

Conserving the nest of life

An exploration of knowledge governance in the Palau

Protected Areas Network

By

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Submitted in partial fulfilment of the requirements for the degree of
Bachelor of Interdisciplinary Studies in Sustainability with Honours

In the Fenner School of Environment and Society,

Australian National University

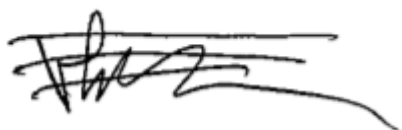
October 2015



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Candidate's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.



Victoria Alice Jane Webber Pilbeam

Date: 22 October 2015

Acknowledgements

This thesis would not have been possible without the support, guidance and dedication of many people. I would like to take this as an opportunity to express my deep gratitude to:

- The Australian Centre for International Agricultural Research for funding this research and for the ongoing support which ACIAR offers Australian researchers striving to help communities all over the world.
- My amazing supervisors Dr Lorrae van Kerkhoff and Dr John Cox. Lorrae for helping me to make sense of this experience, taking me to Palau and for being such an incredible academic role model for me throughout my degree. John, it is an absolute honour to be your first honours student. Thank you for pushing me to be more critical and helping me to engage with a wider body of scholarship.
- The people of Palau, specifically, to all the participants of my research without whom none of this would have been possible and whose insights had a transformative impact on the way I think about the world. I would like to specifically recognise the contributions of all the Palauan elders who shared their wisdom with us.
- The PAN Fund – Clarinda, Noe, Birduu, Regis and Jenny for all their hospitality in accommodating us while we were in Palau and for their support in getting this project off the ground.
- The community of scholars at ANU, especially my Fenner School family for helping me to learn and grow so much over the course of my time at university. Special thanks to my honours cohort, the 2015 honours convenors Associate Professor Frank Mills, Dr Rob Dyball and Veenita Vido, the Small Island States Discussion group for being a monthly highlight, my midterm reviewers Dr Tony Weir and Professor Val Brown for sharing their insights and Professor Richard Baker for his passion for helping students to learn.
- All my friends, especially, Callum, Simon, Emma, Nikki, Fed, Jen, Edith, Dzifa, Michael and Rob for keeping a smile on my face and pitching in a variety of ways to help me cross the finish line.
- Gloria, for being my partner in everything and remaining confident in my abilities even when I was not.
- And finally, to my family, my parents John and Yvonne for their love of learning and for teaching me the importance of community and my sisters Sarah and Rachel for their consistent humour and compassion.

Abstract

This thesis uses a knowledge governance approach in order to understand the decision-making processes around conservation in the Palau Protected Areas Network (PAN). Despite unprecedented knowledge of conservation science, mass extinction of species continues. To explain this phenomena, scholars have identified a gap between the knowledge of conservation and actions which promote effective conservation. While past research has largely focused on somewhat linear attempts to bridge this gap by connecting science and decision-makers, this study argues that an appreciation of socio-cultural values and their associated rules and norms is crucial to understanding what kinds of knowledge are enacted, by whom and why. Knowledge governance offers a critical and inclusive framework for analysing the role of these forces in decision-making processes.

From a constructivist standpoint, a wider theoretical frame based on Jasanoff's civic epistemologies (2005) is brought together with qualitative evidence around decision-making to construct an operational model of knowledge governance. This conceptual approach is applied to a qualitative case study of the Palauan Protected areas with specific reference to three protected areas exhibiting a range of different conservation practices and contexts. Palauan conservation, lauded internationally as a model for innovative marine initiatives, presents a particularly fertile case study for developing theory in this area because its decision-making context combines customary and scientific knowledge.

The findings of this study suggest knowledge governance in Palau is largely determined by whether the audience for conservation in question is internal or external. Because customary knowledge is spoke more effectively to local audiences, it had more traction in decision-making than science and techno-rational approaches which fitted better with the expectations of external audiences. However, this may change as the external audience for Palauan conservation expands and internal audiences become more susceptible to scientific knowledge.

This thesis seeks to learn from, and not just about Palauan experiences of conservation. It acknowledges that Palauan experiences present important and legitimate insights into the ways in which knowledge comes to be seen as a valid basis for action. Though an investigation of this case study, not only do I apply knowledge governance as an analytical tool using the notion of audiences but Jasanoff's original framework is expanded on to include issues around trust and ownership. Through these lessons, this work contributes to a greater understanding of the connections between knowledge and decision-making which is vital to ensuring successful conservation.

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Glossary and Acronyms

Glossary	
Biodiversity	The diversity of life on earth (Primack <i>et al.</i> , 2012).
Knowledge governance	The (in)formal rules and norms that govern whether knowledge is considered a valid basis for action (van Kerkhoff, 2013).
Knowledge systems	A systematic approach to the boundaries between knowledge and action (Cash <i>et al.</i> , 2003).
Techno-rational	The idea that the rational application technology and science will solve complex problems (Corfee-Morlot <i>et al.</i> , 2007).
Glossary of Palauan words	
Babeldaob	The main island of Palau (Etpison and Davidson, 2004b).
Bai	Traditional men's meeting house (Telmetang, 1993).
Biib	Palauan fruit dove (Etpison and Davidson, 2004b)
Bul	"Customary conservation laws" (Johannes, 1981).
Lukel a klengar	Literal translation: "the nest of life". Palauan term for the environment (Kuardei, 2005a).
Mekull	Actions that disturb the order of the universe itself and in so doing endanger the perpetrator and their loved ones, comparable to the concept of sin (Kuardei, 2005b)
Acronyms	
ACIAR	Australian Centre for International Agricultural Research
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organisation of the United Nations
MPA	Marine Protected Area
NGO	Non-Governmental Organisation
PAN	Palau's Protected Areas Network
PCS	Palau Conservation Society
TNC	The Nature Conservancy
TEK	Traditional Ecological Knowledge
UN	United Nations
UNESCO	United Nations Educational Scientific and Cultural Organization
UK	United Kingdom
US	United States of America

Chapter 1: Introduction

When we use the term environment (lukel a klengar), it literally means the nest of life. That is the most important thing to always keep in mind that we are taking care of the nest of life.

(High Chief Reklai Raphael Bao Ngirmang, interview data)

Knowledge issues are at the heart of conservation processes. From the scientific monitoring of global biodiversity indicators to small scale community management of protected areas based on traditional ecological knowledge, conservation decision-makers are continuously negotiating different knowledge systems to form judgements on how to best conserve the natural environment. This thesis focuses on how these processes occur, specifically, on how science and related technical approaches which operate alongside local Indigenous knowledge are included in conservation decision-making. Using the lens of knowledge governance, I explore how different value systems interact in conservation practices. I apply a conceptual framework to elucidate the rules and institutions that govern these knowledge-based interactions drawing from a case study of the Protected Areas Network (PAN) in Palau. This research is intended to contribute to both a greater understanding of the management of a significant conservation area and an operational model of knowledge governance which could be used to better understand and consequently, direct how we care for “the nest of life”.

1.1 Introducing the theory

One of the features of current conservation efforts is that despite having unprecedented access to scientific information about biodiversity, we are in the midst of mass extinction (Cook *et al.*, 2013). This is characteristic the knowledge-action gap, the idea that many environmental problems do not stem from a lack of knowledge¹ but rather a failure to translate that knowledge into action (Meffe and Viederman, 1995; Kolmuss and Agyeman, 2002; van Kerkhoff and Lebel, 2006; Cook *et al.*, 2013). In response, most efforts have typically concentrated on somewhat linear attempts to bridge this gap (see: Roling and Jiggins, 1998; Cash *et al.*, 2003) or project based strategies and methodologies to improve the connection between research and decision-making (Watson, 2005; Cvitanovic *et al.*, 2015; Roux *et al.*, 2015). Far less effort has been directed at understanding the social, political and cultural contexts in which decision-makers must operate, and the associated rules that shape the relationships between knowledge and action. Even less attention has been directed at exploring these issues outside Western settings (van Kerkhoff and Lebel, 2015). This thesis focuses on trying to understand the formal and informal rules which influence what kinds of knowledge are enacted, by whom and why.

¹ In this thesis, knowledge is defined as a justifiable belief following the conceptualisation laid out by van Kerkhoff and Lebel (2006), whereby different forms of knowledge emerges as the result of different approaches to justification. Eg: scientific knowledge justifies itself by complying with accepted standards of scientific practice and peer review.

In recent years, knowledge governance has been proposed as a framework which critically analyses the knowledge processes and practices shaping decision-making (van Kerkhoff, 2013). Knowledge governance refers to the formal and informal institutional arrangements which determine whether knowledge is enacted in decision-making (van Kerkhoff and Lebel, 2015). These arrangements, in turn, reflect wider social and cultural values (Manuel-Navarrete and Gallopín, 2012). In essence, knowledge governance provides a framework through which the often unexamined ways in which socio-cultural values impact on environmental decision-making.

Knowledge governance is a relatively new concept in sustainability (van Kerkhoff, 2013). What case studies there are have focused on a regional level (see, for example: Manuel-Navarrete and Gallopín, 2012; Gerritsen *et al.*, 2013) or on the globalisation of knowledge and its attendant values (see: Burlamaqui, 2010; Hulme, 2010). These works seek to establish ways in which knowledge governance might facilitate interventions (see: Gerritsen *et al.*, 2013) or re-imaginings of previous policy landscapes (see: 2013 Manuel-Navarrete and Gallopín, 2012).

However, these studies despite acknowledging the importance of culture, have not substantially addressed its role in knowledge governance which is an explicit focus of this research. Culture is a frequently contested term (Liamputtong, 2010). There is a particular narrative that Indigenous knowledge is cultural and that scientific knowledge is merely “reality” (Thaman, 2003). However, when culture is understood as “the individual and collective ways of thinking, believing, and knowing” of a group (Tillman, 2002:4), it becomes clear that regardless of context, socio-cultural systems shape how knowledge is produced and validated. Furthermore, this understanding resonates with the definition of governance as the ways in which we organise ourselves to manage our collective affairs (Young, 2002). Understanding the interplay between these two conceptions is crucial to knowledge governance both within this case study and more broadly (van Kerkhoff, 2013). Moreover, mobilising the concept of knowledge governance in a Palauan context provides the opportunity to use its principles to substantially address the interface between scientific knowledge and so called traditional ecological knowledge, an endeavour which has not yet been undertaken in the knowledge governance literature. Exploring the relationships between these two bodies of knowledge and whether or not they result in tensions or mutual benefits is at the heart of this case study.

The knowledge-action gap has become the central point of convergence of several different discussions around knowledge and the role that it plays in sustainability. In this study, current debates around the knowledge-action gap are addressed from the perspective of Conservation Biology, drawing on an analysis of the disciplinary literature with critical insights gleaned from Pacific Studies. Within this context, my explorations of knowledge governance expand on two sub-debates around the knowledge-action gap; namely, the inclusion of different forms of knowledge in conservation and the ways in which knowledge influences policy more broadly (see Chapter 2).

1.2 Introducing the case study

Palau provides a particularly relevant case study for exploring the interactions between science, other forms of knowledge and its implications for two reasons. Firstly, Palau is an area of high conservation value where customary institutions play a strong role in conservation (Gruby and Basurto, 2013). Situated approximately 800 km north of Papua New Guinea, in the Western Pacific, Palau lies at the intersection of three ocean currents (Friedman and Golbuu, 2011). Due to its location, Palau's 586 islands and 616,029km² of ocean territory accommodate an astounding array of biodiversity (Friedman and Golbuu, 2011). The number of endemic species which Palau accommodates is globally significant with more species of coral, fish and invertebrates per unit area than anywhere else in the world (Office of Environmental Response and Coordination, 2014). As such, the ways in which Palauans conserve their biodiversity has implications for world heritage, as well as for local ecology. Furthermore, Palau's primary traditional institution for conservation, *Bul*, is still practiced today (Gruby and Basurto, 2013). The resilience of this cultural institution is in spite of Palau's chequered colonial past (see Box 3.1). The ongoing application of Palau's traditional environmental governance and its colonial history, offers an opportunity for a deeper understanding of the way that culture influences environmental decision-making.

Secondly, Palau is particularly accessible for study and developing theory in this area. Palau has a high literacy rate and is classed as an upper middle income country by the World Bank (2015). These conditions in turn, facilitate the integration of scientific approaches. Palau presents a relatively compact case study due to its relatively small concentrated land mass and population size (around 20,000 people) (UNESCO, 2015). That is not to say that Palau is a case study which lacks complexity but rather that the spaces between institutions and relevant actors are narrower which makes it somewhat easier to observe their interactions. In addition, Palau's PAN benefits from a source of sustainable funding independent from the investment of international donors and the political whims of successive Palauan governments (for more details, see Chapter 3). This reduces some of the financial drivers that may obscure or distort the systems of interaction between knowledge and conservation policy, such as donor requirements – Palauans are largely in the position of being able to approach conservation on their own terms. Moreover, as Connell puts it, local knowledge and theory present an opportunity to “learn from, not just about” a particular context (2007:vii).

1.3 Research questions

The aim of this study is to operationalise the concept of knowledge governance by applying an analytical approach to a qualitative case study of Palau's Protected Areas Network. This study is part of a wider investigation conducted on the PAN with funding from the

Australian Centre for International Agricultural Research. The aim of this thesis can be encapsulated in the question “*how can knowledge governance be mobilised to better understand conservation practices?*”. This more theoretical aim is complemented by the first and second research question which address more practical aspects of the case study derived from the literature surrounding knowledge systems in conservation (see Chapter 2). While the third research question explicitly connects answers to these questions with the overarching aim stated above I investigate the following specific research questions:

1. How does knowledge influence environmental decision-making in the Palau Protected Areas Network?
2. How can knowledge governance be used to explain decision-making processes drawing on different bodies of knowledge?
3. What lessons can we learn from Palauan experiences to strengthen knowledge governance as a practical way of understanding complex decision-making processes?

1.4 Scope and Limitations

The academic conversation around the knowledge-action gap has, since its inception, seen an immense proliferation of concepts, terminology and disciplinary approaches (Kollmuss and Agyeman, 2002). I have chosen to draw only on literature from the field of conservation biology to situate the concept of knowledge governance, although other fields such as agriculture, forestry and health have also engaged with these challenges. This decision was made because it allowed for clearer connections between practical concerns in the case study and those expressed in the wider literature. In a similar vein, my conceptual focus is on supporting a deeper understanding of knowledge governance as a framework and thus, other frameworks are only addressed in so far as they relate to this approach.

One key limitation comes from the cross-cultural nature of this research. I am not Palauan, nor do I speak Palauan and the time for data collection was short. Therefore, it is important to acknowledge that there are bound to be gaps in my understanding of Palauan culture which this thesis fails to address. In order to mitigate the effect of these limitations, I implemented strategies around critical reflexivity (Skelton, 2001) which were crucial to the design and practice of this research (see Chapter 4).

1.5 Thesis Outline

The introductory chapter has established the rationale for both knowledge governance as a conceptualisation of the knowledge-action gap and a case study of Palauan conservation. It also presents the key research questions and outlines the scope of this research.

Chapter 2 conceptually situates this thesis in the conservation biology literature surrounding the knowledge-action gap. It identifies two key debates in which this research seeks

to intervene: how can knowledge influence policy more broadly and how do different types of knowledge interact to bridge this gap.

Chapter 3 contextualises Palauan conservation with reference to its current development, colonial history, traditional conservation regime, and existing conservation practices.

Chapter 4 provides an overview of the research methodology and design. It expands on the constructivist foundations and the conceptual framework behind these components of the research. After which, it outlines the PAN case study and the sub-cases of protected areas. It concludes by explaining the data collection and analysis procedures.

Chapter 5 unpacks the results of analysis using the framework presented in Chapter 4. It also expands on this by including emergent themes. In so doing, it provides an overall description of the ways in which Palauans approaches conservation knowledge and action in PAN, answering the first research question.

Chapter 6 discusses the key findings using the conceptualisation of different audiences and the ways in which this impacts the knowledge governance rules for conservation in Palau. In so doing, it addresses the second and third research questions and speaks to the overarching aim of mobilising knowledge governance to better understand conservation practices. It also includes further research questions.

Chapter 7 concludes with a summary of this thesis.

Chapter 2: Knowledge systems for conservation in the literature

2.1 Introduction

This study focuses on the role that knowledge plays in conservation. In this chapter, literature from conservation biology is used to situate the concept of knowledge governance in wider debates around the knowledge-action gap. Then, I go on to discuss how knowledge governance can contribute to our understanding of how knowledge translates to policy and action. From there, I move on to an exploration of the role that knowledge governance could play in including different forms of knowledge decision-making and mediating the often tense relationship between science and Indigenous knowledge. Both these discussions are used to contextualise research question 1 and 2 respectively.

2.2 Conservation biology and the knowledge-action gap

Conservation biology as it is today, evolved with reference to the interface between science and policy, and subsequently, how knowledge generated through scientific research could be best positioned to influence policy. Conservation biology as a normative environmental discipline, is highly concerned with the translation of knowledge into action (Lackey, 2007). A relatively new field, it was formed in the early 1980s, in response to a growing consensus on the man-made biodiversity crisis (Primack, 2012: xi). Its primary goal is the conservation of biodiversity based on the postulate that biodiversity has intrinsic value and thus, that the loss of this diversity is to be avoided (Soulé, 1985: 730-732). The clear acknowledgment of norms makes it easier for normative concepts like knowledge governance to intervene in this discipline. From an initially narrow focus on scientific explorations of genetics and ecology, conservation biology has developed into a second order science, viewing itself as an active part of a wider social system and making concerted efforts to influence policy (Drew, 2005). This change was precipitated by the growing realisation that, as Meffe and Viederman put it: “the science of conservation biology is necessary, but not in itself sufficient to stem species extinction and ecosystem degradation. The challenge is for science to inform policy to change individual and institutional behaviour” (1995: 327).

