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Coral, Culture, and Climate Change

‘Facts that Matter’ for the Atoll Island Community of Moch,
Chuuk, Federated States of Micronesia

Thesis submitted by

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in February 2015

for the degree of Doctor of Philosophy in the

Discipline of Anthropology

College of Arts, Society and Education

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Statement on the contribution of others

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Adella Edwards, cartographer at James Cook University (see Appendix B)

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Declaration on ethics

This research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council (NHMRC) National Statement on Ethical Conduct in Human Research, 2007. The proposed research study received human research ethics approval from the JCU Human Research Ethics Committee Approval Number # H3109.

20th Feb 2015

Christine R. Pam

Date

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Abstract

The discourse of climate change is well accepted by Pacific Islands Nations, and there is a burgeoning of literature, research, media representations and project initiatives which address issues of vulnerability, risk, and adaptation. In this thesis, I examine an engagement with climate change among people of the small low-lying outer island community of Moch, in Chuuk, Federated States of Micronesia. Rather than pursue a more conventional research approach driven by the ‘effects of climate change’, I examine the ways in which climate change is affected by the Mochese community; how the ‘facts’ of climate change are made meaningful and given force in a quest to ‘*make the island powerful and stay alive*’.

This thesis provides an ethnographic analysis of ‘climate change’, as the people of Moch re-evaluate their knowledge and begin to articulate a relationship between their experience of unusual environmental changes and the global discourse of climate change. My analysis takes place in the context of unprecedented high tide and wave events experienced on Moch prior to and during my fieldwork, and the resultant sense of uncertainty as people struggle to find a ‘local’ explanation and simultaneously grapple with a new story; that the globe is warming, the ice is melting, and the seas are rising. As local experiences become entwined with this story, my attention is drawn to new meanings attributed to the ongoing seasonal practice of building seawalls from coral to protect the island from an encroaching sea. On Moch, in the context of new climate change realities, these seawalls are now being re-conceptualised as a climate change project; as a symbol for the hopes and dreams of a secure future for people living on the island, and as a site of agency for the Mochese community to assert their presence and leadership in a world of climate change. Throughout this thesis I argue the actions of the Moch community to engage with climate change present a ‘new conversational opportunity’ to further realise climate change as both scientifically factual and socially meaningful.

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Chapter 1 Introduction

A state of emergency: ‘tidal swell washes over Pacific Islands’¹

In early December a low pressure system 5000 miles wide developed in the northwestern Pacific Ocean. At the same time the moon’s orbit was approaching its closest distance to the earth (perigee). The combination of the two events caused a massive tidal swell to sweep southwest across the Pacific (Jaynes 2008:1).

On the 26th December 2008, just a few weeks before I arrived in Weno to begin my longer term fieldwork, the State of Chuuk in the Federated States of Micronesia (FSM) declared a State of Emergency. This situation arose in response to reports of severe damage as a result of ‘the unusual high tide and the tidal surge’² that occurred throughout the State from the 8th to the 11th December 2008. The reports were received from a majority of municipalities representing approximately 39 inhabited islands in the Chuuk Lagoon Region, the Mortlock Region and the Northwestern Region of the State. A State of Emergency was also declared in Pohnpei (19th December), Kosrae (24th December) and Yap (26th December) as the unusual high tides and tidal surges caused damage to infrastructure and crops and adversely impacted the livelihoods of many island communities in those states. In response to all four states declaring a State of Emergency, the President of the FSM, Mr. Emanuel (Manny) Mori declared a National State of Disaster on the 30th December 2008.

A State of Emergency sounded serious and certainly framed the context for my initial meetings on Weno with Serino Sinem, the Mayor of Moch Island. Serino had been only recently elected and had just returned from a visit to Moch where he attended his mayoral inauguration ceremony on the 13th of January, 2009. Given his new position, I gave Serino the information sheet about my research project, entitled ‘The Global Discourse of Climate

¹ This was the title of the lead story in The Kaselehlle Press on the 24th December 2008. The Kaselehlle Press is the main newspaper for the FSM, published in Pohnpei and distributed to the other states.

² This is how the Office of the Governor of Chuuk described the event in the ‘Declaration of State of Emergency’, dated 11th January 2009 (pers. Comm).

Change and Small Island States’ (see Appendix A). As with many of the mayors of outer island municipalities, Serino lives permanently ‘off-island’ in Weno. Since leaving Moch as a young man in 1973, he has spent very little time on Moch and the inauguration visit was his first to the island in two years. We talked about the changes he noticed on Moch when he was there for his inauguration; in particular he mentioned the high tide and waves that regularly breach the seawalls, the extent of the reach of the waves onshore, and the erosion of land and the disappearance of beaches. Serino told me that during the December tidal surge the waves nearly reached his house on the shoreline of Moch and that fish were found in the taro pits on the small islands, washed in by the waves. He explained that while there is always high tide in December, the high tide is higher now and the waves come over the seawalls and onto the land. Serino said the main concern for everyone on Moch is to stop their island from washing away and, as the Mayor of Moch, his visionary plan prioritises the need to source funding to re-build and strengthen the seawalls to better protect the community from future wave events. He emphasised the importance of this issue throughout our meeting, in terms of local concerns, state and national government responsibilities, and the need for international support.

A few days after this meeting with Serino I received an impromptu invitation to have morning coffee with the then State Government Representative for the Mid-Mortlocks, Mike Olap. It was early in the morning, and leaving my fourteen year old daughter, Jirin still in bed in our hotel room I got a lift with Mike and Doropio Marar³ to the somewhat ominously named ‘High Tide Restaurant’ (see Figure 1). Mike was a big tall Mochese man, related to Doropio and the family I was to live with during my fieldwork on Moch. Mike lived in Weno and rented an apartment not far from the hotel. We arrived at the restaurant and sat at a table to wait for Mayor Serino to join us before ordering breakfast. I was told this is the only place in Weno to get ‘proper’ coffee, served with a small jug of sweetened condensed milk on the side. During breakfast we discussed many things, including Chuuk State politics, the election of Barack Obama as president of the USA, and my research project. In the context of my research both Mike and Serino expressed their concern for seawalls on Moch. Serino told me that evacuation was seen as the last resort; people feel ‘there is no place like home’ and will not leave Moch until the last soil is

³ Doropio Marar was a valuable friend and research assistant throughout my fieldwork.

washed away. Serino and Mike suggested that a ‘seawall report’ would be a useful document to present to State and National governments in support of an application for funding to repair, maintain, and build seawalls on Moch.



Figure 1: The High Tide Hotel and Restaurant, Weno, Chuuk State, FSM (Photo: Christine Pam).

During eight months of fieldwork over a period of about three years, the Moch municipal government, as well as many people who lived on the island, often directed my attention towards seawalls. Not only were they imagined as the last defence against the big waves and high tide that seemed to impact the island with increasing frequency every year, they also became a site of community agency in a world of climate change. Seawalls, in one form or another, influenced many of my interactions with people on Moch, became a focal point for discussions with municipal government representatives, and substantiated a link between local concerns of climate change, the State and National governments, and the international community. Subsequently, seawalls on Moch are a major focus of my research which problematises ‘climate change’ as a global phenomenon. More specifically, in this thesis I seriously attend to the meaning of ‘climate change’ as it is worked out and given force at the level of local practice, in specific social and cultural realities ‘lived on the ground’ in places distant from the ‘original’ discourse of climate change⁴.

⁴ I have used pseudonyms throughout this thesis unless given specific permission to do otherwise.

‘My thesis is not about climate change’

Up until my involvement with a pilot study on heritage and climate change in late 2007, I had very limited knowledge of Micronesia and absolutely no awareness of the small low-lying island of Moch. However my research interest, which I had developed in my honours thesis (Pam 2010), lay in a critical analysis of the working together of science and other ways of knowing and a fieldtrip to a small outer island community such as Moch offered the potential for me to further explore this engagement in the context of climate change. This seemed pertinent given the globalisation of science and the increase in awareness among researchers of the relevance of indigenous and local knowledges for community development, biological diversity, natural resource management and adaptation to global environmental change (Sillitoe 2000; Payton et al. 2003; Newman and LeDrew 2005; Aswani and Lauer 2006; Ellen 2007; Mercer et al. 2007; Salick and Ross 2009; Macintyre and Foale 2013). I was further motivated by the seeming pervasiveness of ‘climate change’ as a global scientific concept detached from local value and meaning (Jasanoff 2010), and the realisation that any “global consensus on the meaning and urgency of climate change” (Jasanoff 2010: 238) would instead have us ‘act in concert’⁵ across diverse knowledges, values and meanings. I was encouraged by the work of Julie Cruikshank (2001) who discussed the sentient glacial landscapes in the narratives of indigenous people from northwestern North America and the problems associated with incorporating these understandings into global debates on climate change. She argued:

Ultimately we need knowledge bridges that work from local concepts as well as from science if we are to bring broadly based human values to bear on problems such as climate change. (Cruikshank 2001:391)

The problem of climate change presents a salient context within which to examine the working together of science and other knowledges. With this in mind – and as the title

⁵ In her study of climate change in Tuvalu, Lazrus (2009a) was similarly motivated, emphasising a sentiment expressed by Margaret Mead as early as 1980: “We are facing a period when society must make decisions on a planetary scale.... Today’s natural catastrophes and environmental interventions affect the whole of human society - interconnected as it is in reality though not yet politically capable of *acting in concert*....” (emphasis added; Mead 1980: xvii, cited in Lazrus 2009a: 2)

statement to this section suggests – I was determined not to simply conduct research about ‘climate change’. Indeed, I wrote this statement early in my candidature in reference to a seeming profusion of research within the literature which, although significant and valuable, either implicitly or explicitly positions the global science and governance of climate change as *a priori*, as foundational to and motivation for the research. I composed this statement deliberately to keep me focussed on my thesis which sets out to problematise climate change knowledge; to resist the tendency towards simplification which propels researchers to investigate ‘the effects of climate change’ and instead engage with the reality of climate change knowledge as it is assembled in its situated complexity. While the distinction I make here is subtle and sometimes elusive, it is fundamental to my research approach and to my analysis, and will be discussed here in some detail.

Anthropology and the climate change research agenda

While there is an extensive related anthropological literature on environmentalism and human-environment relations (Orlove 1980; Milton 1996; Hviding 1996a; Escobar 1999; Ingold 2000; Strang 2004; West 2005; Peace et al. 2012), my main concern here is the engagement of anthropology with the global environmental problem of ‘climate change’. Human perceptions, understandings, and reactions to climate and weather are ultimately shaped by culture (Strauss and Orlove 2003: 6), and as the various case studies in Crate and Nuttall’s (2009) edited volume, ‘Anthropology and Climate Change’, demonstrate, anthropology is in a privileged position to investigate this relationship in the context of climate change (Crate and Nuttall 2009: 23). This position was recognised two decades earlier by Rayner (1989: 2) who argued the discipline was “uniquely poised at the interface of nature and culture” and had “the potential to play a major role in helping humanity to understand and shape its relationship with the threatened global environment”⁶. In essence, he appealed for anthropology to come on board the climate change research agenda, an appeal that has been repeated in recent years (Brown 1999: 1440, Magistro and Roncoli 2001: 91; Milton 2008: 58; Baer 2008a: 61; Nelson et al. 2009: 273; Reuter 2010: 24) with

⁶ There is a related literature on cultural responses to hazardous environments and environmental change (Lessa 1964; Torry et al. 1979; Marshall 1979; Hoffman and Oliver-Smith 2002; Minnegal and Dwyer 2000, 2007; Mercer et al. 2007).

some even suggesting that ‘anthropology *without* a sense of urgency about global warming is unthinkable’ (Batterbury 2008: 66).

Testament to anthropology ‘coming on board’ is the publication of a number of edited volumes (Strauss and Orlove 2003; Crate and Nuttall 2009; Hastrup and Olwig 2012; Baer and Singer 2014; Dove 2014), books (Baer 2012; Rudiak-Gould 2013a; Connor 2014), doctoral theses (Farbotko 2008a; Lazrus 2009a), research programs (Agrawal et al. 2012; Eriksen n.d), interdisciplinary collaborations (Rayner and Malone 1998; Baer and Singer 2009; Burgmann and Baer 2012), and journal articles (Vedwan 2006; Reuter 2010; MacRae 2010; Marshall 2011; Cassidy 2012; Lazrus 2012; Pam and Henry 2012; Connor and Higginbotham 2013; Lipset 2013; Macintyre and Foale 2013) by anthropologists working on the issue of climate change. While debates ensue about the value of theoretical work that ‘fiddles while the globe warms’ and an applied practice that is ‘insufficiently anthropological’ (Rayner 1989: 2), it is indeed apparent that anthropologists are increasingly engaged, drawing on a variety of approaches and research methods to confront the theoretical and practical challenges of understanding the global phenomenon of climate change.

Certainly among anthropologists, ‘climate change’ has called forth intensive ethnographic research methods, as well as policy-oriented research and/or participatory action research, and has required both critical and interpretive approaches to investigate socio-cultural knowledge and perceptions, and to address issues of climate policy, climate justice, climate movements, global politics and globalisation⁷. Some anthropologists pursue a world system analysis from a strong political positioning (Baer 2012)⁸, whereas others value “critical inquiry through ethnographic immersion” and work hard to maintain a detachment from partisan positions (Peace et al. 2012: 225). A few ‘study-up’ to provide a cultural analysis of elites, especially climate scientists and policy-makers (Lahsen 2008), or attend to climate change as a cultural crisis within more affluent Western communities (Connor

⁷ Of course these are not distinct research areas and anthropologists often enlist multiple methodologies and/or trace connections between the local and the global.

⁸ In the Australian Anthropological Society Newsletter (September 2008) Baer (2008b: 9) outlines his research/participation in the climate justice movement in Melbourne and encourages his fellow anthropologists to not only study this movement, but to become involved in it.

2010) and modern global culture (Reuter 2010). However, many anthropologists maintain a ‘traditional’ research focus on local, indigenous and marginal peoples which, according to Lahsen (2010: 165), suggests a more tentative engagement with the problem of climate change.

Human dimensions

The push within the field of anthropology coincides with a call for more social science research into the ‘human dimensions’ of climate change (Malone and Rayner 2001:175; Huntington et al. 2007: 183; Agrawal et al. 2012: 329)⁹. Such human dimensions research most readily accords with what I refer to as the more conventional climate change research agenda. This research has been dominated by the concepts of ‘resilience’, ‘vulnerability’ and ‘adaptation’ in relation to social-ecological systems (Mimura 1999; Barnett and Adger 2003; Adger 2006; Janssen and Ostrom 2006; Janssen et al. 2006; Folke 2006:254; Smit and Wandel 2006; Adger et al. 2009; Pelling 2011; McClanahan and Cinner 2012;)¹⁰, and is often manifest in the study of local socio-cultural knowledge and perspectives of the environment for understanding vulnerability and effective adaptation to climate change (e.g. Barnett and Busse 2002; McBeath and Shepro 2007: 62; Bridges and McClatchey 2009: 140; Salick and Ross 2009: 137; Long 2010: 5; Williams and Hardison 2013: 532). For instance, in 2008 three prominent anthropologists co-founded the Initiative for Climate Adaptation Research and Understanding through the Social Sciences (ICARUS) to promote social science research on climate change and “improve the chances for well adaptive futures” (Agrawal et al. 2012: 329, 330). This history of ‘adaptation’ in climate change research has been traced by Orlove (2009: 132-137), and its current emphasis is evidenced in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2014a) which recognises the burgeoning literature on climate change impacts, adaptation and vulnerability; identifies the emergence of adaptation as a central area of research; and provides an expanded coverage of the human dimensions of climate change (Burkett et al. 2014: 172).

⁹ In line with Rayner’s (1989) earlier appeal, this research most readily accords with what I refer to as the more conventional climate change research agenda.

¹⁰ Indeed, many volumes and/or articles published in the journal *Global Environmental Change* are dedicated to these concepts in relation to climate change. See Hulme (2010a: 558-559) for a general assessment of the influence of this journal on global environmental change research.

While the diverse work of anthropologists and other social scientists within this particular field of research has made a valuable contribution to understanding ‘climate change’, I am concerned with both the critique that human dimensions research “tends to integrate a limited conceptualization of culture” as a non-pervasive factor, somehow separate from the production of climate change knowledge (Lahsen 2008:204), and the argument that social scientists are ‘strongly encouraged’ to enlist a ‘descriptive’ research strategy initially preconfigured by the physical sciences (Taylor and Buttel 1992: 410; Proctor 1998: 241; Malone and Raynor 2001:176). Although the latter argument was made well over a decade ago, it remains salient and in conjunction with a critique of ‘culture’, has deeper implications for current research about climate change. In particular, it points to the existence of knowledge hierarchies which are embedded within conventional climate change research as presided over by the IPCC (Hulme and Mahony 2010: 708)¹¹ and conflates climate change with ‘science/nature’, potentially ignoring the very social and cultural construction of climate change knowledge. As a result, my attention is directed towards a critical analysis of the production of climate change knowledge.

The production of global climate change: science and politics

Climate change may be understood as a global phenomenon through the universalising discourse of science generally, and more specifically through the work of climate scientists (Taylor and Buttel 1992, Oreskes 2004). Over the last three decades or more, climate scientists have consolidated climate data (Wolfson and Schneider 2002) and developed climate models to establish the ‘truth’ of a changing *global* climate (Taylor and Buttel 1992: 409). This ‘globalising of climate’ was enabled through the social and universalising practices of scientists to mobilise and equate knowledge of weather and climate (Miller 2004: 50-53; Hulme 2010a: 560; Jasanoff 2010: 238; see also Turnbull 2000: 38). While Hulme (2010a: 560) traces this globalising process through the ascendancy of ‘global-

¹¹ According to Taylor and Buttel (1992:410), a hierarchy of climate research has developed, with the physical sciences at the top, followed by the natural sciences, economics, and finally the social sciences furnishing the bottom rung of the ladder; a hierarchy “from the hard and physical down to the soft and personal”. See Bjurström and Polk (2011) for evidence of the physical and economic bias in climate change research.

mean temperature’, he posits other similar examples such as the construction of global indices of vulnerability to climate change. Hulme (2010a: 560) argues:

The modes of such knowledge-making pay little attention to the multiple ways of knowing environments, of living in places, and of imagining the future which are embedded in local cultural practices and knowledge-making traditions.

The danger of ‘epistemological violence’ (Radcliffe et al. 2010, cited in Hulme 2010a: 560) from global forms of knowledge such as climate change are examined further by Jasanoff (2010), who states:

Crudely put, [climate change] detaches global fact from local value, projecting a new, totalizing image of the world as it is, without regard for the layered investments that societies have made in worlds as they wish them to be... To know climate change as science wishes it to be known, societies must let go of their familiar, comfortable modes of living with nature. (Jasanoff 2010: 236)

While the study of local socio-cultural understandings of climate change may appear to address this ‘epistemological violence’, the science of climate change often remains deeply embedded within such research.

The emergent stability of ‘climate change’ as a global environmental problem stems from the convergent goals and expectations of climate scientists and policymakers, especially as realised through the workings of the IPCC (Rayner 2003: 283; Miller 2004: 54).¹² The IPCC is widely recognised as the most authoritative voice on climate change (Adger 2006: 273; Hulme and Mahony 2010: 713), producing expert scientific knowledge for global policy (Jasanoff 2010: 240; Miller 2004: 47). Within the institution, ‘grueling negotiations’ ensue between government officials, industry lobbies, environmental NGOs and scientists to produce comprehensive climate change assessment reports and policy summaries of the science (Weart 2010: 76; Jasanoff and Wynne 1998: 36). Through their critique, Jasanoff and Wynne (1998: 36) identify this as an “entirely necessary part of building useful

¹² See Agrawala (1998a, 1998b) for a comprehensive analysis of the formation and process history of the IPCC. See also Zillman (2007) and Weart (2010).

knowledge in a culture that unites science and policy into a common worldview”¹³.

According to Miller (2004: 47), the IPCC has “articulated a new model of science and politics... in which experts and expert knowledge, as politically neutral agents, [are] accorded significant power to define problems of global policy”. Through enhancing the credibility and power of science and ensuring its own technical authority, the IPCC has co-produced a global science and politics of climate change (Miller 2004: 61).

The critical work of Miller (2004), Jasanoff and Wynne (1998) and others (Pettenger 2007; Lahsen 2010; Jasanoff 2010; Hulme 2010a) reveals processes of knowledge-making and decision-making to bring about a consensus on the problem of global ‘climate change’ (Hulme 2010a: 561, Jasanoff 2010: 239). These are socio-cultural processes that produce very powerful and particular climate change knowledge. Scarce and exceptional research is being carried out to recognise scientists as cultural and political actors, and to question ‘science as specially privileged knowledge’ (Turnbull 1997; Jasanoff and Wynne 1998; Lahsen 2008). In these studies, culture is re-positioned as omnipresent, suggesting “the importance of life experiences, personalities, culture and politics for scientists” (Lahsen 2008: 216) and revealing that scientific knowledge, like all knowledge, “is necessarily a social product; it is the messy, contingent, and situated outcome of group activity” (Turnbull 2000:215). Significantly, a cultural analysis of the production of climate change knowledge among a powerful ‘elite’ (scientists and policy-makers) makes ‘culture’ more conceptually potent for a climate change research agenda.

Political processes that embed the authority of science have further implications for climate change research. While a knowledge hierarchy heavily skewed towards the physical sciences has already been identified (Taylor and Buttel 1992; Hulme and Mahony 2010; Bjurström and Polk 2011), it can also be argued that much of the conventional social science research about climate change is actually negotiated through science, “through the

¹³ Jasanoff (2010: 239) argues, “In the industrial West, science and politics have long collaborated to produce dominant understandings of nature”. Such a culture perceives the role of science as ‘speaking truth to power’ and effectively obscures the political and cultural agency of scientists (Lahsen 2008: 206). Furthermore, Lahsen (2002: 1-2) uses the term ‘epistemer’ to refer to scientists and policy-makers engaged with global climate change because the distinction “often is difficult, if not impossible, to discern, especially in science with geopolitical relevance (Elzinga 1993a: 143)”.

determination of key questions, analytical frameworks, methods and monitoring” (Fairhead and Leach 2003: 1). For instance, through the priority given to such concepts as resilience and adaptation, both of which originated in the natural sciences (Smit and Wandel 2006: 283; Janssen et al. 2006: 241), and through a research focus conducive to more integrated IPCC assessment reports (Reisinger 2011: 24-25). Integrated assessments for the production of global knowledge involve the “difficult task of harmonization at the cognitive level”, in the ways the objects of research are defined and in the preferred methodologies, models and concepts (Jasanoff and Wynne 1998:47). Yet, while the quest for ‘harmonisation’ may seem to bridge the social and bio-physical sciences and pave the way for interdisciplinarity, the disciplinary bias remains clearly established within the IPCC (Hulme and Mahony 2010: 707-708)¹⁴.

Furthermore, there is a geopolitical bias as the IPCC has failed to adequately incorporate the concerns of experts and policy-makers from developing countries, and to address power relations between the global and the local (Malone and Raynor 2001:174; Hulme and Mahony 2010: 708-709; Miller 2004: 62-63; Hulme 2010a: 562). While Indigenous voices and developing nations continue to challenge the global science and politics of climate change (Miller 2004: 59; Smith 2007: 204-208; Lahsen 2007a; Jasanoff 2010: 247-248), the IPCC has done little to renegotiate its processes of knowledge making and consequently, science retains considerable power to legitimise global governance (Miller 2004: 65). This has prompted accusations of ‘neo-colonialism’ (Agarwal and Narain 1991, cited in Miller 2004: 62) and ‘green imperialism’ (Elliot 1998, cited in Smith 2007: 201), and certainly lends itself to Scott’s (1998: 340) related concern for the dangerous combination of universalist claims of epistemic knowledge and authoritarian social practice. Significantly, Scott (1998: 340) argues “it is the imperialism that is troubling”, the failure to recognise other ways of knowing.

Given the critical analysis outlined here, ‘tentative’ anthropological research focussed on socio-cultural perceptions of ‘climate change’ and/or promoting local knowledge for effective adaptation to ‘climate change’ fails to problematise the actual production of climate change and subsequently contributes to the further construction of global climate

¹⁴ As Reisinger (2011: 28) revealed, socio-cultural knowledge “has yet to be integrated effectively into quantitative models that provide the foundations for many key policy decisions”.

change knowledge. In his critique of the urgency to make anthropology relevant to global realities, Kapferer (2000: 176-177) warns against anthropologists “becoming ideological agents in new hegemonic processes”, reminding us instead of the potentialities of anthropology to “question conceptions and theories spawned in dominant centres which, perhaps, more than ever before are once again in full sway”. This suggests more critical reflection is necessary to attend to the particular role of the researcher in knowledge production, and also to:

pay greater attention to the different ways knowledge comes to be made in different places and how different kinds of knowledge gain hold in people’s minds, traction in different cultures and assent in global fora. (Hulme 2010a: 563)

A symmetrical anthropology

It is clear that an anthropological engagement with climate change has recognised other ways of knowing and been instrumental in promoting the value of local and indigenous knowledge for adaptation. Although this is ‘honest work’ for the discipline (Batterbury 2008: 64) and has challenged the ‘globalness’ of climate change as constructed through the knowledge making activities of the IPCC, there is generally little attention given to climate change as a concept being made meaningful through “the realities of lives lived on the ground” (Milton 2008: 58). Clearly, the focus tends to be on the ‘being’ of knowledge rather than the ‘becoming’ of knowledge (Castree 2006: 162). Yet, if we focus analysis on knowledge making, the stability of climate change as a taken-for-granted concept woven seamlessly into the work of many anthropologists and other social scientists becomes problematic.

Drawing on Latour’s (1993) critique of science and modernity, I argue such stability inadvertently reflects a belief in ‘the great divide’ between culture and nature and impedes a more nuanced understanding of climate change realities¹⁵. Fundamentally, it is the belief that:

¹⁵ Latour (1993: 103) proposes that the divide between nature and culture, rather than defining reality, defines the ‘particular way Westerners had of establishing their relations with others as long as they felt modern’.

We [westerners] do not mobilize an image or a symbolic representation of Nature, the way the other societies do, but Nature as it is, or at least as it is known to the sciences – which remain in the background, unstudied, unstudyable, miraculously conflated with Nature itself. (Latour 1993:97)

Latour (2000: 118) discusses this dichotomy as the division of primary and secondary qualities; between “the real stuff out of which nature is made” on the one hand, and “the way that people subjectively represent this same universe” on the other. He argues a theoretical approach based on symmetry – ‘a symmetrical anthropology’ –dissolves this ‘great divide’, and subsequently also the boundaries between those cultures with scientific knowledge and those without (Latour 1993: 101-104). The principle of symmetry attends to hybrids of natures-cultures and requires that both ‘objective truth’ and ‘subjective belief’ are treated equally, challenging the seeming convention that we have one nature and ‘multiple incommensurable cultures’ (Latour 2000: 118)¹⁶.

Despite Latour being criticised for his ‘utopian thinking’ and for ‘childishly and irresponsibly’ levelling the playing field (Castree 2006: 162), a symmetrical anthropology *is* good to think with; to critically reflect on research practice ‘in the field’ that embeds a universal ‘matter of fact’ such as climate change upon which to interpret other ways of knowing as mere ‘cultural representations’; and to critically engage with climate change as always an ‘assemblage’ of diverse knowledges, technologies, strategies, politics, economics, experiences, beliefs, anxieties, fiction and so on – wherever it is at play, be it in the gruelling negotiations of the IPCC, the experimentations in a marine biology laboratory, the framing of a research project, or the construction of a seawall. If, as Turnbull (1997: 553) argues, *all* knowledge is assembled in particular ways to produce a ‘knowledge space’ made up of people, skills, local knowledge and equipment, then a symmetrical anthropology would attend equally to the production of knowledge and perceptions of ‘climate change’ among for instance, scientists and policy-makers, and traditional, local and marginal peoples.

