext. Geographic context and environmental beliefs were the other two prominent attitudinal indicators, but their obviousness was due to explicit conversations regarding how professionals learned about water. These prevalent patterns support the main concepts that emerged.

The participants conveyed the first five water conceptualizations in ways that implied obviousness or a natural assumption, given their profession and geographic experience. These results were easily identified and well supported by subsequent literature reviews. Therefore, citations were provided for further reference and the textual descriptions were kept short. The final four water conceptualizations were more nuanced, difficult to analyse or link to water concepts. These results integrate more participant quotes to provide a full and comprehensive account. Literature incorporated in this text was critical for developing understanding about tacit concepts from a foreign culture.

4.2.1.1 Water is scarce in Israel

Consciousness of Israel's scarce water resources was the most obvious, consistent result. It was often participant's first, most accessible concept when asked how they learned about water. "*Everybody knew Israel didn't have enough water. We were raised on this idea. So water has always been an important issue in this country– many decades"* (P4, iii). Another participant iterated, "*we must save water; you have to save every drop of water… we grew up on the impression we must save water for agriculture… TV commercials and campaigns in the '80's [about Lake Kinneret drying up] were drilled into our heads as children*" (P21, iii).

Awareness about scarce water supplies may seem a simple result from a sample of Israeli WRP professionals with access to thorough research on the subject. The literature cites public consciousness about water scarcity (Becker 2013). However, the diverse examples used to communicate the concept signaled importance, pertinence in the Israelis' daily consciousness.

Two examples included public forecasting conversations and infrastructure reminders to conserve personal water use. Whether *"it's very rainy this winter or not is always a topic, in the paper, the television, the radio; is it above average, a yearly average, or below (said with humour)"* (P3, iii). "*The level of [lake] Kinneret is part of the forecast…every time it rains people ask is the Kinneret higher?*" (P4, iv). In the Arava desert, Kibbutz houses "*have two taps- one is freshwater that's been desalinated for drinking, and the main tap which you shower in is brackish water, too high salinity for drinking. It raised my consciousness of freshwater and its value*" (P22, iv). 'Water is scarce in Israel' was categorized as an environmental belief, a geographic factor, and a cultural norm.

This strong result emerged early during interviews, so I sought disconfirming evidence by asking the professionals who had immigrated to Israel for geographic comparisons.

> "*[Me: Were there any differences in how you thought about water between where you grew up and here?] Definitely here when you come you're inculcated that there isn't very much water. You need to save water. … It's definitely something that is much more of a national consciousness. Even in California where there are also droughts, it was never something that we talked about. It wasn't something that I grew up with consciousness about*" (P10, ii).

A European immigrant echoed this American perspective. "*In England, water is not an issue… In Israel, the dominating issue of scarcity is obvious and instant; I don't think I have*

felt anything more deeply than that" (P9, vi). Statements about scarce water supplies often co-occurred with the expectation or obligation to 'save it'.

4.2.1.2 Water's inherent value

Regardless of whether explicitly stated or tacitly implied, every woman acknowledged water's inherent value, its essentialness for human survival and sustaining life. Water "*is a very important resource that we miss. So you have to care for it. It's very clear. It's something that goes without saying*" (P4, iv). 'Water's inherent value' was indicated by personal responsibility and affective connection. Participants spoke of their protective attitudes and behaviours, about how their inherent regard for water elicited a feeling of commonality between humans. Water provoked feelings of interdependence and responsibility to protect it for human survival. This was the first concept that highlighted anthropocentric water perspectives as dominant in Israel.

4.2.1.3 Water as anthropocentric

The second indicator for anthropocentrism was the relatively absent discussion about environmental values in water management. Professionals from all sectors showed pride in Israeli water technologies such as irrigation innovations, water recycling infrastructures[8], and expansions of the National Carrier's water distribution system (Map in **Figure 3.1**). However, in comparison to human needs, securing environmental needs were infrequently mentioned, unless stated as a low priority in Israeli decision-making. We are "*in charge of supplying water and the first needs are drinking water. And then some also for nature, but first you have to worry about people. In the future we hope to have for both, but we have to prioritize*" (P17, iv). *"'Water for nature' is a big fight here*" (P15, vi).

Water's inherent value for maintaining all human life, combined with a belief that technological solutions enable a comfortable life in water-scarce Israel, frame water as an

[8] **Sewage as a Source**
June 13th, 2013: Two weeks into interviewing- I've noticed the absence of the word 'waste' in engineer's conversations about sewage treatment. Instead, I hear professionals' say 'recycled water', 'water filtration systems', and 'sewage treatment'. The difference in language to how Canadian's frame sewage as wastewater sets a different tone, seems to underscore technological innovation and full-cycle planning for scarce resources. This feels so counter-intuitive given how nascent household recycling and compost are in the country.

anthropocentric resource in Israel. Conceptualizing water as an anthropocentric resource highlighted which values dominate Israeli decision-making about water, a concept well cited in Israeli water research (Becker 2013; Fischhendler and Katz 2012; Sowers, et al., 2011).

4.2.1.4 Water-agriculture-security coupling

Water in Israel was not only intrinsically linked to human security, but also to national security. The coupling between water and agriculture was often implied as a strategy to procure and occupy land. But some participants blatantly linked water and security in governmental relations:

> "*Water is such a security-driven field; you get a lot of men with distinguished military careers, security-based careers in leading water roles. … Water data just in recent years has become a lot less secret, a lot more accessible to the public and public sectors. But the legacy of water and security is still very much embedded here*" (P15, ix).

Opposing attitudes were expressed when discussing the impact of the embedded water-agriculture-security concept. For instance, personal safety, faith in technology, and pride for the WRP were conveyed with the belief that securing water supplies through rapid desalination would alleviate water quality issues. Yet, environmental concern and perceived threats underscored conversations about water quality as an overshadowed and neglected issue in comparison to agricultural and technological advances. "*Israeli Agriculture is world renowned for being very developed and advanced, but what the world doesn't know is that it also destroyed most of our water*" (P12, iii). This participant spoke emphatically about degraded watersheds and polluted rivers that had resulted from the national Water Carrier and intensive agricultural activity.

4.2.1.5 Perceived water threats in Israel

Water concerns arose during almost every interview, despite not being triggered by a direct question. The concerns not only exhibited professional awareness about the issues, but also perceived threat for water's non-security values — tourism, recreation, spirituality, and culture. The impacts of surface water diversion, groundwater over-extraction, and agricultural water pollution have strong scientific documentation in the literature (Katz and Tal 2013; Kislev 2013; Tal 2002). However, documented social and cultural losses from environmental

changes are nascent. Lost cultural practices and recreation opportunities were summarized in a recent riparian ecology report (2012) by Israel's most established environmental non-governmental organization, The Society for Protection of Nature. Their analysis clearly stated a change in Israel's waterscapes: "Few may remember today the abundantly flowing waters of the coastal and inland rivers, and the wetland ecosystems that were an integral part of Israel's landscapes" (Skutelsky and Perelmuter 2012: E03).

A sense of loss, or mourning, pervaded several interviews when participants reflected on childhood water memories and generational changes. Thinking about how much the Dead Sea had shrunk made one woman upset. "*When you see it as a child and then see how it is now, you ask is it the operations, is it climate change, is it bad management, what is it? It makes me upset. It's an emotional thing*" (P24, iv). Childhood memories about playing or splashing in watercourses were followed by disappointment from some women who felt they could not allow their children to play in Israel's waters. The most keenly felt loss was communicated by the Israeli-Arab participant, for whom water from a local spring was a pillar of her culture.

> *"Once there were many springs, in most of the villages here. There was one spring in the center of the village, and everything that happened centered around the spring. The life was coming from the spring. I have a photo — very old, very nice photo. It was a gathering spot; the center of our lives. We did everything there, washed clothes, took our water, had weddings and ceremonies. It was part of our culture. ... After I grew up and went back there, everything had changed. There was no more importance to the springs; they're not part of our daily life. And I wondered why? But today it's not clean anymore, we can't use it. That is the situation for most, if not all of the springs in the North. They are polluted with sewage water….*
>
> *I remember, my parents and I, we used to go to another spring and drink from it. I still remember the taste of cold water from the spring* [said with big smile]. *But today you can't do it. Today you can see the color of the water in the springs is green or brown, with clumps. You won't see clean, pure water. The North has the most amount of springs in the country. The pollution here has a greater impact on the country's water supply than in other areas"* (P13, iii).

Perhaps loss and lacking exposure impact Israelis' current relationship and connection to water. The participants communicated their water concerns with less difficulty than their interaction and connection with it.

4.2.1.6 No common connection to water defined

As a Canadian raised at lake-side cottages and a paddler on frequent long and remote canoe trips, I entered the interviewing process anticipating to hear about an Israeli environmental identity or emotional attachment to water. I remained conscious of that personal bias, my assumption that people's exposure and memories about water, their social and physical interactions with it, forms attachment to water and waterscapes. However, environmental identity was not a dominant component of water connection and was rejected outright a few times when asked. The participants were often uncomfortable answering the question: what is your deepest connection to water? By 'connection' I meant relationship to, attachment with, and empathy for water; attitudes that were best defined by the indicators affective connection and environmental identity (Table 3.4).

A common connection to water was not defined. Some participants communicated connection with water through exposure to nature, as I'd anticipated. Others expressed water connection through employment and intellectual security and as a means to fulfill their 'contribution'. However, primarily, the Israeli WRP professionals articulated ideological, altruistic connections to water.

Emotive accounts of forming an attachment to water involved childhood experiences in nature or physically interacting with it. Most memories with water were social — family hikes, Shabbat by the sea or favourite waterway, or military services spent as an outdoor educator. A love for swimming was often raised, as well as the calm, safety participants felt in the water. Others struggled to explain their regard for water and its fundamental role in sustaining life; their dependence on it for safety, survival and comfort. Emotional connection was often reasoned from freedom and ability to maintain quality of life in Israel.

> *"I have to explain something about this area, the Jordan Valley. It's dry. It's very, very hot here (200m below Sea Level). Even when it's humid it is still very, very hot. If you don't irrigate, everything dies. I am connected to green surroundings. I need it. I feel bad without the green surroundings.* [me: You need it for happiness?] *Yeah. I need it for happiness. I need it to feel safe. … I remember after the rain, when I saw the first growing plants — it made me feel so good. I was very, very small. I don't know why; I think it was one of my most attractive things in life. [Said with a lot of emotion and emphasis]. Something that I could not stand ignoring… It comes from the inside [hand on heart]. It makes me feel better. It makes me feel more safe. It's like everything is okay. When it's raining, for me it*

means everything is okay. When it's drought — for me it's threatening. Drought, it threatens my life. [Silent pause] But I don't think about it. I feel it" (P18, v).

This quotation not only highlights water's threat to survival, but also a second aspect of emotional connection: a sense of belonging in Israel. Though strong connections to water were few, a strong loyalty and identity in relation to the land emerged from the interviews. Some participants explored their attachment to place in Israel while discussing landscapes and vistas, making it clear that water was considered *part* of the landscape or nature in Israel, not thought about on its own. Only the participants who lived in the North and in communities 'off-grid' from the National Water Carrier spoke about their local drinking water source[9]. For others, a sense of belonging was construed while defending their WRP careers' contribution to the country (Section 4.3.2).

Egoistic connection to water balanced the emotive attachment through perceived employment security and intellectual freedom in the WRP field. "*There will always be a need for water and always be a need for services. So as a professional, they will always need me… other professions depend on the market, but with water you will always have a job*" (P8, iv). Water's interdisciplinary properties provoked value for intellectual security; some professionals used this to explain their value for innovation within the WRP. "*I value workplaces that give you the freedom to make an impact. When you can express, be listened to, and have an environment to be creative, that's the most valuable thing*" (P21, vi). The WRP field received appreciation during interviews for enabling a standard of professionalism and intellectual independence. Conceptualizing water in this manner increased the professionals' perceived behavioural control, creating a reputation for the WRP as an avenue for making tangible impact to Israel through work. The influence this egoistic connection to water has on commitment to the WRP is discussed in Section 4.3.3.1.

[9] **Water as 'invisible' to Israeli's**
May 23rd, 2012: Israeli Canadian Workshop. Eran Feitelson made a really interesting comparison in today's session. In his experience, "water is invisible in Israel. It's on a national grid, we drink water from Palestine one day, the Golan Heights the next. But Canadians are so locally sourced, there are lakes everywhere you see it all the time". I'm curious to see what influence this has on my participant's water consciousness, if any.

The ‘connection’ question also provoked altruistic responses. For participants who stated having no connection to water or nature, claiming not to be a stereotypical “environmentalist” or “outdoorsy person”, their connection with water was ideological.

> *“I have to tell you, I’m not a typical environmentalist at all. To be honest, it’s not the priority. Nature is not the source of my priority. Women’s rights, feminism, political agendas are much higher… When I see people in other places that don’t have much water, I feel for them. It does touch on my emotions. But I can’t say I have some psychological drive about water to do this job. It’s more a psychological drive to do meaningful, just work. If anything because the access to water as a human right — an anthropocentric perspective”* (P23, vii).

This quote exemplifies a common environmental belief from the participants that environment and society are inseparable. With social and ecological values intertwined, ‘environmental identity’ was difficult to discern; it often equated to social identities. If participants connected to water for social and intellectual efficacy reasons, then environmental identity and affective connection were not primary attitudes. This finding is key to understanding the relationship between Israeli water attitudes and behaviours since affective connection and environmental identity are important foundations for pro-environmental behaviour.

4.2.1.7 Make a positive social impact

Stated altruism and personal responsibility to make a positive impact on society through work was the second most prominent and obvious finding. It signaled that the participants believe in Israel’s WRP community as a professional avenue for making a positive change. “*[Me: What is your Shifah (ambition)? What are you hoping to achieve?] A change. To make a change. To make our places better to live in. Today the situation is not so good — environment, social, everything, you cannot separate them”* (P13, v). Longing to make a positive social impact underscored professionals’ intrinsic motivation from water’s inherent value.

Participants revealed their personal responsibility to improve water issues in Israel when describing their career development and future ambitions. “*When I was looking for something to study, I knew it had to be connected to my ideology. I have to believe in what I am doing*” (P24, ii). “*There is social concern in most of the things I do, in all of them. I will not choose a*

topic that will not have it- some kind of benefit or good that you can do with the research. It's very satisfying" (P1, iii). Aligning personal values with their profession was important to women professionals across all four WRP sectors. However, it seemed to stem from several sources.

The gendered sample may have influenced the strength of this altruistic attitude. The professionals included parental modelling and protecting their children as reasons that fueled their sense of personal responsibility to water. For instance, one woman was "*afraid of giving water from the [local] tap to [her] daughter…I have to change this situation. It can't be correct*" (P13, v). Israel is a very family-oriented society, but research shows women tend to have more pro-social, pro-environmental attitudes (Koger and Winter 2010; Gifford and Nilsson 2014). Assessing whether gender influenced my pro-social results would require a comparative study in the future.

Kibbutzim culture may have also influenced how socially-focused professionals were. "*I value Kibbutz and why I'm still there is that discussions there are more ideologically-based, or morally-based – we do have the power to influence it. So it's a more, empowered citizenry*" (P16, vi). Several professionals lived or worked on kibbutzim or moshavim. However, the pro-social, empowered attitude extended beyond this subgroup. It appeared to be a cultural norm in Israel.

As self-reports, the application and reach of the participants' intent to create positive social impact cannot be generalized or quantified. However, the consistency with which morals and moral alignment to a profession was linked with commitment to their job in the WRP identified it as a strong influence (Section 4.2.2.1). Making a positive impact through work often co-occurred with the following 'heavy' concept.

4.2.1.8 Life in Israel is "Heavy"

The word I heard Israelis' use was 'heavy'; life in Israel is very 'heavy'. Participants described the impact constant, indefinite conflict had on day-to-day life, linking several attitudes and behaviors to it. This concept was difficult to understand as a person with no experience in wartime or coping with prolonged conflict. What did 'heavy' really mean? One woman explained the phenomenon while drawing comparisons from living abroad.

> *"When I was in Australia, I had this perspective how it is not to live in Israel. Very crazy country. It is! We're addicted to it. We're addicted to the craziness, it's absurd. Because we do not live our life. We live the 'country' life. We do not live just to live. When you are somewhere else, and you are saying, no worries; you get up in the morning, go to work, come back in the afternoon, all is good, all is great. Here we go all the time with this cloud over our head. There's a lot of tension. It could be that we all the time are sort of afraid; worried about our future"* (P7, v).

To understand the psychological impacts prolonged political conflicts have on individuals, I turned to an Israeli political philosopher's book *Citizenship Under Fire* (Ben-Porath 2006). "A protracted conflict, with no clear aims and consequently no well-defined attainable mode of achieving victory, casts a different burden on society than other types of war" (Ben-Porath 2006:12). When individuals' perceive their safety and survival as threatened, such as in times of war, their relationship with their governing body changes to prioritize survival or human security. Protracted conflict impacts the public discourse by perpetuating a security focus, excluding less-valued topics or framing other topics in a security light. The continuous stress on citizens from perceived and portrayed threats impacts their ability to cope and engage as citizens in the conflict (Ben-Porath 2006). The 'citizenship in wartime' concept is integrated into discussion section 4.3.2.2 which draws parallels between citizenship behaviours and professional contributions. This section simply uses the definition of protracted conflict to describe the 'heavy' concept conveyed.