The concept of the knowledge-action gap is the central point of convergence of many different debates about knowledge in the field of conservation. In the context of sustainability, the knowledge-action gap² relates to the so called “gap” between possessing environmental awareness and enacting pro-environmental behaviour based on that knowledge (Kollmuss and

² Also known as the research-implementation gap, the knowing-doing gap, the implementation gap and in a different incarnation as the science-policy gap (Kollmuss and Agyeman, 2002).

Ageyman, 2002: 240). In the context of conservation biology, the knowledge-action gap is a proposed explanation for the understanding that despite the ever expanding body of biological knowledge, we continue to act in ways which result in mass extinction (Knight *et al.*, 2008). Three major questions have evolved out of this idea:

- **(Q1)** What is the role of scientists in bridging the gap between knowledge and action?
- **(Q2)** How can knowledge influence policy more broadly? (Directly equivalent to research question 1, see section 2.3)
- **(Q3)** What is the role of different types of knowledge in bridging this gap? (Directly equivalent to research question 2, (see section 2.4))

The primary focus of this thesis is on the latter two questions because they more clearly relate to the identified gaps in the literature which this thesis seeks to address. The ways in which these questions are situated in the literature will be discussed in the following sections.

2.3 Knowledge Governance in the literature

2.3.1 The emergence of Knowledge Governance

Knowledge governance evolved out of a desire for a more holistic framework than that offered by the existing knowledge systems literature. Knowledge systems denotes a systematic approach to the boundaries between knowledge and action (Cash *et al.*, 2003). Its initial preoccupation was to address the first major academic debate which I identified (Q1), the role of scientists in determining policy (Roling and Jiggins, 1998; Cash *et al.*, 2003; Watson, 2005; Cook *et al.*, 2013). Frequently, within knowledge system arguments, experts are tasked with improving the dissemination of scientific knowledge and the policy community is tasked with bolstering these efforts through improved institutional design (van Kerkhoff and Lebel, 2006: 449). Cook *et al.* (2013) in particular, focuses on the role of boundaries between scientists and policymakers in conservation to the exclusion of other actors. Scholars like Fischer have critiqued the undue emphasis on the role of technocrats, arguing that this exclusion is unlikely to produce robust local environmental regimes (1990; 2000). Moreover, these linear approaches are inadequate because resource crises are not just the product of overexploitation but of the conflicting values and interests of different resource users and so, “such crises transcend science” (Bocking, 2004: 76). Whereas, knowledge systems describe a collection of relatively linear micro-level interactions (Cash *et al.*, 2003), knowledge governance seeks a more holistic model which directly addresses the wider forces at work shaping the knowledge-action gap.

Knowledge governance’s wider focus on the role of cultural norms and institutions offers a more inclusive critical framework for addressing the role of knowledge in policy. Within this context, as van Kerkhoff posits, the so-called “gap” between knowledge and action is actually a “space thick with institutional arrangements that have little to do with sustainability, but still strongly shape the knowledge-action landscape” (van Kerkhoff, 2013: 91). The impact of this is

twofold. Firstly, it requires an understanding of the influence of a wider range of actors who are often omitted from more narrow analyses and secondly, it aims at a more nuanced contextual conceptualisation of the ways in which knowledge becomes action. Such approaches, are likely to produce more socially credible and robust regimes (Hendriks, 2010:156). As such, knowledge governance offers considerable explaining power to the assessment of both how knowledge influences policy (Q3) and how different types of knowledge contribute to this project (Q2), and in so doing it lays the ground work for systematic interventions.

2.3.2 Knowledge governance within the context of civic epistemologies

In her work *Designs on Nature*, Jasanoff elaborates on the concept of civic epistemology which refers to “the systematic practices by which a nation’s citizens come to know things in common and to apply their knowledge to the conduct of politics”(2005:9). In her original application of this framework, Jasanoff compares the acceptance or rejection of genetically modified organisms in Germany, the UK and the US (2005). In a departure from its original application, here, the civic epistemologies framework is used to explore the relationships between different bodies of knowledge within a society rather than to compare between different societies (see Chapter 4). The civic epistemologies concept is based on the constructivist understanding that all decisions and knowledge come with implicit values and their relevant assumptions (Jasanoff, 2005:13). This constructivist approach is mirrored in that of my research (see Chapter 4). Meffe and Viederman echo Jasanoff’s assessment with reference to conservation policy, by asserting that “values are always present, whether admitted or formally expressed, and the policy process merely focuses values more clearly and forces individuals to confront their values and biases” (1995:328). Civic epistemology adds to this by stating that the means through which individuals form values and knowledge more generally are socially constructed and shared (Jasanoff, 2005). Through this framework, the credibility of Western science or any other form of knowledge, for that matter, in contemporary political life is a phenomenon to be explained, not taken for granted (Jasanoff, 2005:250).

2.4 Negotiating between Science and Indigenous knowledge

2.4.1 Science and colonial knowledge systems

In the past, the scientific community has been reluctant to incorporate Indigenous knowledge into environmental policy due, in part, to perceived methodological incompatibilities and to pervasive colonial attitudes. Academic study of Micronesia and the wider Pacific has not escaped this tendency (see: Hau'ofa, 1994; Thaman, 2003). In his assessment of fisheries in Yap, (a neighbouring archipelago with strong cultural ties to Palau) Goldman is pessimistic

about the ability of chiefs and customary institutions more broadly to adequately manage environmental resources (1994). Arguing that:

One must recognize that many of these traditional leaders do not have a high-school education and while their knowledge of their culture and management of traditional lifestyles is beyond doubt, their abilities to grasp the significance and ramifications of the decisions they now make, which affect the environment [...] can be called into question. (Goldman, 1994:45)

Instead, Goldman posits that:

Scientists in the Western world must continue to bear the responsibility for developing ways for standardizing acceptable and reliable methods for environmental monitoring, and for providing guidelines for resource assessment and the determination of sustainable levels of exploitation (Goldman, 1994: 42).

This assessment demonstrates a fairly casual dismissal of customary environmental management regimes, while, at the same time, expressing the idea that Western science is the only way of adequately addressing environmental issues. This feeds into a wider pattern of techno-rational thinking, where experts knowledgeable in science and technology are viewed as the ultimate solutions to complex environmental problems (Corfee-Morlot *et al.*, 2007). Although Goldman speaks to a relatively specific case in Yap, his assessment is part of a wider phenomenon of Western science's reluctance to include Indigenous knowledge (Odora Hoppers, 2002). Many scholars (see, for example: Odora Hoppers, 2002; Tuhiwai Smith, 2012) have cited attitudes such as this as part of the reason that colonised peoples are often sceptical of the intentions of scientific research. It was largely to counteract this that TEK emerged as a concept to give voice to Indigenous knowledge and to assert the importance of its scientific contributions.

2.4.2 Traditional Ecological Knowledge: conceptual inadequacies and local strengths

Traditional Ecological Knowledge (TEK) has been put forward by many as a way that science can move past its colonial attitudes by valorising Indigenous knowledge (Agrawal, 1995). TEK refers to culturally embedded ecological knowledge that Indigenous communities have acquired through generations of environmental custodianship (Drew, 2005). It is part of a wider body of study relating to Indigenous Knowledge Theory (Drew and Henne, 2006). Drew suggests that TEK is a useful resource for science to draw on because it offers both new site-specific data and novel ways of testing hypotheses (2005: 1287). Johannes asserts that this is particularly relevant to the management of coral reef fisheries, where, because of the diversity of species, it is difficult to monitor using scientific methods without considerable expenditure (1981; 2002). Costion *et al.* (2012) make similar claims in relation to inventorying threatened endemic plant species.

There are, however, significant limitations to TEK as a discourse in the context of policy. In theory, sharing TEK is mutually beneficial. For conservation biologists, it provides a rich source of site specific data which can inform conservation practices and for communities, it provides a sense of ownership over projects because it values local knowledge (Drew, 2005). However, TEK often seeks to do this by fitting Indigenous knowledge into Western frameworks and thus, it promotes the notion that these knowledge systems are only legitimate once they comply with dominant non-indigenous cultural paradigms (Agrawal, 1995). In addition to this, TEK's understanding of tradition is often one which sees culture as static and fails to understand the dynamic forces which continuously shape cultural knowledge (Foale *et al.*, 2011). This narrative may appeal to environmentalists (West, 2001) but this approach is particularly alienating for Indigenous peoples that have lost their TEK through processes of colonisation (Simpson, 2004) or who are exploiting their resources to support community livelihoods (Macintyre and Foale, 2004). Furthermore, in order to comply with Western notions of scientific objectivity, many scientists drawing on TEK have done so without proper acknowledgement of the people who produce this knowledge (Simpson, 2004). The result of this, as Tuhiwai Smith describes it, is that knowledge is extracted from Indigenous communities, divorced from its context, rephrased for Western audiences and reflected back to people in a way which alienates them from their own knowledge (2012:1). Thus, while their data is incorporated into scientific analysis and valued, those who produce it are further marginalised. Another issue is that TEK's narrow focus on ecology often acts to exclude other forms of knowledge which are important to understanding indigenous ways of organising society (Drew and Henne, 2006). This is concerning because, as Johannes asserts, simply understanding the biological dimensions of fisheries to the exclusion of social, political, economic and cultural factors is not a recipe for successful management (Johannes, 1981:75). Instead, he presses the necessity of studying "fishermen as well as fish" (Johannes, 1981:76).

2.4.3 Forging a middle way with knowledge governance

Although, in the above, I have put forward a critical view of both science and TEK, these limitations do not invalidate the role that both forms of knowledge play in good environmental governance. Despite some problematic attitudes in the wider literature, conservation science still has an important role to play in understanding biodiversity, especially, in the face of unprecedented global environmental change, where past societal experience may be a poor predictor (Barnett and Campbell, 2010). Similarly, despite the considerable conceptual shortcomings of the TEK discourse, its project of reasserting the importance of Indigenous knowledge remains something worth striving for. That is not to say that local-customary knowledge is the be all and end all of environmental management, certainly not all the world's problems can be solved by purely local solutions. However, the innovative ways in which local communities address environmental issues indicate that there are niches which mainstream

science and technology have failed to fill or, on occasion, even to notice (Odora Hoppers, 2002). This contention reinforces the importance of learning from such experiences which is the focus of the third research question for this thesis. I have also endeavoured to include such considerations in research design and methodology (see Chapter 4).

Negotiating different knowledge systems is key to the success of conservation regimes and knowledge governance presents a way of enabling such approaches. Beyond some of the conflicts noted above, there is immense scope for complementary approaches which valorise both science and more localized forms of knowledge (Gupta, 1999). Knowledge governance contributes to this project by developing an inclusive critical understanding of the rules and norms associated with knowledge-making which can, in turn, be used to identify synergies and conflicts between differing bodies of knowledge. PAN it would seem attempts to chart a way between these two bodies of knowledge, by incorporating *Bul* into its management and relying on scientific monitoring (Palau PAN Fund, 2015) . A major aim of this project is to extend knowledge governance theory to understand such approaches.

2.5 Conclusion

This section has laid the groundwork for the types of interventions which this thesis aims to make in ongoing debates about the role of knowledge in biodiversity conservation. Emerging from the knowledge systems literature, knowledge governance offers a critical approach with a broader focus. Building on Jasanoff's civic epistemologies, knowledge governance requires us to ask not only what we see as important to know as a society but also how we know things as a society in the first place. By providing a critical framework through which to view the relationships between knowledge and action, knowledge governance offers a powerful descriptive tool which can be used to situate policy interventions. As an inclusive framework, knowledge governance also offers a means of navigating between the colonial assumptions which often manifest in science and the conceptual limitations of Traditional Ecological Knowledge.

Chapter 3: Palau in the Pacific environmental policy leadership and context

3.1 Introduction

The purpose of this chapter is to contextualise the case study of Palauan conservation discourses. Pacific island countries are often represented in ways which obscure their heterogeneity (Barnett and Campbell, 2010). This tendency is often a feature of environmental discourses, particularly those around climate change which often depict Oceania as a cluster of sparsely populated impoverished sinking islands (Barnett and Campbell, 2010:2). A case study of Palau presents a very different narrative. Palau's economic reliance on ecotourism (Vianna *et al.*, 2012) and the state's public commitment to a customary conservation ethic (Remengesau, 2015) have lead the international community to regard the Palauan government as a world leader in environmental policy (Beck and Burleson, 2014). However, coastal fisheries are under increasing strain and policy-makers face many challenges in curbing local overexploitation (Friedman and Golbuu, 2011), indicating a potential gap between policy and practice.

3.2 Development in Palau

Palau's relatively high standard of living can, in part, be attributed to the negotiation of a relatively favourable compact of free association with United States of America (US) which was later supplanted by the recent rise of East-Asian tourism. The Compact of Free Association³ between the US and Palau was the result of the long and arduous process of determining Palau's political status and independence from the US (Peacock, 2002: xxiii) (see Box 3.1). This agreement provided Palau with a \$500 million aid package in the 15 years following its independence (this becomes even more considerable when considered on a per capita basis) which significantly buoyed its economy and funded crucial infrastructure in a range of sectors (Ueki and Clayton, 1999: 58). The compact by allowing freedom of movement within the US, generated a substantial remittance economy which further bolsters the Palauan economy (Mineshima and Browne, 2007) and also enabled a number of Palauans, including environmental professionals to be educated internationally (Ueki, 2000). However, when the compact was renegotiated in 2009, the amount of US aid Palau was halved (Haglelgam *et al.*, 2011) and Palau turned to developing its tourism industry in order to achieve a self-sustaining economy (Carlile, 2000). The economic rise of Asia coupled with the expansion of air travel and Palau's geographic proximity to these markets has allowed Palau to become the premier

³ The Compact of Free Association guaranteed Palau substantial American financial support for 15 years following its independence in exchange for giving the United States full authority over Palau's defence policy (Rechebei and McPhetres, 1997). It also allows for the free movement of Palauan citizens within the US (Mineshima and Browne, 2007). Similar agreements were negotiated with other American trust territories in Micronesia (Haglelgam *et al.*, 2011).

Pacific destination for East Asian tourists (Ueki, 2000). The vast majority of the 140,000 tourists who visited Palau in 2014, came from China, Taiwan, South Korea and Japan (Republic of Palau, 2015). In the same year, tourism accounted for over 80% of Palau's Gross Domestic Product (Remengesau, 2015).

Palau's biodiversity is the basis for its current economic prosperity. Palau's pristine beaches and diverse marine environments attract an ever growing number of tourists, with 2014 alone marking a 30% increase on the number of tourists from the previous year (Government of the Republic of Palau, 2015). The vast majority of this tourism centres on marine activities such as diving and snorkelling (Vianna *et al.*, 2012). In contrast to the huge proportion of GDP which ecotourism contributes, annual revenues from international fisheries in 2007 accounted for only 3.4% of GDP (Bell *et al.*, 2011:169). These disparate figures indicate that the health of Palau's marine ecosystem is worth far more in monetary terms than the health of its fishing industry. A study conducted on Palau's sharks by Vianna *et al.* (2012) supports this assessment. The authors found, through a quantitative economic analysis that sharks are worth far more to Palau as a live tourist attraction than as food (Vianna *et al.*, 2012: 267). However, despite the significant economic impetus for conservation that tourism revenues provide, the use of coastal fisheries is still an important aspect of Palauan society.

Coastal fisheries remain a significant part of diets and culture in Palau which complicates the protection of marine ecosystems. Although, international oceanic fishing is relatively marginal to the Palauan economy, local dependence on coastal fisheries is considerable (Friedman and Golbuu, 2011). Nearly all Palauan households are involved in coastal fishing activities whether commercial or subsistence (Gruby and Basurto, 2013:263), with much of Palau's reef fisheries' production geared towards domestic urban markets (FAO, 2009). Furthermore, fishing remains central to Palauan culture with references to fishing throughout Palauan legends (see: Telmetang, 1993; Temengil, 2004; Etpison and Davidson, 2004a), as well as contemporary Palauan stories (see, for example: Callaghan, 2012). Within this context, as with many other places throughout the Pacific, fishing is as much a biological as a socio-cultural issue (Ran-Bidesi and Mitchell, 2005). Additionally, with a burgeoning tourist population hungry for seafood and increasing urbanisation, Palauan coastal fisheries have entered decline over the last decade (Friedman and Golbuu, 2011:51). This illustrates a potential gap between government conservation policy and actual existing practices around reef fisheries. Thus, in the face of competing resource uses, resource managers must strike a balance between environmental conservation and protecting local livelihoods and cultural values. Towards this project, Palauan officials have begun looking to customary Palauan institutions.