¹⁶ According to Latour (1993:104), “Cultures – different or universal – do not exist, any more than Nature does. There are only natures-cultures, and these offer the only possible basis for comparison”.

This is not an attempt to debunk the science or undermine its value, or to deny that anthropogenic climate change is occurring. Rather, I take seriously Latour's (2004a: 246) argument that "the critic is not the one who debunks, but the one who assembles... the one who offers the participants arenas in which to gather". In this sense, the problem of climate change demands a critical inquiry to understand all that are gathered "to make it exist and to maintain its existence" (Latour 2004a: 246); to give attention to socio-cultural contexts and to the knowledge making and political work everywhere involved in its global assemblage (Collier and Ong 2005: 12).

My thesis

A culture that unites science and policy operates as the authoritative voice on 'climate change', defining useful knowledge and dominating the conversation. Despite a commendable intention to champion local, indigenous or marginal peoples, 'tentative' anthropological research embeds the pre-eminence of 'climate change' and risks contributing further to its stability as a global form "whose significance and validity are not dependent on the 'props' of a 'culture' or a 'society'" (Collier and Ong 2005: 10). As such, local voices are often represented as speakers about 'climate change', rather than as active producers of useful climate change knowledge. This approach "detaches global fact from local value" (Jasanoff 2010: 236) and seriously limits the potential for conversations, collaborations, tensions, and debates among diverse epistemic communities. In this thesis I recognise that the science and policy of global climate change is problematic and a limitation to the working together of science and other ways of knowing. I conceive of climate change as a global form and a creative encounter; a global reality only "in the space of assemblage" (Collier and Ong 2005:12); a gathering of "matters of fact and matters of concern" (Latour 2004a: 233). In my analysis, 'climate change' is always in the space of assemblage – always becoming, always gathering – which implies practice, engagement and friction (Collier and Ong 2005:12; see also Turnbull 2000 and Tsing 2002). I argue this approach paves the way for an open and 'proper' conversation among *all* participants, and that this is necessary for the realisation of 'acting in concert' and living creatively in a common fragile world of climate change (Nowotny 2005; Jasanoff 2010).

My main concern in this thesis is the production of climate change realities within the ‘local’ ‘marginalised’ community of Moch. While I acknowledge Lahsen’s (2010: 165) argument that this may represent a ‘traditional’ anthropology, my engagement with ‘climate change’ is anything but tentative. My focus is on the ways in which climate change is being worked out in practice; in “realities lived on the ground” (Milton 2008: 58) and through a determined engagement with the dominant ‘global’ conversation. I trace processes of fact-finding and meaning-making (Jasanoff 2010: 248) instigated through “encounters with place and materiality” (Hulme 2010b: 274), and examine the socio-cultural and political meanings that shape the production and use of knowledge as the community asserts its presence in a world of climate change (Lahsen 2010: 163). I argue that through a focus on knowledge making and emergent ‘global realities’, the actions of a ‘local’ and ‘marginalised’ community can be taken seriously as talking back to that authoritative voice on ‘climate change’, presenting a ‘new conversational opportunity’ for the realisation of climate change as a grave matter of concern.

Ethnographic fieldwork

I was first introduced to people from Moch in January 2008, when I visited Chuuk State in the Federated States of Micronesia as a member of a research team to conduct a pilot study on heritage and climate change in Micronesia (Henry et al. 2008). This study was a collaborative project between James Cook University and the Chuuk Historic Preservation Office (HPO), initiated during an earlier reconnaissance trip in November 2006 by my supervisor, Dr Rosita Henry, and maritime archaeologist, Dr Bill Jeffery. At that time, the then HPO historical research officer Mr Doropio Marar, suggested a research team from the university return to Chuuk to conduct a pilot study on his home island of Moch, in Satawan Atoll in the Mortlock Islands (see Figures 2 and 3). The pilot study was conducted in January 2008 and involved discussions with state and national government officers on the main islands of Weno and Pohnpei, and a short four day fieldtrip to Moch Island. Our fieldwork on Moch was facilitated by Doropio, beginning with a well-attended public community meeting to explain the study, and then followed by formal open-ended interviews with elders of the community, informal discussions and conversations with various people about climatic events and environmental changes, and a participatory mapping exercise conducted with community members.

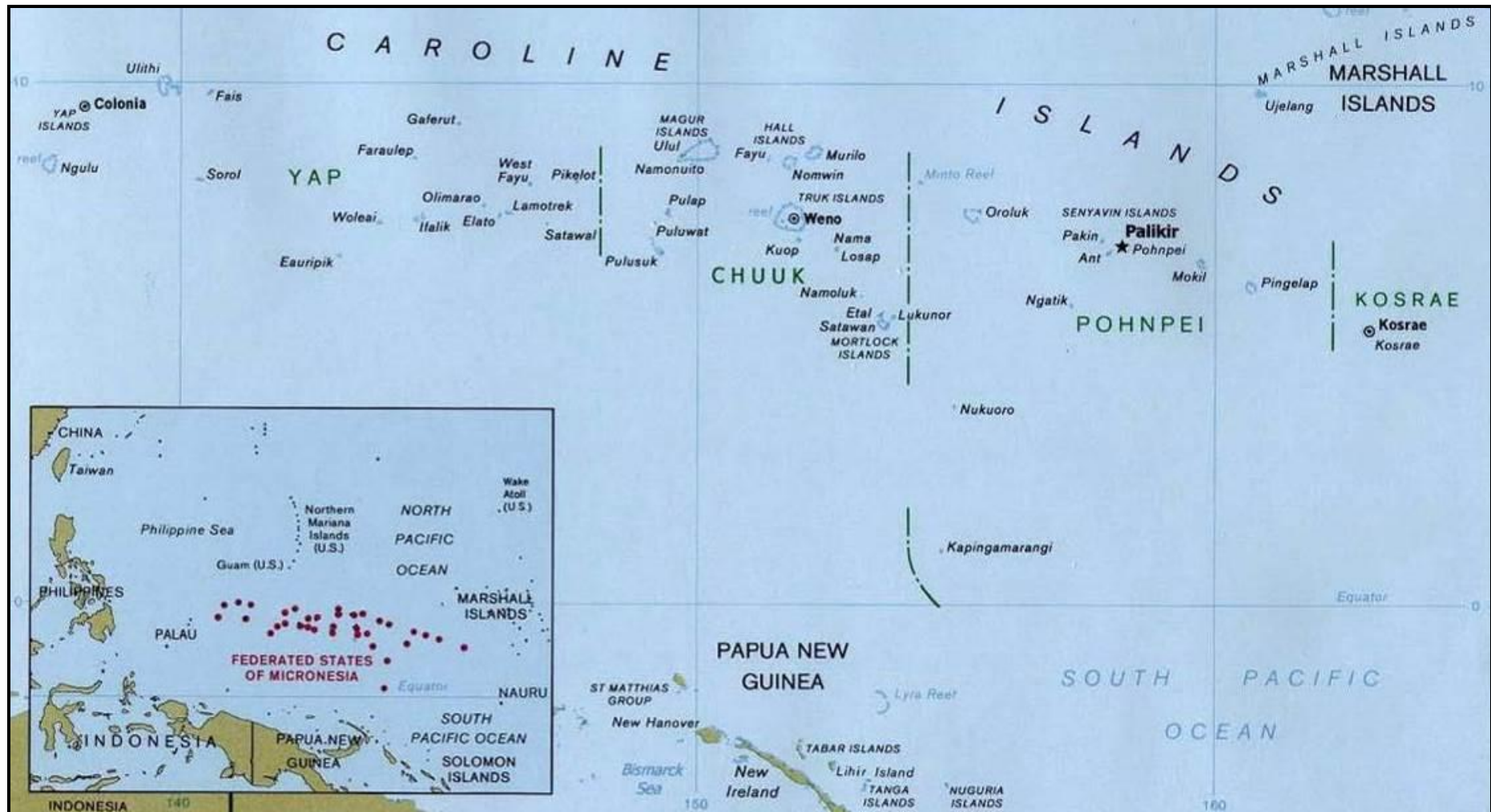


Figure 2: Federated States of Micronesia (Source: Adapted from http://www.lib.utexas.edu/maps/islands_oceans_poles/micronesia_pol99.jpg)

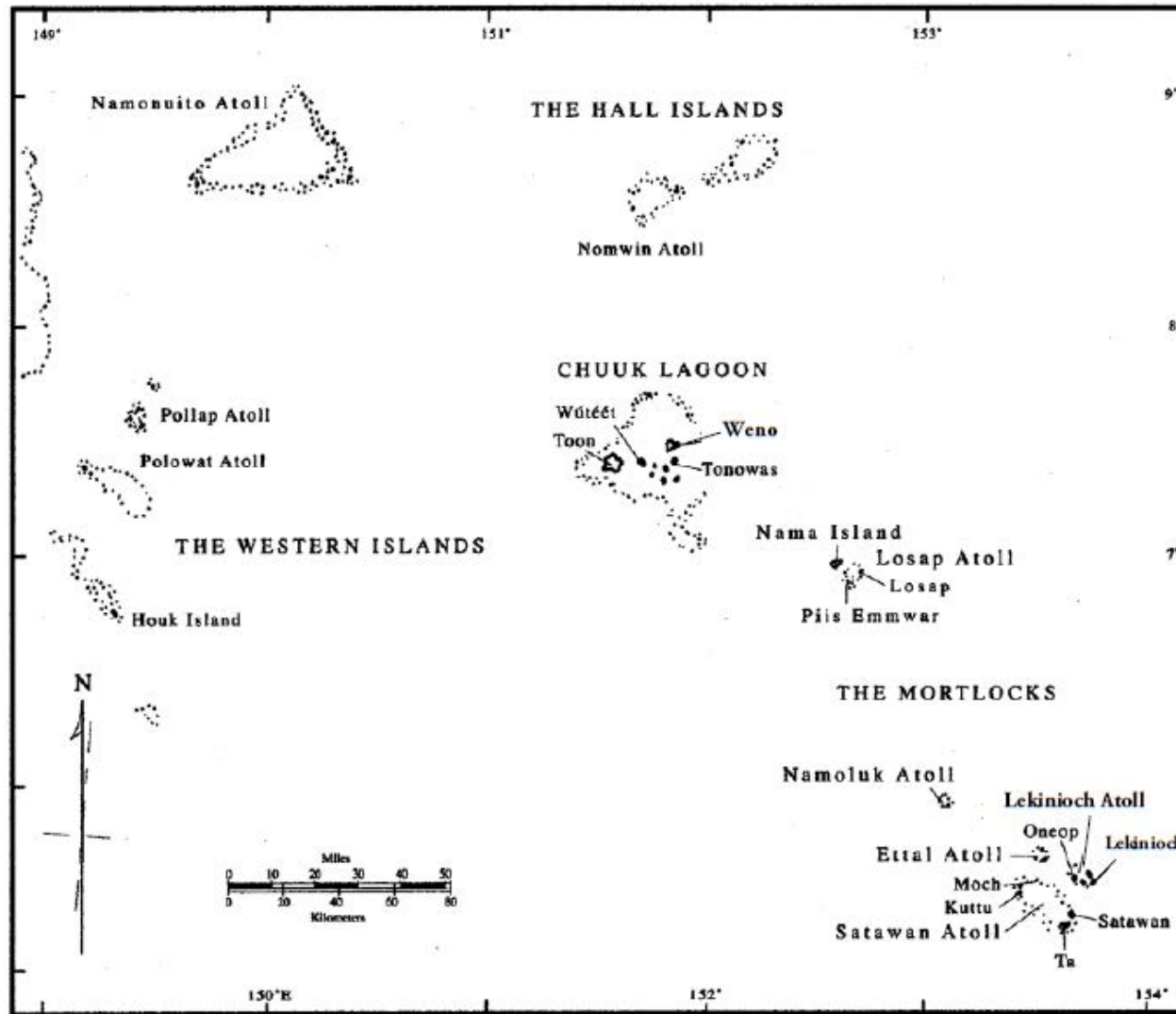


Figure 3: Map of Chuuk State, FSM (Source: Adapted from Marshall (2004: 5))

During this short fieldtrip to Moch, Rosita and I stayed with Doropio's family and visited a number of people and places on the island. We were welcomed into sparsely furnished homes, or sat with people outside their houses, under a lime tree or in the breeze and the sunshine in places close to the shore (see Figure 4). Our interviews and discussions revealed a tentative awareness of climate change in the form of the ice melting and the seas rising, and an associated concern for the future. Some people shared vivid memories of past extreme weather events; fearful memories of Typhoon Pamela in 1976, or of the 'big waves' in 2002. We walked around the island, along the beach of sand and coral or through cleared living areas and vegetation close to, and generally only one to two metres above, the shoreline. On our walk, we were often in the proximity of seawalls mentioned by many as necessary to protect their land, their houses, their families, and their food crops from a seemingly ever encroaching sea (see Figure 5).



Figure 4: Sitting under the lime tree at Rús in 2008, with Doropio Marar (2nd from right) and Rosita Henry (front) (Photo: Bill Jeffery).



Figure 5: Seawalls are ever present on Moch (Photo: Christine Pam).

In order to understand climate change realities and how scientific concepts such as ‘the ice is melting’ is being made meaningful and given force by the people of Moch, I began negotiating with community members to return to the island to conduct further research as part of my postgraduate studies. I was encouraged by community leaders who were happy to have a ‘scientist’ conduct research about climate change on their island and by an offer for my daughter and I to live with Merym and her family during fieldwork¹⁷. I continued to organise the terms of my fieldwork from my home in Townsville throughout 2008, greatly assisted by Bill Jeffery and Doropio Marar who were both still working with the Chuuk HPO during this period. Bill’s regular visits from Townsville to Chuuk, along with Doropio’s efforts ‘on the ground’ and my somewhat intermittent email contact with various government departments culminated in the distribution of a final information sheet about my research project, entitled ‘The Global Discourse of Climate Change and Small Island States’, and consent by the Moch Municipal Mayor for me to conduct fieldwork among the Mochese community.

¹⁷ During my longer term fieldwork Merym was caring for her very ill grandmother (MM) and as such, Jirin and I were not able to stay with her. However, my friendship with Merym continued to flourish and along with her family, became a significant part of both Jirin’s and my everyday life on Moch, and also later for me in Weno in 2011.

My daughter, Jirin and I were met by Doropio when we arrived at the airport in Weno to begin this fieldwork in January 2009, and he became a valuable friend and research assistant throughout my fieldwork. During the two weeks we waited for the boat (the *Lien Pukial*) to leave for Moch, Jirin and I stayed at the Kurassa Hotel and familiarised ourselves with Weno. We walked the ubiquitous wet and muddy roads nearly every day, negotiating the maze of massive potholes and slowly developing the required walking style to limit the flick of mud onto the back of our legs and our skirts (which we were also getting used to wearing) (see Figure 6). I had long conversations with Doropio, who also introduced me to members of the Mochese community living in Weno, and assisted in the organisation of my initial meetings and interviews with state government officers and, most importantly, with the mayor of Moch, Serino Sinem and the State Government Representative for the Mid-Mortlocks, Mike Olap.



Figure 6: A good section of road in Weno (Photo: Christine Pam).

Doropio then travelled with me and Jirin on the boat to Moch, and introduced us to our host family, Kapa and Aprel and their children. Kapa and Aprel had a newly built house in the centre of the island, with an outside cookhouse, bathroom, and a small local hut (*imosen*) nearby. I negotiated with Kapa to stay with his family during my fieldwork; to eat

with them and to contribute to the household through money and work. Jirin and I slept in one of two smaller rooms inside the house, although Jirin soon left me for the company of young women and children who slept in the adjacent big main room. Kapa, sometimes with Aprel and their children and sometimes with related youth, slept in the *imosen* where he told me he could enjoy the coolness of the breeze. We stayed with Kapa and Aprel and their family until I finished my fieldwork in July 2009, and I stayed with them again when I returned to Moch in April 2011.

The day after my arrival Kapa, who was the long-term principal of the Moch School, arranged a meeting to introduce me to members of the community, especially to the Deputy Mayor, Hubert Kiauol. Hubert, also a teacher at the school and *catechista* for the Catholic Church on Moch, opened the meeting with a prayer, followed by Kapa who said it was good to have a study of Moch and reminded everyone present that the whole of the island was my host. I provided copies of my information sheet to those present at the meeting (and to others throughout my fieldwork) and gave Hubert a copy of the report from the pilot study entitled ‘Heritage and Climate Change in Micronesia’ (Henry et al. 2008). Hubert expressed his support for my climate change research and during my stay on Moch would often refer to me in public events – despite my efforts at clarification – as a ‘scientist’¹⁸. This was significant as it indicated that, among certain people on Moch, climate change was clearly understood as a scientific phenomenon. Hubert also made it clear to me on a number of occasions that the name ‘Moch’ should be included in the title of my thesis – not ‘Micronesia’ – and certainly through our many discussions during my fieldwork Hubert kept me focussed on local knowledge and local desires for Moch.

After this initial meeting, the school continued to feature in my fieldwork; not only did I live with the principal and his family and have a daughter in the tenth grade, I worked with Kapa on various funding proposals to employ more staff and improve facilities at the school. In so doing, I met a number of teachers who were working at the school and this led to ongoing discussions with some and the development of friendships with others. I was also pleased to receive a request from the mayor of Moch, Serino Sinem, early in my

¹⁸ Scientists appeared to be held in high esteem by some members of the Mochese community. This sentiment was supported by the reflections of the Peace Corps volunteers who worked at schools on Moch, Satawan and Ta during the period of my fieldwork.

fieldwork to prepare a seawall report for the municipal government which I discuss further in chapter seven. A focus on the report gave structure and meaning to my daily routine, a ‘task’ (Ingold 2000: 195) which provided an opportunity for me to introduce myself to the families of Moch and to familiarise myself with the island landscape. Doropio was integral in this process; organising meetings with people at their places on the shore and acting as an interpreter during interviews. As Ingold (2000:229) suggests, “we know as we go, from place to place”, and certainly as I walked to different places and talked with people from those places about their seawalls, as I recorded information and photographed evidence of wave inundation, and as I listened to stories and experienced the rush of waves onto the shore, the lived reality of Moch became more meaningful.

Though I continued to meet people (mainly men and mainly those who spoke English), discuss ideas, conduct interviews and attend meetings through my association with the school and the seawall report, my developing friendships with Merym and with the women of my household, especially Aprel and Liana, were central to my being on Moch. These friendships, although sometimes difficult, slowly eased some of my awkwardness and allowed me to participate in everyday activities and special events with companionship and a certain sense of belonging, even if limited by my poor understanding of the local Mortlockese language. Further to overcoming my insecurities, I tried to keep in mind Juliana Flinn’s reflection of her own fieldwork on the small island of Pollap, also in Chuuk; “taking advantage of activities, events, and opportunities as they presented themselves – even when they didn’t appear to be directly relevant to my research questions – eventually proved to be enormously productive” (Flinn 2004: 146). So, with this advice and with the support of developing friendships (and often in the wonderful company of Jirin), I was able to work with Aprel and Liana in the cookhouse, play volleyball with women and children in our village, attend a wedding and two funerals, birthday celebrations, Easter celebrations and special church services for the confirmation of a group of children and the baptism of a baby, spend time with Merym to collect pandanus leaves from the small island of Lelang and transform them into a beautifully woven mat, experience traditional fishing for *angarap*, visit with related women from a number of households, watch DVDs with friends, ‘jog’ around the island in the early evening with household members, and ‘holiday’ on the small island of Sanchol with Aprel and her extended family and ‘good neighbours’.

When I returned to ‘the field’ for one month in 2011, these relationships developed through the school and the seawall report as well as through my involvement in social activities and shared events, continued to sustain my research. Whilst ‘stuck’ in Weno for most of this month, I stayed with Mayor Serino Sinem, his wife and children, and members of their extended family in Peniyesene village, and was delighted to find Merym was also living in Weno at that time, in Mechitew village (see Figure 7). Between these two households and another related household in Mechitew village, I became more familiar with the Mochese community living ‘off-island’ in Weno; visiting extended family in their homes, lingering amongst the men who gathered on board the *Lien Pukial* tied at the dock, sharing a restaurant meal with Merym and her husband’s sister Lekila, talking with Mochese students at the College of Micronesia (COM), travelling to and from the central business district most days with Serino and his family, organising rice and other food stuffs to take on my round trip to Moch, and listening to conversations over Skype between Serino and his relatives living in Hawai‘i and the mainland US, or with Kapa and Hubert living on Moch¹⁹. I had ongoing conversations with Serino as we shared dinner in the evenings and was invited to a number of Moch leadership meetings where the submission of the funding proposal for the seawall project was regularly discussed. These meetings were held at the High Tide Restaurant and attended by six to eight prominent Mochese men living and working in Weno. During this time I also interviewed Moch leaders, state government officers, and members of staff at the COM, some for the second or third time.

¹⁹ Since my last visit in 2009, the Moch School had secured the installation of a satellite dish which enabled internet connection on the island. This meant people living on Moch could have direct contact with relatives living in Weno, Hawai‘i, the mainland of the US and elsewhere.

While being ‘stuck’ in Weno actually enriched my research, it was also expedient that during this time the unpredictable schedule of the *Lien Pukial* accommodated a short round trip to Moch. Merym accompanied me on this return journey, and unlike most of my previous trips, I felt nestled among women I knew. This was my third visit to Moch, and the continuity of connection contributed to a sense of familiarity and shared trust which I had not fully experienced before. I was again welcomed by Kapa and Aprel and their family, and during the few short days available before the boat returned to Weno I visited with people both socially and more explicitly related to my climate change research. I found that my feelings of familiarity enhanced the quality of my visits with some people and certainly deepened the substance of my research discussions with others, and as a result, new insights were gleaned even in the very last days of my fieldwork.

You are in the middle of our problem

As already indicated, during the period of my fieldwork I visited both Moch and Weno three times – the first in January 2008 with the pilot study, the second between January and July 2009 when my daughter and I stayed predominantly on Moch, and the third time in March/April 2011 – and this continuity of connection contributed to the quality of my research and enabled a more longitudinal approach to my research topic. My commitment to ethnography meant that during my fieldwork, everything was potentially relevant and as such, I did not limit my engagement to those people, social practices, events or conversations which I may have deemed important or necessary in order to understand climate change realities on Moch.

Yet my research project, and more specifically myself as a researcher, came to embody ‘the climate change discourse’ on Moch, and the ways community members and municipal leaders engaged with me said something about how climate change was ‘worked out at the level of local practice’ (MacRae 2010: 34). This was mostly unavoidable; compounded over time through my initial involvement in the pilot study and then through my negotiations to conduct longer term research on Moch. Certainly people made the connection between my involvement in the pilot study and my later research. For instance, during my fieldwork in 2009 various people mentioned the report that was produced following the pilot study (Henry et al. 2008); one man with a strong interest in climate change told me he had found the report on the internet and shown it to his teacher at COM,

and Merym said her relatives living off-island had cried when they saw the report. Comments were also made that related directly to my first visit to Moch; for example one woman who was interviewed for the pilot study shared an impromptu joke with me that a wave would come and knock down her new house being built on Moch.

Most fortuitously, my fieldwork in January 2009 and again in March 2011 coincided with extreme weather events. As already outlined in the introduction to this chapter, I arrived on Weno in 2009 during a ‘state of emergency’ declared by the FSM president in response to ‘unusual’ tidal surge activity which impacted many island communities. Then in 2011, on the day I arrived in Weno there was a tsunami warning, and with the mayor of Moch and his family, I watched the tragedy unfold on television (CNN, the Cable News Network) as the tsunami hit the coast of Japan. These events framed my research, and in particular, I was requested by the Moch municipal government to write a report on the state of the seawalls and the shoreline on Moch; a report which was used to support a funding application to the national government for resources to build stronger seawalls to protect the island against the effects of climate change. This process not only revealed a particular municipal agency to make sense of climate change in the context of local experiences and desires, but also further established my being on Moch in terms of the action of high tides and big waves, both significant aspects of climate change realities for people living on Moch. So work on the ‘seawall report’ further established my being in the community with ‘climate change’ and evoked ongoing conversations with people about ‘facts that matter’ (Jasanoff 2010: 248); about how things are and how things should be, about the ice melting and seas rising, and about the possibility of evacuation and the desire to stay living on their island. Of course people on Moch were already engaged with climate change prior to my research, but as Hubert Kiauol told me, I was in the middle of their problem²⁰, and this positioning (along with my commitment to ethnographic fieldwork) enabled me to engage in a ‘critical dialogic relation’ (Kapferer 2007: 81) with those Mochese constructing their lived climate change realities.

²⁰ Interview March 2009

Research positioning

My positioning with the climate change discourse, which I initially thought would be limiting, in fact contributed greatly to my ethnographic research and my interpretive analysis of climate change realities among the people of Moch. As such, I contend somewhat with Marino and Schweitzer's (2009: 216) claim that the anthropological investigation of climate change will proceed farther if 'we stop talking about it'. In their chapter on climate change perceptions in Inupiaq communities in northwestern Alaska, they argue the power of the term 'climate change' complicates anthropological investigations of local environmental change; they say using the term alters local patterns of speech and "we can miss documenting local knowledge" (Marino and Schweitzer 2009: 215). Whilst their intention to emphasise a multiplicity of worldviews and divergent explanations of change should be commended, their approach tends to perpetuate an understanding of local knowledge as bounded and static in the same way they claim "the global discourse on climate change is bounded and limited" (Marino and Schweitzer 2009: 216); that such diverse knowledges are somehow separate from and in opposition to each other (see also critique by Rudiak-Gould 2011: 10).

Yet indigenous peoples in northwestern Alaska, just as the people of Moch, are already engaged with the global discourse of climate change and anthropology as a discipline *should* attend to such complexities. Here, Rudiak-Gould (2011: 9) makes an argument for the importance of what he calls 'reception studies'; studies to understand "how societies receive, interpret, understand, adopt, reject and utilize" the scientific discourse of climate change. As an example, he draws on his own attention to both the scientific discourse and local experiences of change in his study on perceptions of climate change in the Marshall Islands. However, somewhat in-line with Marino and Schweitzer's claim, Rudiak-Gould (2011: 12) makes it clear he did not announce himself as a climate change researcher and he asked about environmental changes before asking about climate change²¹.

It is important to emphasise here that while I did not actively set out to talk about 'climate change' and nor did I promote myself as a climate change researcher, people often engaged

²¹ In a study of atoll island communities in the Solomon Islands, Birk (2012: 87) similarly avoids questions of climate change until the end of each interview.

with me through my association with ‘climate change’ and this provided a very different research context to that described by both Marino and Schweitzer (2009) and Rudiak-Gould (2011). Certainly, at the beginning of my study, especially during 2008 when I was negotiating to conduct fieldwork on Moch, I struggled with the compulsion to distance myself from ‘climate change’ in order to limit researcher influence and ‘static’ (a desire for objectivity?). However, throughout my fieldwork and later back in my office in Townsville, I found by actively reflecting on *my being positioned as* a ‘climate change researcher’, very particular climate change realities were revealed. In this sense, I argue my awareness of this positioning was “an imaginative and embodied attempt to enter within the phenomenon in question” (Kapferer 2007: 84), to be immediately present within social processes of meaning-making which gives climate change force within the community of Moch.