Three attitudinal results provided evidence to define the 'heaviness' of life in Israel and are introduced here: a) frustrations with a narrow public agenda; b) water as sensationalized or emotional; and c) a low perceived behavioural control due to diminished emotional capacity from conflict. During analysis 'heavy' concepts were indicated as geographic or organizational factors — sources of external influence on professionals. However, emotional body language also displayed the participants' internal and tacit responses to the concept.

One aspect of heaviness was the reported frustration that security takes precedence in decision-making and media. Many participants felt confined to professional activities that aligned with security agenda initiatives. "*One of the problems is that there are other problems that seem more imminent. They attract more attention. Security issues take precedence*" (P10, v). These conversations frequently evoked defeat about how Israeli media construes water

issues. "*Unfortunately, it's very difficult to get proper media exposure… We're asked to comment a lot about water issues to the Israeli media, but getting the opportunity to present our projects is more difficult. Somehow the media here is more focused on problems, negative media, threats, less interested in the good stuff that is happening*" (P23, ii). Water messaging exemplified an underlying theme: Israel's reliance on stress. Participants provided examples of how water media reinforces 'heaviness' in Israel:

> "*Water issues are well represented in the media because they have sex appeal... Everything that insinuates disaster with water will be published. We love disaster. We need to be in a constant state of hysterics, fear, and stress. We need stress in our lives. Everything that is stressed within the water sector will appear in the paper. Everybody will be very happy to know that things are so serious*" (P1, iv).

Statements such as this one conceptualized water as an emotional issue in Israel. One participant realized during her interview that, "*it's all very emotional. Decisions about water are very emotional in Israel …We need to always be very emotional in Israel*" (P14, iv). Water was thought of as a contributor to the country's 'heaviness' due to the inaccuracy of sensationalized media. "*But when you want to frighten- I use the word frighten- people about the state of water scarcity in Israel, you tell them… the Kinneret is shrinking. So everybody is in panic. This is funny because we have desalination, so we can take care of ourselves*" (P21, iv). Reviewing the emotional terms used in these few select quotations - worry, frighten, panic, threats, stress- highlights how easily threat cultivates national consciousness and unity about water scarcity, a topic discussed further in Section 4.3.1.

Enduring through protracted conflict cultivated a low perceived behavioural control in professionals' personal lives. For instance, one participant explained how Israel's conflict can promote political indifference:

> *"The reason I chose to have my second degree abroad had to do with the really depressing situation that prevailed here during those years. You know, 2000-2001, the second intifada, and also an economic downturn in Israel. It was REALLY depressing. In any terms you looked at, people's hopes for finding an agreement were fading away. In Israel, you must have heard that it's very difficult to even just get by. Wages are very low, [politics is] also very overwhelming and the media tends to frame it in a very misleading way. But the need to work and get by... it gets you detached from the greater, political aspects. ... From abroad, everything looks worse. When you're here and you're part of this mainstream indifference, blurry-*

conscience of the mainstream, you can somehow justify things better than when they are presented in foreign media abroad" (P23, iii).

Diminished emotional capacity may explain why Israeli-Palestinian conflicts about water were ignored topics in my interviews. Israeli WRP professionals avoided talking about transboundary and regional water issues in comparison to the Palestinian professionals I interviewed (for informational purposes only).

4.2.1.9 Avenue for collaboration or peace-building

'Water as an avenue for collaboration' was a concept based on water's inherent interdisciplinarity and the acknowledged relationship between environment and society. Several participants saw professional opportunity in that relationship. "*Water is a symbol or one aspect of environmental, sustainable issues. Water is the joint-point of social, anthropomorphic and environmental — it's the meeting point. It's just something so essential that everything meets at this point*" (P20, iv). An engineer echoed this social activist's perspective. "*We become citizens of the world when we have an environmental issue. It's something that we can talk to our neighbors and build a relationship*" (P7, iv). 'Water as an avenue for collaboration' was communicated by professionals in every sector within Israel's WRP.

Professionals involved in social change advocated using water to spur cooperation on both inter- and intra-national scales. "*For me, the environment is a platform for facilitating peacekeeping. [People] aren't coming together because they love each other. They don't. But they are getting together because they have some shared project that they have some benefit in advancing. In doing so, ties are formed and communities are brought together*" (P15, vii). "*Our view is that we live here together; we both made these hazards, and we have to solve the problems together. We live so closely together — villages are only meters apart… We are helping people cooperate*" (P13, iv). These professional activities targeted citizens and communities, believing in them as the locus of control for mobilizing change. For this reason, 'water as an avenue for cooperation' signaled perceived behavioural control because it created hope; it conceptualized water as a means to minimize political boundaries in Israel, whether between Arabs-Jews, male-female, regional, or international. This attitude relates directly with the 'seeking approaches to resolution or bi-national efforts' behavioural result.

4.2.2 Behavioural concepts

This section summarizes the behaviours participants identified when discussing their accomplishments and ambitions, as well as trends in committing to the WRP from their career development stories. The behaviours exist beyond job descriptions and benefit the environmental movement or water governance trajectory in Israel. Therefore, these professional actions qualify as pro-environmental ones, despite not being specific, quantifiable actions.

Of the four behavioural codes defined for objective two, career commitment and promoting novelty were the clearest and most frequently discussed behavioural topics. Spanning scales of governance and mobilizing change identified more clearly the characteristics needed in order to be successful in accomplishing these behaviours, rather than providing examples to analyse. These second two behaviours were excluded from analysis in objective three, since they did not contribute substantially to interpreting 'influence'; however, they were used to inform recommendations as they identified organizational aspects of Israel's WRP culture. Textual description in this section is short, as much of the data about career commitment and reconceptualising water issues was incorporated into the case discussion (Section 4.3).

4.2.2.1 Career Commitment in Israel's WRP community

Water was not necessarily the strongest driver for IL-WRP career selection. Many participants (n= 17) stated that water was a secondary or indirect driver for their profession. Three participants hesitated to identify as a 'water person', explaining which original disciplines led to their involvement in water. For example, "*[my] interest is in boundaries and borders. It's not the water, it's the borders. Water is just one interest in transboundary resource use*" (P1, ii). Only seven participants targeted water-related work initially. The commonality across the sample was ideological career commitment. Every professional identified moral alignment between their work and worldview as a reason they valued their career. Perceived efficacy, satisfaction from making a tangible impact, was another important aspect of career commitment (Section 4.3.3.1).

Mentorship and interactive workplaces were important determinants of success. Professional networks were noted as important for career commitment, yet were valued differently between sectors. Industry and government professionals reported their networks as motivating, positive aspects of their careers, whereas professionals from civil society and research groups reported the absence of support outside of their own institutions. Many participants expressed a desire to expand their sphere of influence with their profession, wanting to begin impacting decision makers, or regional initiatives, or international projects.

4.2.2.2 Promoting Novelty in Israel's WRP community

In considering this behaviour, professionals exhibited consistent openness to change; they demonstrated willingness to adapt, collaborate and innovate. Every participant valued expanding their respective approaches or activities within the WRP to make them more holistic. Examples included integrating social or ecosystem values into plans for appropriate technologies with communities, or mimicking biological processes in designing new technology. Re-conceptualizations predominantly focused on sustainability elements — reaching more balanced socio-economic-environmental approaches for a given task.

Re-conceptualizing Israel's water governance agenda also involved behaviours that demonstrated critical response to the dominant supply-oriented technological approach. Several participants questioned governance decisions or the impact of management practices. The willingness to provide dissent and institutionalize alternative practices was demonstrated by the professionals' focus on community engagement and improving information accuracy on water issues. Participants discussed their work strategies for bi-national peace building, international collaboration, and 'nexus' work integrating sectors as processes that would advance Israel's water governance. However, re-conceptualizations in the WRP dialogue were often met with resistance or opposition.

Defending more diverse actors and values into the dominant WRP dialogue was a common behaviour. Improving information accuracy in the WRP involved science communications, science coordination mechanisms, ensuring transparency for industry and law, or advising policy makers. One engineer explained, "*I think my impact could be a different point of view. A different way of looking at the big picture, but not from the normative view…*

Do things in a different way to achieve the same goals we outlined. That's why [I took this job] I want people to make decisions according to more accurate research" (P8, v). Ensuring high-quality professional knowledge and access to knowledge was a proud accomplishment for participants. "W*e succeeded to publish many things in Arabic*[10] *in the last few years, making reports and translating lots of documents. And exposing more people to [Arabic environmental] information"* (P13, v). The Israeli women WRP professionals not only promoted community involvement, social networks and interdisciplinary projects, but also more gender parity.

Advocates for more egalitarian gender ratios in Israel's water governance structure believed in woman mentorship as a method to integrate wanted values into decision-making. Woman networking, recruitment and mentorship in the WRP was important to participants. Professionals defended these activities as methods to institutionalize more holistic approaches within the WRP. Since gender topics were carefully navigated during interviews, this behavioural result was less prominent than others; however, the passion and urgency with which it was expressed warrants its inclusion.

Some participants raised gender ratios in Israel's WRP community instantly upon meeting. "*I have to tell you, I'm always looking for the women [when recruiting for conferences]… I find myself asking do you have any women?… [about decision makers and managers]… we're not well represented; there's definitely a glass ceiling on women's voice in water and only some women have pushed through*" (P15, ii). One participant who did push through that ceiling reported frustration with the imbalanced work environment. "*It is often that I am the only woman in a big meeting of men. It's not an easy situation. I've always coped with it, but I never liked it. I still hate it today…It's the psychology of the situation. It is not a*

[10]**Arab-Jewish Intra-national relations**
July 9th, 2012: I asked Arthur about the current trend towards Arab-Jewish "Israeli" communication tonight, because I as an outsider have no way of judging whether it is new behaviour, or an old trend. He liked my question and came to the conclusion that it is relatively new. That since the independence war, tensions within the country had been too high to support any collaboration/communication, but that the progress is improving, albeit localized (Haifa, CFE, FOEME, Heschel). He also reminded me that, "the gap between awareness and action for environmental or ethnic issues has to be viewed according to *priority.* The problems in Syria have spilled over to Lebanon, which gives Iran the Northern and Southern (Hamas through Gaza and Sinai) vantage points. This is a high priority, international issue that overrides other thoughts for the mass public".

very pleasant situation" (P19, ii). Another expressed the importance of mentoring young women in her field for overcoming the discrepancy between working women and women managers. "*In Israel, women are expected to do both- to be a good mother and a good worker… it's very deep in this country to be family oriented… we're expected to be really good mothers, and really good daughters, and really good grandmothers, and it doesn't end, and it takes time. That's an important part of the reason, but not the only one — far from it*" (P4, vi). Despite frustrations operating in a male-dominated profession, succeeding to a high management level made established WRP professionals proud.

In addition to confirming low women manager rates in the WRP, several participants elaborated on how women would benefit water decision-making in Israel.

> "*[Me: What are some of the things you are still hoping to achieve?] Get more young women to be scientists. I definitely want to achieve that… I want them to also be managers and be at the top. Men are DM's, in general, nearly always. The feminine point of view is often very different. The way things are judged can be very different — men put in a lot of political and power issues, it's very hierarchical. For women, that's less important. Wherever I go, decisions are made from a man's perspective. There's an odd woman here or there, but if they count, they are a small minority. I see women can contribute because I think they see the science, or the benefit of the people, or the benefit of the ecosystem instead of the power struggle. This is in general, there are a lot of women in power that are also in struggles. I think fundamentally women make decisions differently than men. And that having more women would be a benefit"* (P19, vi).

This call for more woman participation at the national level was echoed by a participant involved in community-scale projects who advocated for more male participation. *"The women [in the community program] said they would have preferred it if it had been mixed. It should be – it's not a women's issue. It's the natural instinct of women to protect the nature, for the health of their family and their children. But it should also be a men's issue*" (P13, v). Therefore, gender diversity in decision-making was perceived as advantageous at all water governance scales.

4.2.3 Results Summary

As with any study that includes tacit knowledge, there are many combinations of factors that lead to interesting attitudinal results. My results showed Israeli woman WRP professionals have water-saving habits, like 'turning off the tap' to 'save every drop', that have direct, daily

impact on how they conceptualized and interacted with water. Participants discussed geographic factors, such as generational changes and the omnipresent political conflict that promoted personal responsibility in thinking about water. Although few professionals articulated spiritual or emotional connections to water, it was predominantly thought of as an anthropocentric resource in Israel; water is something to manage and utilize for human needs to maintain quality of life. As an anthropocentric resource, water was prone to social conceptualizations including an 'avenue for positive professional contributions'.

Water also provides an obvious and accessible career path in Israel, particularly in technology and engineering. Professionals valued their behavioural impact on Israel's WRP community by advancing its validity and evolution. Dominant professional behaviours were categorized as: improving information and reporting accuracy, defending more social or ecological values, and including more diverse actors. I provided evidence that Israeli woman WRP professionals recognized diverse water needs. The ways they conceptualized water and the professional behaviours they pursued signaled two dominant themes for how one may have influenced the other:

a) Water scarcity is both a reality and social construct in Israel, as demonstrated by social norms, governmental slogans and media representations. Professionals in the WRP see through this construction to various extents, identifying confounding factors and alternative perspectives.
b) Israeli woman WRP professionals exhibited a longing to contribute through work as if it were an expectation or obligation; they felt personal responsibility to provide a social benefit. The need to contribute was communicated through different identity forms, often creating value conflicts.

The following section elaborates on these two themes, providing a case study discussion.

4.3 Case Discussion: two themes for behavioural influence

This case study sought to understand the factors at play in Israel's water research and policy community; to provide first-hand evidence of how professionals' thinking about water influences their choice of professional activities. This section discusses the two dominant themes that arose while interpreting Objective 3, the 'influence' element of the research

question. The themes were selected based on their: a) 'saturation' or consistency in the sample; b) urgency conveyed by the participants; and c) novelty to the current literature. Israeli literature was used to validate or disconfirm the cultural embeddedness of the findings for the Israeli WRP community's professional culture. This approach aligns with interpretation guidelines from the thematic analysis method.

It is important to note that these themes were not the *only* knowledge sources or influences on IL-WRP behaviour; to imply so would flatten and undervalue the professionals' experiences. As dominant themes of my dataset, they are not representative of the entire Israeli WRP professional culture, but rather, a rich interpretation from a small sample. For those professionals who did participate, the following interpretation is the truest understanding I could communicate.

4.3.1 The norm to subscribe to the 'Water Scarcity Ethic'

My results show a daily consciousness of, and interaction with, Israeli water scarcity. Participants clearly identified the mechanisms that provide daily reminders such as water metering and discussing precipitation patterns. However, the participants also explained how the awareness extended beyond habits for 'saving every drop' to involve a broader social and cultural context.

Instead of formal education, the mentality developed from an 'indoctrination': an embedded, informal education to conserve water as a scarce resource. "I*n Israel, it's just always this consciousness. You always think about it, worry about it… Anytime I turn on the tap, there's water, so it's not a tangible knowledge of scarcity*" (P10, iii). Most participants could not recall tangible problems with scarcity, just an intangible knowledge that it persisted. There was a social expectation that everyone in Israel participated in water conservation, regardless of whether one was raised with that consciousness or exposed to it upon immigration to Israel. These results culminate with water scarcity as a unified social issue in Israel–a concept that cultivates social collectivity.

A sense of obligation pervaded this theme, the expectation to subscribe to Israel's water scarcity ethic and conservation behaviours. Explicit emotions within participants' stories demonstrated the obligation's strength: contempt for water-wasteful cultural groups; anxiety

in witnessing wasted water; pride for personal conservation achievements; satisfaction in teaching their children to conserve; and guilt for wanting to participate in wasteful water activities. Based on these responses, maintaining and perpetuating a water scarcity ethic was interpreted as a cultural norm in Israel. One that was accompanied by behavioural norms, for example:

> "*No, there was always water. But for sure, for sure, I went through this indoctrination that all of my generation went through that Israel doesn't have water, you have to save water. This is something, when you brush your teeth- it's in your conscience. Sometimes you want to forget about it. You're in a five-star hotel and you just want to let the water run. But somewhere inside of you [touches the back of her head] you know you're doing something bad and you feel guilty. That's something that started as a child: a conscience that we don't have water*" (P23, vi).

Guilty feelings were one of the indications that water was an emotional concept in Israel. One professional related Lake Kinneret's water level reports as an indicator of Israelis' mood. Dependence on water for freedom, peace, safety, happiness, and comfort was either tacitly or explicitly realized during interviews. Yet, the results showed participants' consistent frustration overcoming the negative emotionality and biased focus in Israeli water reporting. Fearful water media and governmental messaging framed the issue in a threatening tone, perpetuating the social scarcity norm regardless of the claims' scientific accuracy.