Box 3.1 Palau's colonial history: a brief overview

- **1522** The first recorded European to visit Palau, Ferdinand Magellan, passes through on his circumnavigation of the globe.
- **1598-1898** Spain claims dominion over Palau. Spanish engagement largely took the form of a series of Jesuit missions (Hezel and Del Valle, 1972) and occasional voyage stopovers but no real attempts at permanent occupation were made (Ibáñez y García, 1992). This period was ended by Spanish defeat in the Spanish-American War.
- **1899-1914** German dominion over Palau, ended by German defeat in World War 1 (Kiste, 1986).
- **1919-1944** Japan was formally given control of the islands by the League of Nations as part of the South Pacific Mandate (or *Nanyo*) (Aldridge and Myers, 1990). Japan was the first power to establish an occupying presence in Palau and during World War Two the islands were Japan's major base of operations (Rechebei and McPhetres, 1997).
- **1947-1994** United States of America administers Palau as a trust territory, essentially operating the country as a colony (Goetzfridt and Peacock, 2002: xxiii). During the negotiations for independence, Palau attempts to include provisions for a nuclear-free constitution (Smith, 1997). Largely, this is in response to the nuclear testing endured by the neighbouring Marshall Islands at the hands of the US military (see: Aldridge and Meyers, 1990). Thus, the independence movement linked nationalist aspirations with international environmental and peace activism (MacLellan, 2005).
- **1994** Palau becomes an independent nation and enters into a compact of free association with the US (Rechebei and McPhetres, 1997).

Figure 3.1 The ongoing American influence on Palauan conservation



American Smokey the Bear becomes Palau's Smokey the Biib (Palauan fruit-dove). Pictured here, warning of the dangers of forest fires, in Melekeok state, (author photo).

3.3 *Bul: traditional Palauan conservation in the literature*

Bul was the primary vehicle through which resource use was regulated prior to colonization (Gruby and Basurto, 2013:264). In his work *Words of the Lagoon*, perhaps the most complete academic catalogue of Palauan customary ecology to date, Johannes roughly equates *Bul* with “conservation laws” (1981: 64). *Bul* includes provisions for terrestrial and marine areas including fishing moratoriums, seasonal restrictions, fishery reserves, waste limiting practices, and even some gear restrictions (Johannes, 1981). Palau’s traditional land and marine tenure laws constitute the central element of *Bul* (Johannes, 1981). They are immensely complex (see: McCutcheon, 1981; Hezel, 2001), in essence, they are administered by chiefs to determine use rights and they flow through intricate networks of family inheritance. Traditionally, this system of tenure functions by giving fishers, hunters and cultivators defined exclusive use rights to resources in specific locations (McCutcheon, 1981). Johannes argues that because of these defined and defensible property rights, “self-interest thus dictates conservation” (1981:64). In the past, violators of these regimes could be fined hefty amounts, banished or even killed and through this process, they would cause considerable shame to their family, clan, chief and village (Johannes, 1978).

Beyond these more institutional checks, there was a wider culture of environmental sacredness which Stevenson Kuartei terms “*Chedolele Belau*” whereby violation of environmental provisions exposed one to “wrongness of the spirit” (2005a: 93). Actions such as littering were considered “*mekull*” which directly translates as taboo but has a more profound meaning, in that such actions disturb the order of the universe itself endangering the perpetrator and their loved ones (Kuartei, 2005b: 84).

Outside *Bul*, other cultural practices have also contributed to the sustainability of Palauan society at relatively high densities for over 2000 years (Koshiba *et al.*, 2014). For example, Koshiba *et al.* (2014) note that traditional practices surrounding the cultivation of taro and maintenance of mangrove swamp helped to reduce sediment levels on adjacent reefs. Despite this considerable heritage of sustainable environmental management, much concern at the erosion of *Bul* and traditional conservation regimes has been expressed (see: Johannes, 1978; Graham and Idechong, 1998; Kuartei, 2005a).

In 1978, Johannes predicted the continual decline of *Bul* and its associated institutions based on two reasons. Firstly, as Graham and Idechong (1998:143) argue, power was increasingly shifting away from the chiefs to the state through the process of Palauan independence and this process was undermining the primary cultural mechanism for *Bul*. Secondly, the growing incorporation of Palau into the cash economy was set to undermine the development of indigenous knowledge by redirecting attention to paid work other than fishing and the skills that such professions require (Johannes, 1981:81). Of particular concern to

Johannes, was increasing participation in the commercial fisheries industry which drastically amplified the scale of local fisheries exploitation (Johannes, 1981:83). However, in recent years, successive Palauan governments have reasserted the importance of *Bul* in its contemporary politics indicating that its role, at least as a rhetorical tool, remains important to Palauan conservation (see: Palau PAN Fund, 2015; Remengesau, 2015).

In contemporary Palau, *Bul* remains prominent in environmental discourses. So much so, that in his 2015 recent state of the Republic address, Palauan president Thomas Remengesau Jr. made the following remarks:

The sanctuary is Palau's tradition and the *Bul* is Palau's proven success story [...] a return to our traditional ways will allow us to implement a clean healthy high value eco-tourism based economy that will support sustainable fishing while enhancing our ability to support our local industries. Now is the time to implement the *Bul* across the entire Republic. (Remengesau, 2015:16)

Here, president Remengesau directly links his vision of Palauan sustainable development, specifically his policy of making all of Palau's Exclusive Economic Zone into a marine sanctuary⁴, with local customary practices. To evoke notions of *Bul* in this way, issues powerful connotations in that it both acknowledges the centrality of local knowledge and cites ownership over a particular state-endorsed conservation measure. Determining what is and is not traditional, particularly when it relates to the environment, is often itself a contested space which reflects the politics of a particular context (Hames, 2007). Certainly, when asking about the proposed sanctuary's relationship to *Bul* during fieldwork, I found a series of contrasting opinions on the subject. Foale *et al.* (2011) warn that assuming the centrality of a traditional conservation ethic undermines the very real work that has to be done supporting conservation in Oceania. This presents an important critique in relation to Palau where, despite *Bul*'s legacy being enshrined in the Palauan constitution (Graham and Idechong, 1998), included in most governmental environmental policies (Palau PAN Fund, 2015) and the judicial provisions for its application (Gruby and Basurto, 2013)⁵, the overexploitation of local fisheries remains an important issue. Therefore, some degree of critical consideration of the gap between local practice and state rhetoric is necessary.

3.4 Palauan conservation legislation

Palau is a regional and global policy leader in conservation. On the international stage, Palau like many other small island developing states (Barnett and Campbell, 2010) has been at

⁴ Legislation on this proposal is still being discussed but it seems likely to go ahead by late 2015 or early 2016 (Ewart, 2015).

⁵ In theory, because Palau's 16 states own the land and waters up to 200 miles from the shoreline on behalf of communities and with the exception of Koror state, they have a population of only a few hundred (Gruby and Basurto, 2013), there is institutional capacity to effectively administer *Bul*. Responses from participants were somewhat mixed as to how well this worked in practice.

the forefront of a number of significant global environmental initiatives including the elimination of deep sea bottom trawling and the creation of a network of shark sanctuaries (Beck and Burleson, 2012). More recently, Palau has lobbied the UN on the inclusion of a specific Sustainable Development Goal on the protection of the world's oceans (Beck, 2013).

Closer to home, as part of the Micronesia Challenge⁶, Palau created the Protected Areas Network (PAN) as a way of bolstering local conservation efforts in 2003 (Kleiber and Koshiba, 2014). PAN's role is to provide technical assistance, monitoring and funding for member sites and moreover to reframe conservation as a national rather than a state level issue (Gruby and Basurto, 2013). In 2012, this program was further strengthened by the creation of the Palau Green Fund, funded through a 15 US dollar tourist departure levy which provides an autonomous and sustainable funding source for PAN (Gruby and Basurto, 2013). Given the large numbers of tourists visiting Palau's shores, the amount of revenue raised for conservation through this mechanism is considerable (SPREP, 2012). The funds generated are administered through a statutory body called the Protected Areas Network Fund which distributes the funds to various state governments to administer for the management of protected areas which are part of the network (Palau PAN Fund, 2015). In 2012, Palau's work on the creation of PAN, the Palau Green Fund and the world's first shark sanctuary earned the country the prestigious Future Policy Award from the World Future Council (Beck and Burleson, 2012). In addition, Palau is currently debating a world first proposal to designate its entire EEZ (an area roughly the size of France) as a marine sanctuary (ABC News, 2014).

3.5 Conclusion

Palau is in many ways a conservation success story. Palau's reliance on ecotourism for its economic wellbeing presents a strong incentive for enacting conservation measures. This is coupled with a Palauan ideology of a cultural conservation ethic which is also formalised through legal institutions. Within these circumstances, Palau's progressive environmental policy is seen not as a radical departure but as a form of cultural continuity. Palau's conservation record is internationally acclaimed. From advocating the elimination of deep sea bottom trawling in the UN to attempting to make its entire EEZ into a marine sanctuary, Palau has shown itself a world leader in marine conservation initiatives. There are, however, important concerns around the state of Palau's coastal fisheries due to local overexploitation. As such, this case study contributes not only to a better understanding of local practices around knowledge in environmental decision-making but to a wider understanding of what constitutes best practice in knowledge governance for conservation purposes.

⁶ A commitment made in 2003, by all the countries of Micronesia to increase the number of protected areas and ramp up conservation efforts in the region (Kleiber and Koshiba, 2014).

Chapter 4: Methodology and Research Design

4.1 Introduction

The purpose of this section is to provide an overview of my research design and methodology. The foundation of my research methodology is a constructivist understanding of the environment as socially created. From there, I have built my conceptual framework for this research using an understanding of knowledge governance that builds on Jasanoff's civic epistemologies. The way that I chose to approach data collection and analysis, detailed below, flowed on from this model.

4.2 Conceptual underpinnings

4.2.1 Philosophical Stance: Constructivism

The critical stance and subsequent analysis of this thesis reflect a constructivist understanding of relationships between humans and the environment. This work follows the contention that landscapes are socially constructed through the process of interpretation, rather than captured in objective snapshots (Charmaz, 2003). As such, to understand ontology (the way things are in the world), one must understand epistemology (the way that we understand the world). Within this context, as science epistemologist, John Staver argues "the lawful and certain nature of natural phenomena are properties of us, those who describe, not of nature, what is described" (1998: 503). Here, science rather than presenting an objective reality, is considered as one of many ways that we, as a society, understand the world around us (Bocking, 2004). Thus, as Konai Thaman notes "while science makes the world orderly it does not necessarily make it meaningful" (2003: 6). This understanding is crucial to conservation because, at its core, conservation represents the cumulative embodiment of societal attitudes and practices towards the environment (Mascia *et al.*, 2003). As a result, a wider appreciation of the different ways societies engage with ecology is necessary.

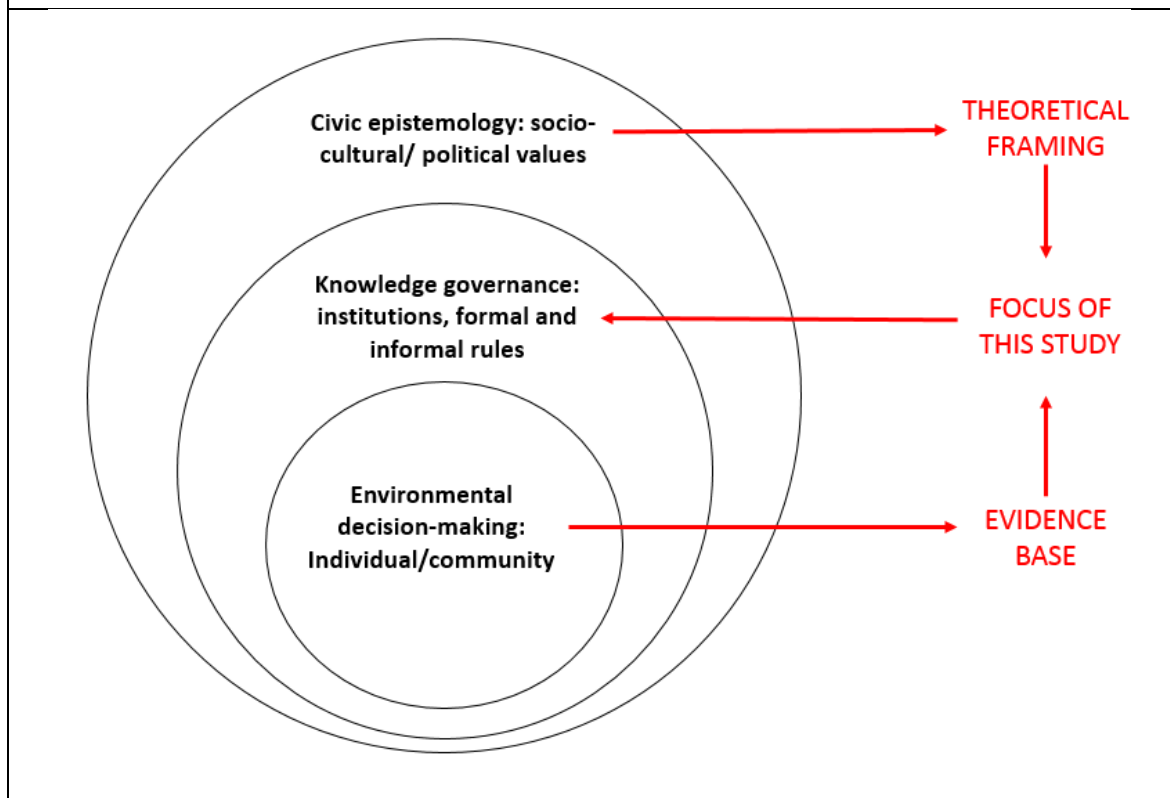
I have also sought to contextualise my position as a researcher within a constructivist paradigm. Charmaz notes that constructivist theory necessitates critical engagement with the way that researchers create "reality" through interpretation (2003: 273). Towards this end, I have endeavoured to contextualise my research position, the subject of my research and the process of research itself, so that social dynamics in these processes are not obscured. Furthermore, critical reflexivity is foundational to my conceptual framework, my data analysis and my data collection.

4.2.2 Conceptual framework

The central tenet of this framework is that by understanding the wider context for decision-making, we can gain insight into why and how actors make decisions and where

opportunities for change may lie. As noted in Chapter 2, such an understanding requires a deeper appreciation of epistemology than the more linear assumption that good information makes good policy or action. With this in mind, my conceptual framework situates decision-making (actions), within knowledge governance (the rules that shape the interactions between knowledge and its application) which in turn is embedded in the wider framework of civic epistemology (the systematic ways in which societies come to know things in common). This understanding is illustrated in Figure 4.1. By bringing a wider theoretical framing and a specific evidence base together, this study aims to explore and refine the concept of knowledge governance. This conceptual approach has shaped my research design and methodology. The requirements around evidence were reflected in focusing my data collection on actual decisions around protected areas management, which were then analysed through the categories invoked in the theoretical framing (see Chapter 6).

Figure 4.1 Conceptual Framework



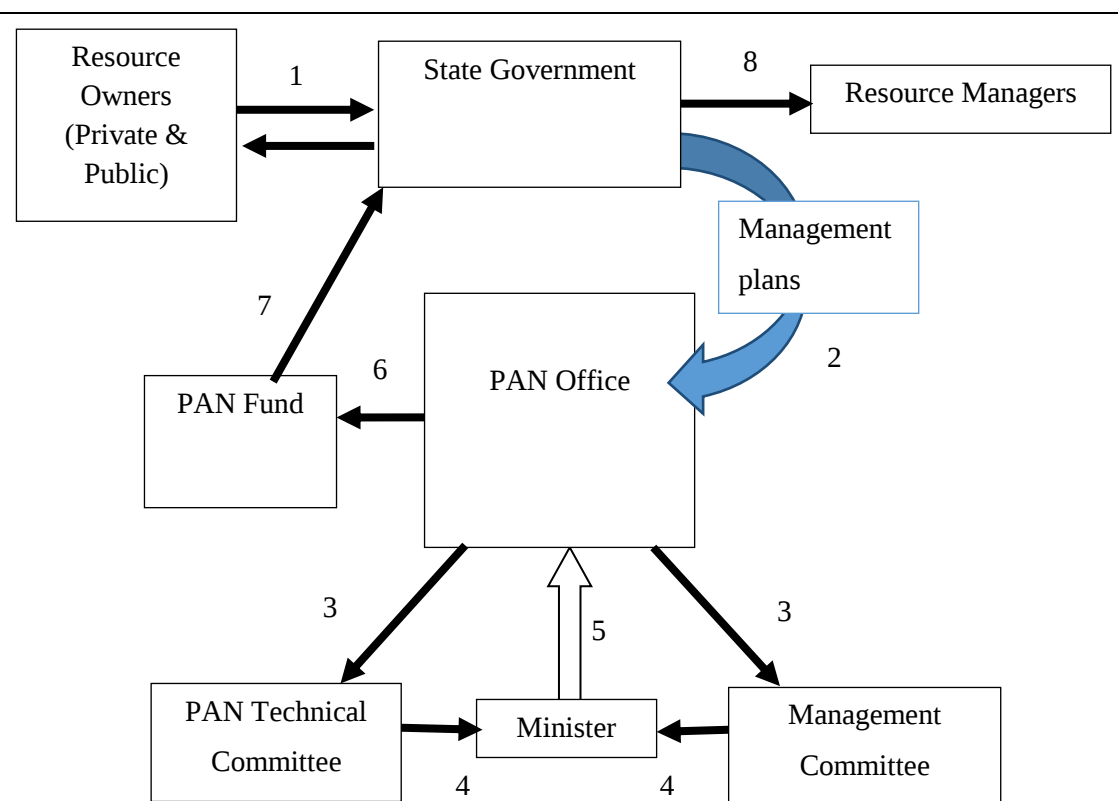
4.3 Case Study

Knowledge governance patterns are culturally embedded and thus, context specific (van Kerkhoff, 2013). To conceptualise knowledge governance requires an appreciation of knowledge norms and practices in a specific time and place towards a specific end. This is why Gerritsen *et al.* (2013) and Manuel-Navarrete and Gallopín (2012) use case studies to ground their conceptual explorations of knowledge governance and why I have chosen to use a case study of the Palauan Protected Areas Network.