Research ‘at home’

In between my field trips to Moch and Weno, and especially during 2010 I attended climate change related public lectures and seminars ‘at home’, at James Cook University in Townsville; predominantly those organised through the Australian Research Council Centre of Excellence for Coral Reef Studies (CoE)²². I felt compelled to attend the CoE lectures and seminars for multiple reasons; firstly, the focus on coral seawalls which had developed through my fieldwork on Moch in 2009; secondly the CoE is internationally renowned for its contribution to coral reef research and is headquartered at James Cook University²³; thirdly the role of coral reef scientists in establishing governance priorities for coral reefs in the context of climate change; and finally a research interest in the interface between science and other ways of knowing.

The seminars I chose to attend were quite diverse, presenting research on such topics as the management of coral reefs, coral biogeography and larval ecology, coral reef fish

²² I continued to attend similar seminars in 2011, 2012 and 2013, although much more intermittently than I did during 2010.

²³ According to the CoE website, “The Centre of Excellence cements Australia’s leading contribution to coral reef sciences, and fosters stronger collaborative links between the major partners and 24 other leading institutions in nine countries... Collectively, the Centre creates the world’s largest concentration of coral reef scientists” (<http://www.coralcoe.org.au/>).

physiology and larval dispersal, and coral immunity, always in the context of climate change and especially in relation to the impacts of ocean acidification and an increase in ocean temperature. Significantly, the first seminar I attended was a candidate seminar for a Super Science Fellowship offered through the CoE for research on the resilience of coral reef ecosystems to climate change²⁴. Despite this context and reference to climate change in both the title and abstract of the seminar, ‘climate change’ was only mentioned once during the presentation, at the very beginning, as an aside, an example only of possible changes that would have an effect on coral reefs. This notable absence was the subject of the first question asked after the seminar; why, given the context of the fellowship, climate change was not mentioned? The presenter responded; he probably should have put in ‘the CC’ a little more often, and that he considered his research, by definition, to be about the resilience of reef communities to climate change. This was not an uncommon sentiment expressed in many of the seminars I attended and raised particular questions; how is climate change as a concept made meaningful within a scientific community; does ‘climate change’ provide an explanatory framework from which coral reef biologists then conduct their research; how does this compare with ‘climate change’ being put to work by members of the Mochese community; and what does all this mean for the governance of coral reefs and the construction of seawalls? These questions have had an influence on my analysis throughout this thesis, and while I consider them directly – albeit briefly – in chapter seven, they are more suggestive of potential future research to understand the working together of diverse epistemic communities.

Moch Island: a coral reef community in Chuuk State, FSM

The Federated States of Micronesia (FSM) is a federation of four relatively autonomous states – Yap, Chuuk, Pohnpei, and Kosrae. The FSM became self-governing in 1986 under conditions set forth in a Compact of Free Association with the United States of America (US); under Compact 1 for the first fifteen years, and under Compact 2, negotiated in 2004, for a further twenty years until 2024. The overall population of the FSM is 103 000, of

²⁴ In 2010 the CoE was awarded five prestigious Super Science Fellowships for the study of the resilience of coral reef ecosystems to climate change. These fellowships, part of the Australian Government’s Super Science Initiative to attract and retain outstanding early career researchers, enhanced the CoE’s profile as a leading research institute on coral reefs and climate change.

which 48 000, or nearly 50 percent live in the state of Chuuk. Chuuk has a number of high islands centrally located in Chuuk Lagoon, surrounded by many inhabited low-lying islands in the north, west and south of the state (see Figure 8).



Figure 8: An aerial view of Weno, and other high islands in Chuuk Lagoon (Photo: Christine Pam).

Moch is a low-lying coral island in the outer island region of the Mortlocks, which extends for approximately 250km to the south-east of Chuuk Lagoon, from Nama in the north to Satawan Atoll in the south (see Figure 3). The region includes eleven inhabited coral islands divided politically and statistically into three sub-regions, the Upper, Middle, and Lower Mortlocks (see Figure 9).

Upper-Mortlocks	Mid-Mortlocks	Lower-Mortlocks
Nama	Namoluk	Oneop
Losap	Ettal	Lekinioch
Piis-Emwar	Moch	Satawan
	Kuttu	Ta

Figure 9: Inhabited islands in the three sub-regions of the Mortlocks

During my fieldwork the population of Moch was approximately 650, which did not include all those Mochese living off-island, predominantly in Weno, but also in Guam, Hawai'i and the mainland of the US²⁵. I was told the overall population of Moch is 'more than 1000', and that if everyone from Moch lived on the island then the island would sink. Certainly Moch has at times been reported as the most densely populated municipality in Chuuk (FSM 1992). While subsistence activities such as fishing, growing taro, breadfruit, bananas, coconuts, and other food plants, and raising pigs and chickens remain the primary way of life on Moch, relatives living off-island provide essential food items, goods and services, and information necessary to sustain their community. Long established connections with other island communities, especially in Satawan Atoll and with Ettal, serves to extend access to local resources and information, and contributes to a shared identity of being Mortlockese for people living beyond their home islands.

There are about 100 households on Moch, distributed between three villages, Inapwei, Peimoch, and Eor. These villages transect the island and are connected by the main path around the island. Whilst households are concentrated on the lagoon side or 'front' of the island, a number of families have moved to the 'back' of the island as the population of Moch has increased and people seek peace and quiet (see Figure 11). Most of the houses have been built since 1970, with an apparent flurry of building activity up until the early 1990s, possibly as a result of the adverse effects of Typhoon Pamela in 1976 (FSM 2002; Marshall 2004: 65-67). Houses continue to be built on Moch, with many in various stages of completion during my fieldwork. Most houses had a concrete slab floor, and whilst cement blocks were now predominantly used as building material, iron sheeting, plywood, thatch, and local wood still formed the outside walls of many houses. Corrugated iron roofing provided a rainwater catchment to fill containers and drums for drinking, cooking and washing, supplementing the water available from household wells. Food was cooked by women on open fires in the cookhouse, although occasionally a kerosene cooker was used for convenience. There was no central electricity supply on Moch, although a large solar power system had recently been installed for the school (and municipality), funded

²⁵ This figure is based on the number of sacks of rice distributed as food relief to every person on the island, and further supported by anecdotal evidence of church attendance and voter turn-out during the 2009 election. According to the census, the official population of Moch is 854 (FSM 2002).

through a European Union Renewable Energy Program. Some households had access to a small solar panel and battery – or took their battery to the school for re-charging – used for lighting, to operate a CB radio, or screen a DVD on a portable player. The high cost of fuel mostly restricted the use of generators to special events (e.g. funerals), and also limited the use of the small motor boats owned by some families. Outrigger canoes were a common sight on the shore and in the lagoon, carved from the large trunks of breadfruit trees.

Nearly every person from Moch belonged to one of five existing matrilineal clans; Sópwunupi, Likilup, Sór, Wáánikar, and Soren Iluk. Whilst clan status was important, it was not particularly elaborate, and was predominantly based on priority of settlement, although land ownership and population size extended some power and influence (Nason 1970: 59-60; Alkire 1977: 47; Lessa 1950: 16-17; Hezel 2004). Sópwunupi is widely recognised as the first clan to settle the island, and subsequently claims chiefly status. As such, a man from the chiefly lineage of Sópwunupi clan is not only recognised as the chief of that clan, but also as the paramount chief of the whole island. Although both clan and village identity were always important and at times quite prominent, people were also predominantly Catholic (96%) and this presented a sense of unity and cohesion, especially given the influence of religion on the organisation of everyday community life²⁶. Indeed, religion was written into the Moch Constitution which established a tripartite relationship of respect between Church, Culture and Municipal. The Catholic Church dominates the island landscape; an impressive cement building centrally located in Inapwei village alongside an equally impressive two-story school building and a somewhat less remarkable municipal building (see Figure 12). A small Protestant Church is located in a family meeting house in Eor village. During fieldwork on Moch I lived with a Catholic family in Inapwei village; a family of Sór clan with strong associations to Peimoch village and paternal links with Sópwunupi clan. I also developed friendships with people from Soren Iluk clan which often took me to Eor village, and was also acquainted with people from Wáánikar and Likilap clans.

²⁶ The remaining 4% of the population of Moch were Protestant.

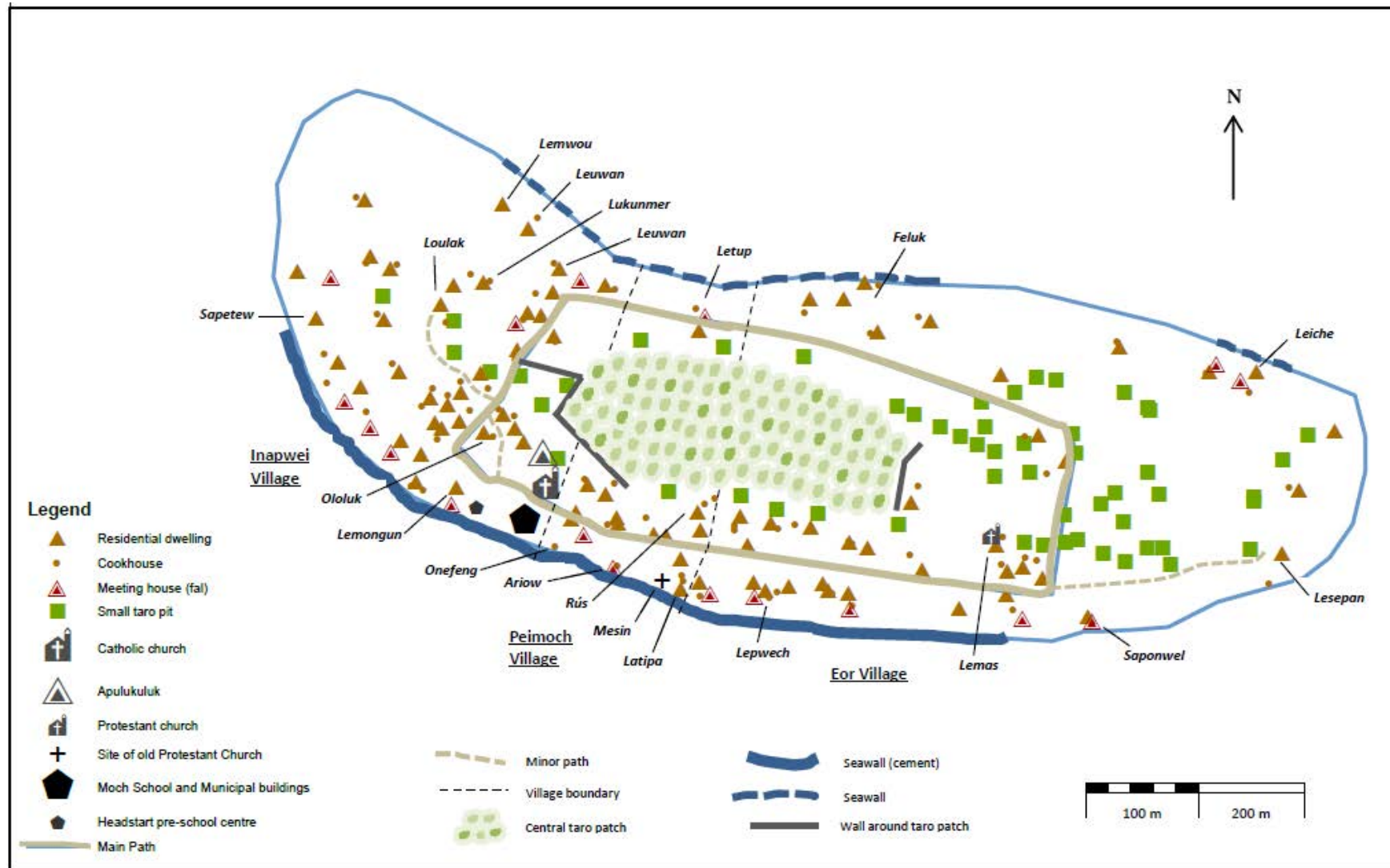


Figure 11: Moch Island

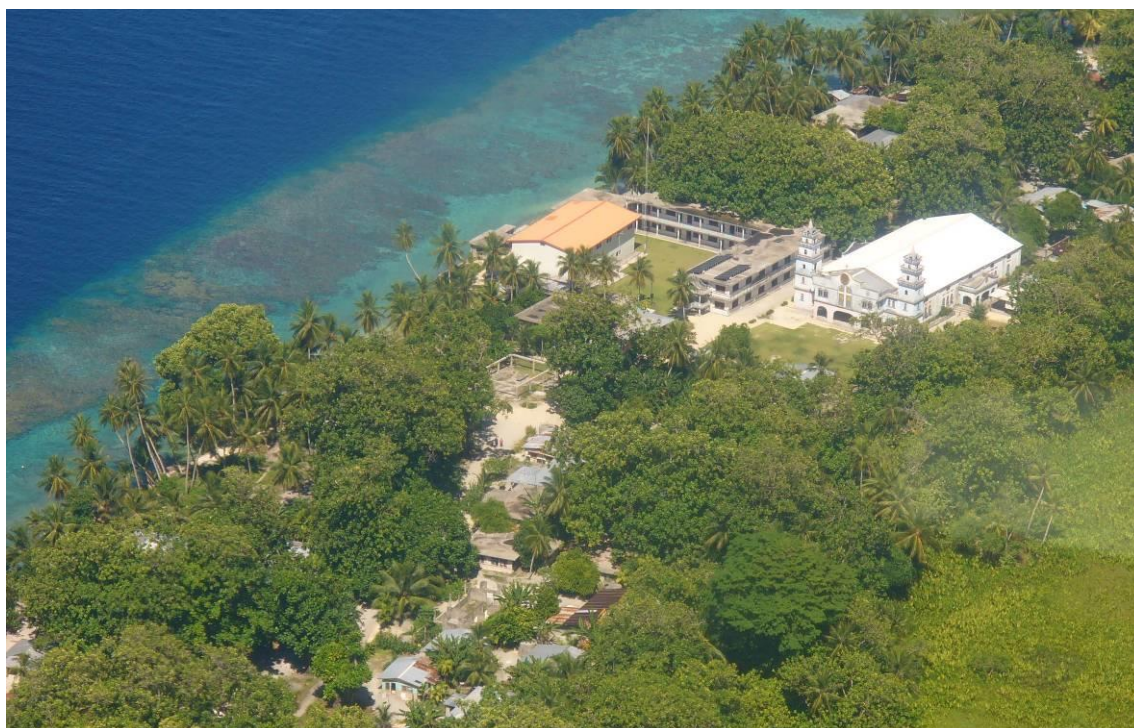


Figure 12: An aerial view of the Catholic Church, the Moch School and the municipal building (orange roof), centrally located at the front of the island (Photo: Christine Pam).

The Moch Elementary and High School is recognised as a school of excellence, always placed in the top ten schools of Chuuk (Hezel 2001). The school is strongly supported by the Mochese community and the municipality, and attracts high school students from other islands in the Mortlocks who come to Moch and live as ‘sponsors’ with Mochese families. The emphasis on education is palpable on Moch, inspired by the success of a number of Mochese men, especially those who have founded successful schools on Weno, and by the efforts of a committed principal and school leadership who ‘dream the impossible’, and an active and engaged municipal government. The municipal government allocated Capital Improvement Project (CIP) Funds to construct the school facilities and the municipal building, and remains active in developing other services on the island, such as the health dispensary and the police sub-station.

Whilst these state institutions provide most of the (limited) wage-labour opportunities on the island, some people are privately employed as builders or labourers, and still others produce locally made goods for sale, such as clothing, fans, mats, and coral pounders. Some families operate small stores from their houses, selling items imported from Weno such as coffee, sugar, biscuits, batteries, mosquito coils, and cigarettes, a few have fuel

available, and some sell sea cucumber and/or shark fin to the occasional visiting business operator²⁷. Given these limited economic opportunities, remittances from those relatives living off-island remain an essential means through which families have access to money on the island (Hezel and Levin 1996, Connell and Brown 2005).

Traditional links with Chuuk Lagoon and the development of public services and educational and economic opportunities on Weno, especially since the end of World War II, have contributed to an out-migration of people from Moch and from other outer island communities to Weno (Gorenflo 1995: 96-97, FSM 2002, Marshall 2004:114-117; Dernbach 2005: 40). Certainly, government departmental offices, the Chuuk State Hospital, a number of private and public secondary schools, tertiary education facilities including the COM, the international airport, telecommunication and postal services, and banking and commercial businesses are all now located on Weno, and as a result nearly one third of the overall population of Chuuk now live in this urban area (Dernbach 2005: 40, FSM 2002). A community base on Weno has become increasingly important for Mochese families; to access educational and employment opportunities, to establish businesses, to receive medical care, and as a base from which to travel onwards to other places such as Pohnpei, Guam, Hawai‘i and the mainland of the US (see also Connell 1986: 45; Marshall 2004: 114-116).

The Mochese community is well established on Weno, mostly with households in Mechitew village where the main meeting place for Moch is located, but also in the villages of Peniyesene and Mwan (See Figures 13 and 14). The number of Mochese living on Weno is difficult to determine as changing family circumstances constantly impact residential status; people not only regularly move between Weno and Moch or elsewhere, but also between households on Weno. Land on Weno has either been acquired through marriage, or purchased by those Mochese who have been successfully employed over the years in well-paying government jobs. While this “new elite” (Marshall 2004: 116) may have enough money to own vehicles, TVs, telephones and computers, and to be connected to the internet and to pay TV (CNN), life in Weno for outer-island communities can be difficult. Many households are often overcrowded, and given limited access to land and

²⁷ When I was on Moch in 2011, a Korean business man was buying shark fin and trying to establish a venture to dry sea cucumber on the island.

opportunities for gardening and fishing, the costs of living are high. People rely on supermarket foods which are expensive and often a long walk from home. There are only a few vehicles available within the community, and not only are fuel costs high, but the roads are notoriously bad and vehicles are in constant need of repairs. Electricity is expensive and unreliable, as the Chuukese Government struggles to pay for diesel to keep the generators feeding the grid, and there is limited access to running water and sanitation. While some are drawn to the “urban lifestyle and Pacific port town characteristics” (Marshall 2004: 114) of Weno, others experience the problems of urbanisation, such as overcrowding, unemployment, alcohol consumption, and living near strangers as challenging and prefer to return to Moch where life is familiar and the costs of living are minimal.



Figure 13: A number of houses have been built close together on this land in Mechitew village. There are two more houses directly behind where this photo was taken (Photo: Christine Pam).



Figure 14: Serino built this house in Peniyesene village. His wife is from this village and access to land has been through marriage. There is another house on this land where people from Moch also stay when they are in Weno (Photo: Christine Pam).

The anthropology of Micronesia and climate change²⁸

There has been extensive research carried out by anthropologists throughout Micronesia since the late 1940s, in part due to the Coordinated Investigation of Micronesian Anthropology (CIMA) supported by the US Navy between 1947 and 1949 (Kiste and Marshall 1999). A substantial literature base has accumulated since then, which has successively and steadily contributed to a “collective knowledge of Micronesian culture and society” (Marshall 1999: 422). It is interesting to note from Kiste’s (1999: 455-457) retrospect of the discipline in Micronesia that ethnographic studies focused on kinship and social organisation, land tenure, and other more ‘traditional’ topics (Lessa 1950; Fischer and Fischer 1957; Alkire 1960; Gladwin 1970; Marshall 1972; Goodenough 1978; Petersen 2009) have given way to a flurry of work focussed on issues of sociocultural change (Nason 1970; Lingenfelter 1975; Flinn 1992; Marshall 2004; Dernbach 2005).

²⁸ I use the term ‘Micronesia’ here for simplicity, to loosely refer to a region of the northwestern Pacific, from Palau in the west through the FSM to the Republic of the Marshall Islands in the east. I am aware that the concept of ‘Micronesia’ is problematic and has attracted much debate within the discipline, especially as a colonial construct and as a so-called ‘culture area’ (Kiste 1999; see also Petersen 2006: 82).

Furthermore, a number of these have investigated social change in relation to the impacts of typhoons on island communities (Schneider 1957; Lessa 1964; Marshall 1979) and the devastating changes wrought by nuclear testing in the Marshall Islands (Carucci 2004).

Pacific Islands have risen to prominence in a world of global climate change; as vulnerable places to the impacts of sea level rise, as the ‘canaries in the coal mine’ for cosmopolitan anxieties (Farbotko 2010: 54), and as an Alliance of Small Island States (AOSIS) in intergovernmental debates. However, given the ‘spectacle of the disappearing islands’, and the long marginalisation of islanders who are subsequently “denied their own agency in the climate change crisis” (Farbotko 2010: 58), it is perhaps surprising that there are so few in-depth ethnographic studies of climate change as it is experienced, understood and implemented by island communities. Important exceptions include work by Rebecca Hofmann in Chuuk, Peter Rudiak-Gould in the Marshall Islands, and Heather Lazrus and Carol Farbotko in Tuvalu. Hofmann (2013) has presented initial research from Chuuk, focusing on changing perceptions of nature, environmental awareness, and migration, especially in relation to the impact of climate change. She posits the potential for new sensibilities to create “pioneer communities at the forefront of global environmental change”. More extensive work has been carried out by Rudiak-Gould (2012, 2013a, 2013b, 2014a, 2014b), who studies climate change attitudes and responses in the Marshall Islands. He examines the reception of information about the threat of climate change to ‘ordinary’ Marshall Islanders, and the various ways that climate science is translated into something believable. According to Rudiak-Gould (2012, 2014a), Marshall Islanders corroborate climate change through importing the phrase into the Marshallese language, through reference to perceived environmental and social changes, and through “synonymizing the new discourse of global warming with the older traditionalist narrative of decline” (Rudiak-Gould 2014a: 152). As a result, there were a “whole slew of perturbations – cosmic, meteorological, geological, oceanic, temporal, moral, cultural, economic – [that] counted as evidence in favour of the scientific assertion of climate change” (Rudiak-Gould 2012: 51). Significantly, rather than these being discarded as a hindrance to climate science communication, Rudiak-Gould (2012: 53) argues such ‘promiscuous corroborations’ can actually enable dialogue between Marshall Islanders and scientists (and ‘Westerners’).

Although further afield from Micronesia, Carol Farbotko and Heather Lazrus have both conducted relevant ethnographic research on climate change in Tuvalu. Farbotko (2008a, 2010) examines the representations of Tuvalu in climate change discourses and their constitutive roles in relations of power. In a world of climate change, Farbotko (2008a) provides a critical analysis of the discourses produced by researchers, environmentalists, and journalists that represent Tuvalu as a frontier of climate change, as a learning space for sustainable living, and as disappearing islands where people are transformed into climate refugees. Yet, as Farbotko (2010: 50) evidences, Tuvaluans are actively engaged in climate change debates and are making attempts to censor such representations. That these attempts have been largely unsuccessful speaks to relations of power embedded within the construction of ‘climate change’ as a global environmental problem.

Alternatively, Lazrus (2009a) has applied a theoretical approach grounded in political ecology to examine Tuvaluan perceptions of climate change impacts and the governance of vulnerability to those impacts at regional, national and community levels. Although Lazrus recognises that Tuvalu’s response to climate change is embedded within the larger Pacific region, she also attends to a more localised governance of vulnerability where political power is invested in traditional authorities and “the potential is strong for adaptation and governance of vulnerability to return to the authority of traditional island leaders” (Lazrus 2009a: 226). She details local observations of environmental changes and argues that, despite a resonance with IPCC predictions, vulnerability must be understood through the different ways in which these changes are perceived among diverse actors. As such, the governance of vulnerability cannot be imposed from above but must be driven by local aspirations and needs. Indeed, critical collaborative work by Farbotko and Lazrus (2012) on ‘the first climate refugees’ demonstrates the value of foregrounding islander perspectives on climate change and migration. They argue that islander perspectives represent migration as an everyday practice and this “offer[s] alternatives for equitable and effective policy to address climate vulnerability in the Pacific” (Farbotko and Lazrus 2012: 388).

Collectively, the substantial work conducted by Lazrus, Farbotko, and Rudiak-Gould presents an extensive critical analysis of climate change and Small Island States in the Pacific. While I understand my own research is therefore in good company, I want to

emphasise a point of difference from which to recognise the significance of my work in Chuuk generally, and with the Mochese community in particular. Tuvalu, like the Marshall Islands, is a low-lying nation state and as such, attracts much attention not only as ‘disappearing islands’, but also as a sovereign state whose existence is threatened by climate change. As a result, research on Tuvalu and the Marshall Islands tends to privilege a state level of analysis as local communities are subsumed within a ‘disappearing nation’. This resonates with a focus on national and regional analysis within the IPCC, and problematises the notion of ‘hearing local voices from Small Island States’ (Kelman 2010). While this will be considered further in chapter two, suffice to say that in contrast, my research remains focused on the low-lying island community of Moch, and its location within and connections with a nation state of high and low-lying islands.

Chapter outline

In the following chapters I engage with theory and the broader literature to interpret the ethnography and present a critical analysis of ‘climate change’. The thesis is ethnographic in order to present the fullness of the circumstances from which I develop my analysis, and also in recognition of my determination to make it accessible and meaningful for a wider audience, especially for members of the Mochese community. In the following chapter I consider the global discourse more directly, especially in terms of the construction of small islands as highly vulnerable to the impacts of climate change. While I evidence an engagement with this discourse at the regional and state level, I focus on the Mochese community and the significance of place and mobility in the context of vulnerability. I examine everyday practices of sociality which contend with risks and orient the community towards the future.

My analysis in chapter three stems from a minor tidal surge event which prompted reflections that ‘it was not like this before’. As a result, my attention was directed towards seasonality as articulated and practiced by members of the Mochese community. Rather than simply documenting seasonal knowledge, I analyse the significance of seasonal expectations as a reflection of the ‘normal order of things’ from which people move along with the world conducting their activities of everyday life (Ingold 2000: 200). In particular, I attend to one prominent man’s tenacity in asserting the significance of his seasonal knowledge in the context of my research project about climate change.

It was apparent there were certain weather events and environmental changes being observed that disrupted seasonal expectations, challenged seasonal knowledge, and actuated feelings of concern and uncertainty within the community. In chapter four, I consider Mochese observations of environmental change within the context of this uncertainty, and attend to community reflections on the transmission of knowledge which seemed to contribute to the very ‘unprecedentedness’ of the changes.

As uncertainty takes hold and people begin to wonder at the cause of such changes, a new explanatory framework is being brought into the community; that the globe is warming, the ice is melting and the seas are rising. In chapter five, I examine the ways in which scientific understandings of climate change are brought ‘home to roost’ amongst the community (MacRae 2010: 45). In particular, I focus on ‘the melting ice’ as a scientific phenomenon that is being actively processed ‘word-by-mouth’ to make sense of unusual high tide and wave events, and consider the work being performed by specific Mochese people to facilitate a shared understanding of climate change as a ‘matter of concern’ for the lived reality of the Mochese community.

The realities of climate change being worked out by people living on the island are becoming entwined with the community practice of building coral seawalls. In chapter six, I strive to better understand the Mochese community’s predilection for seawalls to protect their island from an ever increasing high tide. I examine the way people of Moch engage with coral in their everyday lives to build an inhabitable island. More specifically, I posit the argument that, living in a world of coral, coral rubble and sand, an island *habitus* generates cultural practices oriented towards a relationship with coral, and this relationship engenders a ‘common-sense’ engagement with climate change as revealed through the building of seawalls.