Was that norm-perpetuation intentional? Does the national conversation on water promote ulterior motives? During the interviews, professionals vocalized an ability to see through the knowledge construction to different extents. For instance, some accepted water scarcity as a fact and security element in Israel. Others acknowledged water scarcity as an intangible construct but did not question its origins. Several professionals were diplomatic when discussing the intersection of water and security by suggesting alternative management priorities, but a couple surprised me with how outwardly they dismissed the government's forcefulness in supporting water augmentation and conservation.

> "*But as a child, of course, we were raised on "Save every drop". I can tell you that my child today if the tap is still running, they will immediately go close it. It's not only my child. We are raised to save water. It's a governmental decision. And it's brainwash... It was decided we want our agriculture and to not count on Palestinians for it. When you make this decision, you have to save every drop.*

> *[Me: Is the push to support agriculture linked to cultural values in Judaism, like "make the desert bloom"?] Maybe originally. But, I don't think so. It's an important subject if we want to be independent from our enemies. A lot of topics are kept from the table to avoid hot political issues"* (P14, iii).

First-hand accounts, like this one, provide evidence for Israeli WRP professionals' awareness of water scarcity as a social construct and levels of skepticism about its accuracy and effect. I did not generalize about how all Israeli WRP professionals analyze water constructs. The participants' observation and reaction to it likely depended on their religious and political perspectives. Their honesty in disclosure to me depended on several contextual factors during their interview. However, some skepticism about Israel's water scarcity ethic was reported by professionals in the WRP community. Three or four times in Israel, public conversations about my thesis erupted with skepticism[11]; they made me wonder about how prevalent scarcity skepticism was and how much it impacted Israelis' acceptance of water scarcity as 'fact'.

> "Water scarcity is so dominant a view that scholars often ignore the need to provide evidence and persistently regard it as common sense. Intellectual engagement, academic scholarship and policy making start from and build on that premise and never question it" (Alatout 2008:960).

Israeli academic literature from the past decade notes changing water discourses (Feitelson 2002, 2012; Feitelson and Fischhendler 2009), political impacts of water's coupling to security (Brooks and Trottier 2014; Fischhendler and Katz 2013; Schoenfeld 2004), and water discourse's role in promoting state identity (Alatout 2008, 2009; Shmueli and Aviram 2013). Israeli water scarcity as an intentional knowledge construct is a well-established concept

[11] **Public Water opinions**
June 10th, 2012: Walking back from the beach along Bograshov St. I met a man who grew up in Tel Aviv. When he asked me what I studied, he interrupted me to say, "You know it's all a lie, right. Israel has enough water, we're just brainwashed to think there isn't enough. The government *wants* us to think we need to 'save every drop' so that we're scared…" It was the second time that a person has responded to hearing about my research this way. I wonder how widely accepted is this concept?
June 19th, 2012: Falafel dinner in Ramallah tonight proved insightful. I met two fellow water researchers while visiting the Palestinian Water Authority, with whom I discussed the Region's complexities regarding water. One challenged my perspective, "I think only considering water is too simplistic- you miss the whole picture. It's not only survival, health and rights to access, it's about global politics and religion and living memory of war…"

in this subsection of Israeli water research, yet is infrequently acknowledged by broader audiences.

Alatout (2008) provided a historical account for how 'water scarcity', as opposed to 'water abundance', was constructed as 'fact' in Israel. Alatout referred to the construct as a "technopolitical achievement" (2008:965) and a "water scarcity network" (2008:960), highlighting the absence of deliberation and sound scientific debate during its construction. 'Water scarcity' resulted in broad political implications for Israeli water governance, including: centralized and technological water management, a nation-wide water distribution system (National Water Carrier), a centralized water policy and decision-making framework, and a unified national identity (Alatout 2008). Once construed as a national priority, water became embedded within national security and a unified social acceptance of 'water scarcity' became 'fact'.

Reconceptualizing Israel's water scarcity ethic poses major challenges to professionals because when concepts are securitized they no longer accept negotiation or dissent (Brooks and Trottier 2014). The centralized governance structure also created expectations for water professionals to think and operate at the national scale. Alatout's account underscored how 'water scarcity' and 'state identity' developed during the "*same technopolitical process"* (2008:962 original emphasis). The author defended how 'water scarcity' as a deliberate construct redefined Israeli citizenship and the relationship Israelis have to their environment:

> "Water scarcity was made possible only by a political desire to free Israel, in part from its Zionist connection. It was made possible by a political desire to create a new Israeli identity" (Alatout 2008:973).

The next theme incorporates this water scarcity construct when elaborating on the influence political priorities have on professionals' identity and behaviour.

To summarize this theme, I emphasize that water scarcity persists in the forefront of Israeli daily consciousness. The expectation that Israeli citizens subscribe to a water scarcity ethic influences the way water is understood. It embeds water within a social, collective context. It prescribes appropriate behaviours. And it perpetuates feelings of vulnerability and fear. Together, these water conceptualizations influence the professional culture within the Israeli water research and policy community. I also emphasize that the scarcity construct has positive

ramifications for public water awareness and conservation; it is not an entirely negative mentality.

4.3.2 A perceived expectation to 'contribute'

'Contribution' was the second most consistent theme in the dataset; each professional held the core value of contributing positively to Israel or to life in Israel. Participants proudly stated value for "doing good work" and making a "contribution to the country". Personal satisfaction in making a 'contribution' was conveyed as if it were an expectation to be fulfilled. This theme showed that Israeli woman WRP professionals felt personal responsibility to provide social benefit through work, often referred to as 'doing good work', regardless of how that contribution manifested on a liberal-nationalist spectrum of modern Zionism. The following participant statements demonstrate ways professionals conceptualized their contributions:

> "*Water is very connected to settlement, to people, to work. So its very easy to connect to the water and be a part of the Zionism idea. I think it is very interesting to work in this field in Israel… I am very passionate. Maybe because I come from a very Zionist family… maybe because of that I feel like I also need to- this [job] is Zionism for me. I wanted to give something. So now we have a country. We need to keep this country. I'm not looking at security, I'm looking at the resources we have, the nature we have, the life we have here…"* (P24, iv, vii).

> *"[We] wanted to bring something to society. … [We] were environmentalists that worked out of a love and devotion and wanted to see our environmental administration evolve in a way that would contribute to the country*" (P9, iv).

> *"with water, it's something I can see… After theoretical research, I wanted something practical and tangible. So here I thought I could contribute…to prepare people for vulnerability and uncertainty*" (P6, viii).

To clarify, this theme did not seek to define modern Zionism when discussing professionals' longing to contribute. Zionist values and history were used to inform the underlying values in the longing to contribute. The question was whether or not a longing to make a contribution through work was distinct within the Israeli WRP? Underlying that motivation could have been parental values, egoist ends, or environmental empathy, but those factors would be motivational factors for any international WRP professional culture. What may be unique to the Israeli WRP culture is how the 'contribution' conversations co-occurred

with the ‘social benefit’ and ‘heavy’ concepts. Several professionals linked their drive to contribute to memories about tumultuous years in Israel. Therefore, this theme elaborates on the attitudinal concept entitled ‘heavy’ (section 4.2.1.8), to uncover whether ‘contribution’ was linked to nationalism and conflict.

4.3.2.1 Is ‘contribution’ a fulfillment of ideological identity?

In one sense, the contribution theme signaled Israeli loyalty or identity, a cultural norm to provide to the Country. Participants conveyed a strong commitment to working in Israel. Immigrant participants all intentionally chose Israel as a country to pursue work in — either due to Zionist upbringings and association with a Jewish ‘homeland’ or as an interesting and urgent political location. Native Israeli participants raised nationalist values through reflection on stages of the country’s development and pride for participating in water management advancements. Several Israeli-born participants lived for extended periods of time internationally and chose to return to Israel to develop their life and career. “*I’m happy to be back, I feel at home here. I know it’s some primordial roots thing. And here it’s about Zionism too. It’s tricky, but I can’t avoid it”* (P16, ii). Professionals’ loyalty to live and work in Israel accepted the country’s ‘heaviness’; their affective connection to Israel was founded on ideology, despite its conflictual context. “*This is home. This is Israel. For good and bad. There are many bad things, but this is home”* (P4, viii).

In an article defining an Israeli Environmental Ethic, Alon Tal (2008) agreed that Israelis’ sense of place may not be environmental, but ideological, cultural and mission-based. For instance, Youth Movements were discussed during interviews as institutions that influenced participants’ childhood exposure to nature. Youth movements were originally created as informal outdoor education programs that encouraged environmental familiarity and agricultural settlement as demonstrations of Zionist ideology (Tal 2008). Contemporary Youth Movements were reported to be less political, yet still a source of political awareness.

Tal’s (2008) article provided three historic reasons for the discrepancy between environmental identity and ideological, place-based identity in Israel. The Country’s dry, arid lands presented a hostile environment for early settlers, for which water technology played an essential role in providing safety. From this perspective, technology thwarted Israelis from

their traditional connection to the land. Tal explained how having technology embedded within science education exacerbated the separation. Finally, environmental identity was not a development priority; water security was. In a geographic context focused on immigration, employment, and security (Tal 2008) patriotic contributions to Israel emphasized technology, industrial growth, and innovation. These values were historical roots that shaped the Israeli WRP community's organizational culture.

In the case of this research, professionals, between the ages of 30-80, were raised during rapid phases of Israel's development. Their geographic context, focused on rapid industrial progress and development, made a romantic or spiritual connection to water somewhat professionally unacceptable. With this mentality, whether or not a professional's upbringing cultivated a personal connection to water, an eco-centric contribution to water did not provide a tangible benefit to society. 'Contributions' in the Israeli WRP were most evident, efficient and tangible in technological or anthropocentric forms. Tal (2008) defended Israel's environmental evolution, in that social and environmental work became more prevalent as the State matured. If professionals want to make environmental or social contributions to Israel, do they risk alienation from the dominant professional society?

The discrepancy between environmental identity and ideological identity was supported by the absence of discussion on religious conceptualizations for water. Before data collection,

I predicted religion would be an influential factor in how Israeli's think about water, but I found it a non-result[12]. Or, at least a deeply embedded and disguised result.

Zionist priorities for development were not the only conditions that shaped Israeli WRP professionals' contributions in the past century. The participants were also raised amidst the Arab-Israeli conflict, enduring constant, yet fluctuating levels of security threats. "The ramifications of such a protracted, violent struggle could not help but affect the Zionist environmental experience" (Tal 2008:297). Does the prolonged conflict affect professionals' longing to contribute?

4.3.2.2 Contribution as a citizen expectation during war?

Israeli WRP professionals emphasized that life in Israel depends on a social environment of fear, chaos, stress, and emotion. Although these statements were typically made about facilitating conditions — cost of living, regional conflicts, frustrations with governmental decisions — they were often linked to or exemplified using water. As introduced earlier, conflict and perceived threat psychologically impacts citizen behaviour. When individuals' perceive their safety and survival as threatened, their relationship with their governing body narrows to prioritize survival, or 'security'.

Ben-Porath (2006), an Israeli political philosopher, clearly defined how wartime changes the social relationship between citizens and their state. An independent democratic relationship

[12] **Religiosity as predicted, but a non-result**
May 11th: Arrival to Jerusalem: Religious connection is almost more foreign to me than this country. It's definitely the element that makes me most nervous and cautious about my behavior here, because it is an element I do not understand. From my time spent here so far, religion and politics seem deeply rooted in Israeli culture and identity in Jerusalem. It will be interesting to see if that is mirrored in Tel Aviv and Haifa.
May 26th, 2012: This morning I met a couple for breakfast in Tel Aviv. Sarah, an Israeli psychologist, asked me what my hypothesis was. I replied, "A similar Canadian study found that early childhood memories, traveling, and mentors influenced the ways professionals thought about water, showing emotional attachment to water". In Israel, I predict that I'll hear fewer recreational memories, and emotions derived more through religious beliefs.
July 9th, 2012: Today Arthur and I discussed the polarization between environment and religion in Israel. I am surprised that participants didn't raise Biblical stories or religious teachings as ways they learned about water. No one talked about their religious, spiritual connection to water. One participant who self-disqualified during her interview took some time instead to explain this polarization to me. Her research covers Israeli environmentalism and her recent study found religiosity as not-applicable. Another disqualified participant discussed her efforts to reintegrate environment into her religious education programs. She explained how environmental awareness became science and technology based, functional during the past few decades, and that she wanted to restore Jews' connection and relationship with the land. Arthur agreed with the polarization and with these efforts to reintegrate the concepts.

gives way to co-dependence where citizens willingly relinquish some of their autonomy in exchange for protection by the state. A state, therefore, cultivates an expectation for constructive responses to the conflict by mandating civic participation in forms that contribute to the war effort. Behavioural citizenship becomes less multidimensional during protracted conflicts while a state's security agenda limits which behaviours are perceived as socially acceptable. National vulnerability and security threats place three emphases on citizenship: expected "contribution to the country rather than voluntary participation; support for social unity and patriotism over diversity; and the discouragement of deliberation" (Ben-Porath 2006:12).

Professionals in the WRP clearly echoed Ben-Porath's description of Israeli citizens' obligation to contribute. On an individual scale, one participant stated, "*we're addicted to the craziness - it's absurd- because we do not live our life, we live the 'country' life*" (P7, v). Another expressed involuntary commitment to WRP contributions on an organizational scale, "*When you meet workers from [my company], they feel they are working for 'Schoot amit' – I am saying that in Hebrew — sent by the country to do it, a national mission. Especially in Israel*" (P24, ii). Collective contribution to an end goal creates social unity and patriotism, a mechanism so powerful it can control how public issues are framed.

The author continued to explain how social unity has advantages during wartime; it fosters solidarity, endurance, and belonging amongst its unified members (Ben-Porath 2006). Collectivity demands a unified voice, expressions of the subjects and values that align with the group and suppression of those outside the group. During protracted conflicts, security issues tend to dominate a country's public agenda as the first responsibility the state has for its citizens. Other priority issues can become 'securitized', incorporated into the security agenda, in order to gain representation in the media or promote the security agenda. By socially constraining the diversity of topics and perspectives represented in national messaging, social unity self-perpetuates a security-focused agenda by narrowing 'acceptable' media. Constant consciousness about conflict maintains the threat response that promotes citizen contribution and unity to secure the country (Ben-Porath 2006).

The language Ben-Porath (2006) used to describe citizenship during wartime corresponds with both the WRP participants' and Alatout's (2008) descriptions of Israel's water scarcity construct and its social contribution expectations. Although the 'scarcity ethic' and 'contribution' themes emerged independently during analysis, incorporating them into the existing literature illuminated their relation and potential interaction.

In summary, the Israeli WRP professionals' demonstrated, through both intention and behaviour, a need to contribute. Their consistent longing to contribute was rooted in identity fulfillment and citizen expectation. Cultural and conflictual contexts, including the water scarcity ethic, shaped which behaviours qualified as 'acceptable' contributions to Israel. The following section elaborates on how the two themes influence Israel's WRP professional culture.

4.3.3 Themes' influence on WRP professionals' behaviour

Water's scarcity construct and incorporation into the security agenda impacts Israeli woman WRP professionals' contributions. Zionist values and the protracted conflict were additional geographic factors in Israel found to influence contributions in three ways: a) professionals' career commitment; b) patterns in decision-making; c) perpetuating value conflicts.

4.3.3.1 A spectrum of moral career commitment

When considering organizational culture for Israel's water research and policy community, it appears that its professionals hold a common connection to water through the belief that WRP careers can translate personal ideology into practice. Aligning their personal values with their organization's values was very important. The fact that some professionals did not consider themselves 'water-people' and pursued water careers indirectly, showed that professionals commit to environmental careers for non-environmental reasons. A career within the WRP–a field with a strong reputation for efficacy– was articulated as an avenue for ensured contribution to Israel. Both altruistic and egoistic, this professional empowerment stemmed from perceived behavioural control in the WRP; belief in the sector's impact.

Nationally, the pursuit for water-related careers may be due to social recognition, to their reputations as priority professions in Israel. The results showed that having water scarcity at

the forefront of its citizen's consciousness, embedded within development priorities, was an effective recruiting tool for the WRP community. Professionals were cognizant about water's historic role in Israel. The industry's reputation was underscored by professionals' pride for Israeli water technology and innovation. For example one participant remarked: "*I was born when the country was 22-25yrs old- a young country- but it already had the National Carrier. We were advancing as a world leader in drip irrigation… I never questioned why I am dealing with water [professionally], it's always very- [prominent]*" (P21, iii). Maintaining social unity over a water scarcity ethic and a norm that expects societal contribution perpetuated recruitment to the WRP. One participant articulated the combination of these themes clearly, "*Personally, the political situation in general is motivating because we're worried about our future. So I think a lot of my motivation comes from fear of not working on the issue; not plugging away at water and thinking sustainably. To a certain extent, fear*" (P22, v).

Professional WRP commitment stemmed from faith in the sector's ability to support intellectual independence and professional integrity. Professionals valued their respective WRP careers for being dynamic; continually engaging through interdisciplinary projects; and inherently open to change as an innovative industry. However, barriers to successful collaboration were reportedly due to political resistance and frustrations with low inter-sector productivity.