4.3.1 The Protected Areas Network

PAN functions through the interactions of Palauan state governments working in tandem with the national government (represented by the PAN Office), with technical oversight from the PAN technical committee and independent funding from a government established statutory body called the PAN Fund (Palau PAN Fund, 2015). This structure follows provisions laid out in the Palauan National Congress Protected Areas Act (Palau PAN Fund, 2015). The basic formal interactions of PAN are summarised in the diagram below (see Figure 4.2). These processes are quite complex but the most significant features are that the decision-making process starts with resource owners and involves a variety of other actors (as indicated by Figure 4.2). This means that although there is intervention by several different decision-making bodies, to really understand the environmental implementation (the focus of this thesis) of specific sites, one must target planning at the level of resource-owning communities.

Figure 4.2 Institutional Environment of PAN for decision-making



- 1) States and community consult over designating PAN site
- 2) States designate area after, ratifying PAN act at a state level. States submit nomination and management plan for proposed site
- 3) PAN Office submits nomination to PAN Technical and Management Committees
- 4) PAN Technical Committee and Management Committee provide review and advise minister accordingly
- 5) Minister reviews and approves nomination
- 6) PAN Office submits approved nomination to PAN Fund
- 7) PAN Fund funds management plan
- 8) States hire resource managers to enact the management plan

Adopted from (Palau PAN Fund, 2015)

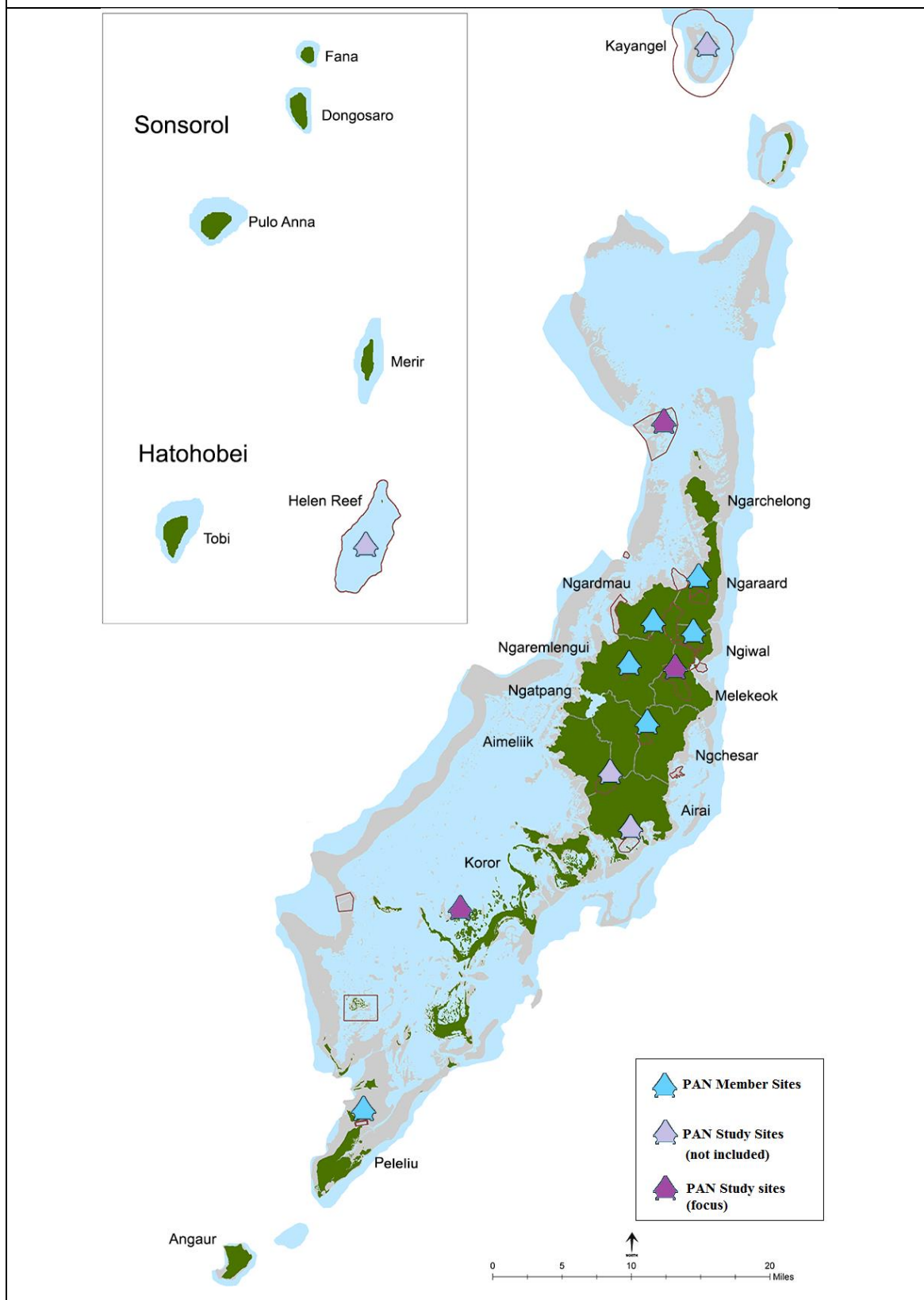
4.3.2 Protected areas sub-cases: selection and context

While the PAN provides broader context, the implementation of conservation at the site level is the real focus of this study. PAN functions as a network of different conservation sites. This means that while PAN's primary goal is to coordinate, offer support for monitoring and provide financial support for management, the bulk of management decisions are made by small teams of local environmental managers at the state level (Gruby and Basurto, 2013). The result of this is that there is a great deal of diversity in the goals and management of different sites (for an illustration of this, see Appendix 1). Therefore, to really understand how decisions are made concerning conservation, it is crucial to survey specific sites to appreciate the different contexts under which they operate. The wider study which this thesis is part of relied on purposeful sampling of seven PAN member sites, three of which are presented in depth analysis. These sites are depicted in purple on Figure 4.3.

The sites chosen for the overall study were determined through a process of purposeful sampling based on three criteria. Initially, sites were chosen based on the goals of their management plans which indicated the type of conservation undertaken at the site (criterion 1), the management goals for the site (criterion 2) and the range of different interests embodied in the management regime of the site (criterion 3) (see Table 4.1). Through the evaluation of these plans, a diverse sample was identified to try and capture a snapshot of how PAN operates across Palau. Then, through consultation with PAN, seven sites were chosen based on an initial assessment of their management plans and the willingness of local stakeholders to engage with the research process. From there, the initial sample was narrowed to the three sub-cases presented here.

Electing for a smaller sample, allows for a more focused analysis, while conserving a diversity. Rather than an attempt at capturing a representative sample, these sub-cases were selected to capture the diversity of knowledge institutions at play in the management of PAN (see: Table 4.1 and for a more detailed account, consult Appendix 1). Each site differed considerably across the sample criteria but each accommodated a range of actors involved in management which provides for a particularly rich context for analysis. In addition, a smaller sample allows for a more in-depth approach and is better suited to the constraints of an honours thesis. The three sites presented in this research are:

- Ebiil Channel, Ngarchelong state
- Ngardok Lake, Melekeok state
- Rock Island Southern Lagoon, Koror state (see Figure 4.3).

Figure 4.3 Map of Protected Areas Network Member Sites

Map adapted from Palau PAN Fund (2015)

Sites surveyed were (listed North to South): 1. (Kayangel), 2. Ebiil Channel (Ngarchelong), 3. Ngardok Lake (Melekeok), 4. Ngerderar Watershed (Aimeliik), 5. Medal Ngediull (Arai), 6. Rock Islands Southern Lagoon (Koror) 7. Helen Reef (Hatohobei)

Table 4.1 Characteristics of the selected PAN sites			
PAN site	Criterion 1: Type of conservation	Criterion 2: Main management goals	Criterion 3: Layers of management and interests embodied in management
Ebiil Channel (Ngarchelong state)	Wider fisheries	Support fisheries (subsistence and commercial)	• State Government • PAN • The Ebiil Society • The Palau Conservation Society • The Palau International Coral Reef Centre • The Nature Conservancy
Ngardok Lake (Melekeok state)	Terrestrial and watershed management	Scientific research, watershed management, education	• State government • High Chief of Babeldaob • RAMSAR • The Palau Conservation Society
Rock Island Southern Lagoon - Ngerukeid and Ngerumekaol (Koror State)	Marine Protected Area with cultural sites	Tourism, preservation of cultural sites, support fisheries	• State Government • PAN • The Palau International Coral Reef Centre • Palau Tourism • RARE • UNESCO • Environmental Quality Protection Bureau • Bureau of Cultural Affairs

4.4 Ethical considerations

An active approach towards ethical concerns was undertaken in this research process. Qualitative research is an inherently value laden and contextual process, these dimensions become even more significant when considered in an intercultural context (Skelton, 2001). This research attempts a decolonial perspective by focusing on breaking down asymmetrical cross-cultural discourses through which (neo)colonialism is constructed and maintained (Howitt and Stevens, 2005). Conceptually, this manifests in a constructivist approach which critically engages with different bodies of knowledge rather than presuming the centrality of Western modes of thought. Methodologically, this research was designed through consultation with the Palau PAN Fund in order, to both follow cultural protocols and to maximise the benefits of the study for Palauans. Data collection was undertaken with an emphasis on respectful listening and interview protocols were designed to leave space for participants to raise concerns and issues which they felt were pertinent (see Appendix 2). For each interview, participants were provided

with information about the study (Appendix 3) formal consent was requested (Appendix 4). There are several intended outputs for this research other than this thesis including: a field report with initial findings (Appendix 5) which has already been made available to participants for comment, a final report for participants due to be finalised after the submission of this thesis, a final report for funders at ACIAR, a policy brief for wider audiences in the Pacific and a journal article for academic audiences. These different outputs reflect an attempt at making the results of this study accessible to participants, the wider Palauan community, conservation practitioners and academic audiences both within the Pacific and abroad. Furthermore, in terms of institutional checks, prior to departure, this project was awarded ethics approval through the ANU Human Research Ethics Committee (Protocol 2015/172).

4.5 Data collection

This study relied on a range of qualitative research methods. Qualitative methods, as Winchester and Rofo (2010) note, are well suited to an in depth assessment of the motivations and the reasoning of stakeholders which is key to cultivating an understanding of knowledge governance. In addition, qualitative methods also provide a degree of flexibility which gives researchers room to explore issues as they arise (Winchester and Rofo, 2010) which is crucial given the relatively uncharted waters that this study explores both conceptually and as a relatively new case study. The data I used for this research was sourced through key informant interviews, document review and observational research.

4.5.1 Key Informant Interviews

The major component of my data collection consisted of a series of key informant interviews conducted in Palau. In the overall study, a series of 20 one to two hour long semi-structured interviews were conducted with a total of around 80 key informants. Interviews were conducted primarily in small groups with some done individually. The amount of data generated through this process was considerable and as such, from the 20 original interviews, I chose a sample of 13 for in depth analysis. Interviews were chosen which represented a diverse range of stakeholders and which directly referenced the management of the sites discussed in this thesis. This sample of interviews includes environmental managers of the sites in question, traditional leaders, legislators, local environmental NGOs, research institutes, as well as PAN officials from a range of different agencies listed in Figure 4.2. On the following page, table 4.2 offers a breakdown of interview participants in this sample.

Questions for the interviews focused on decision-points in the PAN, with specific questions derived using the dimensions of Jasanoff's civic epistemology framework (see section 4.5). Interview procedures were iterative, evolving in relation to ideas raised in previous interviews. For an example of the questions asked, consult the sample interview guide in Appendix 2.

Table 4.2 Breakdown of interview participants		
Type of interview participant	Number of interviews	Number of interview participants
Site specific groups	3	12
Government agencies	2	8
NGOs	4	8
Customary institutions	3	27
Scientific research institutions	1	4
Men		27
Women		32
Total	13	59

4.5.2 Document review

In order to provide a rigorous assessment of Palauan environmental management, I drew on management literature to triangulate the findings from my interviews. Primarily, I focused on the management plans and accompanying literature like management evaluations of all the sites under study (for a full list of documents consulted see Appendix 3). The review process was largely conducted before the fieldwork component of this study. As such, it was used primarily as a tool for sample selection and in drafting interview protocol. For a detailed assessment of these plans within the context of the three study sites in question, consult Appendix 1.

4.5.3 Observational Research

The third method which I used for data collection was observational research. When combined with critical reflection, observational research provides a useful complementary source of evidence for developing an understanding of context (Kearns, 2010). Over two weeks, I visited all the different sites across the PAN used in this analysis. I visited these sites with the accompaniment of a ranger or PAN coordinator which allowed for more informal discussions about management, as well as firsthand observation of conservation areas. Other components of observational research comprised of informal conversation with Palauans and visits to a number of places across Palau including taro fields, museums and archaeological sites. Throughout these experiences, as well as journaling, I took photos and some of these images are included to provide illustrations of my analysis.

4.6 Data Analysis

The dataset was imported into the qualitative analysis software NVivo™. Data was coded on a thematic level drawing on what Jasanoff describes as the 6 “constitutive and interrelated dimensions” of civic epistemologies (2005:259). The themes are elaborated on in Table 4.3 below. The language used by Jasanoff is often quite complicated. To an extent, this is understandable in that her chosen subject, the ways in which knowledge itself is organised, requires stripping back layers of linguistic assumptions. However, given that one of the aims of this thesis is to construct an operational model for knowledge governance, I have chosen to reinterpret Jasanoff’s framework in order to make it more accessible (see Table 4.3).

Table 4.3 Key themes of data analysis drawn from Jasanoff’s civic epistemologies		
Themes used in this paper	Jasanoff’s typology	Description and related questions
Dominant style of knowledge-making	The dominant participatory styles of public knowledge-making	This relates to who has public endorsement to generate sound knowledge on certain issues and what the dominant methods are for information to become knowledge and generate action.
Credibility	Public accountability (basis for trust)	This relates to how knowledge is tested and in so doing, deemed trustworthy.
Effectiveness	Demonstration (practices)	This describes how the benefits or outcomes of knowledge are demonstrated to the wider public.
Objectivity	Objectivity (practices for securing)	The way that knowledge makes claims above subjectivity. Jasanoff construes this as a fairness issue in that it seeks to avoid subjective bias.
Expertise	Expertise (foundations)	There is a distinction to be made here between experts and knowledge holders. Experts help navigate society through conditions of uncertainty by providing knowledge and reassurance. Expertise is largely ascribed through unwritten cultural rules.
Transparency	Visibility and procedural environments	This focuses on the institutional mechanisms for permitting public observation and in turn, participation in decision-making processes.

These six themes formed the basis of my analysis and provided the structure for my results section. Although I had a firm thematic premise for my analysis, coding was still a highly iterative process and it evolved in response to emergent themes in the data. For a more detailed description of the coding conducted, consult the codebook located in Appendix 4.

Chapter 5: Results

5.1 Introduction

This chapter presents an empirical analysis of knowledge governance in the context of the Palauan conservation building on the thematic framework established in Chapter 4 based on Jasanoff's civic epistemologies. I also identify emergent themes of ownership and trust from this analysis which relates to the third research question. The ways in which these themes manifest in this case study shed light on the rules of knowledge governance within the system. In doing so, it directly addresses the first research question on how knowledge influences environmental implementation in the PAN. For this analysis, site specific data and narratives are combined with information gathered through more general interviews with different key informant groups to address these themes. When participants shared a complete story, I have chosen to include these narratives in boxes for ease of reference in later sections.

5.2 Through the framework of Civic Epistemologies

5.2.1 Dominant style of knowledge-making

Dominant style of knowledge-making refers to the process through which information becomes knowledge and how this is made actionable. It is key to describing the pathways through which knowledge becomes action. The two key descriptors that I identified for this theme were consensus and continuity.

Many participants raised the idea of consensus in decision-making around environmental issues. One Palauan elder asserted that this was because “*our culture is all about relationships*” and she went on to note that it was important to avoid alienating people given the relative size of Palauan society. As such consensus and the inclusion of different perspectives was crucial to decision-making, how this was achieved was considered to be less important. One participant working for a local environmental NGO highlighted this by saying:

We value the process of getting a consensus on a decision. We cannot just have a bottom-up decision-making process and frankly in Palau distance between bottom and top is like this (indicates with fingers very small distance). So we actually utilise all sorts [...] because at the end of the day, it's not whether it was a top-down, bottom-up, lateral decision-making it was whether there were enough people that believe in the decision, in the process, to get traction on something and to get by. (Local environmental NGO worker)

In a similar vein, when concern was expressed over the proposed marine sanctuary it was often about whether or not enough consensus had been built in support of it. The fact that consensus is so valued in decision-making allows Palauans to have a relatively high level of trust in its leaders. In contrast, for example, open conflict through court contestation, was not seen as an appropriate way of evaluating knowledge. This could be a particular barrier to those working in

the sciences where there is a tradition of building theory through contestation. Another participant involved in a number of MPA studies at the Ebiil Channel, was frustrated by this misfit. She lamented:

You cannot come into the same community one day and say ‘MPA is the way to go’ and then comes in another time and say ‘they don’t work, we need to go in this direction’. That’s fine, that science continues to do that because everyone needs to push their own theory, right? But that’s where we don’t come from [...]. That’s why we need to be very careful about how we adopt those new studies and implement them with communities [...] It is critical that they maintain that level of trust with us for the next study. When we do come in, [we need to ensure] that this new science is actually building from where we are today and not competing with it because then we are actually pulling the rug out from under our own feet, so to speak. We need to build that level of trust and confidence in the communities that we work in, so that we can continue. (Local NGO worker)

Emphasising continuity with Palauan culture was a key way that knowledge was created and reaffirmed. One incarnation of this desire for continuity was the notion which reoccurred across several interviews that “science validates” what Palauans already know rather than breaking new ground. One participant working for a local environmental NGO encapsulated this by telling the following story (see: Box 5.1). At the end of this quote, the participant posits that although contemporary institutions may change and bring on board science and other bodies of knowledge to satisfy and regulate outsiders, the continuity of Palauan knowledge is still core. This brings forward the notion of addressing both outsider perceptions of Palauan conservation and that of communities which will be explored in further depth in Chapter 6.