In chapter seven, I consider Mochese community and municipal efforts to position coral seawalls within the global discourse and to assert their presence and leadership in a world of climate change. I examine the ways in which ‘coral’ and ‘climate change’ are put to use by the Mochese community, and the tensions that manifest ‘in conversation’ with the global governance of coral reefs as a ‘natural’ ecosystem highly vulnerable to the effects of

climate change. In the final chapter I synthesise the chapters to gather together all that matters in the making of climate change realities for the Mochese community.

Chapter 2 The everyday sociality of a home/island community: challenging a discourse of vulnerability

Introduction: A journey by boat

Despite a disposition towards small boats and expansive oceans that stems partly from childhood memories of holidays spent being severely dumped onto the beach by very big waves, partly from a boat accident in my late teenage years, and partly from a general desire to feel the earth beneath my feet, a 180 nautical mile trip on a ‘small’ boat, the *Lien Pukial*²⁹, across the open ocean from the high island of Weno to the low-lying outer island of Moch seemed like an exciting and somewhat ‘authentic’ way to begin my fieldwork (see Figure 15). My daughter and I travelled on this boat to Moch in late January 2009, during the rough season when the winds blow and the ocean swells. It was a long and arduous journey; very rough with big waves, salt spray, and heavy rain blown horizontal by the wind. Diesel fumes intermittently engulfed the back deck and became trapped under the awning that did little to protect us from the weather. Sometime during the night the engine faltered and we rolled in the darkness with the ocean swell, listening to the hammering and clattering below the deck. While this elicited feelings of trepidation, it also relieved my desire to ‘*just stop for a break*’; this was no road trip and there was no stopping the swell that was the Pacific Ocean at that time of year.

It was a very crowded journey – people pressed in and all available space taken up – and moving around the boat was extremely difficult and best avoided. Indeed, an absolutely necessary trip to the ‘bathroom’ involved stumbling over people, bags, boxes and eskies, finding the little available space for my next foot step, and holding onto whatever was available to prevent myself from falling. The doors to the toilet were dodgy and the window was jammed open, facing onto the walkway the men used to move between the front and back decks; an altogether disagreeable affair that explained why so few women seemed to visit the bathroom. As well, despite taking tablets I felt seasick as soon as the boat left Chuuk Lagoon and then all the way to Moch on the open ocean. I really just

²⁹The *Lien Pukial* is owned by the Moch Municipal Government, and travels somewhat regularly between Weno and the islands of the Mortlocks.

needed to lie down, which entailed holding onto the edge of the raised platform with my fingers at one end and my toes at the other to prevent myself from falling onto the deck, and at the same time trying to keep my skirt somewhat presentable and hold a tarp over my daughter to keep her protected from the rain. After a 24 hour journey, with bruises on my shoulders, back, hips, knees and ankles, we arrived on Moch Island wet and cold and tired and sore. As I wrote in a letter soon afterwards, it was an *‘awful awful trip and I never ever want to do it ever ever again’*.



Figure 15: A very crowded journey: The *Lien Pukial* getting ready to leave Weno (Photo: Christine Pam).

While in the course of my fieldwork I travelled on the boat between Moch and Weno many times, it was on that initial journey to commence my long term fieldwork that I was really confronted by the overwhelming discomfort experienced by my fellow passengers who were travelling to Moch or to other islands in the Mortlocks. Rather than taking the journey ‘in their stride’ as an easy everyday cultural practice – which is what I expected³⁰ – many of the passengers, especially women and children, suffered a miserable journey somewhat

³⁰ Here I refer to my own assumptions, as well as to mentions in the literature of how comfortable Islanders are on the water (Kirch 2000: 49; D’Arcy 2006: 30).

akin to that experienced by my daughter and myself. The ‘survival’ strategy enlisted by most women passengers (if space permitted) entailed lying down as soon as possible and remaining in that position for as long as possible; essentially shutting down for the duration of the journey. However these measures did not prevent many from being seasick. While women near the sides of the boat hung over the rails and vomited into the ocean, others held a towel to their mouth or vomited into plastic bags or onto the deck. Crying children were held and comforted, and a number of women had their backs rubbed by others close by as they heaved over the rails or into their towels³¹.

Men often provided support for related women and children travelling with them on the boat. These men lingered close-by or returned regularly to check on their needs; to fetch and carry, support and comfort. Sitting or lying on their mats, women would direct men to fetch a bag from the other side of the deck, or pass their footwear, or deliver shared food to others further away. One man sat with his seasick wife and nursed both his young children as they vomited onto the deck, and another young man stayed close to an older woman (his father’s sister) and her young grandson as they both suffered from seasickness and the cold rain that blew onto the deck. On another trip I watched a man sitting upright on a bucket, providing support for a young woman who leaned against him for the duration of the journey; and a man and woman who sat together on an esky at the rails for the entire trip, the man rubbing the woman’s back as she intermittently threw up over the side of the boat. Indeed, back-rubbing often accompanied the heaving motions of seasickness, performed by either men or women, whoever happened to be nearby. Whilst a man from Weno, a stranger on his first and probably only visit to the Mortlocks, claimed the journey offered him a good opportunity to touch young women without suspicion, back-rubbing was mostly carried out by caring male relatives sitting among other passengers who were known to each other.

Men were generally more mobile on the boat; they moved easily between the front and back decks, or climbed onto the roof where they were exposed to the weather and the

³¹ In 2011, on my final visit to Moch, I met a woman who loved the boat journey. She was going to Moch with her baby to visit relatives for the first time in many years. She refused my offer of seasickness prevention tablets, and although she remained on her mat with her baby, she sat up most of the way and really enjoyed being on the ocean.

extreme roll of the ocean. They would stand in small groups, talking and smoking cigarettes, or sit on their own on top of the 24 gallon drums of fuel secured to the rails. They tended the heavy fishing lines which were released into the ocean in the hope of catching a tuna or a sailfish³². Although this mobility made it difficult to gauge the effect of the journey on men generally, overall they fared better than women on the journey. However, Doropio later told me that when the waves intensified towards the end of the journey he was also seasick, and like many of the women some men slept during the journey.



Figure 16: Satawan Atoll as tufts of vegetation in a vast ocean (Photo: Christine Pam).

Significantly, on that journey by ‘boat’ to commence my fieldwork I felt I was approaching a very small, remote, isolated (and vulnerable) island only recently tethered to the world of my imaginary (see Figure 16). Certainly, the appearance of Satawan Atoll as tufts of vegetation floating precariously on the horizon, along with the distance we had travelled across a relentless ocean that had challenged my resolve and prompted meditations on death and dying, and the intense discomfort shared by many throughout the journey, all contributed to a feeling of coming to a distant point; an end point; the smallest point in a much larger world. This sensation was supported by an earlier experience, when prior to my first visit in 2008 I had searched for Moch on various maps and was generally confronted by very small dots or an empty ocean. Doropio later shared a similar experience

³² Indeed on one boat trip I woke to the sound of heavy thrashing on the deck, and opened my eyes to stare into the gaping mouth of a magnificent blue and yellow sailfish as it gulped for oxygen. The sailfish was butchered on the boat and, having gone back to sleep, I was told later that I had missed out on eating *sasimi*.

he had during his studies at a university in the mainland of the USA, in which he showed fellow students where his home island *should be* on the map. According to Doropio, the students were perplexed by this and he was left with the feeling that ‘no one knows we are here’. Yet, as Doropio and others attest, there are many island communities ‘there’ in the Pacific Ocean, home to hundreds of thousands of people and to dwelling places made by particular relationships and by particular ways of life; and I also came to realise there is something ‘there’ much more than a small isolated island at the periphery, at the very end of my tether. While sensations of good food and welcoming people amidst the new and beautiful surroundings of Moch quickly dissolved the residual pains and discomforts of the boat ride, my experience of this journey (and subsequent journeys) reverberated throughout my fieldwork, enriching my experience of life on Moch and subsequently challenging my understanding of the ‘vulnerability’ of small island communities.

‘Vulnerability’ and small island communities

Smallness and isolation are phenomena that have long been used to represent islands as sites of vulnerability (Campbell and Barnett 2010: 156-158). However, given the context of my journey by boat, it is important to note that ‘smallness’ not only refers to land area, but also to population size and economic activity. Similarly, ‘isolation’ implies a degree of remoteness from ‘the rest of the world’ not only in terms of physical distance, but also at the level of integration into the global economy (Pelling and Uitto 2001: 49-50; Campbell and Barnett 2010: 156-158). ‘Smallness’ and ‘isolation’ are embedded within the United Nations’ definition of small island developing states as “small island and low-lying coastal countries that share similar sustainable development challenges, including small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments”³³. Indeed, the ‘disadvantages’ of small island states, such as remoteness and isolation, small domestic markets, limited natural resources, narrow production bases, few local skills, vulnerability to natural disasters, fragile political systems and a fragmented population have become

³³ Small island developing states (SIDS) are a group of 52 coastal and island countries designated by the United Nations in 1994 to address their collective concerns about sustainable development (Kelman 2014: 121).

entrenched within global discourses and suggest that “the comparative advantages of smallness and isolation are few” (Connell 2010: 115).

These same ‘disadvantages’ are understood to enhance the vulnerability and reduce the resilience of small island states to climate variability and change (Pelling and Uitto 2001: 53; Barnett and Adger 2003; Mimura et al. 2007: 690-691). The global scientific community has identified small island states as “one of the groups most vulnerable to the adverse consequences of global climate change” (Nurse and Moore 2007: 105), with low-lying atoll islands in particular recognised as the most vulnerable (Barnett 2005: 206). The effects of climate change most likely to be experienced by small islands in the Pacific Region have been well documented in the literature (Barnett and Adger 2003: 323-326; Kelman and West 2009: 3-5; Campbell and Barnett 2010: 11-14; Lazrus 2012: 287-289) and include warmer ocean conditions, ocean acidification, sea-level rise, variability in the timing and amounts of precipitation, and an increase in the frequency and intensity of extreme climatic events. The Intergovernmental Panel on Climate Change (IPCC) refers to small islands as ‘being amongst the most vulnerable countries to the impacts of climate change, sea-level rise, and extreme climatic events’. According to the ‘Small Islands’ chapter in the Fourth Assessment Report of the IPCC (Mimura et al., 2007: 690, 695, 697), projected sea level rise poses a ‘high risk’ to low-lying islands, temperature projections place marine resources of small islands at ‘great risk’, small islands are ‘highly vulnerable’ to waves and storm surges, there is a strong possibility of ‘higher risks’ of extreme events such as cyclones, and a dependency on rainfall increases the vulnerability of small islands to climate change. As such, a global discourse of climate change constructs small island states within the Pacific as ‘vulnerable by definition’, (re)producing an image of fragility and isolation, of small land masses surrounded by a large ocean, of places that are highly vulnerable and ‘at risk’ to climatic forces (Shea 2003: 4).

Appropriating a discourse of vulnerability

Of course, small island states – and islanders themselves – appropriate the discourse of climate change and vulnerability, and enlist metaphors of ‘smallness’ in challenges to the global debates on climate change (Kempf 2009: 201). As early as 1989, a small number of Pacific Island countries attended the Small States Conference on Sea Level Rise (see www.islandvulnerability.org) which recognised the scientific consensus regarding climate

change and expressed deep concern for possible adverse effects. The delegates declared “their intent to work, collaborate and seek international cooperation to protect the low-lying coastal and island States of the world from the dangers posed by climate change, global warming and sea level rise”. This intention has since been taken up by the Alliance of Small Island States (AOSIS), a coalition of 43 small island and low-lying coastal countries that primarily operates as a negotiating force on the issue of climate change within the United Nations. AOSIS expresses grave concern about the emerging scientific evidence for human-induced climate change and urges the international community to adopt mitigation activities that would limit greenhouse gas emissions to a level more likely to avoid adverse climate change impacts on small island states (AOSIS 2009; Farbotko and McGregor, 2010:161). Following negotiations in 2012, AOSIS raised concerns that the talks were falling short of commitments for mitigation; a press release stated, “the science is clear: further delay would mean the opportunity to avert a global calamity would be irrevocably lost” (AOSIS 2012).

Another intergovernmental organisation, the Pacific Regional Environment Programme (SPREP), has become the ‘focal point for climate change’ in the region; providing information, conducting research, managing projects, and supporting the development of policy such as the ‘Pacific Islands Framework for Action on Climate Change 2006-2015’ (Kelman and West 2009). The Federated States of Micronesia (FSM) is a member state of both SPREP and AOSIS and has engaged with the global discourse on climate change for many years. A National Communication on Climate Change developed in 1997 recognises the FSM’s “unique climate change vulnerabilities” (FSM 1997), and more recent government communications state that the FSM is “already among the first victims of the adverse impacts of climate change”, and “prompt and effective actions are needed to save the vulnerable homelands of the people of Micronesia” (FSM 2008a). A ‘Nationwide Climate Change Policy’ was developed in 2009 to reduce the vulnerability of the FSM to the adverse impacts of climate change, primarily through ‘mainstreaming’ climate change within all government sectors (FSM 2009a)³⁴.

³⁴ See Huq et al. (2003) and Sohn et al. (2005) for a discussion on ‘climate mainstreaming’.

Within the FSM, non-government organisations such as the Conservation Society of Pohnpei (CSP) and the Chuuk Conservation Society (CCS) incorporate climate change science within conservation projects and community education programmes. In a paper entitled ‘Climate Change is Real’, then manager of the CSP Environmental Education & Awareness Program, Ben Namakin (2007), provides a comprehensive account of the impacts of climate change on the biodiversity, culture and economy of Micronesia. He premises his paper on the argument that Micronesians should be concerned about climate change because “we are at the greatest risk of its negative impacts” (Namakin 2007: 6), and with a majority population living in low-lying atolls, along with limited access to land and human and economic resources “makes us particularly vulnerable to rising sea levels as they slowly continue to cover our islands” (2007: 6-7).

Small islands – and atoll environments in particular – may indeed be threatened by climatic changes. However, the ‘spectacle of disappearing islands’, especially as represented by journalists, researchers, and environmentalists as they flock to atoll nations such as Tuvalu and the Marshall Islands (Farbotko 2010: 48-49), perpetuates an imaginative geography of islands as small, remote and poor, and further reinforces the consensual science of climate change that defines small islands – and island communities – through a discourse of vulnerability (Campbell and Barnett 2010: 167-170; Farbotko 2010: 51-52).

‘Risk’ and ‘vulnerability’: rendering parts of the world unsafe

Vulnerability and risk are key concepts in the environmental change literature and foundational for the new global reality of climate change (Adger 2006, Janssen et al. 2006: 249; Agrawal 2009: 15)³⁵. Significantly, “the issue of climate change has served to strengthen and reproduce existing discourses of island vulnerability” which, according to Campbell and Barnett (2010: 163), are problematically structured around a duality of small/large, weak/strong, powerless/powerful, dependent/independent, peripheral/central, risk/safety, and unknowing/knowing. They argue that ‘smallness’ and ‘isolation’ are created by colonisation and globalisation, and that vulnerability discourses “represent the

³⁵ ‘Vulnerability research’ has become nearly synonymous with climate change research, and certainly there has been an increase in demand for and range of application of vulnerability and adaptation assessments since the third IPCC report in 2001 (Carter et al. 2007: 135-136).

world in ways that serve the interests of power” (Campbell and Barnett 2010: 158, 163). This is supported by Bankoff’s (2001) analysis of ‘vulnerability’ as belonging to “a dominant Western liberal consciousness [that] inevitably reflects the values and principles of that culture” (Bankoff 2001: 29).

Bankoff (2001) evidences the long history within Western discourse of ‘rendering parts of the world unsafe’, especially equatorial regions which have been imagined as “dangerous and life-threatening to Western people” (Bankoff, 2001: 21). He argues this sense of danger and ‘otherness’ has been attributed to tropical environments through firstly, the paradigmatic concept of ‘tropicality’ (Arnold 1996, cited in Bankoff 2001: 21) that has progressively portrayed “equatorial regions as a zone of danger in terms of disease and threat to life and health” (Bankoff 2001: 21); secondly, the political concept of development that has divided the world between developed and undeveloped nations and established poverty as the principal threat to Western well-being (Bankoff 2001: 23)³⁶; and finally the emergence of a discourse of vulnerability that sets the non-Western world apart as implicitly affected by natural disasters (Bankoff 2001: 24). He states:

The concept of natural disasters forms part of a much wider historical and cultural geography of risk that both creates and maintains a particular depiction of large parts of the world (mainly non-Western countries) as dangerous places for us and ours. More importantly, it also serves as justification for Western interference and intervention in the affairs of those regions for our and their sakes. (Bankoff, 2001: 27)

The concepts of vulnerability, tropicality and development contribute to the same essentialising and generalising discourse that denigrates certain places as intrinsically dangerous; that depicts the inhabitants of those places as passive victims; and that designates modernisation through Western investment and expert knowledge (science and technology) as the solution (Bankoff 2001: 29; see also Lazrus 2009a: 178, 208).

In her seminal work, Douglas (1992) analyses the concept of risk which is deeply entrenched within science and has contributed to building a particular culture that supports

³⁶ Bankoff (2001: 22) also argues Western aid policies divide the world between donor and recipient nations. This is relevant for my discussion in chapter seven.

a new global reality. According to Douglas (1992: 23, 50-51), the calculation of risk has been fundamental to the development of scientific knowledge since the 17th century and has taken over from older theories of causality. She argues that while ‘risk’ originally accounted for the probability of losses *and* gains, within a political context it now only refers to negative outcomes and could easily be replaced by the word ‘danger’ (1992: 23-25). However, unlike the concept of risk, “danger does not have the aura of science or afford the pretension of a possible precise calculation” (1992: 25). Douglas (1992: 15, 22) argues that the scientificity of ‘risk’ lends scientific authority to a Western politics, and accommodates new social relations and new loyalties that serve “the forensic needs of the new global culture”.

Certainly, the global science and politics of climate change is a prime expression of this new global culture, a ‘global risk society’, given a pre-occupation with future-set environmental threats that are induced and introduced by modernisation itself (Beck 1992: 21; Lahsen 2007b: 9). Beck (2000: 226) defines ‘risk society’ as the global phenomenon in which “modernity becomes reflexive, which means concerned with its unintended consequences, risks and their implications on *its* foundations” (my emphasis). Such concerns serve to reinforce the privileged positioning of Western knowledge and politics in defining risks and imposing vulnerability. Furthermore, Beck (2000: 214) argues:

The concept of risk reverses the relationship of past present and future. The past loses its power to determine the present. Its place as the cause of present day experience and action is taken by the future, that is to say, something nonexistent, constructed and fictitious. (Beck 2000: 214)

As a result, ‘risk’ and ‘vulnerability’ potentially become powerful concepts wielded by ‘experts’ within a culture that creates ‘present’ victims and ignores ‘past’ agency and resourcefulness. Clearly then, the construction of small islands as ‘vulnerable by definition’ to the ‘risks’ of climate change is problematic on many fronts and deserves further attention.

Vulnerability is not a new condition: a tradition of mobility (and place)

There have been concerted efforts to challenge the ‘litany of smallness’ (Farbotko 2010: 51) that has defined the existence of Pacific peoples as impoverished and contributed to a

discourse of vulnerability about the effects of climate change (Kempf 2009: 195). In an influential essay, Epeli Hau'ofa (1994: 150) criticises the dominant view of the Pacific as small, isolated island states and territories unable to rise above their dependency on wealthy nations. He claims this representation presents a 'bleak view' of Pacific island existence and instead, he draws attention towards the global reality of ordinary Pacific Islanders living in the world of Oceania, "growing bigger every day" (Hau'ofa 1994: 151). Hau'ofa (1994: 151) argues the world of Oceania is neither tiny, isolated, nor deficient, and that such a narrow and deterministic view "overlooks culture history and the contemporary process of what may be called world enlargement that is carried out by tens of thousands of ordinary Pacific Islanders right across the ocean". Following Hau'ofa's treatise, it is now well documented that ordinary Pacific people move, mingle, and migrate in an extended social universe that reaches well beyond 'a sea of islands' to encompass 'new horizons of travel' (Peter 2000) including the countries of Australia, New Zealand, Canada, and the United States (US)³⁷.

As ordinary Pacific Islanders are expanding their world, Hau'ofa (1994: 156-157) challenges the misinterpretation of 'world enlargement' through understandings of migration and remittances as a form of weakness, powerlessness and dependency. Instead, he reveals the "social centrality of the ancient practice of reciprocity" that exudes agency and connects people in an ever expanding 'Oceania'. Correspondingly, Lazrus (2009a: 199-200) contests the deterministic tendency to impose vulnerability on people simply because they inhabit small atoll islands that are physically susceptible to the impacts of climate change³⁸. Through a focus on Tuvalu as an atoll nation, Lazrus (2009a: 202) considers place attachment and political vulnerability, and argues the 'natural' mooring of nation to territory (i.e. people to place) that constructs Tuvaluan nationality (identity) as inherently vulnerable to climate change ignores the ways in which people continue to be

³⁷ D'Arcy (2001, 2006) provides historical evidence for an extended social universe in Micronesia. Regional connections across 'a sea of islands' are described by Gladwin (1970), Nason (1970) and Alkire (1978), and Marshall (2004) examines the 'far-flung network of people' from the atoll island of Namoluk in the Mortlocks.

³⁸ Lazrus (2009a: 206) questions the overly conscious attention given to place attachments among indigenous and local peoples; attention that is not given to Westerners who are assumed to "smoothly transcend place attachments" and live translocal lives. See also Hastrup and Olwig (2012: 12) for a critique of the 'sedentarist understanding of human society' that regards migration as a failure of adaptation.

resilient, especially through ongoing practices of mobility and an emphasis on cultural integrity. Significantly, her critique challenges the dominant view of vulnerability as a *new* condition arising from the impacts of climate change; a view that I argue creates ‘passive victims’ and ‘climate refugees’³⁹ by ignoring a cultural tradition of mobility and resourcefulness in relation to climate variability and a dynamic and changing seascape⁴⁰.

Both Hau‘ofa (1994) and Lazrus (2009a) emphasise deeper cultural values and traditions of movement to effectively challenge dominant understandings of islands and island communities as either ‘too small and too isolated’ or ‘too vulnerable’ respectively. Certainly in a world of climate change, Hau‘ofa’s notion of an expanding Oceania can be understood as “a specific form of empowerment in the face of coarsened depictions of inferiority, helplessness and smallness” (Kempf 2009: 201); and Lazrus’ (2009a: 202) focus on cultural integrity as a potentially more durable characteristic of identity than place attachment prompts new and insightful interpretations of vulnerability in a world so defined by territorial sovereignty. However, given the significance of people’s travels by boat to and from their ‘small’ home island of Moch I am interested here in Peter’s (2000: 255) emphasis on “local ‘points of departure’ and local theories and practices of space and movement” in order to understand the condition of ‘vulnerability’⁴¹. According to Peter (2000: 255-256), Micronesian movements are intentional and locally-determined as – both

³⁹ The concept of ‘climate refugee’, along with related notions of ‘resettlement’, ‘relocation’ and ‘evacuation’ have been analysed in relation to the migration of island people in the context of climate change by Kempf (2009), McNamara and Gibson 2009; Barnett (2012), and Birk (2012) among others. The concept of ‘climate refugee’ mirrors an emergent discourse on the migration of people from the FSM to Guam and the US in the context of the Compact of Free Association (Peter 2000: 253-254). As Peter (2000: 255) reveals, ‘compact migrants’ are problematically explained in the literature in socio-economic terms, as the one-way movement of people from economically-deprived regions to more wealthy metropolitan areas. In particular, he criticises those migration studies that “provide fixed, limited, snapshots of the migrants’ lives [and subsequently] fail to consider deeper values which structure the movement, and deeper histories in which the movements take place” (Peter 2000: 255). Hastrup and Olwig (2012: 9) also argue the term ‘climate refugee’ represents “a simplification of complex processes that involve many different factors, including long traditions of human mobility”.

⁴⁰ There are numerous mentions in the literature of such resourcefulness in the aftermath of natural disasters such as typhoons and cyclones (Lessa 1964; Nason 1970; Alkire 1978; Marshall 1979; Campbell 2009).

⁴¹ Joakim Peter is from Ettal Island in the Mortlocks Region, Chuuk State, FSM. He is the director of the Chuukese campus of the College of Micronesia.

metaphorically and practically – travellers set out using their point of departure or home/island as a guiding point from which to navigate changing horizons. As he points out, Micronesian islanders have always undertaken travel (as movement) to overcome ‘trouble’ at home and to sustain life on their home/island (Peter 2000: 264). Subsequently, it is through the actual interconnectedness of mobility *and* place that I both introduce Moch as home/island and make sense of ‘vulnerability’ as lived by ‘ordinary people’ in a ‘small’ island community.

The significance of Moch as home/island: people, place, and mobility

Many anthropologists have referred to the significance of land for the people of Micronesia. Goodenough (1966:95), who worked on the island of Romonum in Chuuk Lagoon, found the land tenure system constituted a complex social institution that evidenced the importance of named places⁴². These named places were owned by members of particular lineages, and various forms of ownership, property transaction, and group organisation connected people to specific places and ensured their access to land and food. Similarly, Marshall (1999:125) argues that it is impossible to fully understand Micronesian kinship without attending to the meanings of land and food. He notes that kin are defined as those who share land and food, and posits the ‘mud, blood and grub’ hypothesis to elaborate the symbolic linkages of kinship, land and food. Marshall (2004: 39) emphasises this as pertinent for understanding “the passionate attachment that most [people] have to the atoll as a physical place – pieces of land – that in turn help to define who they are as individuals and as a people”.

Certainly there is a strong attachment to the physical atoll island of Moch, and a proliferation of named places covers every part of the island⁴³. Matrilineal descent connects people through their mothers to specific places, and sharing food is a fundamental practice of relationship. Early in my fieldwork I was introduced to the term, *eterenges*, to

⁴² The naming of places embeds meaning and emotional attachment (Tilley 1999: 177; Marshall 2004: 10).

⁴³ While mapping the island of Moch during the pilot study in 2008, we were told that the island ‘is divided into so many many many different kinds of places, and each part of the island has a name’. These named places, which may be as little as six metres long and three metres wide, carry meaning and history; as one Mochese person made it clear, if waves destroyed the island then there would be no history (Henry et al. 2008).

refer to the extended family or matrilineage that is connected to a place (Lowe 2002: 133). As the diagram drawn by Hubert clearly demonstrates, this concept is centred on the significance of a relationship between people, place, and food (sustenance); a central cookhouse surrounded by related households, a cookhouse ‘with no sides so it is easy to see inside when someone is cooking’ (see Figure 17). Lekila (Lerinda’s sister) confirmed this in her own explanation of family; ‘the central house is the cookhouse, and whenever there is smoke from this place everyone knows that food is being prepared’. Both Hubert and Lekila contrasted *eterenges* with the unfavourable ‘new house setting’ that promoted the Western (Americanised) ‘nuclear family’; here they specifically referred to an inside kitchen where people can cook and not be seen by others⁴⁴.