Social and altruistic values drove moral commitment; WRP professionals valued making a positive social benefit or change with their work. "*I don't have such a romantic affiliation with water …For me it's purely a moral, ideological, values-driven ambition. It's purely values*" (P16, v). Whether pursued directly, knowing a water career would create positive social benefit, or pursued indirectly, focusing on socio-political pressures, every participant valued their contribution to improving quality of life for people and for future generations. "*My political awareness was developed at a very young age. So it's not coincidental that I got this job. It's natural to me, I was looking for something with significance or meaning*" (P20, iii). When professionals felt their morals aligned with their workplace and coworkers, they showed continued commitment and aspiration to complete their targeted behaviours.

The consistency with which morals arose as a contributing factor to selection and commitment to work may signal a cultural or social norm in Israel. Overall, the professional empowerment displayed reflects the attitudes of a kibbutzim-empowered citizenry. It seemed clear as an outsider, that Israelis are, or at least want to be seen as, moral people.

Theme two showed that Israeli WRP professionals feel a personal responsibility to provide a social benefit through work regardless of how that contribution manifested on a liberal-nationalist spectrum of modern Zionism. Contributions both supported and opposed dominant WG approaches in Israel, demonstrating that professionals chose their careers based on an alignment between their ideology and their organization's contribution. Water conceptualizations fit into that ideological alignment in ways unique to each individual. Professionals wanted to make a form of contribution that fit their value set and a career in the WRP enabled that.

4.3.3.2 Entrenched decision-making patterns

Water's scarcity construct and incorporation into the security agenda influences WRP professionals through decision-making patterns in Israel's water governance. "There is no area where the zealous commitment to technological solutions was more profound than in the aggressive development of a water management system to support the burgeoning agricultural sector" (Tal 2008:289). Israel's recent focus on supply augmentation with desalination mega-plant projects exemplifies the country's technological decision-making pattern in responding to water scarcity threats, like extreme drought. Israeli literature refers to this phenomenon as knee-jerk, reactionary, or technocratic (Bekker 2013; Menehem and Gilad 2013; Teschner, et al. 2012).

Despite the pollution and environmental hazards created by decades of security emphasis, Israel's centralized and technological approach was never seriously deliberated by Israeli NGO's or environmentalists (Tal 2008). Social unity expects consensus in decision-making processes, making dissent socially unacceptable (Ben-Porath 2011). Therefore, a securitized water agenda hosts exclusive perspectives and a static governance approach (section 4.4.2.2).

It seemed a socially accepted fact by the participants that security consistently trumped environmental concern. This was a source of low perceived behavioural control for some

professionals. Professionals felt restricted by the activities deemed 'supportive' to security priorities and frustrated by how difficult it was integrate new information. Yet, professionals conveyed motivation to improve Israel's exclusive decision-making process within the WRP. Therefore, my case study shows that Israeli woman WRP professional behaviours represent more diverse foci than those expected by the national water agenda.

Frustrations with governmental collaboration and proper positioning of water issues in Israeli media suggested that many participant behaviours were 'oppositional' or 'counter-culture' to the dominant water governance approach. To generalize that all Israeli WRP professionals are 'oppositional' or 'counter-culture' would be incorrect and over-simplified. Not all of the participants in this sample intended to create change with their professional contributions. A couple were very happy to support the existing water governance trajectory in Israel. Those that did value change as part of their contributions also recognized the need to continue technological advancements and secure basic water resources. If diverse water values are widespread enough within the WRP community, it may identify an opportunity to shift Israel's water governance approach to a more decentralized or inclusive approach (Section 4.4.3).

I identified a discrepancy between how professionals think about water and how the national culture expects its professionals to think about water. The participants communicated more diverse values in how they conceptualize water than those construed by the unified voice on water scarcity at the national governance scale. The value discrepancy was captured in this amusing quotation on gendered decision making:

> "[Me: Can you elaborate on your statement about desalination being a manly thought?]
>
> [Participant]: *When men are in control, it's always about power. Very impressive. Huge, new pumps. HUGE! At the top of the pump is another pump, and another pump because the one is not enough. So if you don't have power you need more power, and more power! It's disgusting; it's very, very impressive, but it can't be right.*
>
> *I strongly believe in mimicking nature. I think the better we understand mother-nature, the better we know how to economically behave. It can't be the right solution if we need to invest so much energy into it. The right solutions are always the simple solutions. It couldn't be right. That's why I am trying to promote sustainable technologies. To find a better solution. To be inspired by what's around me.*

> *I think that all industries would have behaved differently if we had women decision makers. I think we are more — I'm not sure I can say something about this, it's very gendered — but I think we are more concerned about our children's future and the long-term impacts. Things that I'm not sure men who are very focused in what they do, do not see the other implications. The fact that we don't have communication between departments has to do with that as well. Not that women don't have egos. Some women have very developed egos. But I think we are more focused on long-term impacts- whether it's because we're mothers or give birth, I don't know. Whether it's in our DNA or because we're able to see the larger picture, or able to focus not just on one single thing. I think there is an advantage there. I think women would have cared more about the environment"* (P7, x).

Israeli woman WRP professionals voiced the absence of women perspectives in decision-making as a problem for the quality of water governance in Israel. Professionals also exhibited value conflicts when discussing decision-making trends for water in Israel.

4.3.3.3 Internal value conflicts

During my field research I experienced a discomfort that I originally thought was just research fatigue, isolation or the clash between Canadian and Israeli cultures[13]. However, that discomfort and confusion continued throughout my analysis and interpretation processes. It took me a long time to realize that part of the discomfort I felt I had absorbed from my participants' interviews. The subtext I had been listening to, the deeply underlying theme of this research was a tension between participant identities. Alon Tal (2008:279) defined Israel's environmental crisis as "nothing less than a crisis of values". My case study provided evidence

[13] ***Canadian perspective on Israeli Conflicts — psychological benefit to being an 'outsider'***
July 17th 2012: upon departure, thankful to be an outsider: I had a delicious Sudanese dinner with Ben tonight, he studies refugee trauma here in Israel - fascinating, passionate guy. We had a great conversation about the Israeli culture from a Canadian's perspective. We feel that complacent Canadians become more aggressive here. Less orderly. Less willing to follow rules just because they're rules. More outspoken. More opinionated. Less wary of racism and racist comments. We talked about how psychologically heavy life is here, but that it's strangely addictive.

He agreed with me about how much pain there is in the living memory. People keep time, almost by the wars. But also, Jews still have living memory from the Holocaust and Arabs from their displacement. It's a lot to take in, a lot to live with, and a lot to get through in order to move on and secure any kind of peace in the future.

We spoke about the political apathy and defeat experienced by each country, post second intifada and how strange it is to realize that the international scene is more outspoken about the Israeli-Palestinian conflict than Israelis. He had similar frustrations to mine in coming to realize the apathy or lacking political consciousness of I-P issues in Israelis lives.

We spoke about how it feels uncomfortable to enter the culture here. How it is uncomfortable relying on other's willingness to participate in "research" and then go home. For him it's more of an ethical problem than me since his research triggers very personal feelings and presents a power-relationship. But it was nice to know that I'm not crazy in my exclusion here. That as I thought, research is very solitary and it's neither my, nor the culture's fault.

Then Ben told me something very personal, something very interesting. He brought up several times that he feels a deep internal conflict here between his faith and his moral beliefs. He is Jewish and feels guilty taking advantage of his Judaism to get in and out of the country, while using his Canadian passport to pass easily across the checkpoints for protests. He comes from a Nationalist family and a Hebrew-school upbringing. Came here several times with his family as a kid. But Ben thinks very differently about Israel than his family.

Interested in human rights, Ben is critical about many Israeli decisions. He said he, "doesn't believe any country should exist entirely for the benefit of one ethnic group. But that at the same time, somewhere down very deep inside, as a Jew [he] gets nauseated and worried thinking about Israel *not* existing". He told me this story from Hebrew school as a kid where they played a movie called *The Last Jew on Earth*. It is a story about the final remaining Jew who was placed in a museum in a cage. Laughing a little, he explained how he'd investigated whether it was just his Hebrew school or whether all the schools played this movie. To his horror, he realized it was very common and that the schools collectively fostered a "persecution fetish" within their youth.

I am so thankful to have been an 'outsider' while doing this research. I think not being Jewish has allowed people to speak freely about 'hot' topics, if they so choose, without worrying that they'll offend me. And I did not struggle with any deeply-internalized conflict between my heritage and my worldview.

that Israel's water professionals internalize that value conflict. Professionals displayed tension between their Israeli identity and their professional water identity.

Professionals who exhibited internal value conflict addressed that tension in different ways. Some professionals sought solace in organizations with similar social justice values or companies run by kibbutz philosophies, valuing the organizations for being inclusive and open to change. "*It's nice to be surrounded by similarly-minded people. Especially when you're a minority*" (P20, ii). One participant explicitly stated that her profession as a water technician enables her to escape the 'heavy' Israeli identity that comes with the region's geopolitical conflicts.

> "*Here we go all the time with this cloud over our heads. There's a lot of tension. It could be that we all the time are sort of afraid; worried about our future. And in a way, the water issues allows us to speak with some other people that may or may not like the fact that we're Israelis. Either because they're our neighbors and don't want us here, or someone else who doesn't like the way our government is treating our neighbors. But as professionals we can talk about it. And we are. We do have very good records on how to treat water. How to use it, reuse it, clean it…"* (P7, v).

Other expressions of internal conflict were less obvious. Some WRP professionals with international passports used their non-Israeli passports when traveling to business events. Others intentionally pursued international work where professional activities were more easily collaborative and less constricted by national priorities.

Three women working on bi-national water initiatives appeared free from this internal value conflict since they did not identify with all Israeli cultural values. Frankly put, an Arab-Israeli participant stated, "*My nation is not the same as my country*" (P13, vi). Similarly, two immigrant professionals acknowledged having minority or alternative perspectives, but preferred being separate from the Israeli identity. *"[Me:* Was it hard for you to get into this culture when you moved here?] *It's still hard for me. When I'm in the States I'm so foreign, but here I'm totally American. Its fine for me, I prefer to be an outsider. I'm not a 'proper' Israeli*" (P15, x). These three professionals did not discuss water scarcity or 'save every drop' with the same deeply-rooted ethic as other native-Israeli professionals. They did not use the terms 'contribution' or 'doing good work'. The individuals voiced the same frustrations with

the constrained water agenda and rigid governance structure. But, their interviews focused more on cultural losses and parental responsibilities as motivators for their pro-social careers.

The WRP community was perceived by some professionals as an avenue to minimize the protracted conflict in Israel; water careers were conceptualized as avenues for peace-building in the region, as explained in Section 4.2.1.9. In a protracted conflict setting, dissenting or alternative foci to human security are oppositional (Alatout 2008; Ben-Porath 2006; Brooks and Trottier 2014). If environmental and social justice values are minority ethics in Israel's public water discourse, it is important to consider the influence of professional alienation from the dominant, socially unified identity ethos in the country.

For those professionals with eco-centric, bi-nationalist, or peace-building career values, their form of contribution inherently conflicted with the national contribution expected by their Israeli identity and by the dominant water governance agenda. However, the internal struggle I interpreted may not represent identity conflict so much as signal a coping mechanism. Coping — a more hopeful and productive behavioural response — more accurately represents the participants' positive intention better than a negative entrapment within value conflicts. In Section 4.4.2, I pose the question: does the WRP provide a psychological coping mechanism to the 'heaviness' reported in Israel? Is pursuing a water based career an example of a coping mechanism, an avenue to minimise their perceived threat?

Perhaps professionals in the WRP community are not conflicted between social change versus the security agenda, but are attempting both in tandem? Evidence for this was signified by the desire to expand the water agenda beyond the narrow media that persists and by oppositional efforts to either reconceptualise issues in the WRP or institutionalize new processes. Interesting research could come from a broader, more generalizable assessment of the current values comprising Israel's WRP professional culture. What impact these values could have on steering the dominant Israeli water ethos is discussed in 4.4.3. The following section integrates ideas from the literature review in Chapter Two to further explore implications of this case study.

4.4 Implications and theoretical postulations

As evidenced by the discussion, key themes cross-pollinated between my framework and results.

4.4.1 Contribution as identity fulfillment: 'affective commitment' in Israeli WRP community

The first intriguing intersection combines the case study's social norms and identity constructs with literature on social behaviour. Several social norms emerged during analysis, such as the norm to make a social benefit through work, the norm to save water, and the norm to make a national contribution. Multiple identity facets influenced the professionals' water thinking, including place-based, environmental, family, national, and pro-social identity forms. How do social norms and identity inform behaviour?

Three interdisciplinary research domains yield insights into why the Israeli participants displayed strong commitment to the water research and policy (WRP) field: a) identity's relationship to collectivity; b) social norms as instigating pro-environmental behaviour; and c) collective pride's influence on professional behaviour. The following discussion synthesizes meaningful ideas from this integration, placing affective commitment at the center of my Conceptual Framework's Venn diagram, as displayed in Figure 4.1.

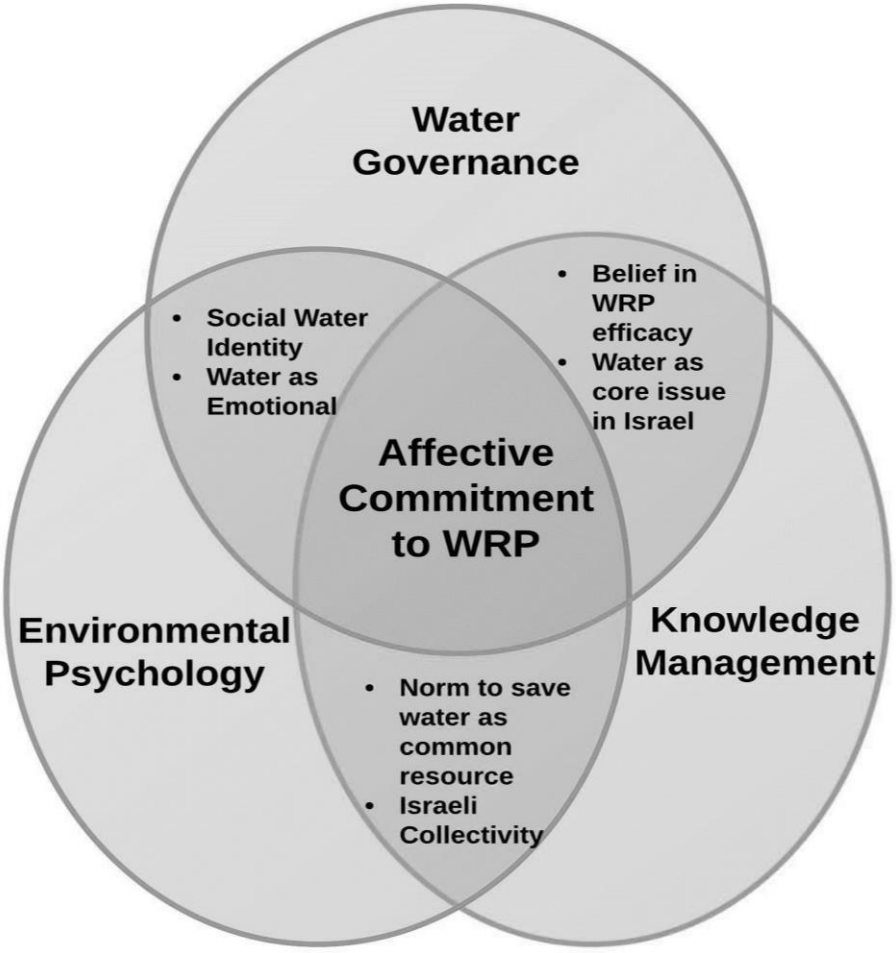

Figure 4.1. Factors that promote affective commitment to Israel's Water Research and Policy Community.

Strang (2006), a leading researcher in water identity and place-based meanings, argued identity construction should be considered a fluid process. Identity construction requires continuous conflict mediation between individual needs and socio-cultural dynamics. Northoff (2010:749) supported this approach with neuroscience, "the bidirectional traffic between subject and environment is mirrored in the brain's neuronal activity." Identity, an individual's concept of self, is a physical state of mind; it is a dynamic state that changes according to values partially grounded in socio-cultural contexts.

In environmental psychology, some researchers propose "identity mediates the relationship between values and behaviour" (Steg, et al., 2014:109), that identity represents

follow-through on intent. Emotional involvement in environmental matters is an important determinant of identity and concern (Kollmuss and Agyeman 2002). Typically, environmental identity and self-identifications that include nature indicate a strong likelihood that individuals choose pro-environmental behaviours (Frantz, et al., 2005; Gifford and Nilsson 2014; Krantz, et al. 2008; Steg, et al., 2014). However, these researchers argued that group identity, affiliation with a group's values and norms, influences individuals' behaviour more than individual identity.

When considering the Israeli participants' water identity, social values and intention to promote social justice appeared more dominant for identity construction than environmental values. Some articulated an environmental identity, but the majority identified with water on a socio-political level. Perhaps environmental values are embedded within this social water identity, due to the belief that environment and society are inseparable. The participants' social water identity was perpetuated by emotionality, showing concern for their children, health, and safety as well as an altruistic responsibility to society.