Box 5.1 We have always practiced informed decision-making

“This happened to me when I first started working here [...]. I was implementing this ecosystem based management and because it was based in Babeldoab, I went to go see Reklai [high chief of Babeldoab] and so we drove all the way to his house in Melekeok and I went in and I was telling him all about this fabulous initiative. I must have [talked] like 10-15 minutes just running on and on about this work and finally, he is listening to me and then he says “Oh so you’re going to do my job now”. And then he tells me, it was looking out of his house which is right next to the beach and he says look out there. Then he says ‘in the old days, when you go to the dock there, there’s a resting platform and there are four corners and the four highest chiefs of the village sit at these corners. So what they do is they talk informally and they get updated about what is happening in the clansman in the village proper and then towards the end of the day, the fishermen come in and others, customarily they show their catch to the chiefs who are assembled there and the chiefs will know the size of the fish, the type of the fish and because to become a chief in the olden days, you would have to live a long life and gained a lot of experience, one of them is sort of an understanding of the marine ecosystem and so the chiefs would know to put a moratorium on certain species because it was dwindling or because of

certain things.'

And essentially what he is telling me is that "in Palau, we practice informed decision-making in our traditional practices. That concept is built into what we do" and so, there is no difference in being informed by science now. The only reason why we need it, is because we are a multicultural society with many different people who are not raised in our conservation ethic and because of this multicultural society that we live in, we have a government that is by nature large and extends beyond the individual village boundaries and so really this process that we are in now is only an expansion of that cultural process that we will operate in. We sometimes forget that, but that is the truth. There is no dichotomy and there is no sort of big gap. It's just using tools today in the context of the society today but managing the way that we've always managed." (Local NGO worker)

5.2.2 Credibility

Participants indicated that the credibility of knowledge was closely linked to that of its individual source. Even during the course of our research, it was important that we be accompanied by a trusted Palauan member of the PAN Fund to confer credibility upon the research process. One participant summarised the importance of who is involved in a conservation by saying:

People won't normally ask 'what is the meeting about', they will ask who will be there. It is about credibility, based on relationships and trust. When I come with someone from the community who is trusted, people will believe you, otherwise they will not, even if you have good science. (International NGO worker)

Knowledge was not conceived of independently from its champions and any distinction made between the two was seen as relatively artificial.

Within the context of PAN, this translated into an emphasis on who the particular PAN Manager of a site was and this was often touted as a crucial factor in the success of any given protected area. The case of the Ngardok Lake PAN site manager was raised several times as an example of how important the individual leadership of a site manager can be and how this in turn, strengthens the work of the whole Protected Areas Network. With one participant stating:

I think because the PAN network is so... Still really new. To look at sort of management or success of its implementation, right now it's really critical... The person who is in charge, the coordinator, the manager. A lot of it is dependent on a person and his or her ability. And I think the case of Ngardok really bears that out. So if there is a lesson here, it's critical that you make that investment in the first or even the second manager and as soon as they've built some sort of institutional culture for it, it becomes a little bit easier. So I look across the network now and in those areas where you see that kind of leadership, you see much better performance. (Local NGO worker)

At Ngardok Lake, those involved with management were equally emphatic that individual managers were crucial. One member of the Ngardok board noted, “*for all the PAN sites in Palau, what I would like to see in future, is for all the PAN sites to have a manager like [ours]*”.

In this case, institutions were seen as largely secondary. Within this context, the components of credibility identified above meant that individuals reinforced the legitimacy of institutions, rather than institutions conferring legitimacy on individuals. Indeed, in several instances, participants would refer to the people synonymous with organisations rather than actually naming the organisations they were talking about. This form of credibility was largely established through the relationships, kinship, knowledge of cultural protocols, and fulfilling specific criteria for expertise (see section 5.2.3). These findings build on the centrality of relationships to how knowledge gains traction in Palau.

5.2.3 Expertise

We found that the notion of expertise manifested in a variety of different ways across this case study: critical reflection on the position of this research, cultural norms surrounding explicit labels, and the valuation of knowledge-holders opinions.

Participants expressed a degree of distaste with the idea of “experts”. Although I met with many Palauans with an incredible depth of knowledge, none self-identified as experts. Self-promotion was considered in poor taste. As researchers we adapted to this by predicating our interviews by saying things like “*we are here to learn, not to tell you what to do*” and generally, by rejecting the label when it surfaced. This is perhaps an illustration that an “expert” as coded in the Western sense did not resonate in this context. One participant echoed these sentiments by asserting:

Palauans will be very quick to say that “we’re not the experts”. Part of it is the humility part. We don’t showcase ourselves, it’s mekull. The other thing is that when we think about “experts” it’s a very western concept. You’re educated, it’s your profession, and you have this experience behind you. So Palauans will never say that they’re conservation experts, environmental experts, and yet they’re extremely knowledgeable. (Local business woman)

Within this context, the notion of “experts” may actually erect barriers to effectively translating local knowledge to action around conservation. As another participant involved in a local environmental NGO noted:

We really had to work hard with communities to help them believe in their knowledge and to share it. Because a lot of times, they didn’t share knowledge not because they were hiding anything, they just didn’t think it was valuable. (Local NGO worker)

Quotes such as these illustrate the need for approaches such as knowledge governance which value the contributions made by local knowledge. In addition, this assessment raises important questions about the exclusionary tendencies of science as a relatively technical formal institution, an idea further discussed in Chapter 6.

There were several factors in determining who was considered an expert. Traditionally, in Palauan society there were strong norms about who could and could not know certain things and who could share information (McKnight, 1968: 19). This tradition seems to continue today in who is qualified to speak about certain issues. From the data, I have identified two major criteria for how expertise is determined in Palau:

- **Practical experience and knowledge of custom**– this was closely linked to age and one participant noted that despite the changing nature of Palauan society, one participant noted “*there, is still that respect that wisdom comes with age*”. This also linked to experience in certain areas. For example, managers involved in terrestrial conservation were often reluctant to speak to the issues faced by MPAs and vice versa. Another manifestation of this respect was the way that those with a deep knowledge of custom were the subject of a great admiration and their advice was often trusted over that of scientists.
- **Foreign exposure** – Often this came in the form of a foreign education among the younger generation. Almost all the young environmental professionals that we met with held foreign university degrees. Among the elder generations, many of the high ranking chiefs, even if they had not been educated overseas, had served with the US military or had worked in other parts of Micronesia. There was a certain notion that Palauans must prove themselves elsewhere, if they wanted recognition at home.

One would assume a certain degree of tension between these two criteria but we saw very few manifestations of this. For the most part, they were seen as largely complementary. Those with foreign qualifications expressed a great deal of reverence towards elders with a depth of customary knowledge and elders expressed a desire for Palauan youth to cultivate both a knowledge of local environments and to receive western university qualifications.

However, when scientific and customary knowledge conflicted on a particular issue, most opted to follow the advice of elders. One example of this in Ngarchelong was the cleaning of sea cucumbers where they were harvested.

I’ve heard an elder or a local say that if you clean sea cucumber out on the reef it will help make more sea cucumber because when you’re cleaning it there, the eggs or whatever will stay there. Instead of how the Chinese do it of just taking it and giving it to the Chinese. So the traditional way of cleaning sea cucumber... Then I’ve heard a scientist say “I’m not so sure about that.” So it’s just two different perspectives on it. [...] But if the elder has merit, then follow her. We don’t know. Let the Chinese do it their way, clean it leave it and the eggs will float and stay there. (Palauan public servant)

Another story which illustrated similar dynamics around the predominance of customary knowledge can be found in Box 5.2.

Box 5.2 The mangroves of Medal Ngediull

At the Medal Ngediull PAN site, in Airai, there is an ongoing concern about mangroves encroaching on the reef protected by the site and the closing off of navigation channels. There is a strong custom of communities keeping channels clear by cutting back the mangrove. In recent years, due in part to run-off from the airport, the sediment load reaching the site has increased greatly leading to a significant increase in mangroves around the reef. Site managers wanted to cut back the mangroves. However, scientists expressed concerns at this practice because of the role that mangroves play in maintaining the integrity of the coastline. Despite the disagreement voiced by scientists, PAN managers and rangers decided to remove mangroves from the site and the community was even brought on board as volunteers to help clear the channels.

That being said, it is interesting to note that the majority of Palauans working as environmental professionals that we interviewed were foreign educated. Indicating perhaps that formal conservation institutions had more of an emphasis on foreign exposure.

5.2.4 Effectiveness

In this case study, the effectiveness of management regimes was closely linked to the tangible benefits that they provided local communities. Following on from Jasanoff's original typology, effectiveness relates to how knowledge demonstrates its value to the wider public. In evaluating the effectiveness of knowledge, I have chosen to use the effectiveness of management as a proxy because it is a direct result of knowledge of conservation.

During most interviews, I asked participants which PAN site they thought was the most successfully managed. One consistent response to this question was Koror state's Rock Islands Southern Lagoon. A number of reasons were given for this:

- **Financing** – this took two forms. Firstly, the site's ability to fund itself outside the support of PAN and secondly, the site's ability to provide financial benefits to the local community. For example, the Jellyfish Lagoon in Koror's PAN site is Palau's most visited tourist destination and Ngardok Lake runs a community orchid nursery. These economic resources, many observed were the result of active pursuit of these goals by Koror state. One participant from Ngarchelong encapsulated both this desire to independently finance management and to deliver more benefits to the community by saying:

Our ultimate goal should be sustainable and that is to be more like Koror state. And that money, in Koror state comes from tourists. It doesn't come from anywhere else, because from tourists. To participate in this money, you just sit home and wait. No! This tourist money, doesn't work like that.
(Ngarchelong legislator)

Building on this idea, the Palau International Coral Reef Centre has begun commissioning socio-economic studies on the value of MPAs to demonstrate some of the benefits of

protected areas to local communities (Kleiber and Koshiba, 2014). Finance was also an important enabling factor for the other demonstrations of effective management.

- **Public outreach** – was an important part of demonstrating the value of conservation areas. Many sites, including Koror brought in local school students to visit and learn about conservation initiatives. One particular strategy that Koror used to promote their work was giving one of their protected areas, Ngederrak a mascot Captain Malii the Napoleon Wrasse (see Figure 5.1).

Figure 5.1 Captain Malii Banner



(Photo: RARE , 2015)

- **Enforcement** – of environmental regulation emerged in discussion with all the PAN managers, especially those working in MPAs, as a major challenge. Due to its considerable resources, Koror state was able to hire more rangers and implement a more rigorous regime to deter illegal fisheries and irresponsible tourist behaviour. This criteria was largely about protecting local communities from themselves.

One message that emerges from these different measures of effectiveness, is that for management to be deemed effective it has to have tangible outcomes for the local community. Amassing scientific data was not seen as a social good on its own terms. However, one notable absence which was listed as the primary goal across all management plans (see Appendix 1) was the conservation of biodiversity. This indicates that the conservation outcomes of management were perhaps more so for external consumption. As further evidence of this, as foreign researchers, at every site visit PAN rangers were curious to hear our impressions of the health of their ecosystems. This implications of this will be discussed in Chapter 6.

5.2.5 Objectivity

Contrary to the way that Jasanoff allies objectivity with fairness, almost universally, among participants, no clear link of this kind emerged. This indicates that the initial framework conflated objectivity and impartiality in a way which did not resonate with participants.

Objectivity it seems, was not seen as an important part of what makes decisions fair. Instead, many participants linked fairness to more flexible context specific knowledge. Indeed, some participants noted that one of the great strengths of management based on *Bul* was that it could be used in a more discretionary way to create more equitable results. One PAN manager from saw *Bul* as an alternative to an increasingly codified form of management which would allow for both conservation and economic growth in the area. He posited that:

Instead of adding more sites, it would be great if it was like the traditional system of Bul. [Where] you can move the boundaries of one protected area to another area. So like, if the fish move and the gleaning will change from molluscs to invertebrates, so if you can be more flexible like before, the traditional leaders would just say ‘okay that part is good’ and then just move the boundaries. I think that would be really good, to be flexible and start following the old system more closely. (PAN manager)

However, many noted the use of more objective knowledge in regulating the behaviour of outsiders unaware of Palauan context:

I think so because a traditional closures, that’s only known to locals in Palau and to the international people that come in and fish the waters, they won’t know it. So if we apply the science, on top of the traditional, then science can be applied to international people coming in and we can enforce it more clearly with them. So I think that’s where the traditional isn’t working as well now. (Local researcher)

In this quote, the participant makes the distinction between local and international audiences for conservation which will be further explored in Chapter 6. Given the increasing numbers of tourists and the fact that many Palauans are venturing further afield to fish, this dimension may become more prominent in years to come. In a similar vein, the concept of transparency in knowledge-making found little traction in this dataset but there was some indication that it may so in the future.

5.2.6 Transparency

Transparency did not seem to be a particularly highly valued function of knowledge governance in Palau by interview participants. The Palauan congress building, is inscribed with the words “*Obiil era Kelulau*” which translates as “the house of whispered decisions” (Republic of Palau, 2015) (see Figure 5.1). This image offers a symbolic representation of how democratic principles and a tendency towards secrecy coexist in Palauan

Figure 5.2 “*Obiil Era Kelulau*” inscribed on the Palauan congress building



(Author photo)

decision-making. One participant working in an environmental NGO, when asked how political decision-making happened in Palau, likened the process to that of discussions which took place traditionally in the *bai* (for illustration, see Figure 5.3). He described these connections in the following narrative (see Box 5.3).

Box 5.3 Whispered decision-making in the *bai*

In the traditional men's house, the *bai*, chiefs would come together to discuss different local issues and to make decisions about the future of their clans. It was considered disrespectful to talk above a whisper or for the chiefs to address each other directly, so they would have a messenger who they would whisper their statements to, who would then take their message to the other chief. Along the way, the messenger would often massage the message to ensure that it was well received by the other chief. The chief can never be wrong, it is always the messenger who is at fault, in contrast, when things go well it is a reflection of the chief's wisdom. Everyone would leave the meeting and only the messenger would know what exactly had happened in the decision-making process.



Figure 5.3 A *Bai*

Pictured, the oldest *Bai* still standing in Palau, Airai state (Author photo).

The PAN network provides an indication of this push and pull between a democratic emphasis on formalised transparency and a more traditional framework based on implicit trust. A participant engaged in the management of Ngardok Lake detailed the proceedings of a public hearing on the last management plan which I interpret as an illustration of some of the ways that disinterest in formal transparency processes might play out at the site level.

Participant: When the first management plan was put out, the state was going to conduct a public hearing, where the community could make any questions or comments to the state officials and then the legislature passed it into law. They are provided with copies of the management plan and then we went through the same process with the plan. [...]

Author: With the hearing, did many people come?

Participant: Unfortunately, I was not able to attend the hearing but I think there were a lot of people who got involved with the public hearing. The people of Melekeok were satisfied with whatever the board put into the plan. So it was able to go out quickly and smoothly because if there was someone in the community who had a negative impression of the management plan, that would have slowed the process. But because nothing came out, it went fine.

Perhaps this is because Palau appears as a high trust environment for policy making and when people trust these institutions, they do not feel the need to know their exact workings. Another possibility is that official processes for transparency are not highly valued because there are plenty of informal channels for people to come to know the inner workings of decision-making. Many participants eluded to this. These channels are particularly robust across all different levels due to the compact nature of Palauan society.

However, some representatives from government stressed the importance of reporting in ensuring that the wider public knows how funding is used. When asked what the major capacity development need across the network is, one public servant responded:

I think that reporting might be one of the biggest capacity needs. It's been something that we've emphasised from the very beginning, we want to see more use of management reports that we are receiving from the states. So there are those types of needs. (PAN public servant)

The participant went on to say in regards to the importance of sites reporting on their progress in that:

Basically, it's the report to our key stakeholders in leadership to say 'what are the green fees contributing to'. This is our way of showing them progress. This is the work that is taking place. [...] Especially, to leadership because when it comes to the green fee there is always that interest in 'can we do something else, in addition to what we're doing now, with the existing green fee collection' and we want to make sure that, it's important that we... It's called the green fee and it's important that it continues to be the GREEN fee. (PAN public servant)

These statements indicate that while formal transparency may be unimportant to local audiences around decision-making, this was not the case when it came to showing local and international funders where the money was going. In this way, the relative importance of transparency depended on the intended audience (further discussed in Chapter 6). This in turn, provides an indication of the friction between traditionally opaque processes and the push for a more open approach to decision-making. If transparency is not a highly held value of current knowledge governance in Palau, this might not be the case indefinitely.