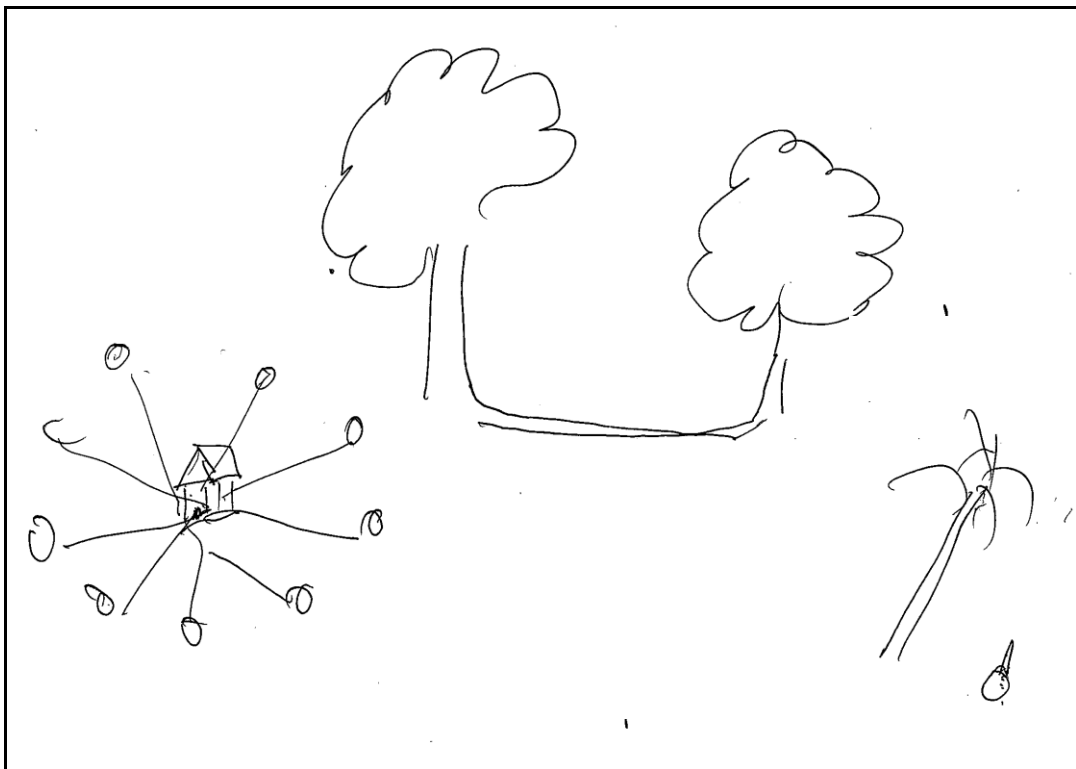


Figure 17: Diagram drawn by Hubert to explain *eterenges* in comparison with the ‘nuclear family’. He made an interesting analogy between the breadfruit tree and *eterenges* (young trees are attached to the parent tree) and the coconut tree and the nuclear family (nuts fall and are separated from the parent tree).

⁴⁴ There are concerns about the ‘Americanisation’ of youth and the impacts of living in the US. As well, ‘Americanisation’ was used to refer to the growing dependence on eating rice, especially among young children. At the Mochese pre-school there was a concerted effort to source local foods to feed the children, such as breadfruit, fish, and banana. The head teacher explained, ‘this is much better for them and so they don’t grow up just wanting rice to eat’.

The centrality of named places on Moch was initially made obvious to me by the light hearted ribbing my daughter and I received when telling household women we were going to ‘Lionel’s beach’ or to visit ‘Merym’s place’; I was soon corrected and told I was going to either Lemwou or Leseban respectively (the specific names of those places). Similarly, when I asked the whereabouts of a young girl from our household, rather than being told she was at ‘Lerinda’s house’ (which is what I imagined) I was told she was ‘in Peimoch’. I came to know that ‘in Peimoch’ did not refer to her individual relationship with Lerinda, her ‘aunt’⁴⁵, but rather to her clan and lineage relationship to that place called Rús which was both in Peimoch village and the place where Lerinda lived. Even though this young girl lived in Inapwei village, in a relatively newly established house in a place called Loulak⁴⁶, she belonged to that place called Rús in Peimoch village, related to the people who lived there through a matrilineage that established deep historical connections to that place.

While many people are adept at tracing their matrilineage through several generations and some maintain a written record of their genealogy, the connections between people and place are everyday realised through practices of sociality and kinship, especially through the sharing of food, but also through claims of relatedness, through political statements of land ownership, and through the telling of particular place-based narratives that reveal histories of connection. Indeed, it is through these everyday practices, stories, and oratories that the home/island of Moch comes into being and is sustained as a familiar place worthy of attachment and belonging for all of the Mochese community. Here, the specific concepts of place, dwelling, and task as developed by Ingold (2000) are useful to better understand the significance of Moch as home/island. According to Ingold (2000: 192):

A place owes its character to the experiences it affords to those who spend time there – to the sights, sounds and indeed smells that constitute its specific ambience. And these, in turn, depend on the kinds of activities in which its inhabitants engage. It is from this relational context of people’s engagement with the world, in the business of dwelling, that each place draws its unique significance.

⁴⁵ Lerinda is this young girl’s ‘aunt’; her MMMZDD.

⁴⁶ Loulak is the place where my daughter and I lived on Moch.

Activities or ‘tasks’ are the “constitutive acts of dwelling”, carried out as part of the normal business of life, and significantly for this discussion, every task is performed ‘in series or in parallel’ with other tasks, within an entire ensemble called the ‘taskscape’ (Ingold 2000: 195). Ingold (2000: 198) argues “the forms of the landscape arise alongside those of the taskscape, within the same current of activity” (2000: 198), and in this sense, I understand place and sociality to be mutually constituted through the ongoing activities (and movements) of everyday life.

The everyday sociality of place: Rús and Ololuk

During my fieldwork, I visited Rús many times. In the mornings, household men – the brothers and nephews and a husband of the women of this place – were often sitting at the table beneath the lime tree (see Figure 18). Unless specifically invited, I rarely broached this space and instead, offered the men a greeting as I walked by to the doorway of the house. Always there were women inside, talking, working, eating, and resting. Lerinda was the mainstay of this house, along with her mother and her mother’s mother’s sister (her ‘grandmother’). During the day Lerinda was often inside the house, sitting on the floor sewing skirts from her hand operated sewing machine, managing the small family shop, or operating the twice daily radio communication to family members in Weno. Other women were regular visitors to this house, in particular Merym, who is Lerinda’s brother’s wife (and her good friend⁴⁷), but also Lerinda’s mother’s sister who lived in Inapwei village, a ‘good neighbour’, and women from an adjacent house of Rús who are clan and lineage related (see Figure 19). Whilst certain related men were also intermittently present inside the house, the talk that emanated from this inside space always included the voices of women.

⁴⁷ Lowe (2002) briefly discusses the companionship between same-sex sibling-in-laws.



Figure 18: Men sitting under the lime tree at Rú, including Lerinda's brother, husband, and cousins (Photo: Christine Pam).



Figure 19: Inside the house, Lerinda and Merym weave a mat while another related woman of Rú watches. The radio used to communicate with family in Weno is in the top left hand corner of the room (Photo: Christine Pam).

The talk inside the house generally revolved around matters of concern for the people of Rús; reminiscences of past shared adventures such as walking home to Moch from Satawan along the reef and small islands of the atoll; discussions of changes to the collection of donations for the up-coming celebration of the Diocese; considerations of a new design of fan from Kuttu; deliberations about food; debates about the imminent election; gossip about a student from Ettal who was sponsored by a related household; stories of relatives who are living far away, and memories of those who have died⁴⁸. On one particular morning, Merym shared an extensive monologue with Lerinda, Lerinda's mother and her 'grandmother', and a Rús neighbour. During her talk she regularly mentioned names and words that I recognised; of people and places and a type of shellfish, and when she had finished I asked her about her story.

Merym told me it was about a time, maybe in 1989 or 1990, when Pila, her mother's sister, went looking for *limach* (shellfish) on a reef near the small island of Lelang. Afterwards, a man from Sór clan came to Merym's house and demanded that Pila sign a paper from the court. The man claimed that Pila had been taking shellfish from a reef that did not belong to her; that he did not want Pila to fish on that reef because it was a place for the Sór clan (this direction was included in the court order). Pila refused to sign the paper and Merym went to see the man. She told the man that he did not know about that place, and she proceeded to tell him the history. They argued and fought over the piece of paper (court order) and it ripped into two. Merym explained to me that that place is for the clan of Soren Iluk. She relayed a complicated story about that place which involved her great great grandmother who was from the Soren Iluk clan, her great grandmother, and some half-brothers, sisters, and daughters. She said her great grandmother gave the land to the half-brothers because they looked after that place, and she gave the reef to 'these people here' (indicating Lerinda's mother and grandmother). The half-brothers then gave the ocean to one brother's sisters and the land to his daughters who were from the Wáánikar clan.

⁴⁸ On one visit I was shown various photographs of relatives living in Missouri and in New York. There were even photos of Lerinda's brother and some of his children at 'ground zero' in New York in 2001 following the attack on the twin towers. On another occasion my attention was directed towards a framed photograph of Lerinda's grandfather which hung on the wall. I was told that he built the *fáál* (meeting house) in Ariow in 1964 using traditional methods and materials.

Merym was confident in her knowledge of that place near Lelang, and her oratory confirmed a connection with ‘these people here’ through a political history of place. Indeed, through her story the mutuality of place and sociality becomes evident.

I also often heard the talk of a small group of women who sat together on the porch of a house in Ololuk. The house was off the main path, on a side track that offered a short cut between where I lived and the church, the school, and municipal buildings. At first I was shy to meander off the main path along this side track and would only walk this way in the company of those from my own household. However, I soon learned that this house where the women sat was a related household⁴⁹ and I began to take this side track gladly for the sense of belonging it offered. Indeed, I often found my own daughter at this house, sitting on the wooden bench on the porch or on the cement floor inside the house, or in the adjacent cookhouse peeling breadfruit (see Figure 20). She was always in the company of women and children, and often talking with Kara, a woman who had recently returned to Moch with her baby daughter to continue teaching at the school⁵⁰. Kara told me her daughter is ‘*the last woman for this place* [Ololuk]’. Her mother’s sisters either have no children or only have boys and her own sister is too young yet to have children. She also said it does not matter whether her mother’s brothers have daughters because ‘*those daughters are not from this place*’⁵¹.

⁴⁹ Ololuk is my host Kapa’s place. Kapa returned to live there with his sister after his first wife had passed away and before he married Aprel.

⁵⁰ As is generally practiced, Kara had left Moch when her pregnancy was close to term and had given birth at the hospital in Weno.

⁵¹ Kapa is Kara’s mother’s brother, and they are all of the clan Sópwunupi and from the place Ololuk. As Kara indicates in her statement, Kapa’s daughters are from a different place and a different clan (i.e. they are from the same matriclan as their mother Aprel, the clan of Sór).



Figure 20: Peeling breadfruit in the cookhouse at Ololuk (Photo: Christine Pam).

Certainly it was the return of Kara and her daughter that prompted the flurry of sociality that embraced Ololuk for most of my stay on Moch. Particular women would regularly gather at this house to sit with Kara and her baby, to assist with bathing and feeding, to provide jiggling and playful pinching and slapping, and to offer soft lullabies and a cool breeze from a fan when the baby was sleeping. While they were there, women would perform household tasks, such as sweeping the living room and the porch, sometimes directing a subtle rebuke at Kara for the messy state of affairs. As Kara settled back into her life on Moch, and following the departure of her mother to Weno, the women drawn to this place through their relationality looked after the baby when Kara was teaching at the school and became more involved in food preparation activities and other household tasks. Related women, especially Kara's mother's brothers' wives, would collect *sáfey* (local medicine) to keep the baby healthy or attend to her when she was sick, and specific arrangements were made for Kara's mother's female cousin (MMBD) to stay with Kara while her husband was away (see Figure 21).



Figure 21: Kara's mother's brothers' wives apply local medicine (*sáfey*) to her baby daughter on the porch at Ololuk (Photo: Christine Pam).

As is the case for Rús, it was not that men were absent from this place of Ololuk; whilst Kara's father had already passed away, her brother and her husband and other related young men were sometimes present. Also two of her mother's brothers, the oldest of whom is Kapa, walked through this place every day on their way to and from the school where they both worked or the church or municipal building. Rather it was that Kara and her mother and her baby daughter provided the constancy and continuity of this place for their family, occupying the houses and the cookhouse and facilitating the everyday activities that constituted Ololuk as a place on Moch.

As indicated here, places such as Ololuk and Rús are revealed through the sounds of women's voices and the efforts of women's bodies. During my fieldwork familiar women would gather and talk in their cookhouses while they prepared food, or inside their houses where they sat together on the floor and managed shop, sewed skirts, played dice, or cared for babies. Outside they swept the place clear of rubbish, removed weeds from around their houses, tended to plants and animals, and visited the well to bathe or to wash clothes in

large tubs of soapy water. Indeed, a preference for matrilocal marriage means that women (and unmarried men) in particular, may live their whole lives with their mothers and their sisters on their own land⁵². For instance, Lerinda's mother was born in the late 1930s and grew up in a local house in the place of Rús on Moch. She married when she was sixteen years old and had eight children. In the late 1970s, Lerinda's mother and her extended family, including her husband, children, mother, mother's sisters and her mother's mother, all moved into the cement house that Lerinda and her mother now occupy. Lerinda, who is now in her 40s, is the only daughter to have remained on Moch, and as such, along with her mother and her grandmother, has sustained the everyday practices of sociality that is the place of Rús.

Even though they will most likely travel on the boat to Weno, and maybe even visit Guam or Hawai'i, or the mainland of the US, women such as Lerinda who live for the most part on Moch are recognised as the ones who sustain many of the practices, and who practice much of the knowledge that others living predominantly off-island identify as belonging to themselves as Mochese. As I was told, these are the women who know how to pound taro into *kkón*⁵³, bake taro cake, weave mats, preserve breadfruit and prepare a local oven (*uum*). Lerinda's sister, Lekila, who lives permanently off-island in Weno, expressed her disappointment at not knowing these 'cultural skills' (she has never prepared a local oven or learnt to weave) and was very appreciative of Lerinda for 'holding this knowledge for the family'. As she readily acknowledged, Lerinda is the one who remains on Moch and 'keeps the family'⁵⁴.

⁵² There is a debate within the literature about residence (Marshall 1989: 96), and certainly a preference for matrilocal residence on Moch did not preclude women from moving to live with their husband's family. Similarly, matrilineal descent did not preclude close relations with patri-kin or the exchange of land and knowledge between fathers and their children.

⁵³ *Kkón* refers to breadfruit or taro that has been cooked and pounded into a pudding using a heavy pestle made from coral (pounder). There is a strong association between Mochese identity and *kkón*, especially when the taro or breadfruit is from the home/island.

⁵⁴ As indicated by Flinn (1994: 118) for Pollap Atoll, families strategise to keep people at home/island to tend to family concerns.

The movements of people, food, ideas, and things

While Merym lived at the far end of Moch in Eor village, I would often encounter her somewhere along the main path of the island; either I would see her leaving the church in Inapwei village, or she would call out to me from inside her cousin's house in Onefeng⁵⁵, or I would be told by someone else that she was in Rús. Merym walked this path most days, a distance of 700 metres or so, to fulfil her commitments and sustain her connections⁵⁶. Even when Merym was not literally walking these paths of connection, she was preparing food at her home in Leseapan to be shared with members of her extended family, often carried by her daughter to those who live in other places on the island (e.g. her married brother, and her cousin at Onefeng). While in comparison, Lerinda generally stayed closer to 'home', she also regularly prepared food at Rús that was shared with familiar people in other places, such as her mother's sister in Sapetew, her mother's brother in Lukunmer, and Aprel, her mother's mother's sister's daughter's daughter in Loulak. As Lekila explained, 'Lerinda will send food to these people (her *eterenges*) as a way for them to feel that they belong'⁵⁷. However, food is also shared with people beyond the *eterenges*, especially to patri-kin who live nearby, but also to other clan relations and, as Kapa explained, to 'good neighbours' who share strong Christian values⁵⁸. While 'good Christian neighbours' may refer to "behavior that demonstrates good character" (Flinn 2013:16), it also evidences the significance of nonconsanguineal, nonaffinal relationships in the sharing of food and support⁵⁹.

During more public celebrations or community events, specially prepared foods are distributed among an even more extensive network of people. Following a Church wedding service for two young couples, many people from the community gathered in

⁵⁵ Maria grew up in Onefeng with her grandparents.

⁵⁶ Indeed, such movement amongst the very proximity of people and places on the home/island seemed to provide an enduring mnemonic of relatedness.

⁵⁷ Significantly, it was food grown on the home/island that people longed for when living off-island. As well, it was the ability to grow 'local foods', especially taro and breadfruit, which came to mind when people considered the possibility of having to leave the island because of 'high tide'.

⁵⁸ Certainly, Aprel often shared food with Kapa's sister's family in Ololuk and his brother's family in Leuwan, and with their 'good neighbours'.

⁵⁹ Marshall (1977) emphasises the significance of these relationships as 'created kinship'; embedded within those activities of sharing that realise relatedness.

Apulukuluk⁶⁰ to congratulate the couples, to make speeches, and to share the substantial amount of food that had been prepared by relatives over the past few days especially for the event. Holding containers, children queued in long lines to receive a share of the food for their families, dispensed by a number of women who organise the proceedings (see Figure 22). It is this practice of sharing food – and other items such as utensils, toiletries, and clothes – that many people identified as ‘a way of living on Moch’⁶¹.



Figure 22: Children queue with their containers in Apulukuluk, as women distribute food prepared for the wedding (Photo: Christine Pam).

⁶⁰ Apulukuluk is the large and impressive traditional *fáál* used by the Catholic congregation for various celebrations. It was built by the Mortlockese community to honour and celebrate the succession of Father Amando Samo, a Mochese man, to Bishop of the Caroline Islands Diocese.

⁶¹ On Moch, a similar practice of sharing food occurred at funerals, graduations, and school picnics. Lekila compared this with her experience of the graduation on Satawan Island; she said she was shocked to find that food was produced individually by each family for their child. However, Kapa said that all of the Mortlocks has a similar culture of sharing food.

This ‘way of living’ is further realised by the movement of food (and people and things) between Moch and Weno. Always the boat leaves Moch with people on board taking sustenance from places of belonging to relatives living in Weno, especially *kkón* (pounded taro or breadfruit) prepared from the home/island, coconuts grown on family land, and salted fish caught in the lagoon. In particular, *kkón* and salted fish are transported even further afield, packed into eskies and suitcases on board flights from Weno to relatives living in Guam, Hawai‘i, or the mainland of the US⁶². Likewise, the boat from Weno to Moch is loaded with processed foods, such as rice, noodles, tinned meat, coffee, sugar, and flour, and with building materials, fuel, passengers, letters from loved ones, and parcels from relatives living in the US (see Figure 23). Certainly during my fieldwork, much energy was invested by the community, both on Moch and in Weno, to sustain this two-way movement of food and people and things.



Figure 23: Men load sacks of rice onboard the *Lien Pukial* in Weno, ready for the next trip to the Mortlocks (Photo: Christine Pam).

However, more than just this movement by boat, the community on Weno (much the same as on Moch) is constantly engaged in everyday activities to sustain life on the home/island. Serino initiates meetings and lobbies government officers for funding and resources for projects on Moch, or discusses issues over skype or by radio with the deputy mayor and others on the island (see Figure 24); students travel to school or college to improve their

⁶² See Marshall (2004: 73; 1972: 63) for such movements to and from Namoluk.

chances of paid employment to ‘help family’; efforts are made to find a suitable mechanic to repair the *Lien Pukial*; people communicate with relatives in Hawai‘i or the US mainland to organise money to purchase building materials for a house being built on the home/island; some accumulate knowledge and take new ideas to Moch; women and men who earn a good income in government jobs procure resources that help the community; others sew clothes from home or prepare food in a roadside café to earn money to ‘help family’; and people dedicate time and money to purchasing goods for Moch or readying people for the journey to further away places. Indeed, while much is written about the ‘dependence’ of small island communities on remittances and support from off-island relatives (Connell 2010: 122-123; Birk 2012: 89), it is the intentional activities of sharing – *to and from* the home/island – that establishes identity and a way for belonging.



Figure 24: Serino communicates with people on Moch over skype (Photo: Christine Pam).

Furthermore, the movement of people within an extensive Mochese community overcomes tension and ‘trouble’, and manages ‘work for family’, both of which are important strategies for maintaining connections and sustaining life on the home/island. During my

fieldwork, Lerinda's mother's sister and her grandchildren moved to stay at Rús during the tidal surge warning; Kara's husband returned to his mother's place when there were difficulties in their relationship; and it was common for people to move to Weno for medical treatment and to have their babies. In addition, a number of people told me they moved to the back of the island for 'peace and quiet'; social tensions at home in Loulak contributed to Kapa's young daughter moving to Ololuk for a while; problems in Weno resulted in Serino moving his sister's son back to Moch; and I was told about a young man who moved from his adopted family to live with his birth mother to create enough social distance so he could marry his girlfriend⁶³.

The significance of working together for family is embedded within a Mochese saying, *aramas chok angaang*, meaning that people are important because when they come together the work gets done. Again during my fieldwork, Liana, Kapa's brother's daughter moved to live and work in Loulak to support Kapa's wife Aprel while my daughter and I were living there; Merym and her husband moved to Weno to earn money for their family; the bodies of two older people who had passed away in Weno were returned to Moch for burial; Serino moved some of his nephews to Weno to work on his driveway; a young woman and her son moved to Moch from the US to care for her grandfather; a number of youth moved to Weno to attend private high schools or to begin college; older men working in Weno expressed their intention to retire on Moch; and there were sad farewells as loved ones were moved to the mainland of the US to further their education or to 'work for family'. Overall, such mobility embedded within an extensive Mochese community is important for maintaining connections and sustaining life on the home/island.

Gender and mobility

Gender is significant to a discussion of mobility among the Mochese community, as men are generally understood to be more mobile in relation to the 'stability' of women⁶⁴. As Satal explained; while women provide the stability of place – they stay in place with their mothers and sisters – men travel and fish, and are responsible for the movement of land

⁶³ See Marshall (1972: 63).

⁶⁴ See Moral and Escobar (2004) and Flinn (1994) for a discussion of gender mobility. Also see Alkire (1989).

between different clans. In a conversation about Mochese culture, Lekila said that girls are educated in the houses and the cookhouse, whereas boys move out of the houses when they are nearly teenagers and are educated in the *fáál* (traditional meeting house); about fishing ('catching fish and catching girls'), building local house, and working in taro patch. While girls and women now travel off-island for education and work opportunities⁶⁵, and women move around the home/island and atoll, and work at the Moch School and in the health dispensary, this idealised structure of mobility is clearly evident within everyday life and within the social organisation of the community. Certainly men were generally more mobile in their work for family, fishing in the lagoon or working in the taro pits, and there were many more men than women employed in the school and municipal government, or involved with the church. In contrast to women, I would often see men seated on the cement floor of a *fáál*, or on canoes that had been pulled from the lagoon and upturned on the shore, or in larger, more 'unrelated' groups, talking together outside the church or nearby the school and municipal government buildings (see Figure 25).



Figure 25: Men gather outside the church (Photo: Christine Pam).

⁶⁵ See Marshall (2004) and Flinn (1994) for similar movements from Namoluk and Pollap respectively.

In addition, matrilineal kinship and the ‘solidarity of siblings’ (Alkire 1984: 6)⁶⁶, along with a preference for matrilocal marriage means that men generally move when they marry, either to live with their wife’s family on her land or to establish a new household on their own (family’s) land that is then gifted to their wife and children⁶⁷. Indeed, as found on other island communities in the Mortlocks, a man transfers land to his wife and/or his children (Nason 1970: 93; Marshall 1972: 67), and in this sense the culturally sanctioned mobility of men infuses a flexibility of land ownership within the community. For instance, Loulak was land that belonged to Kapa’s family (Sópwunupi clan). When he married Aprel, rather than live with her family in Rús (where it is crowded), he built a new house at Loulak and gifted this land to their children (Sór clan)⁶⁸. Therefore, Loulak has become a new place for Sór clan, connected with the *eterenges* of Rús. During my fieldwork, Aprel’s older brother would visit Loulak for brief periods, to sit on the porch, drink coffee, and talk. On one occasion he checked on the young breadfruit tree next to the cookhouse, and pinches off the tips between the leaves to manage the growth of the tree; on another occasion he carries away a pig that had died during the night. As Aprel’s older brother, he is of her clan and *eterenges* and has a role to play in this new place.

Although it was not unusual to see married men – who lived elsewhere – ‘at home’ at the place of their mother and sisters, generally they would only stop briefly on their movements around the island. Indeed, the presence of married men ‘at home’ appeared to be tempered by mutual avoidance that regulates the sister-brother relationship⁶⁹. For example, while Lerinda’s married brother (Merym’s husband) appeared to be more present and ‘at home’ in Rús than her husband – relaxing inside the house, drinking coffee, using the radio, lingering at the table under the lime tree – this may have been regulated by the friendship between Lerinda and Merym that resulted in Merym also being regularly at Rús. Certainly, the presence of Lerinda’s brother in Rús was noted by others, some of whom

⁶⁶ See also Marshall (1972: 82).

⁶⁷ Although uxorilocal residence is common practice on Moch, virilocal residence is acceptable and does occur under certain circumstances, such as the availability of space on the wife’s land.

⁶⁸ Marshall (1972: 61) found a slight preference for daughters over sons on Namoluk because they perpetuate the matrilineage and “bring land into the lineage through their children’s inheritance from their father”. According to Flinn (1994: 127), “Pollapese speak of land moving out of the group through the men and into the group through the women”.

⁶⁹ See Moral and Escobar (2004).

joked about him sitting at the door of Lerinda's husband's kitchen because there was no food at his house.

Although good humoured, it is interesting that this joke was relayed to me on separate occasions by Merym and by her brother, alluding to the potential strain between a man and his wife's family (Marshall 1972: 68-69). Married men are 'burdened' with a dual responsibility; they are expected to provide for their wives' relatives, and to continue to 'work for family' (i.e. their own *eterenges*)⁷⁰. During my fieldwork this divided responsibility revealed certain tensions. On one occasion Merym told me she had just gone to the small island of Lelang with her husband and daughter, and with her brother and his wife and son, to collect coconuts to make oil. She said she was not happy because when she visited her brother later to find out when the oil would be made, she was told the coconuts had gone to Weno on the *Lien Pukial*, to her brother's wife's mother. On another occasion, Merym was cooking turtle at Leseapan. She said her brother had caught the turtle and she had offered to cook it for him so that the 'meat' would be shared with her family.

Despite such tensions, marriages are a strategic affair; potentially creating ongoing alliances between two matrilineages – involving people and land – and establishing feelings of affection among affinal kin⁷¹. Hubert insisted that access to land and having lots of children to work the land remains important for decisions about marriage⁷², and certainly population size and land ownership, along with priority of settlement, were markers of matrilineage and clan status on the island. Although Hubert acknowledged a number of changes – that 'the population is one of the most disastrous things to confront Moch'; that with the consent of their family, young people now tend to choose their own partners; and that increasingly there is equivalence between a man's access to land and his

⁷⁰ Some families postponed marriages so that their sons could continue to give 'work for family' their undivided attention.

⁷¹ The involvement of Kara's mother's brother's wives and daughters in Ololuk evidences the strong connections between affines which is not unusual on Moch. As well, the relatedness of people and land may also be contentious as indicated by Merym's oratory about land/reef ownership discussed earlier in this chapter.

⁷² See Marshall (1972: 83).

ability to earn money – marriages remain a family concern, and continue to create strong cross-cutting ties and to activate the ongoing transference of land ownership.