Does this social identity signal collectivity? Participants did identify collectively for water as a common resource. Plural pronouns were often used while discussing the country's norm to save water. A sense of interdependence and connectedness as Israelis in their homeland was exhibited. According to Hoefstede, et al.'s (2010) research about cultural influence on workplace values, Israeli culture exhibits individualism and collectivism almost evenly (46% collectivist). What behavioural impact do collectivity and cultural norms have on WRP professionals?

Section 4.3.1, showed the 'norm to subscribe to a water scarcity ethic' is a focal, social norm in Israel perpetuated by accessible information, situational reminders and conformity. Supportive examples included childhood indoctrination to develop water-saving habits and guilt or frustration with others' non-conformity. In environmental psychology, "studies suggest people are likely to act on normative goals even when they conflict with [personal gain]…depending on the strength of the norm and situational cues (Steg, et al., 2014:107). Knowledge management research acknowledged the same behavioural trend in different language: "collective societies reinforce the notion of group. Such cultures are generally driven

by group rather than individual interest" (Chen, et al., 2010:231; also Hislop 2013). Group affiliation, or strong social norms, influence individuals by defining appropriate actions and increasing a sense of obligation. Research showed that social norms that are pro-environmental, such as a 'norm to save water', particularly encourage actions with moral alignment (Frantz, et al., 2005; Steg, et al., 2014).

Do these concepts — 'appropriate action', 'moral action', 'group interest' — from EP-KM literature describe the 'contribution' phenomenon discussed in section 4.3.2 as a major motivator for WRP commitment? Professionals from Israel's WRP community did express value or satisfaction for aligning their morals and career. They showed a sense of pride for making positive professional contributions to Israel's water-saving efforts. The brain's reward system produces a sense of fulfillment or pride when a person actualizes their values (Northoff 2010). From this perspective, the norm to save water and norm to contribute to Israel are very much linked. Collectivity, and the social norms that dictate it, was not the only factor that influenced commitment in the WRP, but it was consistent across professional categories and ages.

Another indicator of group affiliation within Israel's WRP professional culture was the participants' pride for the sector's innovative and advanced reputation. Such pride cultivated belief in the field's efficacy. Professionals perceived the WRP as an avenue to make a positive impact, an avenue to make a contribution that would fulfill their value-based identity including social or environmental empathy. Van den Hooff, et al., (2012) demonstrated how emotions, specifically pride and empathy, influence professionals' willingness to engage in knowledge sharing actions. Their research showed how pride is not always egoistic, that collective performance can create pride and motivation too. Case study examples of Israeli WRP collectivity came from participants' 'we' statements regarding organizational achievements or goals. Also, the frequency with which participants used the phrase "doing good work" to describe professional ambition signaled motivation to maintain that collective performance as well as high individual performance expectations.

Van den Hooff's (2012) finding that pride and empathy promote knowledge sharing as a behavioural outcome correlates with my behavioural results. Several professionals engaged in

activities that improved information accuracy and transparency within the WRP. Professionals valued interdisciplinary approaches to water issues and displayed willingness to collaborate across disciplines. Pride for the sector as an effective avenue for contribution perpetuates empathy for water issues in Israel, perpetuating focus on each other.

Affective commitment has also been shown to improve knowledge sharing behaviour. Studies showed affective commitment, as a professional quality, promoted knowledge documentation and sharing due to an intention to realize an organization's goals; it positively correlates with willingness to engage in behaviours beyond professionals' prescribed roles (Matzler, et al., 2011; 333). Affective commitment not only signaled social identification with an organization, but also emotional attachment and involvement (Matzler, et al., 2011). Matzler, et al., (2011) used two theories to show how both relational domains, such as social norms, and value conflicts motivate professional behaviour through affective commitment. This relates to my study because it places affective commitment to Israel's WRP in the center of the framework's diagram, explaining how the ways professional's think about water influences their professional actions. This is an interesting area for future research.

4.4.2 Professional contribution as a coping mechanism

The second group of interdisciplinary ideas integrates themes of conflict that have threaded through this Chapter. Israeli water scarcity, as an intentional knowledge construct, mirrors theoretical research from the larger WG-KM literature on power theory and hydro-hegemony — briefly introduced below. However, the psychological impact controlled knowledge has on individuals is missing from that literature. This section looks to environmental psychology to consider the influence Israel's scarcity construct has on its' WRP professionals. By integrating all three literatures I question whether the contribution theme is in fact a coping mechanism for intrapersonal value conflict, created in part by the water scarcity construct. **Figure *4.2*** displays how concepts from each literature overlap combined to identify this question.

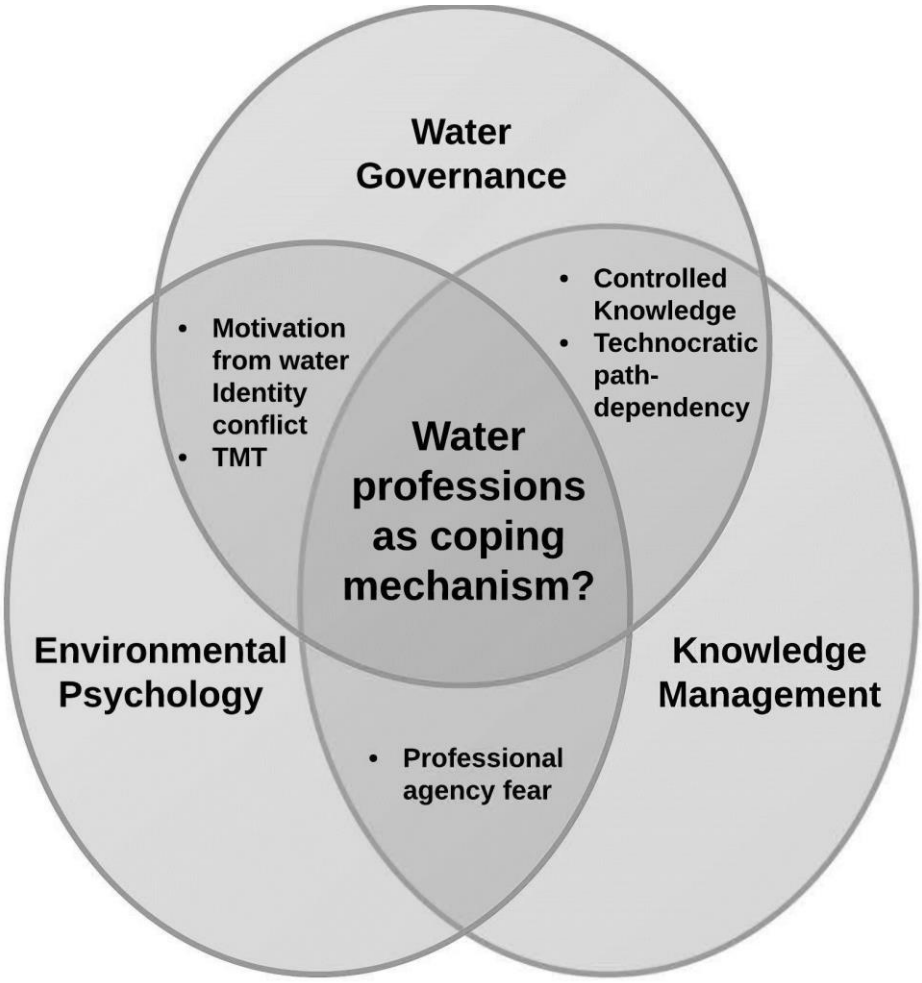

Figure 4.2: Factors that influence whether WRP professions provide a coping mechanism for Israeli conflict and individuals' value conflicts.

4.4.2.1 Constructed water knowledge and state identity — political control

Many tactics exist to control or maintain power over water resources, some more subtle than others. Zeitoun and Warner (2006) outlined coercive mechanisms authoritative actor groups use to maintain their dominance with water resources. For instance, military force, the most aggressive use of power provides the capacity to capture and defend water resources. Feitelson 2000) (proposed Israel's hegemonic era of water policy began in 1967 with the capture of the Golan Heights. However, hegemonic control is not necessarily obvious. More subtle socialization processes, such as knowledge construction, securitization, and sanctioned discourse enable a hegemon to define a water agenda and how people comply with it (Zeitoun

and Warner 2006). Israel's water scarcity construct has a "hegemonic character, the fact that there is both a scientific and a political consensus around it…an entrenched consensus… [It] is reproduced in the daily practices that take it for granted, in utterances that do not put it into question" (Alatout 2008:978-9).

Another more recent power-theory framework (Brisbois and de Loë 2015) defined two methods applicable to my case study's examples of ideological control in Israel's WRP. Structurally, the centralized governance authority and management creates an exclusive decision-making process that dictates which water values and policies are valid. The technocratic, security-driven path-dependency some participants described is an example outcome of structural power. The second method, discursive power, delves deeper into the manipulative potential of socialization; the "supreme exercise of power to get another to secure their compliance by controlling their thoughts and desires" (Lukes 1974:23). Discursive power defines very clearly what the participants referred to as 'indoctrination' to 'saving every drop', or, the water scarcity ethic. Brisbois and de Loë (2015) acknowledged both the professional freedom (for the elite) and constraint created within an intentionally controlled water governance agenda.

The above research identified the manipulative potential water has as well as the fear it can provoke. The research did not demonstrate how political constraints and constructed knowledge influence professionals in their related field; how they influence the professionals making and informing decisions. Research studying the psychological impact of hydro-hegemony or water securitization would merge WG-KM literature with EP, yielding interesting insight on the bi-directional impact it has on professionals and on instigating change within a sector.

4.4.2.2 Constrained WRP agenda — professional agency and self-efficacy

Relevant literature identified several constraints controlled agendas and knowledge constructions create:

a) They exacerbate the gap or tension between science and policy (Sarewitz 2004).

b) Sanctioned discourse suppresses opportunity for dissent making alternative approaches difficult and risky for professionals (Brooks and Trottier 2014; Islar and Boda 2014).
c) Social unity over knowledge constructs excludes and de-merits those that oppose the construct, isolating 'alternative' individuals and neglecting other issues (Zeitoun and Warner 2006).
d) Constructed knowledge becomes entrenched and self-perpetuated, which leads to political stagnation (Sarewitz 2004); this highlights the lack of democracy in decision-making and maintains power asymmetries (Brooks and Trottier 2014; Sarewitz 2004; Zeitoun and Warner 2006).

What impact do these knowledge constraints have on Israel's WRP professionals? Does the acknowledgement or skepticism about controlled water knowledge decrease professionals' self-efficacy or willingness to engage in pro-environmental behaviour? I found that Israeli WRP professionals performed pro-environmental behaviours that were not primarily rooted in pro-environmental attitudes. These behaviours were primarily rooted in the subjective norm — to subscribe to the water scarcity ethic — and other facets of Israeli identity. The moderate impact of environmental attitudes on determining environmental behaviour is consistent with pro-environmental behaviour literature (Gifford 2014; Koger and Winter 2010).

The 'water scarcity' construct severed water governance ideology from the revered and religious connection to the land in Israel, redefining connection as a nationalist end (Alatout 2008). This polarization between nationalism and environmentalism was demonstrated by the participants when discussing their connection to water. The centralized governing framework developed with the 'water scarcity' construct also changed Israel's WRP professional culture (Alatout 2008), emphasizing many of the organizational qualities the WRP participants were frustrated by.

Insights from psychology point to perceived behavioural control (PBC) as one of the most influential factors in determining pro-environmental behaviour (Hines, et al., 1987; see section 2.2.5). Perceived constraints reduce PBC: if an action is perceived as low-impact, too costly, or too challenging an individual is less likely to act on their values and attitudes (Koger and

Winter 2010; Milfont and Duckitt 2010; Russel and Fielding 2010). Low PBC is also known to inhibit professional willingness to engage in knowledge processes (Head 2014; Hislop 2013). In this way, low PBC has several interpersonal and contextual origins, but manifests its impact on an intrapersonal level. McDonald's (2014) framework found that in workplace settings, external factors significantly contributed to a professional's motivation and control over their self-efficacy. McDonald (2014) defined PBC as an important motivational variable, equating it with "coping mechanisms for perceived stresses" (p294) and professional agency.

Participants exhibited frustration and defeat about operating within such a constrained agenda. However, even more consistently, professionals exhibited ambition or pride for their positive behaviours that succeeded in fighting Israel's structural control. I identified tension from participants struggling with internal value conflict. That tension frequently resulted in increased, not decreased PBC — such as ambition to improve information accuracy. Cognitive dissonance provides one explanation for this positive response:

> "whenever people experience discrepancy between two thoughts, cognitive dissonance produces an uncomfortable state of tension that motivates them to take steps to reduce it" (Koger and Winter 2010:115).

This raises a question: are WRP professionals committed to their careers as a method of coping with internal value conflicts between personal and professional water identities? Are they more willing to dissent and challenge and take risks as professionals than risk uncertainty as an Israeli?

4.4.2.3 Constrained WRP agenda — Motivation from value conflict

Regardless of whether professionals exhibited tension between internal, disciplinary-societal, or societal-international values, value conflict has a psychological impact. Defense mechanisms are often used to cope with the pain and discomfort psychological conflict creates (Koger and Winter 2010). For instance, apathy results from emotional or cognitive overload which eradicates a person's ability to care about an issue. Remember, here, the participant quote relaying political apathy due to the diminished emotional capacity experienced during 'heavy' protracted conflicts. To be clear, I am not attempting to make claims about the professionals' extent of denial/displacement/suppression over environmental and political

concerns. However, the theme of subscribing to a water scarcity ethic and wanting to make an ideological contribution does align with a defense mechanism called 'sublimation':

> "the most mature and healthy defense mechanism is sublimation, when people channel unconscious anxiety into socially acceptable projects… by channeling the feelings into a culturally useful creation, the individual is protected while also *contributing* something of value" (Koger and Winter 2010:78. Emphasis added).

The commitment-related behaviours underscore the professionals' obligation to comply with the water scarcity ethic; they acknowledge water research and policy professions as national priorities in Israel. Committing to the WRP contributes value to society by reducing anxiety created by the water scarcity construct.

The reconceptualization behaviours underscore contributions that sought to minimize the above constraints. The contributions targeted governance elements that had been eliminated in order to form unified acceptance of the water scarcity construct. Efforts to improve inclusivity in decision-making emphasize decentralized management. Efforts to incorporate more social and environmental values expands the definition of Israeli citizenship and WRP identity. Efforts to improve information accuracy help to de-securitize water and reinforce science-policy relationships. These behaviours mirror 'oppositional' citizenship behaviours associated with protracted conflicts — expanding the agenda, encourage engagement, support inclusive citizenship (Ben-Porath 2006).

It is interesting to note that the professionals whose behaviours aligned with the expected compliance from Israel's water governance structure did not articulate or display this psychological tension. Whereas, professionals who were able to explicitly and/or tacitly express their value conflicts were the professionals that discussed the most creative, alternative behaviours. This finding is in line with how Koger and Winter (2010) describe sublimation, in that acknowledging emotional tension from value conflict frees up cognitive space for creativity that would otherwise be consumed by upholding defenses. Such a simple finding has intriguing implications: professionals that acknowledge difficult emotions around water knowledge and water governance in Israel can better operate within and improve that system. The alternative, may be living and coping with perpetual fear.

Fear and existential threat are the final sources of motivation contributing to the question of whether Israeli WRP careers exemplify coping mechanisms. Terror management theory helps to explain how a constrained water agenda might motivate compliant contributions.

Terror management theory suggests that existential threat motivates pro-environmental behaviour due to human coping mechanisms that emphasize self-validation and belonging. Fritsche and Hafner (2011) found that threat promotes social identity and a longing to contribute meaningfully to defending or validating that social in-group.

> "Therefore, in countries where pro-environmental norms are deeply anchored in society and are thus salient in everyday life, perceptions of self-threat might lead to even more of an inclination to act in a pro-environmental manner...both holding a valid cultural worldview and perceiving oneself as living in accordance with the standards of this worldview are assumed to buffer existential threat" (Fritsche, et al., 2010:67-68)

If, then a pro-environmental norm is embedded within a threatening and controlled knowledge construct, individuals' longing to contribute would be self-perpetuated. The case study implication is, therefore: Israeli WRP professional culture needs to acknowledge the threatening water scarcity construct to redefine behavioural norms in water governance.

When considering my Israeli case study, participants identified two sources of threat: a) environmental threats — both scientifically supported and socially constructed, and b) existential threats. If water is securitized in Israel, then these two threats, environmental uncertainty and protracted conflict, are coupled. Although it seems important to distinguish which threat is driving professionals' PEB's, origin of threat does not in fact matter. Fritsche, et al., (2010:77) found that threats can "arise from threatening societal conditions unrelated to the environmental crisis". It may also seem important to distinguish whether perceived threats or the country's pro-environmental norm is more impactful on driving PEB's. However, environmental psychology literature has acknowledged their interaction in catalyzing each other (Jonas, et al. 2008). Pursuing the psychology of contradictory threats would be an interesting avenue for future research based on the value tension exhibited in this Israeli case study.

4.4.3 Challenges for a sustainable subculture — entrenched knowledge and collaboration

Finally, the other half of the bi-directional relationship between humans and their environment requires consideration of how professionals' psychology influences Israel's WRP community. For instance, is the internal value conflict about water identified for WRP professionals mirrored on the national scale? Does the conflict between the participants' Israeli identity and WRP professional identity correlate with the disconnect between Israel's water governance values and its WRP professional's values?