5.3 Emergent themes

Through the process of data collection and analysis some themes emerged that were not directly or substantially addressed by Jasanoff's civic epistemologies framework. The expansion of this thematic framework directly addresses the third research question by building on existing theory relevant to knowledge governance. This section outlines these ideas and how they were demonstrated within this case study.

5.3.1 Ownership

One theme which is not adequately addressed by Jasanoff's framework but which emerged through this study was the notion of ownership over knowledge and decision-making processes. When we asked the Palau Conservation Society (PCS) about what made its work different to international environmental NGOs involved in Palau like The Nature Conservancy (TNC), after having remained silent for the length of the entire group interview, one of the participants answered simply that "*PCS is Palauan and TNC is not Palauan*". This a relatively self-evident statement but it belies a wider undercurrent to Palauan conservation, that it must be defined on Palauan terms to work. Taking into consideration Palau's history, having had political control wrested by a series of colonial powers this need for ownership seems a logical response. In this case study, this manifests in the desire for continuity, the reliance on those knowledgeable in tradition and the desire to see conservation knowledge yielding tangible benefits for local communities.

5.3.2 Trust

Trust was another important theme not adequately covered by the Jasanoff's framework. Dimensions such as credibility, objectivity, transparency and dominant styles of knowledge-making are all, in a way, facets of trust in knowledge-making processes. However, to consider trust as a separate theme offers considerable explaining power to these other conceptual concerns. In this case study, Palau appears as a high trust environment for decision-making and knowledge governance. Thus, elements such as transparency and objectivity appear somewhat negligible because there is a general impression that the right decisions are being made in the right way.

5.4 Conclusion

Using Jasanoff's framework of civic epistemologies elements of knowledge governance in Palau emerge. Palau appears as a high trust environment where relationships are central to the function of society. The current dominant styles of decision-making are embodied by the notions of consensus and continuity. Credibility was seen largely as a personal quality rather than as the function of institutions. As such individual experts had an important role to play in directing conservation. Although the word "expert" was largely seen as distasteful, there were

common ideas around what qualifies knowledge-holders to speak on certain issues, namely, experience, international exposure and knowledge of custom. The latter was seen as an important tool for navigating environmental uncertainty. Transparency and objectivity were not highly valued functions of knowledge governance. The perceived effectiveness of conservation regimes was a reflection of the tangible benefits which they brought to the local community. All of these different aspects were important in fostering a sense of ownership over conservation institutions.

Chapter 6: Discussion

A cherar a lokelli. - (The distant eras reveal. The distant past reveals the distant future)

(McKnight, 1968:18)

6.1 Introduction

In Chapter 5, I applied each individual theme of Jasanoff's civic epistemology framework to the overall knowledge governance of Palauan conservation and through this process I derived a raft of knowledge governance rules. In this chapter, I connect these findings to an explanation of the interactions between customary and techno-rational knowledge within the PAN. In doing so, I directly address the second research question around decision-making which draws on different bodies of knowledge and the overarching aim of the study to operationalise knowledge governance. The implications of this analysis for the way that we think about the knowledge-action gap offer an indication of the form that a new conceptual model of knowledge governance might take which provides addresses the aim of this thesis and the project set out by the third research question of learning from Palauan experiences.

6.2 Knowledge governance in PAN: a tale of two audiences

This section answers the second research question by discussing the knowledge governance of customary and techno-rational bodies of knowledge in relation to internal and external audiences.

6.2.1 Different rules for different audiences

There appeared to be a dual nature to Palauan conservation which reflected the different audiences being addressed. There was one narrative around the primacy of protecting biodiversity largely for external consumption and another which focused more on supporting local livelihoods. However, these two narratives were not mutually exclusive and often they complimented each other. For example, the emphasis on external audiences was often presumed to feed into tourism dollars which in turn, supports local livelihoods. The major division between these audiences was largely between those considered internal (Palauan communities) and external (tourists, donors, international scientists etc.). Meaning, there was one set of requirements for making knowledge useful for internal audiences and another for external audiences. For instance, formal transparency was not a primary concern for local communities but it was imperative to those seeking to justify external funding. Furthermore, some themes such as effectiveness and expertise manifested in completely different knowledge governance rules and norms depending on the audience in consideration Table 6.1 summarises these differences across the themes identified in Chapter 5.

Table 6.1 Synthesis of results in relation to different audiences			
Original Themes (Jasanoff)	Relative importance to wider system	Expression in this case study	
		Internal audiences	External audiences
Dominant styles of knowledge-making	High	Continuity and consensus	Democratic
Credibility	High	Personal	Institutional
Expertise	High	Practical experience and knowledge of tradition	International exposure
Effectiveness	High	Tangible benefits for local community	Biodiversity outcomes
Objectivity	Low	Flexibility rather than objectivity	Closely linked to fairness
Transparency	Low	Unnecessary due to high levels of trust.	Important to conserving funding
Emergent themes			
Ownership	High	Central to knowledge-making	Largely absent
Trust	High	A high-trust environment for decision-making	Largely absent

In Palauan conservation, customary knowledge appeared to have more traction than the techno-rational because it was more closely associated with internal audiences. Several participants voiced these views by stating that the one of the primary uses of science was to regulate the behaviours of outsiders, while *Bul* was more directly relevant to Palauans. In PAN and Palauan conservation more broadly, ultimately the bulk of decisions are made by the states, small communities of resource-owners (Gruby and Basurto, 2013). Meaning that knowledge had to speak to internal Palauan audiences first and to outside audiences second, in order to gain traction. Within this context, while customary ways of understanding may find it harder to address external audiences (Huntington, 1998), they still had greater traction locally not only because of their provenance but also because they explicitly addressed Palauan concerns. Clear proof of this was that when science directly contradicted customary knowledge, participants tended to opt for the latter's advice (see Box 5.1 or the quote on cleaning sea cucumbers section 5.2.3). This meant that the criteria for what made knowledge actionable in Palau was largely determined by the socio-cultural values of local audiences. Table 6.1 indicates this by showing how the relative importance of the themes discussed above are closely linked to the importance placed on them by local audiences. There are significant implications of this for themes which were not seen as important to the wider system like transparency and objectivity but were important to external audiences. Section 6.2.4 explores this in relation to changing audiences for Palauan conservation.

6.2.2 Framing and reframing Palauan conservation

Throughout this case study, participants demonstrated the ability to negotiate these different knowledge governance regimes. One notable illustration from this case study, comes from the incorporation of the Ebiil Channel site into the PAN (Figure 6.1 and Figure 2). To build these models, I bring together my expanded version of Jasanoff's framework with evidence of the decision-making process taken from the case study (an approach consistent with that of the methodological conceptual framework in Figure 4.1).

In the initial phase, those wanting to join PAN needed to convince the local community. This meant complying with a certain set of knowledge governance norms (e.g.: getting knowledgeable Palauan elders on side and demonstrating the benefits of incorporation to locals) (Figure 6.1). Perhaps the most important step to this process is embodied in the dominant styles of knowledge-making component where consensus is established for a particular course of action and it is linked back to existing practices and values (Figure 6.1). The layering of these conditions produces an overall sense of ownership which further reinforces the knowledge basis for this decision. Conversely, in this case, rules around objectivity and transparency were largely irrelevant to process of internal decision-making.

However, once a consensus was established within the community, the original knowledge basis had to be reframed for external audiences, in order to gain access to PAN funding and support. For this process of acceptance, the conditions were quite different (see Figure 6.2). For example, rules around objectivity and transparency which were initially sidelined (see Figure 6.1) become central to the approval of Ngarchelong state's nomination (see Figure 6.2). In fact, mastery of knowledge which made claims to objectivity was a core component of what experts were included in this process to provide and transparency closely linked with the democratic emphasis of the dominant styles of decision-making. While, on the other hand, ownership was no longer directly relevant to the process (as seen in Figure 6.2). The knowledge governance norms around certain themes manifested differently because of this change in audience. For example, here, effectiveness was demonstrated through biodiversity conservation rather than a tangible benefits to the local community. Note that despite these changes, trust remains consistent as an enabling factor in both phases of decision-making.

Figure 6.1 Framing the incorporation of the Ebiil Channel into PAN for internal audiences

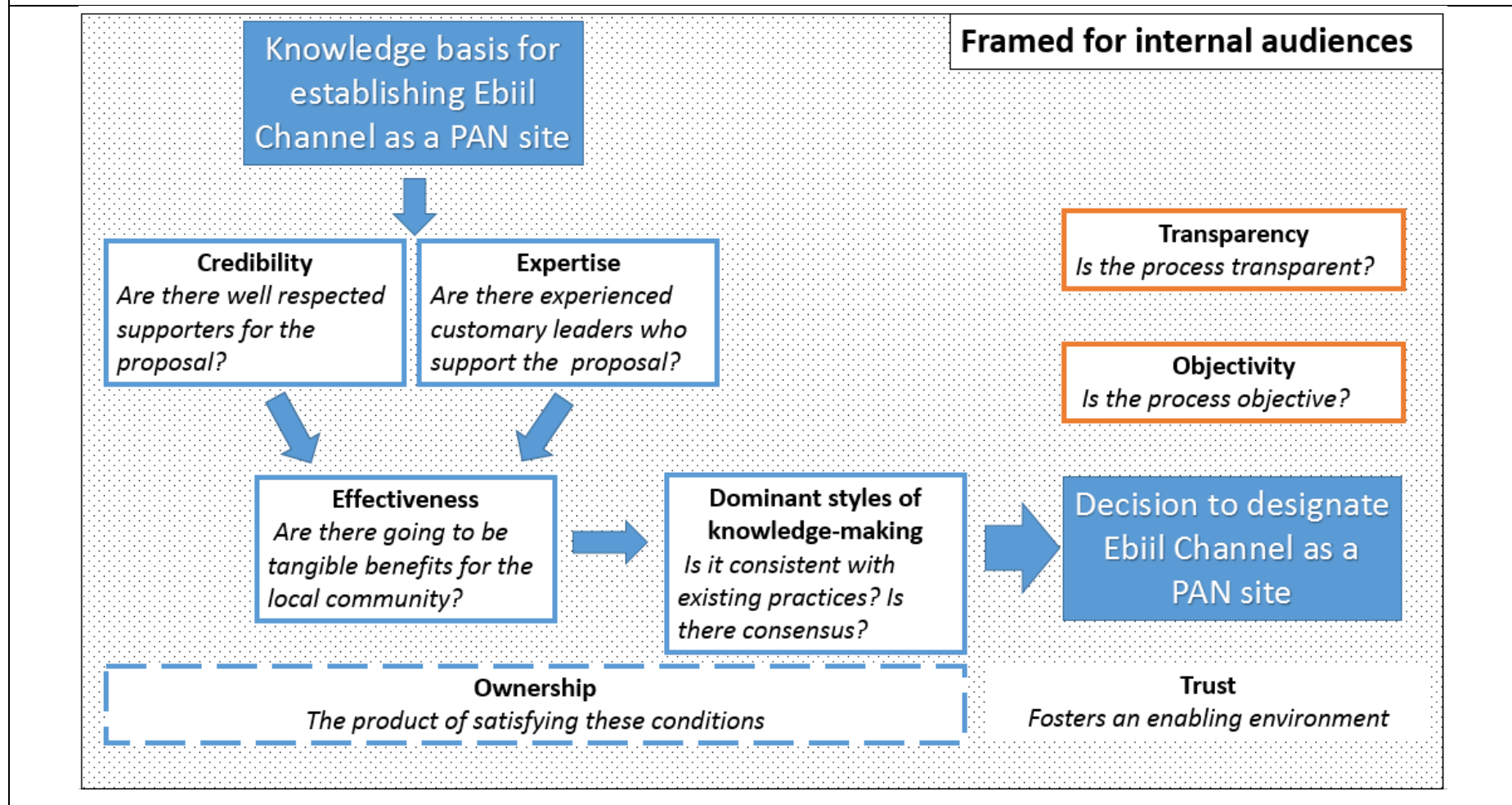
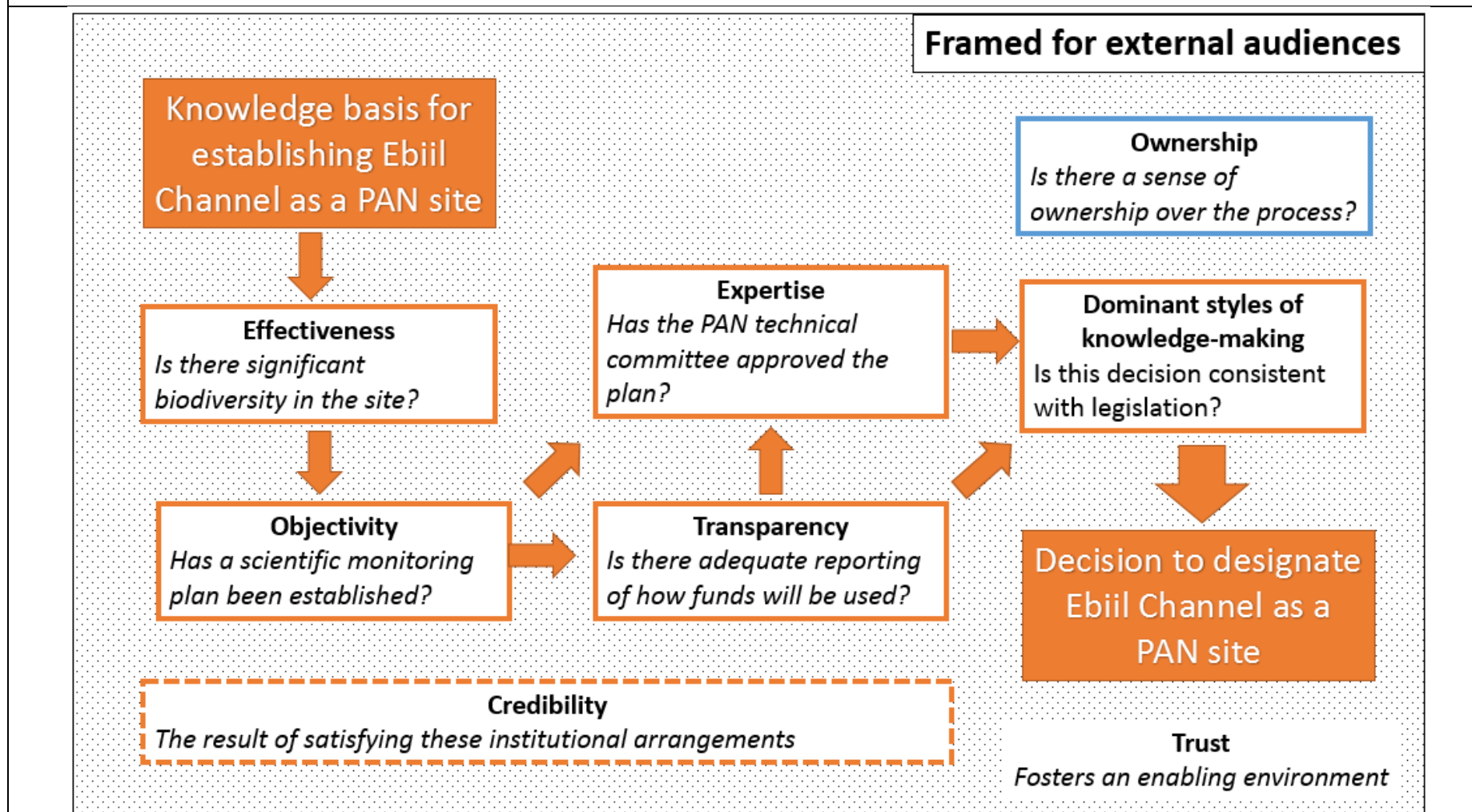


Figure 6.2 Framing the incorporation of the Ebiil Channel into PAN for external audiences



This example demonstrates some of the ways in which those within the PAN negotiate between these different knowledge governance regimes and their respective audiences in order to steer decision-making processes. In this case, both knowledge regimes were satisfied, and the decision to incorporate the Ebiil Channel site into the PAN proceeded. However, had these conditions not been fulfilled, these decisions may not have been made. It was when both sets of conditions were not fulfilled that conflicts arose. For example, the scientific advice to keep mangroves intact (Box 5.1) undoubtedly complied with various knowledge governance rules associated with coastal science but because it broke with continuity of existing environmental practices and contradicted the advice of experts in local custom (i.e.: it failed to comply with the knowledge governance regime associated with internal audiences), it was ignored.

6.2.3 A parallel system of knowledge governance: science and custom in the *bai*

In Palau, techno-rational and customary bodies of knowledge appeared not to conflict openly but instead to operate in parallel. For the most part, there was a notable lack of open conflicts around “science vs. custom” and many participants saw no dichotomy (see Box 5.1). This sits in contrast to what one might expect based on the disconnect between the epistemologies of these two bodies of knowledge which scholars like Tuhiwai Smith (2012) and Thaman (2003) point to. However, this absence of conflict does not necessarily denote cooperation but rather that there is a perception of a parallel relationship between these bodies of knowledge. This is echoed in statements made by participants along the lines of “we need science for outsiders but for locals tradition will suffice”. In such claims there is evidence of Sahlins’ claim that “in all change, there is continuity” (Sahlins, 2000: 9).