The adoption of children is another common (and emotional) practice within the Mochese community that creates strong cross-cutting ties between patri-kin⁷³. Examples include a young girl adopted by her father's mother's brother and his wife, and a young boy adopted by his mother's father, who was in his second marriage following the passing away of his first wife. However, this young boy's mother had also been adopted as a baby by her mother's sister and her husband (the father mentioned above). Therefore, the young boy was adopted by his mother's mother's sister's husband and his second wife; an arrangement that involves relationships in the clans of Wáánikar, Sópwunupi and Sór. Furthermore, adoption provides certain flexibility in clan identification, as indicated by Merym's assertion of belonging to Soren Iluk clan. While Merym's mother's mother's mother was from Soren Iluk clan, her mother's mother was adopted to Sór clan which is also the clan of her mother. When Merym fell in-love with Lerinda's brother, a man from Sór clan (from Rús in Peimoch village), she strongly asserted her identity as Soren Iluk through her great grandmother in order to create social distance so they could marry. Some people think they should not have married, not only because Merym's mother was from Sór clan, but also because the origin of the clan Soren Iluk is connected through illicit behavior with the clan of Sór (see below). As indicated here, the adoption of children, and the mobility of married men (and land ownership) create strong and convoluted connections of people and place that fundamentally establishes a dense network of relationships among the Mochese community⁷⁴.

While women may provide the everyday stability of place, it was their exceptional mobility that was emphasised as fundamental to the settlement of Moch, embedded within clan narratives that were shared with me during my fieldwork. I was told the first woman

⁷³ See Carroll (1970), Rauchholz (2008), and Berman (2014) for discussions of adoption in Pacific Island communities.

⁷⁴ I was often surprised and bewildered at the extent of relatedness on Moch, and the significance of adoption and patrilineal ties; it seemed that everyone was related in some way to everyone else. For example, Merym explained that a particular man's mother is the cousin of her mother's father's mother, and April told me that Merym's father's mother is her father's father's sister.

of Sópwunupi clan was sent away from Weno by her chiefly brother due to the jealousy of her brother's wife – she was sent off on a canoe with people from Satawan who dropped her off on Moch; the first woman of Likilup clan regularly visited Moch as a stop-over – to bathe at the spring – on her prodigious travels between Kosrae and Chuuk Lagoon; and the first woman of Sór clan moved away from Kuttu to the adjacent small islands because she was upset with her sister, and eventually she was taken to Moch to live with a family from Likilup clan. This woman from Kuttu married a man from Sópwunupi clan who gifted land to her and her children, and subsequently she established the Sór clan on Moch. Even the first woman of Soren Iluk clan, originally from Moch (most likely from Sór clan), was banished to the back of the island – to *iluk*, ‘the dark side’ of the island – for an illegitimate sexual relationship, most likely an incestuous relationship. This woman was given land by the paramount chief of Moch and founded the clan, Soren Iluk⁷⁵. Such clan arrival narratives are based on the significance of mobility to overcome tensions at home/island and to establish new people/place relations, which reflect continuity with contemporary activities discussed earlier in this chapter.

Furthermore, as these clan narratives suggest, the named matriclans of Moch are not generally confined to either the people or the island of Moch⁷⁶. Rather, through the mobility of women, matriclans (and matrilineages) are dispersed (and continue to be dispersed) throughout the region, among both neighbouring and more distant island communities, and this provides an ongoing basis for kinship identity that facilitates interisland relations, support, and exchange (Fischer and Fischer 1957: 130, Marshall 1972: 57-58, Flinn 1992: 47, Petersen 2006: 83). In addition, just as ‘good neighbours’ are embedded within a culture of sharing on the home/island, so too strong relations of support are evident between island communities that are not immediately based on shared kinship. Lekila talked about these connections in the context of *killisou chapur*, which she described as meaning ‘in return’; ‘someone goes but their return is waited for’; and ‘meet

⁷⁵ See Rauchholz (2011: 60).

⁷⁶ The clans of Moch have been recorded on the neighbouring island of Ettal (Nason 1970: 59-60), on the more distant Mortlockese island of Namoluk (Marshall 1972: 59), and on the islands of Chuuk Lagoon (Goodenough 1978: 81). As one man told me, the Sór clan first came from the villages of Weitchep and Sapuk on Weno. The clan then settled the outer islands of Lekinioch and Kuttu, and then from Kuttu to Moch.

each other as family'. She said, these 'relatives on Kuttu, Satawan and Lekinioch are not blood, but they are the ones who will look after you when you visit or go to that island'. While these are often long-term relationships carried on through generations, they are also connections in the process of becoming. Kapa talked of his friendship with the principal of the school on Ettal. The principal's daughter is sponsored by Kapa while she attends the junior high school on Moch, and this further strengthens a connection which may develop through their families over time. Similarly, Merym's household was sponsoring a student from Lekinioch because the student's older sister and Merym's daughter became 'promise sisters' or *pwiipwi* when they both attended the Moch School in 2004 and 2005⁷⁷.

'Going around'

While the mobility of people and food and things, such as those discussed above, are culturally sanctioned and embedded within the everyday practices of dwelling, certain 'movements' are not publically condoned by the community and attract varying degrees of comment, criticism, and/or gossip. In particular, it was considered disrespectful to be where you did not belong; 'to wander around in other people's places'. Merym identified this as *rapaan*, meaning 'being somewhere that you shouldn't be'; 'going around'. While this can be applied to anyone, generally 'going around' was a term used to refer to the behaviours of children and youth, and to the clandestine mobility of men. I was told that in the past, children were expected to stay in their own village and not to 'roam the island like they do now', and Merym remembered her father scolding his nieces and nephews for being in his village where they did not belong. Despite the benefits of living in a small community where everyone is known to each other⁷⁸, many people on Moch 'secured' their houses from people 'going around' the island. People carried keys clipped to their clothing, and I was often reminded to 'secure your room' when I left the house. On one occasion, an 'unknown' young man entered the house during the night, seemingly to contact Liana who was sleeping in the living room with my daughter and another girl, and this prompted much interest and gossip over the following days. In a similar context, a young woman told me of a song that girls sing about 'going around' at midnight to meet

⁷⁷ People regularly talked about *pwiipwi* relationships on Moch. Marshall (1977: 646-649) discusses the significance of these 'created sibling/friend relationships' for Chuukese society.

⁷⁸ Many people considered this a positive in comparison with living among strangers in Weno.

boys, and most tragically, I was told of the suicide of a young man who had been reprimanded for ignoring instructions to stay at the house and not to ‘go around’ at night. Lekila also shared her thoughts about married men who ‘go around’, following their ‘second nose’ (i.e. their penis) looking for sexual relationships⁷⁹.

As well, during my fieldwork there were many lightly disparaging references to ‘outsiders’, those young people who do not attend school, who ‘go around’ and are ‘not settled’. Serino first heard the term when he was in high school on Weno in the early 1970s. He said when there was trouble at the school it was often caused by those who were not students at school, those ‘outsiders’ who were lingering where they did not belong. Others identified ‘outsiders’ as school drop-outs, as those young people who have not completed their education for whatever reason. Indeed, the significance of an education was apparent in the sympathy some people expressed for ‘poor families’, those whose children only work in the taro patch or go fishing; I was told ‘they have no future’, no educated children who can earn money off-island. Yet, as was raised with me by one ‘outsider’, ‘what if everyone goes to school and goes away’? This sentiment appeared to be shared as some ‘outsiders’, while not having completed their education, were obviously well-placed and respected within their families and the community for the work they performed on their home/island, recognised for ‘keeping the family’ or for being a ‘good husband’, and for being the ones available to work on community projects such as the seawall⁸⁰.

The response-ability of a ‘vulnerable’ home/island community

The perpetual movement of people and food and ideas and things was an everyday reminder of the dense network of relationships that constitutes Moch as a dwelling place and as the home/island of an extensive community. While matrilineages provide relative stability through the connection of people and place, the significance of cross-cutting patrilineal ties, the flexibility of land ownership, the prevalence and ambivalence of adoption, the proximity of ‘good neighbours’, the making of sibling/friend relationships,

⁷⁹ Interview March 2011

⁸⁰ As one man said in relation to the municipal government’s seawall project, ‘the outsiders, we are the ones that make the seawall to protect the land’.

the unity of shared Christian values, and the connections of *killisou chapur* embed a dynamism and flexibility that establishes a community well-placed to respond to ‘trouble’ and to navigate (and instigate) changing horizons⁸¹. Certainly during the period of my fieldwork, a lot happened – and was made to happen – on this ‘small’ home/island, and I was genuinely overwhelmed by the ongoing and everyday dynamic of ordinary people’s relationships and activities that, in the business of dwelling, materialised an ever-changing and responsive home/island community.

Whether living on Moch or elsewhere, such as Weno, Guam, or the US, the home/island orientates activities; it is the shared ‘point of departure’ for those movements that are fundamental to the response-ability of the community. Indeed, as Peter (2000: 255) explains, such movements “are locally guided, defined, and determined by events and situations at home/island”. This was especially obvious in Weno, where loading the ship with goods for Moch is a constant and ongoing activity that often takes precedence over other work and education commitments; where the home/island looms large as the ‘point of departure’ for the deliberate movement of food and people and things. As well, Mochese leaders on Weno (and elsewhere) negotiate with state and national government representatives and departmental officers for the benefit of their home/island, Mochese students in secondary and tertiary education aspire to complete their courses to ‘work for family’ and support their home/island, and those Mochese living permanently in Weno (and in Pohnpei, Guam, Hawai‘i and the US) continue to cast their electoral votes for their home/island⁸². These activities validate kinship and connections, and are fundamental to what it means to be Mochese for those living and ‘performing culture’ off-island.

Of course, actuating kinship and sustaining life on a ‘small’ home/island can be challenging, and even dangerous, especially when activities of movement either rely on communication technologies that are not readily available, or depend on travelling on the

⁸¹ As Marshall (1972: 56) identifies, “‘close kin’ is a flexible category that takes shape for any individual largely on the basis of situational and circumstantial considerations”.

⁸² For example, Serino, who has lived his whole adult life on Weno, has married a woman from Weno and had children on Weno, and who has worked consistently for the Chuukese government for many years, identifies strongly as Mochese and continues to cast his votes in elections on the basis of being Mochese.

ocean in often sub-standard vessels⁸³. Despite my own feelings of the boat journey, this was made particularly clear to me in an email I received from Serino about the tragic sinking of a ship that was carrying the bodies of two people home to Moch for burial:

The story... In the morning, about 13 miles away from Namoluk, the ship got burned from the engine room, they were trying to stop the fire but they could not. All the passengers abandon the ship and start swimming to land. Luckily there was a motor boat that found them and took all the passengers to Namoluk and only one man died. There were around 113 people on board, including the sailors. The two coffins and all items that were on the boat all gone with boat. It is sad news and most of the people on the ship are from Moch because of the two remains. (Received 5th December 2014)

I imagine that people were terrified by this event – especially women and children who do not like to travel on the boat and who are not ‘at home’ in the water – and that there was much grief experienced for the loss of their loved ones who were being returned to the home/island for burial. Yet people continue to risk this dangerous journey – in order to realise their identity, to sustain (and develop) the home/island, and to strategise for the future⁸⁴. As a result, within the current of ordinary people’s activities, houses are built, huge breadfruit trees are felled, friendships are made, Apulukuluk is re-thatched, a solar power system and satellite dish are installed, new households are established, the ‘dream’ of a senior high school is realised, children are born and old people are cared for, a police sub-station is established, long distance conversations ensue, food is shared, new clan chiefs are installed, money is transferred, taro pits are tended, the engines of the *Lien Pukial* are repaired (again), funding submissions are written for municipal government projects, a ‘hurricane shelter’ (aka, the Catholic Church) is built, students are sent away to college, jobs are found, political leaders are elected, seawalls are re-built, and risks are managed and decisions made for the future (see Figure 26).

⁸³ This is often the case for ships that service the needs of Pacific Island communities (Newell et al. 2015).

⁸⁴ In accordance with Rabinow (2008: 27), the travel is undertaken in the context of a quest to avert possible future loss; i.e. there is a link between a potential loss and the risk of deciding to travel. This resembles a concept of ‘risk’ that accounts for the probability of losses *and* gains (Douglas 1992: 23-25).



Figure 26: The plan for a satellite dish was realised in 2010, and people regularly used the technology in the Moch School office to contact relatives living off-island. However, recent funding and technical problems have left the community off-line (Photo: Christine Pam).

These activities (and the extensive home/island community they actuate) rely on movement and travel (and migration and remittances), and are “very much related in their core rationales” (Peter 2000: 261) to a long tradition of travel to sustain life on the home/island⁸⁵. Indeed, while contemporary movements may well be constrained by a colonial history (Peter 2000: 257-260), subsumed within a modern state bureaucracy (see Marshall 1979), and increasingly mediated by a monetary economy, and while second-generation ‘migrants’ living in Guam or the US may well become more ‘Americanised’ (Connell 2010: 123), the ‘small’ home/island of Moch remains significant as a physical place of belonging; not only as a place enlivened through the everyday activities of kinship and dwelling, but also as a place constitutive of an extensive – and responsive – network of connections.

⁸⁵ See also Flinn (1994).

Discussion and conclusion

While atoll environments may be vulnerable to the effects of climate change⁸⁶, the main assumption that follows – that small island communities are inherently vulnerable – fails to recognise the everyday activities of ordinary people; essentially presenting a “de-humanized understanding of vulnerability” (Lazrus 2009a: 190-191). As my fieldwork reveals, ordinary people activate a responsive Mochese community that extends well beyond the home/island to include familiar people living in Weno, Pohnpei, Guam, Hawai‘i, and various states of the US mainland. This extensive community shares relatedness and identity through practices of mobility that reveal continuity with the past and enable the ongoing management of risks to sustain life.

Practices of mobility are often referred to in the literature as ‘migration’ and ‘remittances’, and within the context of climate change can evoke the spectre of ‘climate refugees’. Of course migration in direct response to climate change is not easily determined especially given the embeddedness of practices of mobility within the sociality of island communities. As Mortreux and Barnett (2009: 111) conclude:

Social responses to climate change are fundamentally mediated by perceptions of the problem and of the benefits and costs of responses, which themselves are contextualised by the larger social milieu.

In this sense, it is dangerous to simply attribute practices of mobility to a response to the impacts of climate change because the agency embedded within such practices becomes subsumed within a discourse about ‘climate refugees’ that problematically creates “weak, passive victims with little internal resilience to fight for much more than relocation” (McNamara and Gibson 2009: 479).

Although it is recognised that the mobility invested in a ‘remittance economy’ confers flexibility and an ability to reduce the vulnerability of small island communities, especially following a disaster, it is considered *unfortunate* that remittance flows provide more

⁸⁶ There is some evidence that this may not be immediately the case (Kench and Cowell 2001; Kench et al. 2006; Woodroffe 2008).

stability over time than other sources of income (Connell 2013: 162). Furthermore, remittances are primarily understood as ‘countercyclical’; a criticism about the assumed ‘normal service’ of the flow from migrants to those living on home/islands (Connell 2013: 162-163). While there are definitely tensions associated with the demands placed on migrants to support home/island communities (Besnier 2009: 72-73), Peter’s (2004) testament to his home/island ‘paradise’ evidences the deep connections and reciprocal nature of belonging embedded within an extensive home/island community. Such intangible aspects of reciprocity must be incorporated into understandings of the ‘remittance economy’ and migration in order to fully comprehend the fortunate self-reliance (and the potential for self-reliance) enacted to sustain the lifeworld of small island communities.

In the following chapter, I again examine everyday practices of sociality, but this time in the context of a minor tidal surge event which impacted the island soon after my arrival. While such an event may conjure notions of ‘vulnerability’, my attention is instead drawn towards seasonality as it is articulated and practiced by members of the Mochese community.

Chapter 3 ‘We are accustomed to this’: Seasonal expectations and the ‘normal order of things’

Introduction

In this chapter I examine seasonality as articulated and practiced by members of the Mochese community. My analysis stems from a minor tidal surge event which occurred just three days after I arrived on Moch to begin fieldwork. Given a state of emergency had already been declared in response to an earlier tidal surge in December 2008, this event prompted various people to reflect on past such events in general and to comment ‘it was not like this before’. I was told that every year the waves come and ‘we are accustomed to this’ but the waves are getting higher and people are worried. As evidenced by my fieldwork and in line with Lazrus (2009a: 139), the experience of such unusual events stimulated a reflection on the ‘normal order of things’; in this case, those seasonal expectations from which people move along with the world conducting their activities of everyday life (Ingold 2000: 200).

In particular I focus on the resolve of one older man, Hubert Kiauol, who was recognised for his knowledge of such things and who first directed my attention towards the seasonal calendar for Moch. While I document certain knowledge embedded within the seasonal calendar for Moch, I resist a tendency to simply represent seasonality as a list of traditional ecological knowledge conducive to scientific objectivity and rationality⁸⁷. Rather, I attend to people’s practical engagement with the world to emphasise seasonal cycles as “inherent in the rhythmic structure of specific activities” (Ingold 2000: 200). I am particularly concerned with Hubert’s tenacity to assert the significance of his knowledge of a normal order within the context of both my research topic about climate change and the unusual events experienced by the community. It is through his insistence and assistance, and through discussions with others and an ethnographic engagement with everyday activities that I began to understand and reflect on the significance of seasonality for the particular climate change realities of Mochese people.

⁸⁷ For a critique of this approach see Pam (2010). Also see Lazrus (2009a: 140-145), Hviding (1996b: 168-169), and Cruikshank (2001).

Tidal surge warning

One late afternoon Kapa and I were sitting together on the porch outside his house. A man approached the porch, leant on the rail and talked with Kapa. He had just received a message over the radio from his family in Weno; the weather bureau had issued a tidal surge warning for the region, effective from 3.00am the next morning and the predicted height of the waves was fifteen feet. Local municipal officers were informed about the situation, and in the early evening a small group of police walked around the island and delivered the warning to the community over a megaphone. It was only my third day on the island and I was unable to gauge how concerned I should be. Fifteen feet seemed a very high wave for a low-lying island, and yet Kapa and his wife Aprel and family appeared calm; there were no apparent preparations being made or conversations of concern, and the evening progressed without incident. These were the only people within my immediate frame of reference and except for Kapa moving into the house to sleep, all seemed to remain tranquil. Thus I went to bed telling myself all must be well.

As if attuned to the 3.00am warning, I woke at 2.50am to a big wind blowing outside. I lay awake listening for waves crashing onto the island (what do waves crashing onto the island sound like?) and planning a survival strategy (daughter, passport, lifejackets, EPIRB, satellite phone, and so on.). However instead of the sound of waves, all I heard above the noise of the wind was snoring coming from the other room. At 5.20am, the morning call of roosters sounded like a siren and I was immediately alert, and then again at 6.00am when the church bells began to ring out across the island. These bells had not yet become a familiar pattern to me and I was alert and questioning; were the bells a warning, a call to service, or just the mark of a new day? That morning we had an early breakfast on the porch and even though it was raining and the wind was still strong, everything felt 'normal'; the situation did not even warrant a day off school, much to my daughter's disappointment. Partly due to my having recently arrived on Moch and partly due to the location of the house in the middle of the island away from the shore and close neighbours,

this ‘normalness’ contributed to a sense of bewilderment; surely something had happened and yet it felt as if nothing had happened at all⁸⁸.

During the following days my bewilderment was somewhat resolved as the local responses to the warning and the ongoing impacts of the actual tidal surge were revealed. The Municipal Office was placed on alert and the *Catechista*, Hubert Kiauol, warned people during morning service (those early church bells!) to keep children away from the shore. People were worried about the possibility of a wave and those with radios listened to the official weather reports at 9am and 4pm for further news of the tidal surge. One man, a brother of Serino, told me he was worried when he heard the warning because it would be a long walk from his house to the church and community hall if his family needed protection, especially as his wife’s mother and grandmother were both not well and would require assistance. Others expressed concern for their houses and cookhouses and other infrastructure close to the shore.

As I talked with people it became apparent that many were not only worried about the wave warning but had also made preparations to protect themselves and their property. Canoes and motor boats were taken out of the water and pulled further up the bank to higher ground, a sheet of tin was positioned to protect a local hut from any waves, and people stayed away from the shore. Pila, an older woman who was very worried about the warning tied the household canoe to a coconut tree and then moved all the loose utensils from the cookhouse to the house which was further from the shore. During the night she could not sleep, and instead sat outside and watched for the waves. The warning also elicited immediate memories of past experiences for some people, and this translated into action. One particular woman lived in a plywood house close to the shore in Inapwei village. Her house still held damage scars from the big wave in 2002 which had swept through her house and injured one of her sons⁸⁹. When she heard the tidal surge warning she took her two grandchildren and went immediately to stay at her sister’s house in Rúš in Peimoch village, a concrete house of sturdy construction further away from the shore.

⁸⁸ My experience of ‘not knowing what is happening’ – heightened in this moment by the tidal surge warning – contributed to my later reflection on the relationship between knowledge and uncertainty as people expressed concern and confusion about the changes being observed on the island (discussed in chapter four).

⁸⁹ Discussed in more detail in chapter four.

On the day after the tidal surge warning I sat for a while on the shore at Ariow and looked out from the island into the lagoon. The lagoon was choppy and I noticed a very strong current which ran along the island and out through the Pukial channel into the open ocean. Doropio commented on the current and told me it was strong along the back of the island as well; so strong that it had trapped sharks in the inlet between the shore of the island and the outer barrier reef. He said the unusually strong current was a sign of a wave and that people were worried and continued to listen to their radios for news. However, despite the anxiety felt, more or less, by various people on Moch, there was a calmness that persisted along the front of the island as people continued with their everyday life. The women of the house where I lived continued to prepare food and the youth continued to work on improvements to Kapa's local hut (*imosen*). A man walked by with a young breadfruit tree to plant in his garden, teachers taught their classes at the school, and people left their houses to attend morning church services and to visit relatives. This feeling of calm was further enhanced by some conversations that seemed either unaffected by the wave warning or expressed a lack of concern; 'although there are warnings, it is very rare for there to be a wave'. Also, whilst the lagoon was choppy, the shore seemed well protected from the rolling ocean waves that might breach the seawalls and penetrate inland to claim people and things.

This sense of calmness and protection was not so apparent along the back of the island. Fewer people lived at the back of the island; houses are dispersed and many are close to the shore, protected from the full force of the ocean waves by the outer barrier reef and in some cases a seawall. On the days following the tidal surge warning there was talk about waves that had come onto the land at a place called Letup. I walked with Doropio to the back of the island; the ocean waves were big and strong and crashed noisily against the outer reef. When the waves breached this barrier, they rolled towards the shore, one on top of the other until the volume of water matched the height of the land. This happened quickly; within moments of standing on a collapsed seawall well clear of the water I was swamped up to my knees by a wave which threatened to claim the sandals from my feet. It was compelling to watch, an overwhelming force that gathered strength and defied containment. As we walked the shoreline along the back of the island, debris could be seen scattered many metres inland, deposited by waves that had overwhelmed the seawalls at

about 5pm the day before. We traipsed through water unable to escape, held by land that was lower than the edge of the shore.

Places along the back of the island were differently affected by the waves. For example, at Lemwou the waves rolled through the cookhouse and penetrated 15 metres inland, whereas at Lukunmer the waves reached five to six metres in-land, and people expressed concern for their cookhouse only ten metres from the shore. However, it was at Letup that the full force of the waves could be seen. Debris on the ground evidenced the path of the waves from the day before; through the cookhouse, alongside one house, across the main island path, between another house and some family graves and to within seven metres of the central taro patch (see Figure 27).



Figure 27: Effects of the tidal surge at Letup (Photo: Christine Pam)

One woman from Letup told me she could hear the wave coming but it was too late for her to escape. The wave came in very quickly and the water came up to her thighs. The current was so strong she had to crawl out of the cookhouse and hang onto a coconut tree nearby. Her story was accompanied by much laughter; and as we laughed the waves came in again,

one on top of the next until they broke over the seawall and rushed onto the land. Whilst attempts were made to protect the taro plantings close to the shore and to redirect water away from the graves and other vulnerable places, there was a strong feeling among those present of not being able to do anything to stop the waves once they breached the seawall. We simply stood aside from the path of the wave and watched as it reached its extent inland and then withdrew back to where it had come from; peaceful again until the next set of waves rolled in.

‘Every year the waves come’: the Mochese seasonal calendar

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proceed to extract seasonal knowledge (as ‘traditional environmental knowledge’) from its cultural context in a form relevant to the study of climate change or even validate such knowledge against other climatic and meteorological sources¹⁰⁷, I am interested here in the embeddedness of seasonal knowledge within social relations and in particular, within the shared activities and practices that unfold a normal ordering of life on Moch.

Living with the seasons: the temporal dimension of human activity

Given relatively constant temperatures, humidity and day length, there is a tendency to regard places on the equator as ‘relatively seasonless’ (Orlove 2003: 121). Certainly, islands close to the equator experience “little of the annual weather cycles we associate with the seasons in the temperate zone” (Johannes 1981: 40). Yet as Johannes (1981: 40) states, whilst relatively constant water and land temperatures, humidity, rainfall and day length “provides only subtle clues to the seasons... it is clear that life responds to these cues” and that these “seasonal environmental rhythms are charted traditionally in Palau, as in the rest of Oceania”. This holds for people of Moch who have knowledge of changes in the sky and in the winds and the waves and the tides which account for a star-month and an annual cycle of seasons.

However, even though ‘each star a month’ and each month is designated to one of two seasons in the Mochese calendar, a seasonal cycle does not necessarily correspond to the sidereal year “since weather [and other phenomena] that characterizes a particular season might start earlier or later than usual in a given year” (Orlove 2003: 127). This is significant given that in terms of living with the seasons it is the experience of weather and climate events and other ‘natural’ cycles (e.g. animal and plant reproductive cycles) rather than specific reference to the sidereal calendar which effects a rhythm of everyday life for the Mochese community. As Orlove (2003: 136) concludes, “to speak of seasons is to stress a temporal dimension of human activity and experience”.

According to Roncoli et al. (2009: 94), “seasonality is the most basic scaffolding of people’s sense of time, structuring fluctuations in resource availability and deployment of

¹⁰⁷ Lazrus (2009a: 140-146) provides a detailed critique of attempts to use traditional environmental knowledge to fill in the climate story.

adaptive resources”. Thus, whilst some important aspects of life within the Mochese community may have been fixed to calendar months (e.g. school terms and religious celebrations), many activities of everyday life resonated with rhythmic seasonal conditions and natural cycles, often understood as a “means for relating oneself to the realities of nature” rather than to a calendar based on astronomical events (Gladwin 1958: 897, Lefale 2010: 328). Furthermore, as Ingold (2000: 200) suggests, “in dwelling in the world, we do not act upon it, or do things to it; rather we move along with it. Our actions do not transform the world, they are part and parcel of the world’s transforming itself”. In this sense, our actions ‘belong to time’; our activities are the embodiment of a pattern of resonances which constitute the totality of human-environment relations (Ingold 2000: 200).

Certainly on Moch experiences and observations of seasonal conditions resonated with particular activities and practices of everyday life. So whilst the two officially named seasons on Moch were designated months corresponding to specific astronomical conditions and events, various seasonal cycles were not dependent on the month (star) of the year but were rather “inherent in the rhythmic structure of specific activities” (Ingold 2000: 200). For instance, when the ocean waves break over the barrier reef and travel all the way to the shore along the back of the island, men carved model canoes from the wood of breadfruit or *kilifa* trees and competed in canoe races from the reef to the shore. This was the season for *Nou Nou*, and although I was told the season finished in March, it was actually timed according to the particular quality of the waves. Similarly, it was not ‘in May’, the month of the calendar following the last waves of the season, that Pila went into the lagoon to tend to her fish weir or to fish, but rather when she deemed the conditions to be safe from the risk of a big wave. So when I heard at the beginning of June that Pila had caught eight fish in her weir I knew the wave season had ended and it was definitely *leraak*, the season of summer, the season when the ocean (*sáát*) was calm (*lua*).