The sustainable subculture identified by case study reflected current Israeli environmental literature (Becker 2013; Feitelson 2009; Teschner, et al. 2012). Development-focused concepts such as integrated urban planning or sustainable development are not new to Israeli dialogue, having been introduced in the 1990s. However, value-based concepts such as social justice, "the connections between Judaism and environmentalism, and the awareness of connections between environmental issues…are still emergent" (Schoenfeld 2004:8). The participants' frustration with dispersing information about their social or environmental justice initiatives echoes their nascent nature in Israeli dialogue. The biggest barrier was the entrenched knowledge and decision-making within water governance, the prioritization of the technocratic approach. Entrenched knowledge minimizes knowledge adaptability and stagnates political change (Brown, et al., 2011; Head 2014), two targeted governance shifts in the Israeli WRP community (Becker 2013; Teschner et al 2012).

This case study could identify concepts such as: water as an anthropocentric resource, technological optimism, chronic water scarcity, or male decision-makers as entrenched knowledge, or perceived 'facts'. The participants discussed the impacts entrenched assumptions have on preventing inter-sectoral collaboration and promoting technological solutions. Although Israel's water sector has a reputation for technological innovation, its hierarchical water governance structure has stagnated (Becker 2013). Transitioning to new practices based on new values has proven difficult (Teschner, et al. 2012). Typically, civil society leads change in Israel's environmental movement (Schoenfeld 2004). One established professional offered a historical perspective on Israel's young environmental movement: "*Israeli academia has never led environmental agenda or sustainability. We're behind in those*

fields. The research institutes in this country are leading forward the agenda — only, there aren't many. That is why civil society is a strong and needed presence in Israel" (P9, vi). This bottom-up approach to obtaining a water governance shift is consistent with the unclear role portrayed for civil society in descriptions about WG in Israel.

If in order to achieve the targeted shift in Israel's WG, a shift in knowledge valued is needed, then how can the professional culture harness motivation from its professionals? Social learning organizations and network governance are not new or novel recommendations (Al-Jayyousi 2004; Brooks and Trottier 2014), but they're difficult to implement within the context of protracted conflict and deeply entrenched, politically controlled knowledge. Therefore, further research from knowledge management and environmental psychology could provide insights into how to transform entrenched knowledge into pro-environmental behaviours.

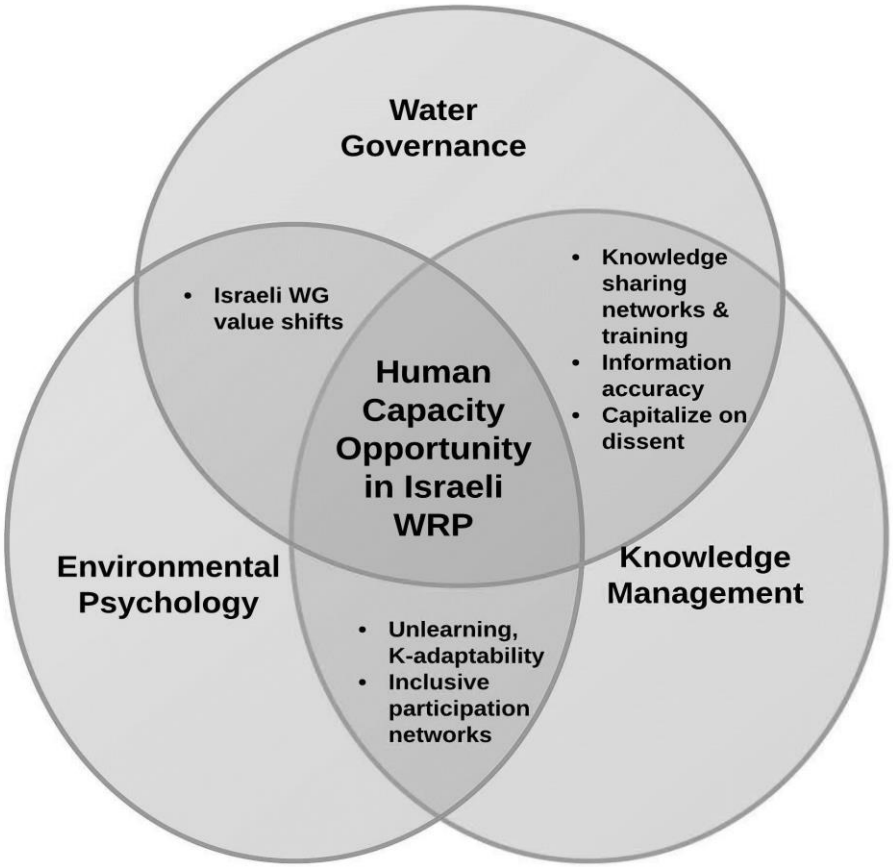

Figure 4.3: Implications and opportunities for WRP professionals to influence value shifts in Israel's targeted WG shift.

Social learning, social networks, consensus-building and taking down 'disciplinary silos' are frequent proposals for triggering governance transitions (Mostert, et al. 2008; Wolfe and Hendricks 2010). Chapter Two highlighted a gap in this literature in considering the micro-level tacit-knowledge processes involved in knowledge sharing and creation. For instance, the psychological and cognitive impacts of professional adaptation or unlearning.

Brown et al (2011) researched the factors involved in keeping knowledge entrenched and propelling path-dependency in centralized, technocratic water governance regimes. They identified three main factors that maintain the dominant WG approach: a) political risk prevents decision makers from being willing to try new approaches due to fear of destabilization; b) professional agency fear shows professionals motivation or dissent can be squandered by organizational expectations and rigidity; c) technological efficiency was too enticing as an immediately available solution. The governance regimes in their study required redesigning to reflect water ecosystems' adaptive and dynamic natures, but the process of redesign depended on the elite's buy in to the changing dialogue. Without cooperation from decision-makers, a culture of uncertainty avoidance was maintained. The disparity between practitioners' and management values was defined as a "missed opportunity for long-term sustainable change" (Brown, et al., 2011:4045). Wolfe and Hendriks (2010:60) also identified risk as an important consideration for WG innovation. Their study found, "norms among early adopters of innovation were the use of education to support innovation and the accumulation of information to support risk taking".

Uncertainty avoidance – a reliance on structure, precision, and security – is a strong component of Israeli workplace culture (Hofstede, et al., 2010). Recent reconfigurations in Israel's government streamlined water governance relations and decision-making. In accordance with Brown's research, uncertainty avoidance may pose a challenge to Israeli WRP professionals in achieving a more dynamic, inclusive WG structure. Participants communicated desire for opportunities to dissent; they voiced longing to change some old values and for more interdisciplinary networking. They were willing to take professional risks, like collaborate across-sectors and integrate new knowledge, for the benefit of the sector. This presents opportunity for Israel's WRP.

Chapter Two introduced 'unlearning' as an important and frequently forgotten factor in knowledge adaptability and implementing change (Hislop, et al., 2013). Adopting new practices or knowledge undermines a professional's competence, creating psychological uncertainty (Brown, et al., 2011; Majchrzak, et al., 2012; Sarewitz 2004). It is important to consider the psychological impact unlearning has on professionals in designing social networks and training for a regime shift. Hislop, et al (2013:552) explain how "cognitive unlearning may be accompanied by challenging emotions such as anxiety, fear and confusion…it is more likely to involve the unlearning of values and assumptions than simply the unlearning of behaviours". A common limitation in environmental training programs is the focus on task efficiency without acknowledging barriers to adopting and implementing target behaviours (Fraijo-sing, et al., 2010). Interventions to facilitate pro-environmental behaviours or adoption of pro-environmental values need to integrate the normative goals, cultural values, and motivations of the people involved (Fraijo-sing, et al., 2010; Steg, et al., 2014; cite; cite). Holste and Fields (2010) demonstrated through an experiment with tacit knowledge in collaboration, that affect-based trust — the belief of shared values and attitudes — facilitates a professional's willingness to collaborate.

Can Israel's WRP capitalize on its professionals' affective commitment derived by professionals' social water identity to build affective trust? This research was primarily an exploration into the Israeli WRP community's culture. Answering this question requires continued research to develop a generalizable account of Israeli WRP professional values and goals. Recommendations are provided in Chapter Five.

4.4.4 Implication Summary

This study is interdisciplinary in nature, therefore its findings demonstrate breadth rather than depth in scope. Three broad ideas culminated from integrating case study themes and the conceptual framework.

Israeli woman WRP professionals demonstrated affective commitment to their careers, which was rooted in an alignment between their personal ideology and their pride for the WRP community's reputation and efficacy. The participating professionals communicated other commitment factors, such as financial or intellectual, but affective commitment was the

strongest, most consistent factor. Literature showed professionals who demonstrate affective commitment are invested, and more likely to contribute to their professional culture by stimulating knowledge sharing and collaborative behaviour. Affectively committed Israeli WRP professionals benefit their professional culture with collective pride and higher motivation to realize organizational goals. This led me to question whether there was unrealized potential; whether the power of affective commitment has been fully realized by Israel's WRP community.

I call into question whether professionals' longing to contribute was a manifestation of a coping mechanism for internal value conflict and fear. Literature clearly defined how a national water scarcity construct can constrain professionals with a narrow agenda, but also motivate professionals to minimize those constraints. I identified tension between professionals' WRP identities and their national identities. The tension primarily translated into optimistic, pro-social actions. This response is indicative of literature on coping with intrapersonal value conflict and existential threat.

I recommend further research to collect a larger, male-female sample. Establishing generalizable claims about the prevalence of affective commitment and intrapersonal value conflicts in Israel's WRP would create a valuable opportunity. If these characteristics represent tacit common denominators among professionals, they could provide a powerful platform for inter-relating and building professional trust. Literature on water governance and social change frequently recommends trust-building that emphasizes shared values. Therefore, Israeli WRP training programs and social networks need to identify how to incorporate underlying values to promote professional risk-taking, pride and trust.

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Chapter 5. Conclusions and Recommendations

5.1 Notes on approach

Throughout my research I maintained my original intent: to consider how people think and behave in water governance scenarios in new and interesting ways. My motivation came from experience conducting a performance audit as an environmental consultant. In 2010, I spent three months trudging through wetlands and ravines on Vancouver Island assessing other biologists' completed Riparian Area Assessments and how well property owners adhered to them. In finding a surprisingly high error rate, I realized that even when science *is* translated into water policy, its application, monitoring, and compliance are determined by human behaviour and values. I learned first-hand that water-problems are largely people-problems and that understanding the people involved in water management processes is essential for long-lasting solutions.

At water governance conferences, I grew increasingly aware of the absence of conversation on human behaviour. I listened to presenters broach behavioral barriers in water governance, using buzz-words like 'relationship-building', 'taking down disciplinary silos', 'stakeholder dialogue', 'community buy-in', and 'knowledge integration'. These conversations always seemed to culminate in one silver bullet solution: build trust. But they ended there; there was no further discussion about what composes trust or how to develop it. The thought leaders did not provide tools to accomplish knowledge integration or interdisciplinary dialogue, they just underscored the importance of these processes. Something felt missing. As a graduate student, I chose to integrate neglected concepts from water governance implementation: management science and human behaviour. To think about the 'gap between knowledge and action' in a new and interesting light, I considered the confluence of three disciplines, thus, leading to the framework detailed in Chapter Two.

My thesis also maintained an undercurrent: the revaluation of voice. The writing process respected knowledge as a whole, whether through defending marginalized knowledge, both tacit and female; using my own field-researcher voice to bring context to the story telling process; or drawing parallels between professionals' voices and literature-based voices. I wanted to research and write in an honest and engaging manner. The question is, once that

voice is valued and listened to, what shall we (as researchers interested in improving WG) *do* with that knowledge? What conclusions and recommendations can be drawn?

5.2 Theoretical conclusions and recommendations

The literature review in Chapter Two detailed the benefits that arose from integrating water governance (WG), knowledge management (KM) and environmental psychology (EP) literatures. On a theoretical level, each literature recently adopted a social, human-centric lens to complement its technological management lens. All three evolved to conceptualize knowledge as process oriented and dynamic. They each validate diverse knowledge types and sources, yet struggle to integrate them. Each literature operates on a variety of scales, acknowledging the need to incorporate macro- and micro-perspectives and contextual variables as well as the challenges created by that inclusivity. All three acknowledge the individual scale, as a component of a larger unit. These theoretical similarities formed the foundation of my research program.

In reviewing the literature, I identified overlapping research domains that supported my conceptual framework. Water governance literature calls for improved multi-level interactions and coordination in implementation, supporting the position that the problem with water governance is *behavioural coordination* between actors. It acknowledges that work in water research and policy is inherently interdisciplinary and situated within socio-political systems of interrelated factors. Knowledge management concepts benefit the WG literature by defining knowledge processes and professional skills that improve implementation success. Research in WG incorporates those knowledge processes into its fundamental principles. Overlaps between KM and EP literature provide a behavioural lens by considering knowledge's use and impact. The recognition that individuals' knowledge can be socially constructed and dynamic offers a more holistic lens for considering the impact knowledge has on professional behaviours than the dichotomous tacit-explicit, or local-expert ones typically used in WG research. Pro-environmental behaviour models benefit this end by integrating non-rational and external factors into behavioural studies. Pro-environmental behaviour research in workplace settings recognises the need to consider organizational and personal factors concurrently. In a

WG context, the models lend insight for understanding the impact of tacit knowledge, professional norms, and how to target behaviour change in water governance.

In addition to interdisciplinary conclusions, in Chapter Two I defined conceptual strengths and gaps from each literature overlap. Water governance literature has clearly identified principles and challenges for 'good governance' with extensive case study support. Yet, I identified a disconnect between the tacit challenges created by interdisciplinary knowledge management and the explicit solutions proposed to resolve them. The solutions' macro-focus on group dynamics and consensus-making excludes the psychological micro-perspective on how individuals biologically make decisions and the underlying variables that influence those decisions. These social approaches disregard processes that unconsciously yet significantly contribute to individuals' knowledge and individuals' social behaviour. Therefore, I drew upon knowledge management and environmental psychology literature to supplement this gap. I considered how tacit knowledge — including experiential and affective sources — determines several social and adaptive skills required by transdisciplinary work, as well as develops an individual's identity and worldview.

Chapter Two culminated in rationale and a design for the conceptual framework. I applied pro-environmental indicators to a water governance case study that considered professionals' knowledge management. Environmental psychology theory, particularly pro-environmental behaviour, offered defined influences on behaviour. Water governance literature provided a contextual setting for the research; its intersection with KM literature identified desirable professional behaviours to investigate. The framework placed my Israeli case at the center of a Venn diagram with the integrated literatures, questioning how the ways WRP professionals think about water (Obj. 1) influenced (Obj. 3) their professional behaviours (Obj. 2). Common methodological practices from EP-KM and WG-KM research were combined to design a compatible research approach for the transdisciplinary framework.

Trends from the methodological review in Chapter Three revealed how water governance and environmental psychology research collect and utilize individuals' tacit knowledge. Environmental psychology tends to emphasize quantifiable behavioural predictions, whereas water governance prioritizes qualitative data for informing governance theory. A case study

approach was selected to validate the importance of contextual factors in the relationship between environmental attitudes and behaviour. The case study design used professionals as units of analysis, exploring one conceptual case of individuals' knowledge management in Israel's water research and policy (WRP) community. Qualitative data were collected using semi-structured interviews and an autoethnography to maintain researcher reflexivity. Thematic data analysis was then guided by a framework consistent with pro-environmental behaviour (PEB) principles and the research objectives.

As explained in Chapter Three, I intended to integrate tacit knowledge within an academic domain that typically over-looks and undervalues its use. Providing evidence of individual decision-making based on tacit knowledge does not fit easily within existing water policy or management structures. Water governance processes must reassess and integrate tacit knowledge to improve their effectiveness. Qualitative research provides a theoretical and methodological platform to do so. Qualitative paradigms have recently proliferated to explore situated identity – feminist geography, queer studies, and immigrant studies – each with corresponding interpretive practices (Denzin and Giardina 2015). I applied autoethnography to underscore my stance on revaluing professional tacit knowledge. "Autoethnographers use emotions as part of the rational analysis of the social, inviting readers to a form of knowledge that does not exclude their own feelings" (Ruitz-Junco and Vidal-Ortiz 2011:195). Autoethnographic statements displaying first-hand cultural observations and experience can be useful in defending case study research to a broad audience (Ellis 2004). In using two methods that value positioning (tacit knowledge) to identify and articulate tacit knowledge, the research design was compatible with the research philosophy, making it a reliable choice (Mansvelt and Berg 2010; Yin 2009).

As the case study provided a contextual account of WRP professionals' knowledge and decision-making, the obvious audience was the broader professional water community. Less obvious audiences include researchers interested in the application of humanistic, situated methods that elicit tacit knowledge, as well as environmental psychologists considering qualitative methods for behavioural studies. Combined, Chapters Two and Three resulted in the following recommendations.