In this arrangement there are echoes of how decisions were made traditionally in the *bai* (Box 5.3). In that, although these two forms of knowledge exist in the same decision-making space, they do not directly address each other. This significantly limits the potential for conflict but also limits a deeper form of cooperation. Within this context, like the traditional go-betweens, Palauans are continuously engaged in reframing and moderating conservation knowledge so that it conforms to relevant knowledge governance norms and in turn, is accepted by the necessary audience. To an extent, this mirrors the conceptualisation of boundary work, translation that happens at the demarcation between experts (read scientists) and decision-makers (Guston, 2001), made by some scholars (see: Cash *et al.*, 2003; Ison *et al.*, 2007). However, this thesis makes the point that although the ability to (re)frame conservation is important, it is in understanding the attributes of the wider structures in which these processes take place that true synergies between different forms of knowledge are enabled. Put differently, outside the *bai*, men behave differently, when out on the lagoon in the act of fishing, they may be much more direct (Johannes, 1981). Moreover, the Palauan context for decision-making is

not static and this parallel system with different knowledge governance regimes for different audiences may face increasing strain as the audience for Palauan conservation changes.

6.2.4 Dynamics: a changing audience for Palauan conservation?

Although currently the audience for Palauan conservation is largely spoken of as internal, there was some indication that its external audience was growing. There was a notable push from some actors towards a more techno-rational approach which may endanger the current emphasis on *Bul* and other customary knowledge institutions. This shift can be linked back to the notion of audiences because it is driven by attempts either to regulate outsiders (i.e.: tourists, foreign fishers) or to promote Palauan conservation to international donors and scientists. In both instances, these groups continue to increase their presence with both the number of tourists visiting Palau swelling (see Chapter 3) and international green NGOs such as TNC, RARE and One Reef expand their Palauan operations.

In addition to this, the internal audience in Palau is changing, as more and more environmental professionals are western educated and younger generations are being introduced to environmental science in school (Bhandari and Abe, 2000). These processes have been underway for some time now (see Chapter 3) but the cumulative pressure of these developments makes a change in the current organisation of knowledge governance increasingly likely. Thus, as the audience for Palauan conservation changes (both internally and externally), customary knowledge may either have to form a greater reliance on science and more technical approaches or it may need to speak more directly to these audiences to maintain influence over conservation practice.

The degree of integration which this knowledge system should undertake is somewhat unclear. Pretty calls for greater integration between science and local-customary knowledge in order to promote more resilient cultural institutions for conservation (2011:127). As an extension of this, greater cooperation between the two might enable both bodies of knowledge to better address both internal and external audiences. For example, complementing customary knowledge with scientific theories of global change may help to better inform local communities about how protected areas could contribute to climate change adaptation. However, perhaps, as Cobern and Loving posit, there is a benefit to stopping the complete integration of customary and scientific understandings of natural phenomena (2001). At present, it appears that the dual nature of conservation knowledge in Palau works quite well in ensuring both internal and external support for resource management. Drew and Henne note that the current divergence of conservation science and TEK is largely a product of their differing epistemologies which bring different understandings (2006). These understandings are often complementary but they are still derived through different processes. Greater integration brings with it the risk that scientific processes may supplant customary knowledge which in turn,

threatens the ownership associated with Palauan conservation. The analysis in this study suggests that maintaining these parallel and complimentary knowledge systems may become more difficult as pressures on conservation increase

6.3 Research implications

This section directly addresses research question 3. Firstly, it does so by elaborating on how the lessons learnt through this case study both in terms of expanding Jasanoff's original typology of civic epistemologies and secondly, by incorporating this notion of different audiences contributes to a deeper understanding of the practical application of knowledge governance to understanding decision-making processes. It also lays out how future research might build on this work.

6.3.1 Towards an operational model of knowledge governance

This study puts forward several ways in which knowledge governance can be mobilised to better understand decision-making around conservation. Chapter 5 offers a systematic framework for evaluating how knowledge gains influence over practice. As an extension of this, Figures 6.1 and 6.2 present modelling for how one might map the different filters through which knowledge passes to gain recognition as a valid basis for decision-making. This kind of operational modelling of knowledge governance is currently absent from the literature but it offers a more systematic understanding of the interactions of different norms and rules around environmental management decisions.

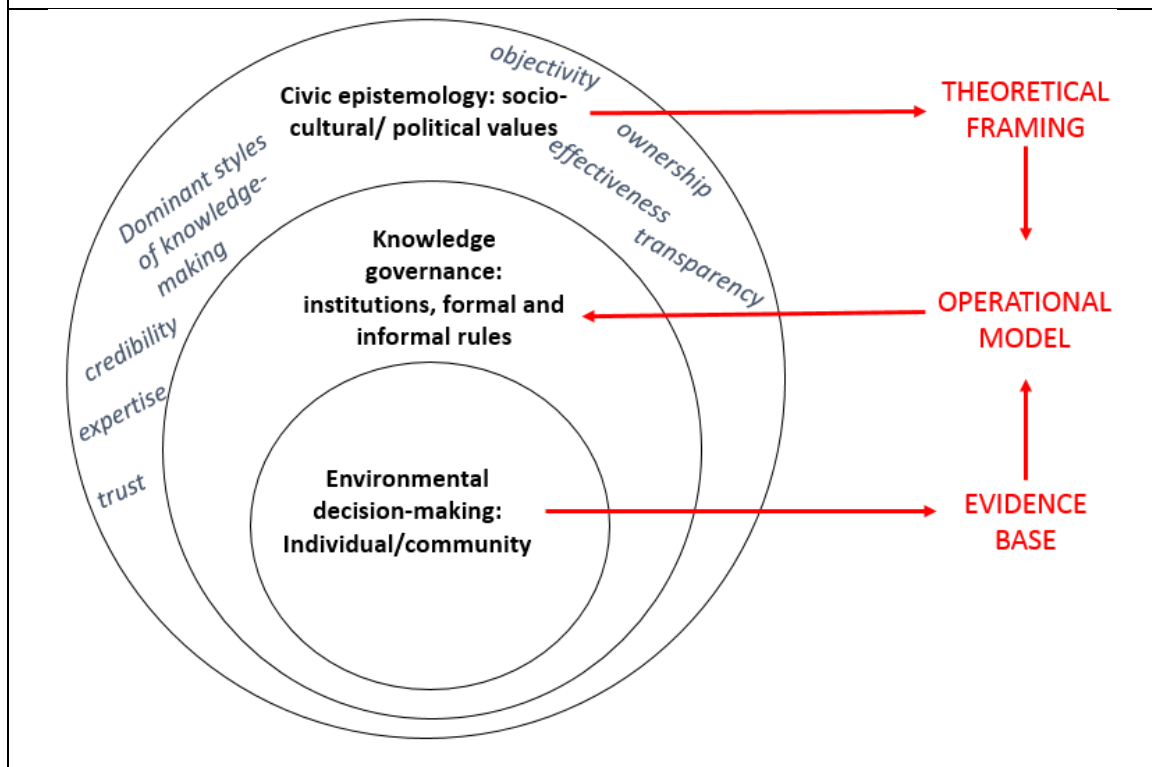
In a similar vein, coupling an expanded version of Jasanoff's civic epistemologies with this notion of audiences for conservation, sheds light on some of the subtleties and dynamics of the relationship between science and customary knowledge. As well as making Jasanoff's model more accessible to those wishing to understand decision-making, this thesis has added themes around trust and ownership to expand on the Jasanoff's original thematic analysis. In its previous iterations, knowledge governance has not been used to describe the interactions of localised forms of knowledge and techno-rational approaches. However, by including the concept of audiences in a knowledge governance framework, one can identify potential frictions and synergies which occur between the two. When considering the importance of conservation work in postcolonial contexts (West, 2001), it becomes clear that there is a real imperative for this type of work. Moreover, it presents a means of deconstructing the interface between culture and science which in turn promotes more socially robust and inclusive forms of conservation.

6.3.2 Future Directions for research

Thinking back to the methodological conceptual framework put forward in Chapter 4 (see Figure 4.1), I identified that the rules of knowledge governance could be identified through a combination of a wider theoretical framing (civic epistemologies) and an evidence base (environmental decision-making in the PAN). From here, my conceptual framework has

evolved to generate an operational model which could be used as a further basis for research (see Figure 6.3, below). This section indicates directions for future research by addressing these two components.

Figure 6.3 A revised conceptual model for operationalising knowledge governance



The ways in which Jasanoff's civic epistemologies framework is applied here illustrates some of the strengths and weaknesses of developing a general theoretical framing. As a theoretical starting point, civic epistemologies provided a useful foothold in unpacking some of the forces at work in the knowledge governance of PAN. For example, the theme of dominant styles of knowledge-making was a particularly useful analytical tool. However, trying to fit Palauan cultural interactions into a framework which is not of Palauan origin has some inherent issues. Some themes which were particularly important to local decision-making in Palau like ownership and trust were absent from the original framework (see Chapter 5). Conversely, some themes were largely absent within the Palauan context particularly those around transparency and objectivity as originally conceived by Jasanoff. The absence of some themes does not mean the framework is irrelevant but it does reflect some of the critiques of general theory made by sociologist Raewyn Connell. Connell posits that most general theory is developed in the metropole (the urban and cultural centres of the imperial powers) and as such despite its claims at universality, is often based on assumptions which do not hold in the periphery (places outside the metropole) (2007). Jasanoff's original work focused on building a generally applicable civic epistemologies framework with case studies exclusively from the metropole (the US, UK and Germany in this case) (2005). As such, given Connell's critique, it is unsurprising that there are

silences and gaps in understanding when applied to a Palauan case study. What the contrasting relevance of certain themes in this case study indicates is that future theoretical framings must be responsive and evolve in relation to their object of study.

Providing a wider evidence base will assist in this process of theory development. Strauss and Corbin talk of the necessity of induction and deduction interacting to create theory (1998:22) and so it is with this proposed framework that to avoid these kinds of gaps, more case studies using are sorely needed. One particular avenue for developing theory in this area could be research of a more ethnographic nature. Such work was not within the scope of this research but it would lend itself well to further exploring the interplay between socio-cultural values and the knowledge-action gap. Whatever form future research processes take, an iterative approach is called for – if the proposed framework is to demonstrate merit in different locales then it must adapt to its object of study.

Chapter 7: Conclusion

This analysis — based on knowledge governance — shows how societal rules and norms impact on environmental decision-making both within this case study and more broadly. Palauan conservation presents an interesting case study for exploring such questions because customary and techno-rational framings coexist within its decision-making context. From a constructivist standpoint, by bringing together a wider theoretical framing of Jasanoff's civic epistemologies and evidence from the Palau Protected Areas Network, this thesis represents a move towards an operational model of knowledge governance. Through this process, it elucidates how knowledge influences conservation in this case study (research question 1) and how knowledge governance can be used to explain the decision-making processes which draw on science and customary knowledge (research question 2). In so doing, it contributes to the wider application of knowledge governance to decision-making processes (research question 3).

At present, in Palau, there is a perception that the customary and techno-rational bodies of knowledge operate largely in parallel, with one geared towards internal audiences (Palauan resource-owners) and the other towards external audiences (international donors, fishers and tourists) for Palauan conservation. The result of this is that in practice, they observe quite different knowledge governance rules and expectations. In order to garner internal and external support for conservation, Palauans navigated these different knowledge governance regimes by reframing knowledge accordingly. In a context where there was an emphasis on ownership, be it in terms of continuity, tangible benefits for local communities or the endorsement of local customary experts, it was much harder for science to gain traction when compared to customary knowledge of conservation.

However, the dual nature of this knowledge governance system is coming under pressure as the audience for external Palauan conservation grows and locals are increasingly adopting scientific conservation language, practices and values. This may lead to greater integration between the two which could potentially generate a more robust conservation regime or the erosion of customary conservation institutions like *Bul*. Alternatively, the parallel system of conservation knowledge may continue.

Knowledge governance is still a young concept. This is the first time that this particular conceptualisation has been used to directly address the interface between socio-cultural values and environmental decision-making. This research demonstrates the potential of knowledge governance as an inclusive critical framework that negotiates both the relationship between science and local-customary knowledge and the ways that societies enact knowledge more broadly. Moreover, the interaction between theory and empirical evidence from the case study reveals a number of different lessons for both. In the first instance, applying Jasanoff's typology of civic epistemologies allowed for a systematic evaluation of how Palauans structure their discourses of conservation. The results of this investigation expand on Jasanoff's original

framework by incorporating thematic issues around ownership and trust. In a similar vein, the idea of audiences for knowledge governance emerges from the analysis of PAN presented. Through these lessons and by offering operational models for how knowledge governance regimes affect decision-making, this thesis contributes directly to new ways of understanding such questions and in so doing, enables greater connection between conservation ideas and practice.

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Appendix 1: Overview of management literature for thesis study sites

Ebiil Channel			
State	Ngarchelong	Plan submission date	February 2012
Goals	1) <u>Maintain marine resources and habitats</u> 2) <u>Meet subsistence food fish needs</u> of the people of Ngarchelong 3) <u>Support limited, small scale commercial fishery</u> 4) <u>Support non-extractive tourism</u>		
Major resource uses	• Fisheries (both subsistence and commercial) • Biodiversity conservation • Tourism activities (relatively small scale at this stage but with room for considerable growth)		
Threats identified in plan	• Overfishing (from commercial and subsistence fishing in nearby areas) • Climate Change (coral bleaching, increased cyclones) • Sedimentation and pollution (from land-based activities) • Physical damage to coral (from tourism activities, boating and ship groundings)		
External actors	• The Ebiil Society • The Nature Conservancy • Palau Conservation Society • The Palau International Coral Reef Centre		
Decision points	• Promoting sustainable fisheries was a major emphasis of the management plan, is there any tension between this and the conservation aspects of management? Does this plan have the support of fishers from Ngarchelong? • The plan mentions the possibility of adjusting the boundaries of the MPA, has this process taken place? • There was some concern expressed in the plan about illegal commercial fisheries. How does the management of this site navigate this? • The plan calls for more socio-economic surveys to be conducted on the impacts of MPAs on local communities. What were you hoping to achieve with these surveys? Why were they deemed necessary? • How is tourism being incorporated into the management of the site? Is this industry likely to expand in the coming years? To what extent? • The plan expresses some concerns about how onshore activities are effecting the reef. Have any provisions been made to deal with these issues?		

Ngardok Lake reserve			
State	Melekeok	Plan submission date	February 2010
Goals	1) To provide <u>high quality water supply for the people of Melekeok State</u> 2) To provide for the <u>enjoyment and education</u> of the people of Melekeok State, Palau and visitors to Palau 3) To <u>maintain the ecological integrity</u> of Lake Ngardok and the natural habitats it provides 4) To provide for <u>the protection of the native plants and animals</u> within the watershed 5) To <u>provide opportunities for research</u> on the organisms and natural systems within the watershed 6) To <u>raise capacity for effective management of natural resources</u> within the State.		
Major resource uses	• Water supply for Melekeok state (capital and public service infrastructure) • Education and enjoyment • Research site for understanding Palau's terrestrial biodiversity • Biodiversity Conservation		
Threats identified in plan	• Poaching • Fire (could lead to the destruction of forest habitat) • Water use (with increasing numbers moving from Koror to Babeldaob, there is likely to be a higher demand for water and greater use. If use exceeds resupply, then it could significantly degrade the ecological condition of the area) • Erosion (the soil is easily eroded due to slopes and the thin organic matter on top of volcanic soils. There are already several areas where erosion is of major concern.) • Invasive Species (e.g.: pigs, dogs, cats, rats) • Climate change		
External actors	• Babeldaob Watershed Alliance (BWA)- a joint initiative with the state of Ngaremlengui to protect water resources on Palau's main island. • The Palau Conservation Society • RAMSAR- named as a wetland of international significance in 2002.		
Questions around decision points	• In the management plan, the Lake is described as a "living laboratory". How does the site contribute to a wider understanding of Palauan conservation? What types of monitoring are carried out on this site? • Ngardok was the first member of PAN, can you tell me about how the decision was made to join PAN? • In the plan, there is an emphasis on adaptive management, how often has the plan been updated? Do these ideas fit into everyday management of the site? • My understanding, is that about 400 people live in Melekeok state but another 600 or so work there during the day. Are these workers included in decision-making about the site at all? • One of the educational objectives for the plan was to give tourists an appreciation of Palau's land-based attractions. How has this progressed? Why is tourism seen as an important part of the management of this site?		

Rock Islands Southern Lagoon			
State	Koror	Plan submission date	July 2012
Goals	1) <u>Biodiversity/Natural System Health Enhancement</u> - Maintain the full range and richness of biological diversity and the high environmental quality of the RISL. 2) <u>Subsistence and Commercial Fisheries Improvement</u> - Subsistence and commercial fishing and other extractive activities in the RISL are environmentally and economically sustainable and culturally compatible, and provide continued benefits to the people of Koror and Palau. 3) <u>Cultural and Historical Preservation</u> - Nurture and sustain Palauan culture by preserving and maintaining the landscapes, artefacts and oral traditions associated with the stonework village sites in the RISL, and preserve Koror's historical sites. 4) <u>Tourism, Recreation, and Economic Enhancement</u> - High quality tourism and recreational activities in the RISL are environmentally and economically sustainable, culturally compatible. 5) <u>Koror State Government Institutional Capacity Development</u>		
Major resource uses	• Biodiversity conservation • Tourism-The Rock islands are Palau's number one tourist destination. (This site is of immense economic importance to Palau, this point is certainly stressed in the management plan). • Cultural sites- prehistoric rock paintings, archaeological remains, WW2 wrecks and a rich oral history surrounding it. • Fisheries- both commercial and subsistence.		
Threats identified in the plan	• Overfishing • Pollution • Climate Change • Overall weathering and damage to cultural artefacts • Development (dredging) • Tourism (the plan is cautious to explicitly name this as a threat but it does express concern that high visitation of sites particularly Ongeim'l Tketau/Jellyfish lake will damage the ecology of the area.)		
External actors	• Bureau of Cultural affairs • Environmental Quality Protection Bureau • Palau Conservation Society- helped to develop the plan. • The Palau International Coral Reef Centre • Palau Tourism association • RARE • UNESCO- listed as a world heritage site		
Questions around decision points	• The Rock Islands are a UNESCO world Heritage site, what impact, if any, does international scrutiny have on the management of this site? • The RISL is probably the most visited place in Palau. How does that effect management? • Given that Koror state already had access to considerable funding for the management of this site, what was the impetus for joining PAN?		