As the examples here suggest, ‘seasonal cycles’ are not prescribed through reference to some set sidereal calendar which is then consulted in order to time particular activities¹⁰⁸.

¹⁰⁸ However, it is important to note that although the season for picnics and holidays is associated with certain conditions, such as calm weather, low tides during the days, abundant breadfruit and good fishing, it

Rather, seasonal cycles are embodied as the very activities which comprised those seasons. As I mentioned earlier, *leraak* is especially appreciated by the Mochese community. It encompassed the season to safely fish on the reef, in the lagoon, and on the open ocean, the season for breadfruit, the season for working in the taro patch and for building houses and seawalls, the season of preference for women to travel on the *Lien Pukial* to Weno and the season for picnics and holidays on the neighbouring small islands. Indeed, as Lieber (1994: 51) suggests for Kapingamarangi Atoll, the calm summer season is the ‘busy season’.

Breadfruit season

On Moch, *leraak* was most commonly known as ‘breadfruit season’; it was activities related to breadfruit which marked its beginning and end¹⁰⁹. As Hubert told me, ‘summer is the season we harvest breadfruit’ and when the breadfruit is finished (*a mow máái*), ‘it is then the beginning of winter [high tide season]’. Breadfruit (*máái*) would begin ripening on the trees around March and as the season progressed the fruit became more abundant; the season resonating with activities of harvest and preparation and consumption. The breadfruit trees on the island were massive; they dominated the landscape and challenged assumptions about the poor quality of coralline soils. During breadfruit season young men would climb high into the branches of these huge trees to harvest the fruit. They relied on a climbing rope (*selintemáái*) thrown over a lower branch to clamber up the tall trunk and then they disappeared among the branches wielding a long stick (*ias*) to reach and dislodge the hard fruit (see Figure 32). People on the ground, usually women, then collected the fruit as it fell from the trees.

also aligns with the graduation of students from both elementary and high school and encompasses the long summer vacation between school years (i.e. it aligns with dates set by the calendar).

¹⁰⁹ According to the Chuukese-English dictionary (Goodenough and Sugita 1990: 44-45, 330), *raas* refers to breadfruit harvest season (May to August) and *rek* refers to season of main breadfruit harvest and of westerly winds.



Figure 32: A boy uses a rope (*selintemáúí*) to climb a breadfruit tree while a man stands by holding the stick (*ias*). (Photo: Christine Pam)

At the beginning of the season people noted individual fruit ready for harvest, but on busy days (usually a Saturday) when breadfruit was abundant, the sound of hard fruit hitting the ground contributed an overwhelming sense of activity suggestive that the season for breadfruit was well established. At this time, women pushed wheelbarrows full of breadfruit from the base of trees to the cookhouse where the fruits were peeled and cored, cut into large pieces and cooked in large pots on the fire. The cooked breadfruit was then often pounded into *kón* (a dough-like pudding) by men using heavy coral pounders (see Figure 33). In the midst of the season and usually on a Saturday, the sound of cooked breadfruit being pounded would reverberate across the island, contributing to the soundscape of activity which was the season of summer. Breadfruit season was also the sound of tree ripened breadfruit as it fell from the trees and hit the ground with a splatter. It was the care needed to dodge the slippery mess of sticky yellow flesh as you walked the

path or climbed the stairs to the school office, and the sweet smell of rotten fruit and the accompanying buzz of hundreds of flies that embraced you briefly as you passed by.



Figure 33: The husband of a woman from Ololuk pounds breadfruit in the cookhouse (Photo: Christine Pam)

Hubert told me that under certain conditions the season for breadfruit could seem to have no end. He said:

There is a name for this in our tradition. We call rekufetal. Fetal means walk... Rek, do you know 'rek'... when we start to harvest new fruit.

He explained further:

The kind of summer for food, not just stay here, just walk around. It can begin on May, June, July, all the year. When

*another one [fruit] has gone, another one is coming. It means no end, walking around...*¹¹⁰

According to Hubert, *rekufetal*, the long walk of breadfruit, did not happen every year as it depended on a high summer rainfall; ‘*when you see the rain everyday that’s the sign*’. He said the rain was necessary to wash salt spray from the trees; salt spray, which came from the wind and waves of high tide season and covered the breadfruit trees, caused the fruit to fall early when it was too small to eat. During my fieldwork, Hubert talked with me about the small breadfruit he had noticed falling from the trees. Nevertheless, he predicted *rekufetal* because by early June there was good rainfall nearly every day:

*When the salt spread the rain is come and wash it away.
That’s why it going to be good this time... Later in the year
we call rekufetal. Food come and ...come. Not stop. We just
eat breadfruit from now to...*¹¹¹

Although Hubert claimed, ‘*summer is the season we harvest breadfruit*’, this did not mean that summer always continued until the breadfruit stopped. As Hubert explained, *Even in the winter we also harvest breadfruit... because of rekufetal it is going on and on*. I then asked Hubert if the breadfruit season kept walking, how he knew that summer was ended and winter had begun. He responded:

*We know the winter time because we see the high tide and we
can see the big wave and a big wind.*

In this sense, *rekufetal* can be understood as a variation in breadfruit season, one in which the breadfruit kept walking past the season of summer. While Hubert thought ‘*not most of the people of Moch know rekufetal*’, this was in terms of knowing the signs (salt spray and rainfall). However, in relation to the activities of everyday life, the seasonal variation of *rekufetal* was accepted within the normal order of things, and associated with the practice of making *mar* (preserved breadfruit). As Hubert said:

*When there is a lot of breadfruit..., that time the women they
preserve the fruit... they put under the ground.*

¹¹⁰ Interview June 2009

¹¹¹ Interview June 2009

At that time, extended families would gather to process and preserve the abundance of breadfruit as *mar*; breadfruit that was harvested, peeled, chopped into small pieces and preserved in the ground for consumption when the season had ended. Certainly, making *mar* was in process among some families towards the end of my fieldwork in June. At one time, fifteen members of my extended household, including women, men and children, collected well over 100 breadfruit (six wheelbarrow loads) and under the direction of one older woman spent many hours together making *mar* (see Figure 34).



Figure 34: Making *mar* at Ololuk (Photo: Christine Pam)

Although the seasonal practices described above appeared frenetic at times, breadfruit was relatively easy to grow, harvest and prepare and as such, a seasonal dependence on breadfruit seemed to afford a certain ease within the community. Whilst one should not ignore the many hours women spent preparing and cooking breadfruit or the effort it took men to pound the breadfruit, unlike taro it did not involve many hours of hard and muddy work in the taro patch, nor was it an itchy process to cultivate the plants and prepare the fruit for eating. Indeed to avoid the discomforts associated with taro, men would often

shower immediately after working in their taro pit and women would wear gloves when peeling and grating the harvested taro. This effort associated with growing taro in comparison to breadfruit (and other crops such as banana, papaya and coconut) contributed to its greater value; I was told that whilst breadfruit could be given away, uncooked straight from the tree, taro was always cooked and prepared first ('this is custom'), and was the preferred food for special events. Therefore, during the season for breadfruit local food was often available for a seemingly smaller effort. This aligned with holiday activities such as graduation parties and picnics on the small neighbouring islands, which in turn contributed to the generally felt fondness for *leraak*, the summer season (see Figure 35).



Figure 35: End of year picnic on Sanchol for the year ten students (Photo: Christine Pam)

The busy season

However, as suggested above, *leraak* was also the busy season encompassing the season for particular work activities such as constructing houses, building wells, repairing seawalls, and digging in the taro patch. While work in the main taro patch and smaller taro pits occurred throughout the time of my fieldwork, I was told by some men that during

high tide season water in the taro patch made the work very difficult. In particular, at the end of February Kapa's brother, a man with a large family, pointed out it was not yet breadfruit season and water in the taro patch made it very hard to work there and to find taro ready for harvest. He attributed this water to high tide season and to the amount of rain which had fallen in the previous week. Of course taro was cultivated and harvested in high tide season, but extensive work to dig new taro pits and to re-plant old ones was carried out in the summer under more favourable conditions (see Figure 36).



Figure 36: Digging a new taro pit (Photo: Christine Pam).

However, as with Pila and her fish weir, it was not 'April', the month that marked the end of high tide season and the beginning of summer on the calendar that directed a flurry of work in the taro patch. Rather, it was the experience of favourable conditions when they occurred that was embodied as such work. Comparable conditions also supported other similar activities such as digging new wells, and certainly when there were lower tides during the day (i.e. when people 'don't see high tide') and the ocean waves failed to break

over the barrier reef, people invested time and energy into building and repairing seawalls (discussed further in chapter six)..

Further, in contrast to *leffang* which was dominated by high tide and wave activity which limited people's movements, the summer conditions of calmer seas meant more frequent trips to Weno to purchase and freight building materials. Whilst men generally were in control of this process, the calm seas encouraged women to travel to Weno and a few would handle their own building projects, managing the family's funds and coordinating the purchase and transportation of materials. At times, this 'anomaly' was interpreted by others as suggestive of the woman's circumstances (e.g. she had a 'bad' husband or no husband, or her relatives who provided the funds did not trust her husband to manage the project), and attracted comments of derision, albeit often tinged with admiration. Bags of cement, cement blocks, lumber, corrugated iron sheets, louvers, toilet bowls and many other items were transported to Moch on board the *Lien Pukial*, and in summer there was an outbreak of construction activity on the island. During this time and in these conditions new houses were progressed to the next stage of completion, newly dug wells were lined with cement blocks, and the new school bathrooms slowly took shape (see Figure 37).



Figure 37: Construction of a new house (Photo: Christine Pam)

Lunar resonance: sleeping out and fishing by the light of the moon

The somewhat ‘faster’ lunar cycle also connected with particular behaviours among the community¹¹². For instance, the light of the moon encouraged people to venture outside their houses at night. As I mentioned earlier, Merym and her husband were drawn outside to witness the beauty of the light of the full moon reflected on the exposed reef. So too on another evening – a few days before a full moon – Merym, Lerinda and I moved outside Lerinda’s house in order to continue to *kéré* pandanus leaves by the light of the moon¹¹³. Another time when the moon was nearly full, Jirin and I went for a ‘jog’ with Liana and another woman and her daughter. As we walked side-by-side together on the path around the island, the young girl gestured towards the moon; she pointed it out to me and named it for me, ‘*maram*’. Later that same evening, I watched a young father holding his baby daughter outside his house, talking with her gently and directing her attention towards the moon.

On another occasion the moon was used by Lekila – a Mochese woman from Rús who lived and worked permanently on Weno – to illustrate her point about the security of life on Moch. At the time, Lekila was staying briefly with her family on Moch; a familiar base from which to conduct her short-term work in the Mortlocks with Headstart, a government program for pre-school education. In one of my discussions with Lekila, she told me she would like to remain on Moch where everyone knows each other. In particular, she felt on Moch that her daughter could go outside the house and roam around and be safe, that she did not need to worry. Within this context of safety and security, Lekila said that when she told people on Weno that during full moon on Moch they could take their mats and sleep outside, ‘those people find it hard to believe’.

Further, it seemed the moon was also understood to have affected human relations. As Kapá explained, a long time ago the phases of the moon would be used to influence people and situations. He provided a couple of examples; if he liked a woman but she did not like him then he could use the phases of the moon to influence her, to make her feel different

¹¹² Johannes (1981: 40) suggests the primacy of the lunar month to chart seasonal environmental rhythms in Oceania.

¹¹³ *Kéré* is a process whereby lengths of dried pandanus leaves are scraped with a shell or other hard implement to make the leaves flexible for weaving.

towards him. Similarly, if neighbours were causing him trouble, he could use this to make them talk nicely to him. Although Kapa initially claimed this did not happen anymore, it was suggested that ‘those people who just go and sit in church but who have no faith still use this, still do this’.

However among the community of Moch, the lunar cycle related most significantly to the daily ‘rhythms of fish and fishermen’¹¹⁴. As Johannes (1981: 32) describes for the Palauan fisherman:

The moon provides him with vital information concerning where, when, how, and for what to fish. Its phases accurately foretell not just the timing and approximate height of the tides, the strength and direction of tidal currents, the brightness of the night, and the accessibility of different fishing areas, but also the locations, behaviour, and vulnerability to capture of many species of fish.

Certainly during my fieldwork on Moch, the moon often featured in my discussions with men about their fishing activities, further evidenced by the correlation of my ethnographic observations (e.g. the number of canoes in the lagoon or the amounts of fish being prepared in the community) with the lunar calendar. For example, I was told about the community fishing practice of *laló* which involved a ‘leaf sweep’ for fish called *mamachuk*. It was explained that coconut palm leaves are tied together to make a ‘net’ which is used to herd the fish into the shore, a practice described by Johannes (1981: 12) as a ‘leaf sweep’. Once successfully encircled, it seemed the fish were then either scooped up in great numbers with a net or caught by a line (*‘laló with a line’*). *Laló* involved many men fishing together from their individual canoes near the island of Aferen at night when the moon was clear and bright. I was told it was a big event and there was the potential to catch lots of fish which were then distributed to all those involved, usually most of the island community.

Apart from what I was told, I also heard rumours of *laló* on the two days before the full moon in April. On one of those days I noticed many fish (*mamachuk*) had been salted and

¹¹⁴ Here I draw on the work of Johannes (1981), and in particular his chapter entitled, ‘Rhythms of Fish and Fishermen’.

left in the sun to dry; an observation accompanied by mention of *laló* (see Figure 38). When on the following day I was told about *laló* again, Jirin and I climbed the stairs to the roof of the school to look for canoes on the lagoon at sunset. Yet as the moon rose there were no canoes to be seen. However, a little later as we walked with Aprel and Liana home from Peimoch there were men gathering at Ariow, and then at 8pm the shell horn sounded. That night we stayed up late, playing cards and waiting for *laló* to finish so we could prepare the fish. I finally went to sleep with my door open so Aprel could wake me when the fish arrived – but there were no fish. *Laló* was not successful on that particular night.



Figure 38: Fish salted and drying in the sun (Photo: Christine Pam)

Two members of Likilup clan told me that while *laló* was initially owned by them, it had been given by the chief of Likilup to his children who were from the clan of Sór. Hence, when the moon is full and there are *mamachuk* in the lagoon near Aferen, it was for the chief of Sór or another important member of that clan to decide for *laló*. Although I was told ‘they own that fish’, it was actually the communal practice of catching *mamachuk* using a leaf sweep at night during full moon that appeared to be owned by the clan. Apparently anyone could catch *mamachuk* with a line on other occasions. For instance, one

afternoon a few days before new moon I visited Merym at Leseapan. While I was there her husband prepared his fishing gear for that afternoon; he was going fishing for *mamachuk*. He made lures from colourful lolly wrappers and shiny thread, and attached about eight hooks to his fishing line which was wound onto a wooden hand reel. He then paddled his canoe to join a circle of more than twenty canoes gathered in the lagoon near Aferen. The men fished from about 4pm to 6pm, and as the sun went down the circle dissolved and the fishermen headed back to shore. This was repeated the following afternoon, with more than thirty canoes forming a rough circle in the lagoon which again dissolved at sunset. Jirin and I watched as they returned to the shore, where one of the fishermen gave us seven fish, all *mamachuk*. However, at this time of the new moon there was no mention of *laló*.

Although with reference to the above fishing for *mamachuk*, Merym's husband mentioned they would instead fish at night as the moon became full, this did not mean that fishing only occurred on bright moonlit nights. On a dark night in April (around the new moon), I was awakened just after midnight by a woman knocking on the windows and doors of the house. Her husband had been fishing since 7pm, and she was trying to wake Liana to give her some fish for our household. On another dark night, my partner who was visiting Moch for a short time went fishing with some men outside the atoll in a motor boat. As they returned around 11pm he noticed there were many canoes in the channel, all with lights. It is possible that, as Johannes (1981: 54) suggests, the fishermen "take advantage of the fact that many species are attracted to artificial light on dark nights... This technique does not attract fish effectively when the moon is bright because it tends to drown out that of a lamp or torch".

It was also likely that dark nights were considered favourable for spearfishing on Moch. Spearfishing, both during the day and at night was an important activity among some men. Using diving goggles and a hand-held spear with a piece of rubber for propulsion, they would venture underwater near the drop-off from the reef into the lagoon or the open ocean looking for octopus, lobster, and reef fish, as well as the predatory fish that patrol the reef. When spearfishing at night, an underwater torch was an essential item. Given a significant portion of often quite limited funds would have to be spent on batteries for the torch this

was obviously a productive fishing method¹¹⁵. It has been found in Palau and elsewhere that “the brightness of the moon is of great importance in nighttime underwater spearfishing” because reef fishes are more active on bright moonlit nights and “being more alert they evade spearfishermen more easily” (Johannes 1981: 53). Taking this into account, it is highly probable that the phase of the moon also influenced the fishing behaviour of skilful Mochese spearfishermen.

Fishing for tuna: moving along with the world

The temporal dimension of human activity discussed here is not intended to suggest an environmental determinism whereby the ‘natural’ cycles of the sun and the stars and the moon determine the practices and behaviours of people living on Moch. Nor do I assume that through such behaviours people somehow take control of these cycles, acting upon them from the outside. Rather I wish to engage more fully with Ingold’s concept of ‘moving along’ with the world, to understand the pattern of resonances as humans and non-humans attend to one another and effect a particular rhythm of life for Moch. As Ingold (2000: 201, citing Mae-Wan Ho 1989: 18-20) suggests, the world is a process we are part of:

The rhythmic pattern of human activities nests within the wider pattern of activity for all animal life, which in turn nests within the pattern of activity for all so-called living things, which nests within the life-process of the world... At each of these levels, as Mae-Wan Ho shows, coherence is founded upon resonance.

Probably it was the practice of fishing for *angarap* which made this resonance most obvious for me. *Angarap* was the Mochese word for skipjack tuna, but also for the community practice of fishing for *angarap* using a leaf sweep and spears. Although men could catch skipjack tuna at any time (usually by trolling), it was the call for *angarap* which elicited much excitement within the community:

¹¹⁵ Merym’s younger brother Jasen often went spearfishing and even took my daughter with him on one occasion. During my fieldwork, Jasen worked as a secretary for the Moch Municipal for two quarters (six months) and earned eighteen dollars. Of this, he told me he spent fifteen dollars on batteries for his torch and two dollars on cigarettes. The batteries were for his torch so he could fish for his family.

At first when they find out that the fish is around there they will make announcement to all the people of the island calling 'angarap'. Whenever they call out 'angarap' everyone would come knowing that we will do fishing for angarap'¹¹⁶.

Over a period of three days coinciding with the Easter holiday in April, *angarap* was called at least three times. On the first day a number of people mentioned '*leset*' (fishing) or told me that *angarap* was happening. Initially I was unsure what this meant, but as Jirin and I walked to Leseban we were caught in a stream of women and children who, as one woman acquaintance explained, were going to the beach located at the end of the island in Eor village to watch *leset in angarap* (see Figure 39). Jirin and I joined them, and on the way to the beach we passed men sharpening their spears and others carrying their spears as they also walked along the path to the beach. On the beach, Jirin and I sat down with a group of women as the children played in the sand and shallow water nearby.



Figure 39: A stream of women and children heed the call for *angarap* (Photo: Christine Pam)

¹¹⁶ Interview with Atel, chief of Soren Iluk (June 2009)

From the beach I could see a number of canoes in the lagoon just off the small island of Weninek, and watched as many more were paddled out across the narrow channel from Moch (see Figure 40). While some men sat on the beach with their spears, apparently waiting, others waded out across the channel to join the many men already standing chest deep in water near the canoes or standing on the beach of Weninek. The men shouted to each other, splashed the water with their paddles and occasionally jumped from their canoes into the water to scare the fish or to handle the coconut palm leaves which were tied to a very long rope. Then about an hour after my arrival on the beach a somewhat open circle of men and canoes and coconut leaves was formed in the water, the shouting of men reached a crescendo, and women and children on the beach joined with screams and cheers; I was watching as at least 35 canoes, two motor boats, and about 50 men with spears were involved in a seemingly coordinated effort to catch a school of *angarap*.



Figure 40: ‘Whenever they call out *angarap* everyone would come’ (Photo: Christine Pam)

On this first occasion *leset in angarap* was not successful; the fish escaped the leaf sweep. As Satal explained, the tunnel made to direct the fish into the shallow water near the beach was too narrow and the fish did not go through. He said he would be ‘blamed’ because he was from Soren Iluk, the clan that owned *leset in angarap*. However, over the next few days other calls for *angarap* were ‘successful’ with many fish being speared and much

tuna being eaten by the community¹¹⁷. At first I understood these successes as the culmination of particular knowledge and careful technique attuned to the topography of the reef and the behaviour of the fish. For instance Atel, the chief of Soren Iluk told me about *fun penepin*, a small reef near Weninek. He explained:

Whenever they call out angarap, everyone would come knowing that we will do a fishing for angarap. When the fish is there, there is a certain reef or rock out there where the angarap is. That spot they call 'fun penepin', meaning to block the fish. Whenever people are on that rock the fish will remain where it is running around in that area [near Weninek]. It will not go out into the big ocean...

'Fun penepin' will be where canoes will start getting ready and move from there to bring the fish. And they went to that fun penepin when the fish is already inside here, inside this area. So while they are on that fun penepin that's when they are getting ready for the net¹¹⁸.

Satal also identified the significance of *fun penepin*:

Certain people will go out to that fun penepin and wait there... you can just paddle on your canoe and stay on that rock. Keep the fish inside here... So while the people are coming and make the net ready the fun penepin is already there¹¹⁹.

However, whilst such knowledge and technique was no doubt necessary for the practice of *leset in angarap*, it was the actual infrequency of the event which pointed to an achievement of resonance, the 'mutual tuning-in relationship' of human activity nestled within the life-process of the world (Ingold 2000: 196). As it turned out, *leset in angarap* was a rare event and I was very fortunate to have witnessed it during my fieldwork. I was told by a few of the men that the last time it happened was in the year 2000; they could

¹¹⁷ On one occasion Jirin and I were paddled across the channel to Weninek where I was able to video at close proximity the coordination of the leaf sweep and the spearing of many fish in the shallow waters very near the beach. With the support and contribution of the Chief of Soren Iluk, I edited this footage as a DVD entitled '*Leset in Angarap*: fishing for tuna on the small coral island of Moch, Chuuk State, FSM' (2010).

¹¹⁸ Interview June 2009

¹¹⁹ Interview June 2009

remember that work on the new Catholic Church was interrupted by the call for *angarap*. Ason, the brother of the chief of Soren Iluk told me:

At that time they build our church. Every day we put up one post and they shout for angarap so they leave the work. For one week... people went down [and] get angarap and come back and keep working on the church¹²⁰.

Others told me it was earlier still, in the 1990s, but on all accounts it was a practice which had not happened within the community for many years. Again the chief of Soren Iluk and his brother both offered an explanation as to why *angarap* happened infrequently:

Could be that sometimes we just don't feel like going to take the fish. Sometimes the fish came with a very small school of fish so we really didn't mind to go fishing for that. Or sometimes we did not even aware that the fish is there, they just stay and go and people don't know¹²¹.

Laló every moon but angarap, sometimes. I really don't know why. Before last couple years they see the angarap rolling around there but people don't like to work on the angarap so they leave it¹²².

As suggested here, *leset in angarap* was a practice that demanded attention as well as the willingness to attend. For *angarap* to be called, it was essential that people were aware of the fish in the lagoon near Weninek, that they wanted to work for *angarap*, and that the clan of Soren Iluk provided permission. As I was told with regards to the event I witnessed, men had noticed a school of fish and it was *decided* to have *angarap*. Indeed, it was decided to have *angarap* a number of times as the fish remained in the lagoon over a period of days (similar to previous times). Given that skipjack tuna is a highly migratory pelagic fish that mostly lives in the open ocean¹²³ its presence in the lagoon was intermittent, most likely resonant with particular rhythms of the ocean. Then people also

¹²⁰ Interview May 2009

¹²¹ Interview with Atel, June 2009

¹²² Interview with Ason, May 2009

¹²³ See the species summary for skipjack tuna (*Katsuwonus pelamis*) on FishBase, a widely cited biological database for fish species, especially finfish (<http://www.fishbase.org/>).

needed ‘to mind to go fishing’, which as the statements above suggest was also a somewhat rare occurrence. Thus, it appeared significant that when *leset in angarap* actually happened it was during the Easter holiday, as well as previously when the new church was being built. These were both large community events¹²⁴ which coincided with the appearance of fish in the lagoon. As such, people were already attuned to each other through shared activity – celebrating Easter and building the church – which readily translated into a willingness to work together for *angarap*. As Ason said, *every time they work together, very easy*¹²⁵.

Therefore, *leset in angarap* can be understood as “the resonance of movement and feeling stemming from people’s mutually attentive engagement, in shared contexts of practical activity” (Ingold 2000: 196) not only among themselves but also with the rhythms of the world. It was an activity steeped in human/non-human relations or rather, it was the moment whereby such particular relations – such a pattern of resonances – unfolded (Ingold 2000: 200). Indeed, all of the activities and practices discussed throughout this section lend themselves to such an understanding. Whether it was harvesting and cooking breadfruit, fishing for *mamachuk*, digging in the taro patch, or picnicking on the small islands, such activities were nestled within and conducive to the life process of the world. They were activities which embodied resonance; which substantiated a moving along with the world. Significantly, whether they occurred ‘annually’ with the seasons, more regularly within the lunar cycle, or quite infrequently as with *leset in angarap* every ten years or so, these activities suggested an attentiveness to the world and unfolded a normal order of things for life on Moch.

¹²⁴ Although both of these were religious events, it was the communal activity rather than the religious context which accommodated *leset in angarap*. However, it is significant that 96% of the population of Moch was Catholic and the other 4% was Protestant, meaning that much of the communal activity which occurred during my fieldwork was steeped in religion.

¹²⁵ Interview May 2009

Discussion and conclusion

There has been a long interest in the role of ‘traditional environmental knowledge’¹²⁶ for understanding and adapting to climate change (Nurse et al. 1998, Barnett and Busse 2002, Parry et al. 2007, Mercer et al. 2010: 214, Kelman 2010: 608, Nakashima et al. 2012). This is firmly established in the Fifth Assessment Report of the IPCC (IPCC 2014b: 26) that reports ‘high confidence’ that “adaptation planning and implementation at all levels of governance are contingent on societal values, objectives, and risk perceptions” and that:

Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples’ holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation.

Experiential place-based knowledge of the weather and seasons is often documented within the literature as ‘local knowledge’ or ‘traditional environmental knowledge’ and is increasingly being recognised as a valuable contribution to understanding and adapting to climate change (Cruikshank 2001: 378, Crate 2008, Byg and Salick 2009: 156, Turner and Clifton 2009: 181, Roncoli et al. 2009: 94-96, Green et al. 2010: 351, Lefale 2010: 331, Weatherhead et al. 2010: 523, Veland et al. 2013, Klein et al. 2014: 150). While some researchers warn against a tendency to document such knowledge as a ‘decontextualised inventory’ (Cruikshank 2005: 259, Roncoli et al. 2009: 95, Lazrus 2009a: 140-142) and instead pursue a more nuanced understanding of knowledge as “embedded within social relations and cultural meanings” (Roncoli et al. 2009: 95), it is often the case within the climate change literature that much of this research expresses an *intent* to investigate local

¹²⁶ ‘Traditional environmental knowledge’ (TEK) is a term often used interchangeably with ‘traditional ecological knowledge’, ‘indigenous knowledge’, ‘traditional knowledge’, and ‘local knowledge’. There is an extensive critique of these concepts and their uses within the literature, including by those who carefully engage them in their own work (Agrawal 1995, Sillitoe 1998, Ellen and Harris 2000, Raffles 2002, Nason and Peter 2009, Williams and Hardison 2013, Klein et al. 2014). With reference to ‘TEK’, Anderson (2011) warns “by the time a concept is acronymized to that extent, it is in danger of becoming so cut-and-dried that it is mere shorthand”.

knowledge relevant to climate change¹²⁷. While I adhere to the concerns related to documenting a list of traditional environmental knowledge, my intentions were neither to document seasonal knowledge nor pre-determine its relevance to climate change. Rather, this chapter attends to the significance of seasonality *because* it was impressed upon me in the context of my research.