5.2.1 Theoretical recommendations for future research

Typically, water governance research emphasizes the need to *build trust* between actors, without considering the role tacit knowledge plays in trust-building processes and knowledge creation. **Water governance researchers should continue to look to environmental psychology and knowledge management fields for guidance in resolving behavioural coordination issues between its actors.**

Further, the research intersection between KM-WG provides insight for how water knowledge can be socially created and politically manipulated. Models from environmental psychology can help WG researchers define the factors that influence its professionals' psychology and decision-making, ultimately improving implementation effectiveness.

I recommend that water governance researchers continue to collect professionals' tacit knowledge on water, defining water conceptualizations within given WRP professional cultures. This process would continue to validate diverse knowledge forms to traditionally explicit-knowledge audiences, and would continue to inform professional interactions within water governance. Understanding the values that underpin professional culture could help advance the water governance conversation beyond the quintessential trust-building solution. Particularly, this process should be conducted outside of academia to guide professional interactions and behavioural trajectories between industry, government and NGO cultures.

I recommend further research into the qualitative use of pro-environmental behaviour models and their compatibility with qualitative methods like autoethnography, personal observation and interviews.

I recommend continued use of emotive indicators in pro-environmental analyses. I integrated two additional emotional indicators to my codebook, as well as noted emotive body language and expressions during interviews. The indicators proved invaluable during analysis and interpretation for identifying tacit knowledge. This method helps to validate tacit knowledge by enabling researchers to apply their emotional intelligence during their interpretive inquiries.

I recommend further water governance research on the role qualitative inquiry plays in driving social change. The information-era has placed society in a critical process of questioning authority and re-legitimizing knowledge (Lather 2009). Qualitative inquiry is

instrumental in promoting situated, moral dialogue and incorporating new knowledge types into policy (Denzin and Giardina 2015). This hits at the core of my thesis: if water governance requires a shift in what knowledge is valued then we need to make a shift in *how* we value it. That re-valuation process is a tacit process.

5.3 Case Study Conclusions and Recommendations

Chapter Four addressed the proposed question: *How do WRP professionals think about water and what influence does that thinking have on their professional behaviour?*

I identified many cultural norms, personal values and experiences that influenced the ways Israeli woman water research and policy professionals think about water, including their contextual and affective knowledge about water. As with any study that includes tacit knowledge, there were many combinations of factors that led to interesting attitudinal results. My results showed professionals have water-saving habits, like 'turning off the tap' to 'save every drop', that have direct, daily impact on how they conceptualized and interacted with water. Participants discussed geographic factors, such as generational water losses and the omnipresent political conflict that promoted personal responsibility in thinking about water. Although few professionals articulated spiritual or emotional connections to water, it was predominantly thought of as an anthropocentric resource in Israel; water was something to manage for human needs and to maintain quality of life.

Water also provided an obvious and accessible career path in Israel, particularly in technology and engineering. Professionals exhibited openness to change; they valued their behavioural impact on Israel's WRP community by advancing its validity and evolution. Dominant professional behaviours were grouped into: improving information and reporting accuracy, incorporating more social or ecological values, and including more diverse actors. I provided evidence that Israeli woman WRP professionals recognize diverse water needs and commit to their WRP career primarily for moral reasons. The ways professionals thought about water and the professional behaviours they pursued signaled two dominant themes for how one might influence the other, the study's third and final objective.

First, water scarcity was both a reality and social construct in Israel, as demonstrated by social norms, governmental slogans and media representations. Woman professionals in the

WRP saw through this construction to various extents, identifying confounding factors and alternative perspectives. The expectation that Israeli citizens subscribe to a water scarcity ethic influenced the way water was understood. It embedded water within a social, collective context. It prescribed appropriate behaviours. And it perpetuated feelings of vulnerability and fear. Together, these water conceptualizations influenced the professional culture within the Israeli water research and policy community.

'Contribution' was the second dominant theme in the dataset; personal satisfaction in 'doing good work' was conveyed as if it were an expectation to be fulfilled. The Israeli woman WRP professionals felt a loyal attachment to Israel, a personal responsibility to provide social benefit through work, regardless of how that contribution manifested on a liberal-nationalist spectrum of modern Zionism. I explored tacit underpinnings for the professionals' longing to contribute, including identity fulfillment and citizen expectations in wartime. Israel's cultural and conflictual contexts, including the water scarcity ethic, shaped which behaviours qualified as 'acceptable' contributions. Professionals exhibited internal value conflict, tension between different identity facets, in discussing their contributions.

The 'water scarcity construct' and 'expected contribution' themes influenced professional behaviour by promoting moral career commitment, entrenching decision-making patterns, and spurring internal value conflicts. In order to generalize such claims to the broader Israeli WRP community, a larger, co-ed case study design would be required.

Chapter Four concluded by integrating the two themes into the theoretical framework from Chapter Two, synthesizing key messages and implications from the research. The first key concept defined a social water identity for the Israeli WRP participants, explaining how social norms and collective pride identified participants' affective commitment to the WRP field. Affective commitment was placed at the center of the framework's Venn diagram. Literature on affective commitment provided evidence for improved knowledge sharing and professional motivation. The synthesis generated two research recommendations:

a) Conduct further research investigating WRP professionals' social norms, pride, and value conflicts to promote pro-environmental and knowledge sharing behaviours.

b) Future research could also combine collectivity or social in-groups with hydro-hegemony research to question whether Israeli WRP professionals' affective commitment could benefit regional water conflicts.

The second key message related Israel's 'water scarcity construct' to two forms of water research on political knowledge control. The psychological impacts controlled knowledge has on individual water governance professionals was an identified gap in the literature overlap between knowledge management and WG. I addressed this gap by drawing from environmental psychology. In considering the influence Israel's scarcity construct has on its WRP professionals, I explained how a constrained national water agenda created both behavioural barriers and motivators within the sample set**.**

I questioned whether the participants' commitment to their careers was a method for coping with internal value conflict between their personal and professional water identities. And whether the participants were more willing to voice dissent and take risks as water professionals than risk uncertainty as Israelis. Insights from literature on defense mechanisms and existential threat identified a benefit from conflict in that it often motivates pro-social behaviour. The identity conflict spurred two areas for future research and two implications:

a) Future research studying the psychological impact of hydro-hegemony or water securitization would merge WG-KM literature with EP, yielding interesting insights for the bi-directional impact hydro-hegemony has on professionals.
b) Pursuing the psychology of contradictory threats would be an interesting avenue for future water governance research based on the value tension exhibited in this Israeli case study.
c) Findings regarding coping mechanisms and professional behaviours created an intriguing implication. Professionals that acknowledge difficult emotions around water knowledge and water governance can better operate within and improve their system.
d) An international implication arose from Israel's water scarcity construct. Countries that look to Israel for WRP leadership may benefit from their explicit water management knowledge. However, implementation would need to address

the differences in water governance structure and implicit water knowledge. The country's water scarcity construct is instrumental in implementing and maintaining their governance regime.

These first two messages discussed influence on Israeli WRP professionals. But in keeping consistent with the bi-directional relationship psychology supports, the third message considered how professionals' water knowledge and corresponding behaviours influence Israel's water governance. Professionals' psychology can impact its organizational culture when opportunity arises.

In the third key concept, I demonstrated a disconnect between the dominant values in Israeli WG literature and values articulated by the Israeli WRP participants. Having professionals who are both affectively committed to the field and motivated by value conflicts gives the Israeli WRP human capacity potential. Not harnessing that potential represents an opportunity cost. This section assessed entrenched water knowledge in Israel as the primary barrier to taking advantage of WRP professionals' implicit potential. I question how the Israeli WRP community can harness motivation from its professionals to achieve the targeted shift to more inclusive WG, a shift that requires knowledge re-valuation. Further research from knowledge management and environmental psychology could provide insights into how to transform entrenched knowledge into pro-environmental behaviours that are advantageous to water governance transitions. A broader, more generalizable assessment of the current values comprising Israel's WRP professional culture could aid in steering the dominant Israeli water ethos. Recommendations for this key idea follow, within the applied observations.

5.3.1 Applied observations and recommendations

Understanding professional culture can optimize collaboration between sectors and realize behaviour change. Israeli WRP professional culture was found to enable and inhibit pro-environmental behaviours as work. According to this study, Israeli women WRP professionals exhibit openness to change and willingness to take professional risks. Professionals from all four sectors valued innovative activities and organizations that supported professional autonomy or creativity. However, the national water governance structure was reportedly risk-adverse — prone to avoiding uncertainty — a cultural value that

inhibited change. Both collective pride for Israel's WRP reputation and individualist performance standards fostered motivation for Israeli water technologists and engineers. High quality performance standards were valued by academic, government, and NGO professionals too, but collectivity for these sectors was exhibited on a smaller, organizational or departmental scale. Industry and engineering had the most cohesive mentality and sense of accomplishment. Overall, Israeli women WRP professionals chose pro-social, innovative behaviours and committed to companies that aligned with their worldview. In defining these professional culture attributes the following observations were made.

Observation 1: Participants advocated for more women in management in Israel's WRP community. Women mentorship, networks and participation was important. Participants voiced difficulties women face being represented in decision-making processes and climbing to executive levels. Improving gender parity in Israel's WRP management was communicated as a strategy to improve water decision-making.

Recommendation: Support women's participation in Israeli water governance.

Observation 2: Participants exhibited openness to change; they pursued professional activities that incorporated diverse values and audiences into Israel's WRP agenda. Diverse values included but were not limited to: social rights, ecosystem services, sustainability concepts, Arabic environmental information, and alternative technologies. Participants from each sector advocated to restrain the powers that dominate the WRP agenda; they wanted to improve water management in military and agricultural sectors, and expressed concern about the impacts large scale technological solutions have on the environment.

Recommendation: support professional behaviours that broaden the national water agenda

a) Work to decouple science and technology in water governance dialogue, which largely excludes social science and alternative values.
b) 'Sustainability' conferences were reported in Israel. Professionals suggested focusing interdisciplinary efforts on water since it was perceived as an opportunity for hope and change in the region.

Observation 3: Participants demonstrated willingness to take on more interdisciplinary actions, collaborate more often between sectors, but did not have the mechanisms to do so. Participants, particularly outside of industry and engineering, requested more networks, social networking and training opportunities.

Recommendation: Support interdisciplinary water network and training programs beyond technology and innovation foci.

a) Create more interdisciplinary training grounded in WRP values and goals. Acknowledge the tacit foundations in the WRP professional culture to underscore commonality between individuals and to support professionals' psychology and interactions.
b) Provide support through social networking and coordination mechanisms to foster knowledge adaptability in Israel's WRP community.
c) Support inclusive networks to enable a more hybrid water governance approach that allows for some decentralized input. If civil society typically leads the environmental movement in Israel, the country's water governance structure should consider making space for civil society's voice. Inclusive governance may help to build affective trust, acknowledge entrenched values, collectively define target values, and support interdisciplinary projects.

Observation 4: The disconnect between the WRP professionals' values and the Israel's centralized water governance values presented a barrier to professionals' in realizing their intended behaviours. The water scarcity construct was found to influence professionals' contributions in conscious and unconscious ways. The centralized, securitized mentality would need to be addressed in order to realize the above recommendations.

Recommendation: harness professionals' unrealized potential

a) Israeli WRP professional culture should acknowledge the threatening water scarcity construct in order to redefine behavioural norms in water governance.
b) Identify the values, practices, assumptions Israeli WRP professionals need to unlearn in order to achieve the target goals.

c) Capitalize on professionals' affective commitment to the WRP in order to support knowledge sharing and information accuracy initiatives as a method to relieve entrenched knowledge.
d) Capitalize on Israeli WRP professionals' pro-social commitment to underscore value-alignment between professionals. This may help build affective trust between and across sectors.

The recommendations proposed were extrapolated from corresponding literature reviews or directly stated by participants. They are considerations for professionals interested in using tacit knowledge to improve Israel's WRP or water governance. They do not propose definitive problems and solutions.

The themes identified by this sample are two of the many influential factors for Israel's professionals WRP culture. On my final day in Jerusalem, I met Eran Feitelson for coffee to ask for his perspective on what 'good work' and 'save every drop' meant. His response was that "Israel has the most complexity per square-kilometer in the world"; that a person could live their whole life in Israel and still be perplexed by the many layers of complexity.

At this final stage of research, I realize several ways I could have done this study differently. I could have conceptualized the field work with transition management theory, identity theory, or terror management theory. I could have organized follow-up phone calls with participants to deepen my insight into the two main themes. I could have contacted Arthur Leiberman to discuss the identity conflict I interpreted within my dataset. I could have read more autoethnographic writing examples to develop my social language for drafting Chapter Four. I've researched this topic for five years and I still find articles that intrigue me.

It is satisfying to end the research process with more questions than I started. Completing this project changed the way I see the world. I learned how much I do not know and how much I enjoy inquiring. After all, "experience has intellectual consequences" (Kerr 2011:102).

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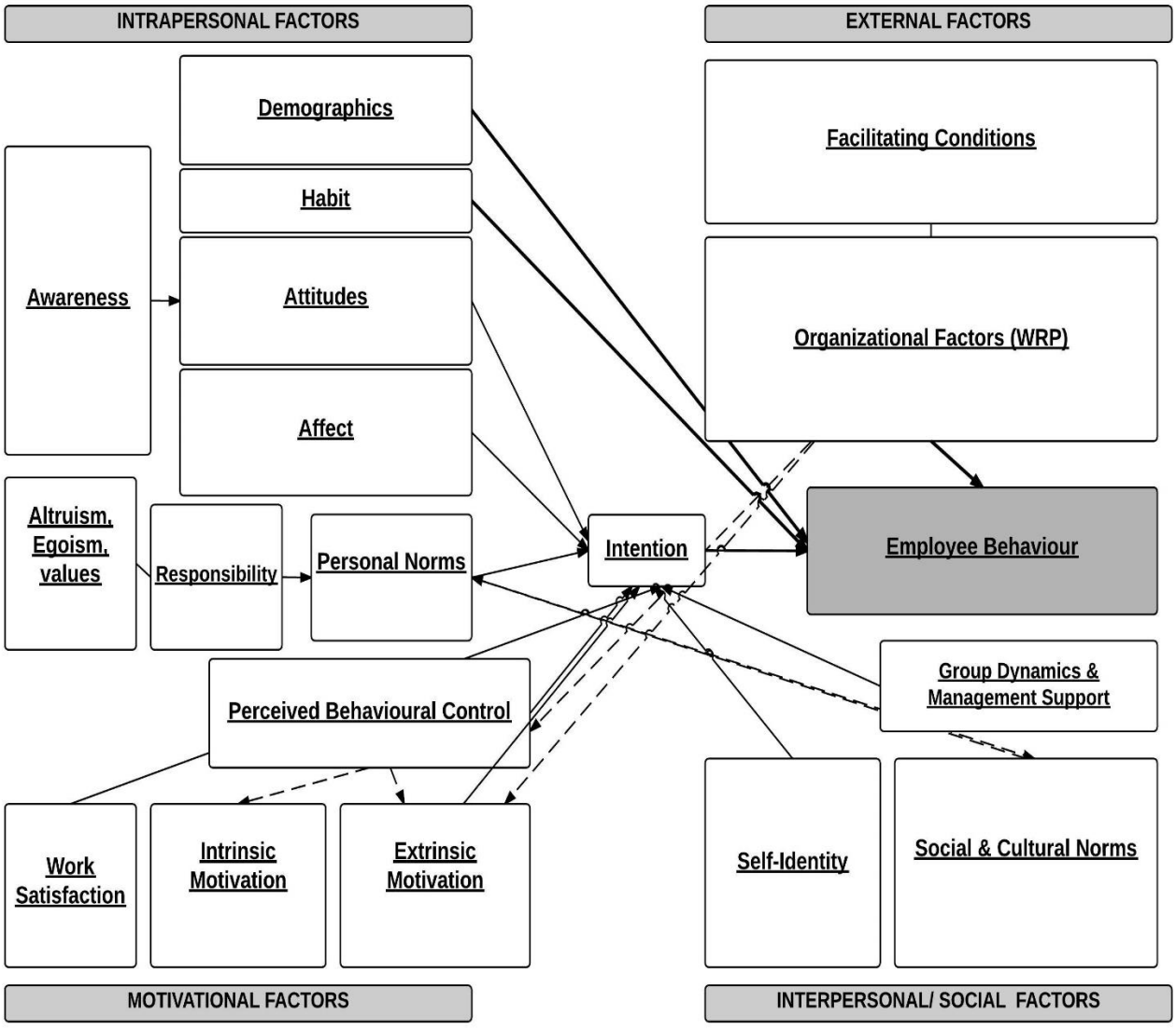
Appendix A: McDonald's (2014:295) Conceptual Diagram for Pro-environmental Behaviour at Work



Appendix 1. An integrated model for professional pro-environmental behaviour displaying influential factors in four categories: intrapersonal, motivational, Interpersonal, external (Adapted from McDonald 2014:295).

Appendix B: Interview Question Set (May-June 2012)

Intro's: Taylor – Master's student, enjoying Israel, experience in outdoor/env. education interested in awareness-action. Enjoying talking to the Israeli's met so far. Thank you. Tape record? Consent form.