Appendix 2: Sample interview guide

General questions

- 1) To begin with, can you tell me about your role(s) and how you're involved with the PAN/Conservation in Palau?

Key decision points

- 2) Can you tell me about how this site became part of PAN?
 - a. Why decide to join PAN in the first place? What were the benefits to the move?
 - b. Who was involved in the process?
 - c. Was there any opposition to this? On what grounds?
- 3) Can you tell me about how you make day to day decisions about the site?
- 4) How did you incorporate science into your decisions?
- 5) How was *Bul* or the traditional knowledge included?

Effectiveness

- 6) In the management plan/the mission statement of your organisation, there is a goal about X, how are you progressing towards that goal? How do you measure progress?
- 7) Which protected area in the network do you think is performing the best and why?
- 8) What is the role of scientific monitoring and reporting requirements in the management of the plan? Do you find these exercises useful to management?

Objectivity, transparency and credibility

- 9) What makes for a fair decision?
- 10) How are decision-makers held accountable? By whom?
- 11) What makes people trust that the right decision was made?
- 12) How was the community involved with decisions around the site?

Expertise

- 13) What kind of skills do you see as crucial to the management of the site?
- 14) Whose input is necessary to get a particular decision?

Future challenges and opportunities

- 15) Going forward, what changes would you like to see in the way that the PAN is managed and why?
- 16) Looking forward in a wider sense, what do you feel are the main challenges and opportunities that Palau faces with its conservation?
- 17) Did you have any final comments or thoughts on some of the issues that we discussed that you wanted to share?

Probes:

- Could you provide me with an example of that?
- What does that mean in the context of X?
- We have heard that X, has that been your experience?

Appendix 3: Participant Information Sheet



Culture and science, tradition and technicalities: exploring the complexities of decision-making in the Palau Protected Areas Network

Participant Information Sheet

Researchers:

Our names are Lorrae van Kerkhoff (Senior lecturer and researcher) and Victoria Pilbeam (Honours student). We are researchers from the Fenner School of Environment and Society at the Australian National University. We are collaborating with the Palau PAN Fund in designing this study, however the research remains independent from the Fund and its operations. This project was financed by a grant from the Australian Centre for International Agricultural Research.

Outline of the Project:

The purpose of this project is to investigate the different factors that influence decision making in the Palau Protected Areas Network (PAN) to better understand the range of information, values and knowledge people draw on when making environmental management decisions. We are particularly interested in how cultural, traditional and customary understandings are connected with scientific and technical perspectives. Towards this end, we are conducting interviews and group discussions with a range of stakeholders involved in the management of Palau's protected areas, including local environmental managers and custodians from a range of different PAN sites, as well as people working within the PAN Fund and Office, relevant NGOs and relevant government departments. The insights provided will be analysed and form the basis of a report, a journal article and an honours thesis.

Important points about your participation:

- **Voluntary Participation & Withdrawal:** Participation in this project is entirely voluntary. You may refuse to take part in the research, refuse to answer questions and withdraw from research at any time without penalty and without providing explanation, until the work is submitted for publication. If you do choose to withdraw, any data which you provided will be destroyed and not used. There are no implications for your relationship with the PAN Fund should you choose not to participate.
- **What does participation in the research request of you?** Participation in this research involves participating in an interview or group discussion and, where possible and appropriate, visits to relevant sites. If you give permission, these discussions will be audio-recorded and notes will be taken. These recordings will then be transcribed and then made available to you in a written form for you to look over before any written work that comes out of this project is finalised.
- **Location and Duration:** The research is taking place primarily in Palau, with some interviews conducted with key informants overseas via the internet. You are only expected to meet with researchers on one occasion and discussions are expected to last around an hour, or longer if site visits are included.



- **Risks:** While we will not identify people by name in our reports and publications, you should be aware that readers may be able to identify you through your role or position. We are also aware that cultural practices and customs may be subject to restrictions and privacy. We fully respect this, and if our discussions start to intrude on culturally sensitive areas, we ask you to inform us immediately, and we will redirect our conversation accordingly.
- **Benefits:** It is unlikely that you will benefit directly from this research, but by taking part you are helping to improve understanding of environmental management in Palau and the institutions involved in this process. Our findings will be provided to the Palau PAN Fund and other interested organisations, who may choose to act on them if appropriate. Results will be shared with participants in the form of an executive summary of the report, short reports online, and full details will be available on request.
- **Confidentiality:** If you undertake an interview, no one other than the researchers will have access to any data that you provide. If you take part in a focus group or group discussion, we cannot guarantee that other participants will keep information that you provide confidential but they will be encouraged to do so. As noted above, we will not identify any participant by name, but readers of final reports may be able to identify individuals through their positions.

Data Storage: While we are in Palau, data will be stored on password protected computers. Once we return to Australia data will be stored on computers at the Australian National University, which only we have access to, in password protected folders. Hard copies of data such as transcripts will be stored in a locked filing cabinet in a locked office at the Australian National University. Data that you provide will be stored for a period of at least 5 years following any publications arising from this research.

Queries and Concerns:

If you have any concerns or questions about this research, you can raise them by contacting the senior researcher: **Dr Lorrae van Kerkhoff**, Email: lorrae.vankerkhoff@anu.edu.au, Phone: +61 2 6125 2748

If you have any concerns or questions about the research that you want to manage locally or raised on your behalf, our designated local contact for this project is: **Ms Clarinda Ziegler**, Palau PAN Fund, Email: cziegler@palaupanfund.org (680)488-3863 P.O. Box 6094, PRA Building#202, Koror, Palau 96940

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee. If you have any concerns or complaints about how this research has been conducted that cannot be addressed through the contacts above, please contact:

Ethics Manager
The ANU Human Research Ethics Committee, The Australian National University
Telephone: +61 2 6125 3427
Email: Human.Ethics.Officer@anu.edu.au

Appendix 4: Participant Consent Form



WRITTEN CONSENT for participants, to be kept by the researcher.

Culture and science, tradition and technicalities: exploring the complexities of decision-making in the Palau Protected Areas Network

I have read and understood the Information Sheet you have given me about the research project, and I have had any questions and concerns about the project addressed to my satisfaction.

I agree to participate in the project. YES ☐ NO ☐

I agree to this interview being audio-recorded YES ☐ NO ☐

I agree to be identified in the following way within research outputs (please tick one):

- ☐ Full name
- ☐ Pseudonym (fake name)
- ☐ No attribution (no name given)

Signature:.....

Name (Printed)

Date:

The Australian National University | Canberra ACT 0200 Australia | CRICOS Provider No. 00120C

Appendix 5: Field report for participants

Lorrae van Kerkhoff

Email: xxxxx

Victoria Pilbeam

Email: xxxxxx

These notes outline our data collection activities whilst in Palau, and our next steps for further data collection and refinement.

Background:

As noted in the project proposal, we are interested in understanding the interplay between science and culture as two important dimensions of decision-making for natural resource governance. So how do they interact? Can their interactions be strengthened with careful planning and management? The purpose of our field work in Palau was to speak with and learn from a wide range of people connected with the Palau Protected Area Network, with different roles and different contributions to these questions. As a pilot study, we were unable to speak with all the States or other groups with relevant contributions to make due to limited time and funds. We selected groups in close consultation with PAN Fund to gain a diverse range of experiences and expertise, given our limited resources.

Aims and objectives:

This pilot study aims to test a preliminary framework that incorporates aspects of governance that are often excluded in science-driven academic and aid-based analyses of environmental management and change, particularly culture and politics.

Its objectives are to identify and analyse the range of influences in the organisation, decision-making and implementation of the Palau Protected Areas Network, through focusing particularly on the PAN Fund as a vehicle for governing the interactions between science-based knowledge, traditional ecological knowledge and broader cultural values.

Field work 1-14 June 2015:

Formal and informal group discussions

Over the course of our visit we met with roughly 80 people. These meetings were mostly held as group interviews (or discussions), where we followed an outline of topics and themes we wanted to cover, while also allowing and encouraging participants to raise their own

interpretations of the ideas we were interested in. Our approach to the discussions was that we were here to learn, and all were generous with their time and insights. Below, are the activities we conducted for our fieldwork. To respect the disclosure wishes of our participants, we have not included any names in this initial report.

Informal discussions included dinner meetings with:

- representatives from The Nature Conservancy;
- representatives from the Palau Conservation Society and Palau Resources Institute

Formal meetings with PAN site staff and connected representatives in

- Helen Reef, Hatohobei
- Medal Ngediull, Airai;
- Ngerderar Watershed, Aimeliik
- The Ebiil Channel, Ngarchelong
- Ngardok Lake, Melekeok

Additional important formal meetings were held with

- High Chief Reklai
- The Council of Chiefs
- The Mechesil Belau

And with representatives from

- Palau International Coral Reef Centre
- The Shark Sanctuary Foundation
- PAN Office
- Bureau of Arts & Cultural
- Environmental Quality Protection Board
- Ebiil Society

We were unable to meet with The Minister for Natural Resources, Environment & Tourism; and representatives from the Coral Reef Research Foundation. We will seek some input from them via email or phone over the next few weeks.

Observation and site visits

Discussions were enriched by observations during site visits. Site visits included both visits hosted by PAN staff or representatives, as well as ‘tourist’ visits to Koror State Rock Islands:

Site visits were conducted to:

- Ngerderar Watershed, Aimeliik State
- The Ebiil Channel, Ngarchelong State
- Ngardok Lake, Melekeok State; and
- The Rock Islands Southern Lagoon in Koror State

Data preparation

Victoria has transcribed 10 group interviews, and our notes from the site visits have been written up in digital format. This work is ongoing. When complete, our dataset will include:

- 13 transcripts of group interview
- 5 transcripts of individual interviews
- 2 sets of notes from informal discussions
- 6 sets of notes from participant observation

Where next? Data analysis

Once complete, notes will be forwarded to participants to check for accuracy and to make additional comments if they wish.

Following this, the next steps in our process are to analyse the data. We will start with descriptive questions:

- How and through what processes are Palauan culture, custom and tradition integrated into the activities of the PAN Fund?
- How, why and through what processes are science or research-based knowledge integrated into the activities of the PAN Fund?
- How are any technical requirements of Fund projects or programs integrated with local ecological knowledge, customs and management?
- Do these two domains contradict each other or complement? How? Why?

From these, we will move to more analytical questions around decision-making:

- Is there a dominant **style of decision-making**? When are different forms or processes for decision-making deployed?
- How do different groups or contexts demonstrate **public accountability**? Who are they accountable to? Are there multiple accountabilities, and if so, how do they interact?
- How do people determine **effectiveness** in their decision-making about conservation and protected areas? Are there different kinds of criteria applied by different groups? How? To what ends?
- How is **objectivity or fairness** of decision-making approached, presented, or conducted?
- Who holds “**expertise**”? on/of what? For what purposes?
- How is **transparency** exercised? By whom? What are the social expectations of transparency by or of different groups?

We will also note any other key themes that emerge from the data that are not covered in our analytical questions. Initial impressions from the data so far have raised initial topics we will examine more closely (this is not an exhaustive list).

- The ongoing contribution of *bul* to local conservation, particularly in so far as it relates to regulating local use, but its limitations in addressing non-local issues such as international fishing incursions.
- Occasional conflicts between traditional governance and formal legal processes, as discussed particularly by the Council of Chiefs
- The use of science as seen primarily for legitimising or validating decisions that have largely already been made, as well as for monitoring purposes.
- Some challenges with the current PAN reporting structure.

- Concern for immediate rather than long-term threats, e.g. difficulties with enforcement and concern over how to regulate illegal international fishing rather than climate change.
- Diverse views on the role and importance of the proposed EEZ Marine Sanctuary.

Approximate timeline:

- August: finalise any outstanding data (e.g. email questions to the Minister)
- August to September: Finish collating data from all sources and return notes to participants for additional comments if they wish.
- September: Analysis and drafting report, consultation with PAN Fund and any interested others on preliminary themes and findings
- October: Draft report
- November: Finalise report

[From previous proposal document] We will deliver:

A final report for PAN Fund and all study participants; a final report for the Funding agency; a conference presentation (slides made available) and, if suitable, an academic publication. If sufficient funds remain, we may be able to return in person to present our findings; if not they will be provided electronically.

Appendix 6: List of documents reviewed

This Appendix lists the 13 documents reviewed as part of this project. This list is comprised of all of the site management plans, their supporting documents and more general documents consulted as part of the wider study which includes documents that do not directly relate to the sites presented in this thesis. These documents are included because they were still used to contextualise the wider knowledge governance of PAN. As the documents below were used more in orientating the research than in the final text, they are not included in the reference list.

Management plans and supporting documents

Helen Reef, Hatohobei state

Hatohobei State, 2011. *Helen Reef management plan 2011-2016*, Available at:

http://www.palaupanfund.org/pdf/managementplan/hatohobei/HELEN%20REEF%20MANAGEMENT%20PLAN_FINAL.pdf (accessed 31 March 2015).

Ebiil Channel, Ngarchelong state

Ngarchelong State, 2012. *Ngarchelong Marine Managed Area management plan 2012-2017*, Available at:

http://www.palaupanfund.org/pdf/managementplan/ngarchelong/NMMAmp_Ngarchelong.pdf (accessed 4 April 2015).

Palau Conservation Society, 2012. *Fact sheet: Ebiil Conservation Area*, Available at:

<http://www.palaupanfund.org/pdf/managementplan/ngarchelong/fsEbiil.pdf> (accessed 7 June 2015).

Ngeruangel Marine Reserve, Kayangel state

Ngedebuul Conservation and Resource Planning Team, 2013. *Kayangel Protected Areas*

Network: Five Year Management Plan 2013-2018, Available at:

http://www.palaupanfund.org/pdf/managementplan/kayangel/KPAN_MP_Final090412.pdf (accessed 10 April 2015).

Medal Ngediull, Airai state

Airai State Resource Management Planning Team, 2014. *Medal Ngediull Conservation Area: a five year management plan 2014-2019*, Available at:

http://www.palaupanfund.org/pdf/managementplan/airai/MedalNgediullMP_Airai.pdf (accessed 28 March 2015).

Ngardok Nature Reserve, Melekeok state

Melekeok State, 2010. *Ngardok Nature Reserve: management plan 2010-2014*, Available at:

<http://www.palaupanfund.org/pdf/managementplan/melekeok/Ngardok%20Management%20Plan.pdf> (accessed 20 March 2015).

Melekeok State, 2010. *Fact sheet: Ngardok Nature Reserve*, Available at:

<http://www.palaupanfund.org/pdf/managementplan/melekeok/NgardokNatureReserveFactSheet.pdf> (accessed 20 March 2015)

Ngerderar Watershed, Aimeliik state

Aimeliik State, 2011. *Ngerderar Watershed Conservation Area Management Plan 2011-2016*,

Available at:

<http://www.palaupanfund.org/pdf/managementplan/aimeliik/Ngerderar%20Watershed%20Reserve.pdf> (accessed 14 April 2015).

Rock Islands Southern Lagoon, Koror state

Koror State Government, 2012. *Southern Lagoon Management Plan 2012-2016*, Available at:

<http://www.palaupanfund.org/pdf/managementplan/koror/Rock%20Islands%20Southern%20Lagoon%20Area%20Management%20Plan%202012-2016%20latest%20July%2018.pdf> (accessed 3 March 2015).

Koror State Government, 2012. *Rock Islands World Heritage Dossier*, Available at:

<http://www.palaupanfund.org/pdf/managementplan/koror/Rock%20Islands%20WH%20Dossier%20Feb27-2012.pdf> (accessed 5 March 2015).

Protected Areas Network general documents

Palauan Conservation Society, 2009. *Management Plan Criteria/Template*, Available at:

http://www.palauconservation.org/cms/images/stories/resources/pdfs/PAN_Management_Plan_Template-Criteria.pdf

Ministry of Resources and Development, 2009. *Protected Areas Network Regulations*,

Available at:

http://www.palauconservation.org/cms/images/stories/resources/pdfs/PAN_Regulations.pdf

Hinchley, D. and The Nature Conservancy, 2007. *Biodiversity Planning for Palau's*

Protected Areas Network: An Ecoregional Assessment, TNC Pacific Island Countries 1(7).

Appendix 7: Codebook

Coding directly inspired by Jasanoff's framework

Name
- Dominant style of knowledge making - Consensus - Continuity - Conflicts - Credibility - Personal - Expertise - Customary knowledge - Foreign exposure - Practical experience - Dislike towards concept - Effectiveness - Contribution to local livelihoods - Site financing - Enforcement - Public outreach - Ecosystem health - Objectivity - Flexibility - Fairness - Transparency - Reporting - Disinterest in - Need for

Coding of emergent themes

Name
- Trust - High trust environment - Ownership - Assertions of - Need for