Before begin, clarify: 1) Hebrew allowed. 2) Personal, casual approach.

1. **How did you come to choose this career?** (Where does your story begin?)
   - Mentors? [*Yoetz Eeshi*]
   - Settled or still establishing?

   Transition: Have you always lived in _____?

2. **What do you remember about water from your childhood?** (What stories can…)
   - What influenced the way you think or relate to water? [*worldview: Hashkafat olam*]

**Outside school (Books, people, daily expressions?)
   - What is the source [*makor*] of your deepest connection [y*achas*] to water?

   Transition: has [____] contributed your choice in career?

3. **What do you value** [*erech*] **most about your job? What are you proud of**?
   - Elaborate: how keep connected and motivated
   **common in your experience? Females?

4. **Tell me about your *Tikvah, Shifah.* What do you hope to achieve in your field?**
- If you were young again, just starting out, would you choose the same career?

5. Having reflected and shared those memories, you obviously have considerable knowledge about _____. ***Mah hayeeta matzee'ah lamatchil ba'tchum?***
   - Leadership needed?
- Process changed? Next generation focus on social change after era of tech. innovation?

End well: This has been wonderful. You've given me a lot to think about.
- Questions I should have asked? Questions for me?
- Any <u>recommendations for women or students?</u>
- Transcript – accurate portrayal of your voice. Approval, additions.

<u>Clarify</u>- Can you run that by me again? I'm afraid I didn't follow it.
Would it be alright if we went back…
<u>Depth</u>- Hmmm- sounds like there's a story there.
Repeat phrase with ? tone.
<u>Detail</u>- Do you have a specific instance in mind, or are you speaking in general?
That's interesting could you tell me more?
Can you give me an example? Could you describe how …

Appendix C: Participant Validation Email (sent May 2015)

Hello _____ ,

I hope you have been well [*something personal to catch their attention*]. This email is in regards to our interview on _____ 2012. We discussed how you thought about water as an Israeli and as a professional in water research and policy. I realize it's been a long time since we last met; I had a job opportunity that took me away from this research for a while.

It is standard practice in interviewing methodology to have participants validate their interview transcripts. Knowing how busy your professional schedule is, I only included the sentences from our conversation I'd like to quote you on and the research result they correspond with. Please take a moment to review them below. If you approve their use, please respond to this email with a simple 'approve' message by July 30th, 2015. Feel free to respond with questions for clarification, to have a quote removed, or to request your full transcript. If I do not hear from you by the end of July, I will assume you are comfortable with the quotes I have selected for you.

Thank you for your time,

Taylor Wilkes

"*Proposed quotation"(Participant#, page#).* [**Corresponding result]**

"*Proposed quotation"(Participant#, page#).* [**Corresponding result]**

"*Proposed quotation"(Participant#, page#).* [**Corresponding result]**

Appendix D: Autoethnography compilation

Israeli Culture and My Behaviour – Researcher positionality & reflexivity

April 8, 2012 – one month to departure: Pre-departure, this cross-cultural field work is looming overhead like an inescapable storm. Everything is so new- the literatures I'm reviewing, the method's I'm applying, and the current geopolitical context in Israel. As a researcher aware of the impact colonizing behavior has on a group of people from another country, I seek cultural understanding before beginning to conduct interviews. But where is the balance of learning beforehand and during? Where is the balance between ignorance and pre-disposition?

May 11-12 – Arrival to Jerusalem: With only one day here in Jerusalem, there have been so many signs of the separation between people. While waiting for my Sharute, I met an Israeli woman born and raised in Jerusalem who exchanged stories with me about international research. Sixth generation native from Jerusalem, this woman was in love with the city; when she heard I was staying in the Arab sector, though, she became suspicious and almost defensive. One of the drivers warned me, "There are many Mohammed's over there. You understand me? You be careful".

I find instantly upon arriving to this country that I am more subdued, quiet, and almost instinctively submissive. I'm unsure of whether I feel I need to behave this way or whether the brutally opinionated national culture encourages me to recede into a safer shell. I am still unfamiliar with Arabic and Hebrew, so that makes me more timid. Though, I'm sure this will change.

For me, religious connection is almost more foreign than this country. It's the element that makes me most nervous and cautious about my behavior here, because it is an element I don't thoroughly understand or have personal experience with. Religion and politics are deeply rooted in Israeli culture and identity in Jerusalem. It will be interesting to see if that is mirrored in Tel Aviv and Haifa, locations where religion is not as prominent.

May 25, 2012 – Two weeks of cultural emersion: The learning curve has been steep since arriving here two weeks ago; my work has become secondary to this preliminary phase of cultural infusion and adjustment. Awkward too, is immersing one's self entirely into a new culture, yet working to remain distant enough for objective reflexivity.

I've learned that the difference and separation between Jews and Arabs is everywhere. More than just politics and religion, but the betrayal, fear, and hateful scorecard that comes with so many decades of conflict. From an outsider's perspective, the so-called 'civilian-army' exacerbates it all. Those who are and those who are not required to serve become separate (but equal?) civilian groups – the Hasidic seemingly superior and the Israeli-Arabs caught between their country and faith. Young soldiers are commonplace in Israel, especially at transportation hubs. They act as constant reminders of Israeli solidarity regarding national threats, despite it otherwise being a politically fragmented society.

Skepticism of foreigners is transparent. The upfront, brash, self-serving spirit of the place can be difficult to withstand I think, particularly as a 'polite' Canadian. I find myself hesitant to ask questions and approach locals because of this exterior persona, whereas traveling in other places like Europe and Central America I felt much more welcome to do so. Also my rosy-tinted perspective seems more apparent in this place. A quality I value in North America, which often motivates me and keeps me optimistic, I fear here is interpreted as naivety. Maybe it is. But I've met quite a few Israeli's from the older generation that look at me as if I've never felt pain; cannot comprehend hardship or the deeper value in life.

Then there is the other side of conflict – pride.

Both cultures, once passed preliminary defensiveness, are so eager to share the beauties of their customs and foods, to negate the predispositions people hold about the Middle East. Israeli warmth, though difficult to find at first, is unmatched to that which I've seen in Canada or the US thus far. I've been sitting on this balcony for hours now sipping Turkish coffee. The city is starting to quiet as the sun descends before Shabbat. Saturdays are peaceful in this city. Families gather at the beach and in the evening the Muslim prayer casts over Jaffa on loud speaker. It's nice to be in a place of such history and pride, though eerie how easily it masks the anguish it continues to create.

This culture is a strange mixture of ambitious drive to work hard, innovate, improve the state of the Nation and the quality of life for its people, while simultaneously accepting life for its challenges the way they come. As a researcher I'm supposed to be conscious of Israeli culture and the influence it has on my behavior – specifically for my interviews. The truth is: I don't know yet. I'm still experimenting.

June 14, 2012 – two weeks of interviewing, feeling research isolation: Today, as I visited another two new campuses filled with students my age and interest group I had not yet felt so alone. I am beginning to wonder, now, what the impact on my research is that I am experiencing this kind of social isolation. How do I stay interested and involved in the culture, yet still protect myself from this constant (exhausting) feeling of 'other'?

It's an awkward balance, making connections during research. Each day, I set out on public transit to meet one individual, once. Make a strong connection and then leave. I feel invisible here. Those who do speak to me quickly realize I'm not Israeli and usually turn to talk to others. I've noticed a distinct absence of my outgoing approachability due to the constant influence of this. I'm typically a very friendly person, but here I rarely approach people on the street or strike up conversations.

This is likely why I do not feel as submersed in the culture as I should having spent a month here. And I wonder, what the impacts are of my understanding Israel properly. I find it an exhausting culture to be part of. Is it really an every-man-for-himself culture? Or is that just my perception in the chaotic streets of Tel Aviv? I was pleased to have this feeling validated by a personal contact named Tova, an Israeli-native who, "every 7-years [has] to get out and away- go live somewhere else for a while. There's too much going on in Israel".

June 19, 2012 – trip to Palestinian Water Authority in Ramallah: So far, my interviewees have been relatively closed-lipped about water issues pertaining to social and human rights contexts. They all mention scarcity, but rarely acknowledge Palestinian dilemmas with water. I grew tired of only hearing one side of the equation, so I've been in Ramallah for a few days to balance out the Israeli perspective. I sensed that 'problems with our neighbors' and 'scarcity' were loaded terms.

I spent a day yesterday travelling between offices to speak to the employees at the Palestinian Water Authority (PWA) – they're so frustrated. They reported feeling no independence or self-sufficiency, so many obstacles to making progress on projects. Life is so emotional and irrational and heavy; the conversation often veered towards personal or political topics rather than strictly professional. People there are tired of discussing the I-P conflict. They're ready for change and hope.

Despite the frustration radiating out from the workers and crippled hope from civilians, the checkpoint at Qalandiya was what taught me the most about the occupation's emotional influence. I am just a visitor, I only have one tiny experience with Israeli soldiers' power abuse minimizing my rights. I took pictures during the process of passing through Qalandiya, then was demanded to delete them by adolescent Israeli soldiers. Highly aware that that daily defeat and humiliation would crush my motivation, hope and eventually compromise my morals, I cannot imagine what it would be like to be a Palestinian.

June 29, 2012 – a local, maybe, but not an insider: Hosting my family here has proven that I'm beginning to acclimatize here. For instance, I've grown accustomed to social protests marching by my

apartment on Saturday nights and the competitive chaos between bikers, pedestrians and drivers in the streets.

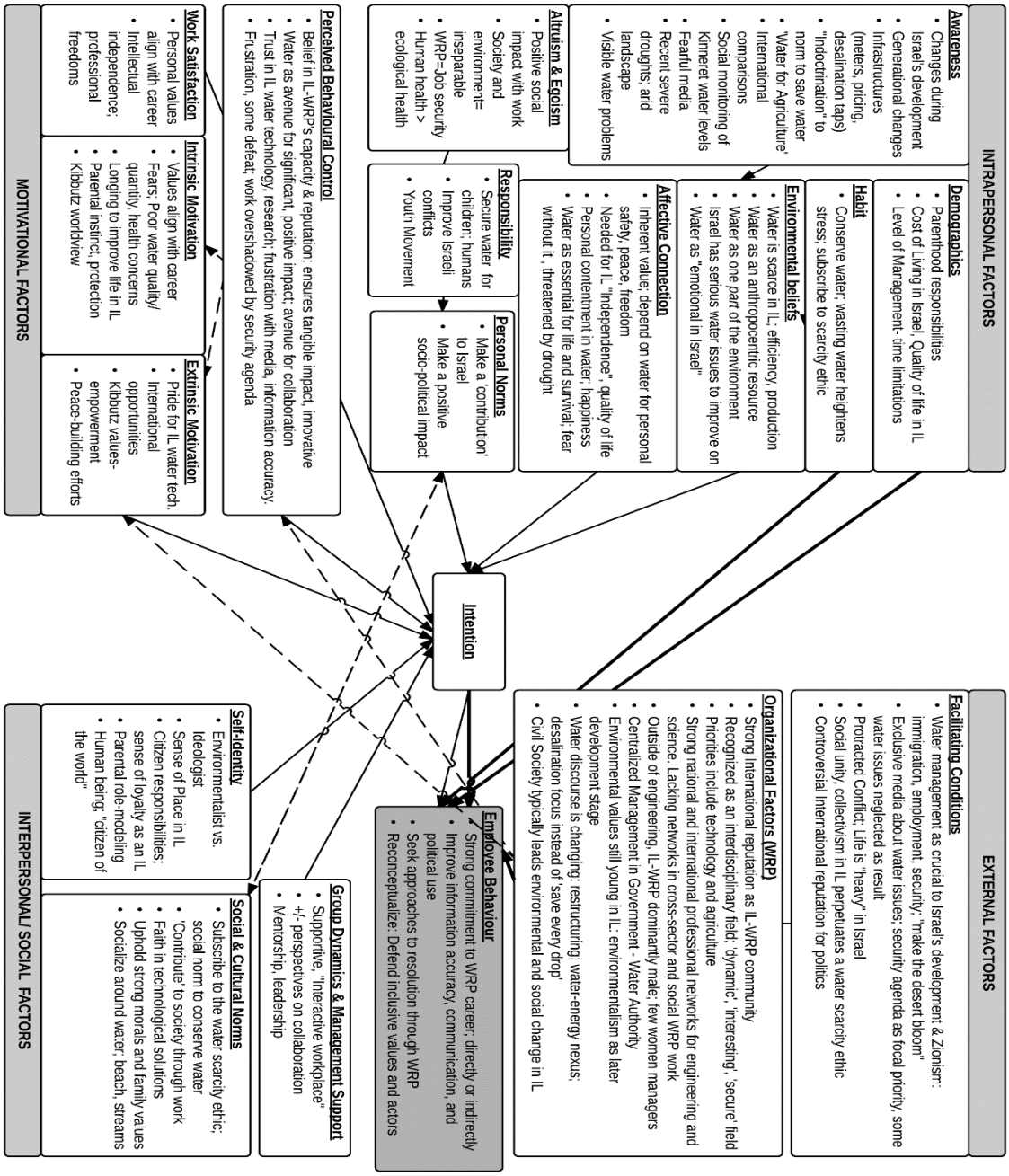
I've developed an 'Israeli callus' too. I know to haggle or ignore shop owners. I know I'll get scammed at the shuk (market) because I'm an obvious foreigner and to just let it roll off my back. I understand the national transit system and am oriented in my city. I know the major problems going on in the country and am aware of the regional political fires. I've been to the West Bank a couple of times, so I see things from multiple angles. Having been to and interviewed people in several different cities, I have a handle on the differences between them. The saying "Haifa works, Tel Aviv plays and Jerusalem prays" is very true

July 9th, 2012- Final two weeks: It is not my right to have an opinion whether Jewish people deserve a homeland; I do not have a strong enough foundation in religion or history to truly understand what is going on (can anyone, ever?). But my frustration with the Israelis' lacking acknowledgement, concern, and regard for the discrepancies and human rights issues has grown. It feels uncomfortable to live in the country with the upper hand. Yet still, I understand that this is a harsh, complicated country to live in and in order to maintain a minimal quality of life for your family you can't think about or act on politics every day.

Arthur reminded me that the "gap between awareness and action for environmental or ethnic issues has to be viewed according to *priority*. The problems in Syria have spilled over to Lebanon, which gives Iran the Northern and Southern (Hammas through Gaza and Sinai) vantage points. This is a high priority, international issue that overrides other thoughts for the mass public." I need to find a way to understand this concept better. Constant military and cultural conflict is so foreign to me as a Canadian. What can I learn from this apathy or psychological distance for water governance in Canada?

July 17th, 2012 – upon departure: So what is the relationship between Israeli culture and my behavior? Confused, overwhelmed introversion coated by aggressive, self-serving independence. I may not dress like an Israeli, or talk like an Israeli. I follow most traffic rules and try to stand in line. I may be a bit pushier, more pro-active and self-reliant. But I'm more aware of the complexities in the world, the impact of political power on everyday living, and the sense of purpose derived from religious identity.

Appendix E: **An integrated model displaying factors that influence professional behaviours in Israel's Water Research and Policy (WRP) community** (Adapted from McDonald 2014:295). Line weights correspond to strength of influence on behaviour, varying from direct (solid) to indirect (dashed). 'Employee behaviour' shaded to isolate it as an outcome. Bulleted results within each factor category are arranged in descending order according to consistency.



Interpreting the figure:

The figure isolates behaviour as a darkly shaded textbox aligned furthest to the right. Four quadrants encompass the behavioural outcomes, dividing the influential factors into subcategories: intrapersonal, motivational, external, and social factors. Grouping the factor categories within quadrants helps to clarify sources of influence for a reader, but the subcategories do not constitute a dominant role in forming results. I have adapted McDonald's model for the purpose of this discussion (See section 2.2.5 for rationale). Most of the codes from the template provided in chapter three were included in McDonald's original model. The extra, 'miscellaneous' codes aligned with McDonald's defined categories: 'WRP insights' were Organizational Factors, 'Gender issue' became Demographics or Self-identity, and 'interactive workplace' fell under Group Dynamics or Work Satisfaction. Therefore, adapting McDonald's model to display results is consistent with the framework in chapter two.

As depicted by the heavy solid arrows, Demographics, Habit, External Factors and Intention are factor categories that McDonald's review found to directly influence employee behaviour. The other factors influence intention. McDonald's model challenges the outdated assumption that knowledge equates to action in a linear manner. The figure shows several knowledge sources raised awareness about water issues for the professionals. The understanding and the environmental beliefs created by that knowledge are only one factor that influences behavioural intention.

Some factors both influence and are influenced, designating a wider reach or impact on behaviour. An employee's perceived behavioural control (PBC), for instance, connects motivational and external factors in determining its contribution to behavioural intention (willingness and capacity). Perceived behavioural control is one of the factors consistently ranked as influential by meta-analyses. Other models categorize PBC as an intrapersonal factor; however, McDonald's framework found that in a work setting, external factors significantly contributed to a professional's motivation and control over their efficacy.

It is important to note that as these results were not quantified, formed into percentages, they are arranged within their factor category in descending order according to salience. The top bullet in each textbox (except behaviour) represents the concept most consistently raised by participants.