As I have evidenced, people attend to the world as ‘seasoned inhabitants’, as those who know how to read the land and the sea and the sky as a register of the weather (Ingold 2011: 119). While some, such as Hubert, articulate such knowledge as a clearly defined seasonal calendar of the wind and the waves and the tides, mostly such knowledge is embodied as people go about their everyday activities “in the specific relational contexts of their practical engagement with their surroundings” (Ingold 1995: 76). Hence, the seasons are “as much something lived and of which one is unmistakably a part as something of which one has abstract knowledge” (Raffles 2002:325). Given my being ‘unmistakably a part’ of this seasonal engagement during the time of my fieldwork, it is helpful to draw on Raffles’ (2002) critique of ‘the local in local knowledge’ and to reimagine local seasonal knowledge as ‘intimate knowledge’ or ‘affective sociality’:

It is a site for the social production of knowledge and the re-working of human-nature boundaries. It is always in a field of power. It is always in place. It is always embodied. And it is always, above all else, relational. (Raffles 2002: 326)

Therefore, rather than using the calendar as a way of documenting ‘local knowledge’ relevant to climate change¹²⁸, I argue it is essential to recognise Hubert’s insistence on the significance of his seasonal knowledge *in relation* to my perceived role as a climate change researcher. Indeed, seasonal knowledge is being produced through the circumstances of our relational engagement, with each other, within the situated intimacy of everyday life on Moch and in the context of unusual climatic events. Indeed, what is fundamental within

¹²⁷ Following Lefale (2010: 331), “the main goal of [such] research is to document and evaluate the potential role of traditional ecological knowledge in weather and climate and how this could be integrated into contemporary western scientific methodologies of weather and climate observations, research and assessment and response to human induced climate change”.

¹²⁸ Roncoli et al. (2009: 95) suggest “seasonal calendars are often used in ethnographic research as a way of eliciting and systematizing local knowledge of climate”.

this chapter is Hubert's affective claim for a particular association between local seasonal knowledge and global climate change and furthermore, an understanding of the Mochese calendar as the 'normal order of things' operationalised through people's intimate experiences of unusual tidal surge events. There were other unusual changes being observed by people on Moch which not only emphasised a 'normal order' but also contributed to a sense of uncertainty about the future, and these will be considered in more detail in the following chapter.

Chapter 4 ‘It was not like this before’: experiences of change and the uncertainty of knowledge

Introduction

As suggested in the previous chapter, Mochese people attend the world as seasoned inhabitants, through the situated intimacy of shared knowledge and practices resonant with the ‘normal order’ of the weather and the climate. The seasonal calendar reflected this normal order, operating as a guide to seasonal expectations and a reference from which to identify and discuss seasonal variations (Veland et al. 2013: 321). Notwithstanding a level of seasonal variability ultimately accepted within this normal order (e.g. *rekufetal*), it was apparent there were certain weather events and environmental changes being observed within the community that were considered ‘abnormal’, especially unusual tidal surge and wave events. While these events pointed to the normal order of things through their very disruption of seasonal expectations and community activities, they also challenged seasonal knowledge and actuated feelings of concern and uncertainty which contrasted with a sense of confidence in moving along with the world. In this chapter I consider Mochese observations of environmental change within the context of this uncertainty. In accordance with Lazrus (2009a: 140), I recognise observations of change as based on a particular knowledge of place, evoked through social practices, life experiences and emotional memories. While from this base, uncertainty is generated as people realise ‘it was not like this before’, I am also concerned with community reflections on the transmission of knowledge which seemed to contribute to the very ‘unprecedentedness’ of the changes.

‘It was not like this last high tide season’

While many of the experiences and observations of change presented in this section were the result of specific questioning on my part, these were also important topics for discussion among people of the community, especially ‘at this time of year’ (the season for high tide and waves). Indeed, there was a general consensus within the community that ‘it was not like this before’ and I was frequently drawn into conversations about noticeable changes and often encouraged to inspect the adverse impacts of unusual events.

Seasonal patterns

During my fieldwork Father Joseph was the Catholic priest on the island, a Mochese man from the chiefly lineage of Sópwunupi clan. He told me the seasonal calendar for Moch used to be clear, but now the seasons overlapped and the distinguishing signs of tides and winds and waves were often blurred¹²⁹. Indeed I was variously told by Father Joseph and others that the particular waves expected in March and April now occurred earlier in December and January, and that high tide time between January and March now extended into the summer season. In particular, when I was on Moch in 2011 this ‘seasonal overlap’ became palpable as Satal explained the uncertainty that was the summer just gone:

We supposed to have summer season last year but it did not happen... [Summer] very calm and sunny and that's the time we go out far in the ocean, did not care or wondering whether there will be big wave because we know this is summer so we don't need to worry about big winds. We can paddle far away from the island to fish way out in the ocean. [But] that didn't happen so we went there and come back quickly because winds started and waves started¹³⁰.

He went on to discuss changes he noticed in relation to the season for breadfruit:

We did know for sure when would be the harvest, the season of breadfruit and things like that. But these days we are not any more. Like we were expecting breadfruit season this month starting from February till this month [April]. We call this 'selian ali' – means food for the fish (ali) – so we can eat ali, the fish and the breadfruit at the same time, eat together. That's not happening these days. That was considered normal.

The waves and the tides

Most emphatically on Moch, there was a sense that the waves and the tides were not as they were before. All of the men I spoke with emphasised that high tide was getting higher

¹²⁹ Other studies describe seasons that are becoming increasingly unpredictable (Henshaw 2003, Turner and Clifton 2009, Rudiak-Gould 2012, Lazrus 2009a).

¹³⁰ Interview March 2011

each year and many noticed the low tides which exposed the reef happened less often. Seawalls were often used to evidence this increase in high tide; as one man who lived on his wife's land close to the lagoon told me, four years ago the water did not come over the seawall but now it does. Another older man, the chief of Likilup clan, had increased the height of his seawall because of high tide. With reference to this he remembered when he was younger it was not possible for high tide to 'go up inland' but now, he said, it was very easy; 'High tide just wash up inland' (see Figure 41). And yet another man said, 'It is changing fast – before when high tide rushes inland there is waves, but now even without waves it comes right inland'. Women also noticed a change in the tides. For instance, Merym told me they could not use their fish weir last summer because the tide was always too high above the reef flat. She said just a few years ago the tide was low and you could walk out on the reef – even the children would ask her, 'where is the sea going' – but now the tide stayed high. Other women recognised the change was happening rapidly, that every year the tide was higher and every year it was getting worse.



Figure 41: The waves come onto the land at the back of the island (Photo: Christine Pam)

Many people noticed that waves now regularly came onto the land. Serino told me that even though some of these waves were normal – ‘there are waves in December every year’ – they are now accompanied by higher tides which carried them onto the land. Certainly in some places on the island people observed waves encroaching ever further onto their land, and in some circumstances too close to their houses (e.g. Latipa). In relation to the waves, Satal reflected on the changes he has noticed since he was a young boy:

When I was very small this alang [outer reef flat] very high and waves slow to come to the island, and the current also, only during high tide big currents come to the island. But these days not any more - high tide, low tide waves come into the island¹³¹.

Somewhat more intimately, he explained the pattern of waves he relied on to safely enter the ocean from the reef when spear fishing had become unpredictable:

We do like what we did to go out fishing outside the reef...where the big waves are rolling, so you have to make sure you are out before the big waves jump on you. We call this ‘airrer’. So what we did, we go out and stand right in front of the wave and count one, two, three – mostly three waves come, big waves, and after the big wave there will be a very small one so that we can rush out and go out. I mean on the reef, for spear fishing, or on small canoe on the reefs for fishing. Not so confident counting the waves now because don’t know if there will be a small one or a big one.

The land gets smaller

Serino insisted the land of Moch was getting smaller; not only was there increasingly more people and more houses on the island, but the land itself was being eroded by the waves. He said the actual building of the original seawall in the 1970s was evidence that the land was being washed away, that something was needed to protect the land¹³². During my fieldwork the erosion was manifest in the gaping holes behind sections of the seawall, or in

¹³¹ Interview March 2011

¹³² Serino refers to the seawall at the front of the island that was built by the community with government funding.

some places the presence of a newly built seawall further inland, behind the hole behind the old seawall; a sure sign the shoreline could no longer be maintained. One woman, Serino's sister, watched as each year the land near her house at Latipa was eroded¹³³ (see Figure 42). She said, '*I really worried because maybe next time when there is big waves coming so my house will be out in the water*'¹³⁴. Certainly, many people noticed that 'every year the waves take one inch or one centimetre of land away'. Along with the land, people witnessed coconut trees and other vegetation also being taken by the waves, such as *rekich* (large trees that keep the soil in place, firewood), *lefaeus* (local medicine, used for *mwáramwár*), *mosor* and *net* (local medicine, building material, firewood), *keop* (*mwáramwár*, local medicine), *nen* (local medicine, edible fruit), and *kulufo* (building material, long sticks for picking breadfruit, fishing rod). These were all significant plants and their loss was a cause for concern.

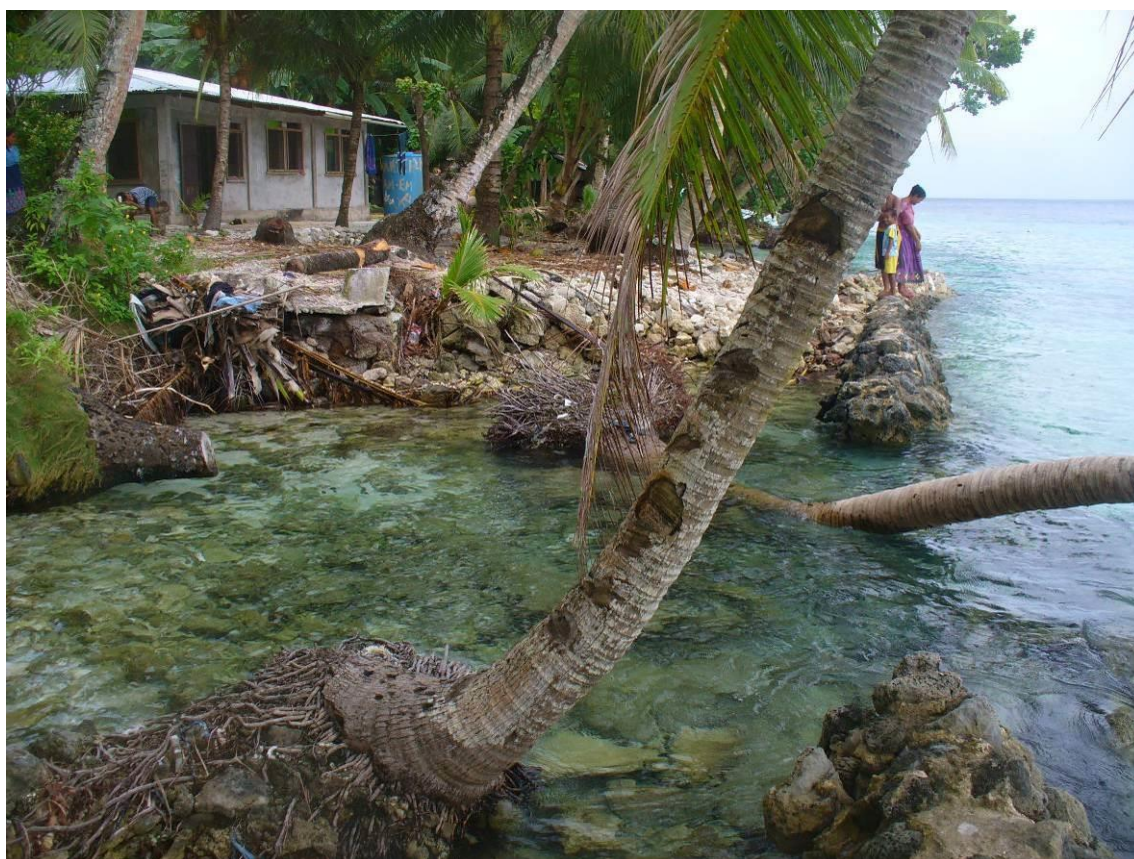


Figure 42: Serino's sister noticed that each year the land near her house at Latipa was being eroded (Photo: Christine Pam)

¹³³ Over the three years of my research I also witnessed ongoing erosion at this place on Moch.

¹³⁴ Interview March 2011

People also noticed the erosion of sand beaches from Moch. Serino told me about the beach that used to be at Latipa when he was a young boy; he was eight or nine years old and would run with the waves into the lagoon and was then chased by them back to the shore. Similarly, Merym told me of the wide beach that used to stretch out from Leseapan, a place for picnics and playing volleyball. She remembered one time when her uncle visited with his young family from Pohnpei; he had brought a new volleyball net with him and was extremely disappointed that the beach had disappeared. In the same conversation, an older woman in her 70s said there used to be a beach all around Moch just like the one at Leseapan. Another younger man marvelled at a photo he had seen taken in the 1960s or 1970s which showed a beach along the front of Moch, and still others commented favourably about the beaches that used to be on the island.

This erosion of sand was also noticed on the many small islands scattered along the barrier reef between Moch and Satawan. For instance, on the two occasions I visited Sanchol I was told by various people that the sand had been taken away by the waves. Certainly, the soft sand I experienced beneath my feet at the place I waded into the lagoon for a swim was atypical; much of the 'beach' of Sanchol was coarse coral (see Figure 43). During the eighth grade school picnic the accompanying teacher said at one time you could walk along the sand beach of Sanchol and then take about five steps through the water and be on the sand beach of the neighbouring island, Purouniap. She emphasised, 'not anymore, there is an expanse of coral and water between the islands now'. Also with us on the picnic was a Mochese Catholic nun, a Sister who had recently returned to Moch for a short time to look after her sick mother. Whilst she had previously worked in the Philippines and Japan, her current position was with a youth program in Pohnpei. The Sister said at one stage there were beaches between all the islands from Moch to Satawan but now the sand had been washed away.



Figure 43: The small sand beach on Sanchol was a good place to enter the water for a swim. Notice the coral rubble to the left of the photo which surrounded the rest of the island. (Photo: Christine Pam)

The sand erosion described above was supported by others' statements that the islands between Moch and Satawan used to be connected by sand but 'big waves took it away'. Within this context many people evidenced the changes they noticed through reminiscences of what used to be an 'easy' walk along sand beaches from Satawan to Moch. This walk was mostly the result of feelings of homesickness which they experienced as young students attending the junior high school on Satawan¹³⁵. Both men and women remembered making this journey home to Moch, often more than once. One man said he walked from Satawan to Moch five times because he was homesick, leaving Satawan at about 4pm and arriving on Moch the following day. Whilst some students walked through the night, others would stop and sleep on one of the many small islands along the way. I was told that one time, all the students from Moch carried a pool table from Satawan to Moch. They left Satawan at 1pm on a Friday and arrived on Moch the

¹³⁵ Before the junior high school opened on Moch in 1996, Satawan was the closest option for high school students from Moch and other islands in the lower Mortlocks.

next day; they walked all day and all night with no sleep. Some of the students' parents were 'really mad'. On the Sunday they paddled back to Satawan for school. While today, students are able to attend high school at home on Moch, the increased difficulty of walking between Moch and Satawan may limit the options available for people to travel between these two islands, especially given the high cost of fuel for motor boats and the limited access and physical skill and effort involved in paddling a canoe¹³⁶.

Plants are not growing so well

Some people noticed that with increasing high tides the salt water came up into the taro patch and the water in some of the wells now tasted salty. Kapa said salt water was coming up through the ground on Moch – 'especially last five years, water comes a little higher each year' – and with a tidal surge it would be even higher. The central taro patch was especially affected by this inundation despite the short section of 'seawall' built in the 1970s to protect it from an adjacent area where salt water was known to rise to the surface. Salt water was now coming up inside the taro patch and I was shown specific places which looked black and swampy with edges overgrown with grasses. Jasen told me that an area owned by his *eterenges* was so badly affected by salt that no taro grew there. It began to get salty in about 1994 and since then the affected area has increased. While his family have tried to 'lift' the area (using vegetation underneath the mud) always during high tide season in December it would go salty again. He said now they 'just leave it'; they did not want to disturb the area in case the salt water spread further.

The municipal representative for the village of Inapwei, Freddie told me that even on the small island of Aferen 'salt water coming up through the ground', and now there was not enough taro to feed everyone on Moch. Kapa was especially concerned about his taro pits on Aferen as well as on the small island of Apuson. He organised for me to visit these islands, which certainly revealed marshy pits with little or no taro located in amongst areas of seemingly healthy looking taro. However, the young man who accompanied me on this

¹³⁶ A motor boat can take up to two hours to travel from Moch to Satawan, depending on the weather conditions. At times it is particularly rough in the lagoon and the motor boat travels to Satawan around the outside of the atoll. While I am unsure exactly how long it takes to travel to Satawan on a canoe, on one occasion two young men paddled this distance to buy cigarettes when they were no longer available on Moch; they were away overnight.

visit pointed out that an abundance of green leaf does not mean good taro; he said when people dug the taro up it was often rotten due to the effect of salty water. According to Freddie, this dire situation meant people were beginning to change their eating practices; to increase their cultivation of *káá* (sweet taro or dry land taro) and to re-introduce *áfuuch* (fragrant fruit) into their diet. Although during my fieldwork *áfuuch* was mostly harvested by women for its perfume – to make *mwárámwár* (head garland made of flowers) smell good – I was often reminded that the fruit were edible. Indeed on one occasion fruit was set aside to ripen specifically so I could taste it. I was told that in the past, *áfuuch* was more highly valued as a food plant and like breadfruit trees today, the trees were often gifted by men to their children or their wives (see Figures 44 and 45).



Figure 44: Making *mwárámwár* (Photo: Christine Pam)



Figure 45: Áfuuch (*Crateva speciosa*) – this fruit was set aside to ripen so I could taste it (Photo: Christine Pam)

As well as taro, people were noticing changes in other food plants on Moch. Satal wondered at these changes:

One thing I am wondering whether this will be the connection [with climate change] – look at it and see if I am right or wrong. Plants we have these days are not growing so well and not bearing very good fruit; breadfruit, coconut, bananas, all those. I have that in mind but I am not so sure what the cause. The taro also. This month suppose to be breadfruit season but as you look around only few... Even banana very few, not that many. [Pawpaw] small fruit and mouldy¹³⁷.

¹³⁷ Interview March 2011

Big waves and typhoon

Many of the concerns people had about changes in the waves and the tides, and the erosion of land and damage to food plants (discussed above) were heightened during more ‘extreme’ climatic events, especially tidal surges, ‘big waves’, and typhoons. While these were not necessarily new events for the community, there was a sense that tidal surges and big waves in particular were occurring more often and were more severe, and that certain elements of them were novel. For instance, many considered the December 2008 tidal surge event that instigated the state of emergency as something new; I was told it was new because the waves came from the ocean side and swept over the small islands between Moch and Satawan and into the lagoon (see Figure 46).

Many people talked about the effects these waves had on the islands, in particular on the land which belonged to them and their families (see Figure 47)¹³⁸. I was told the taro pits on Lelang were swamped by salt water and that immediately afterwards people went to the island to dig up the taro before it went rotten; even using goggles to find the taro under the water. Large pieces of coral were washed inland and breadfruit and coconut trees were badly damaged and would take at least two years to recover. I was also told the breadfruit trees had died on Fecha and Sourepen, and that many plants were washed away from the islands (one man said he saw big trunks and branches and the roots of trees scattered all along the reef). Indeed, there was ‘lots of erosion’; I was told that half of the very small island of Ant was washed away and there was ‘big erosion in the ocean’ which affected the reef and the fish.

¹³⁸ I visited a number of these islands (Weninek, Lelang, Sanchol, and Manumok) and was shown the impacts of the December waves; land erosion, taro pits filled with black marshy water, felled coconut trees, and mounds of coral pushed inland by the waves. I also witnessed people cleaning up debris and repairing huts.



Figure 46: Merym's husband showed me the impact of the tidal surge on the taro pits on Lelang, including those owned by his *eterenges* (Photo: Christine Pam).

Significantly, most of these islands were under water for a time because of the waves; one man said he had never seen this happen before. Another told me that before when there was a typhoon the waves would not wash over the islands but now (with increasing high tides) even when there was no typhoon (only tidal surge) the waves came over. He said even among those who were not convinced about the changes to high tide before the December tidal surge, there was now a belief it was getting higher because it had affected Satawan and Nama (Upper Mortlocks), two islands which apparently had not experienced the impacts of tidal surge before. This man expressed his concern about an increasing high tide during these extreme events; 'Can you imagine if there is typhoon – people just wash away'.



Figure 47: The small islands near Moch, in the northern section of Satawan Atoll (see Appendix B for the corresponding map of Satawan Atoll).

Presented as confirmation of the waves washing over the islands and a major point of interest following this tidal surge event was the discovery of a small shark swimming in a taro pit on the island of Lelang. Many people told me the story of the man who went to Lelang to check his taro after the tidal surge and found the shark. It was described as an extraordinary happening and further contributed to a sense of uniqueness which surrounded this tidal surge event. Also described to me as extraordinary was the movement of a boundary marker by the waves. Tá Ruwanu is a group of four small islands that belonged to a particular *eterenges* on Moch (see Figure 47). Satal is from this *eterenges* and he told me the boundary rock called Faun Karar had been there from a long time ago, but the waves in December caused the rock to move. He was astounded that the boundary marker was disturbed by the waves and wondered at the implications of this for the actual boundary of his islands.

The shark in the taro pit and the movement of the boundary rock fed into stories of other extreme events; narratives which not only established such events as unusual or memorable, but also seemed to consolidate as evidence for their increasing impact and frequency. For instance, while discussing the effects of the December tidal surge one woman said she was scared when the waves came close to her house because it reminded her of Typhoon Pamela. Although she was in Weno at the time of the typhoon in 1976, she travelled to Moch immediately afterwards and was shocked by the devastation; there were big trees blown over and all the houses were either damaged or destroyed. Ason told me how the big wave at that time swept the meeting house from Letup across the island and into the central taro patch. Indeed, earlier interviews revealed many older people had fearful memories of Typhoon Pamela which felled giant breadfruit trees without a sound above the noise of the strong winds and brought waves rolling across the island, sweeping a man into the central taro patch¹³⁹. They also remembered the long time for recovery – building new houses and replacing food crops which were completely destroyed by the waves – during which they felt ‘very frightened about what happened because they witness the disaster, the cause of the typhoon’.

¹³⁹ During interviews for the pilot study conducted on Moch early in 2008 we asked people about their memories of Typhoon Pamela. Even though I did not ask people specifically about Typhoon Pamela during my fieldwork in 2009, memories of this event were certainly present in my discussions with people about the tidal surge in December 2008.

It is important to note that due to the proximity of Moch to the equator, typhoons in this region are actually quite rare¹⁴⁰. However, despite – or perhaps because of – this fact, it was not just memories of Typhoon Pamela that surfaced during discussions of recent events; so too did stories of a typhoon from generations past, the typhoon of 1907¹⁴¹. Serino remembered listening to the old people tell stories about this typhoon; how they looked into the lagoon but they had to look up rather than across because of the height of the wave, how they heard the screams of people from Satawan and Ta being carried by the wave out through the channel and into the ocean, and how after the wave they found people dead on the reef and brought them back to Moch for burial. He also heard how the people of Moch were lucky because the deep water in the channel protected Moch, directing the wave away from the island. Kapa also mentioned the ‘big wave in 1907’ which swept people away from the islands of Ta and Satawan. He said that despite an historical connection with Chuuk, after the 1907 typhoon a lot of people were moved to Pohnpei and this established the first connection between the Mortlocks and Pohnpei. While some people eventually returned to their home islands, a large number of people remained on Pohnpei and have played a significant role there over the years (Hezel 1995: 102). Certainly during a short visit to Pohnpei I met a young man whose grandmother left the island of Ta after the typhoon in 1907. He identified strongly with Ta as his home island despite having never lived there; he said his grandmother is from Ta and he is from Ta.

However, my discussions with people about the tidal surge most often triggered memories of the ‘big waves’ in 2002 and 2005. Indeed, at times these memories seemed to overlap such that it was difficult for me to determine exactly which event was being evoked by our conversations; the tidal surge of 2008 or the ‘big waves’ of 2002 or 2005. Nevertheless, I was specifically told the waves in 2002 were the biggest in recent years. One family who lived at Leiche, a place close to the shore at the back of Moch, remembered there were four waves which caused much damage and washed the walls of the *fáál* and the thatch roof and tin from the house all the way inland. Two treadle sewing machines were damaged and the well was ruined. As a result of the waves the water on the land was hip high and they had

¹⁴⁰ Typhoons in the northwestern Pacific generally travel further north of the equator.

¹⁴¹ See Spannemann (2007) for details of the ‘Good Friday Typhoon of 1907’.

to use a boat to collect their possessions and retrieve the building materials. Two men from a neighbouring place also remembered the water being ‘right over’ their land; they said they could paddle a canoe all the way to the central taro patch.

Most vivid was the memory shared by Jarvis whose family had sustained serious permanent injury as a result of the waves. This memory was raw in its telling from a man deeply affected by his experience¹⁴². Jarvis told me the waves in 2002 were unexpected; they came silently and without warning during a clear still day. He said, *there is no warning with this wave from the water*, and proceeded to explain what happened:

Oh I was standing over there and I saw the first [wave] when it came in... Just floating all over here, and the second one was coming, oh a very big big wave... My baby's in the room [of the house], right down in this room here... And I run inside and pick him up, hold up like this and run out into the door, rushed to the door and go out, and flood was coming about this high [hip high]... Very strong, because the current...

Jarvis carried his baby to people standing on higher ground near the central taro patch and then returned to the house for his wife's brother:

I run with my baby... they shouting ahh come on... and I run up and give them... and run back to pick up my brother-in-law was got stuck in the bathroom. Because the bathroom was rolling with the water, in the water, the waves. And then when I saw him and I pick him up he was injured the head... Unconscious, I pick him up and run with him.

Even though Jarvis's brother-in-law was permanently disabled by the waves and his family was not able to return to their house for six months, it was agreed they had been very lucky:

¹⁴² Here Jarvis was interviewed for the pilot study in January 2008 (prior to the December tidal surge). However, I was able to continue this discussion during my fieldwork in 2009, especially given both the ongoing effects of the 2002 waves on his family and the memories which were evoked by the more recent events.

Some people they really love us and they said that we were lucky we didn't die, die in the house, that we're lucky because the incident was happen at daytime. If night-time every one of us are dying in the house.

When I asked Jarvis if people were scared after the event, he said:

Yeah they really feel scared if it will happen again. But we expect it to come back again and bigger than the first one.

He mentioned another 'big wave' in 2005 and I asked him if he also saw those waves approaching the shore. He said:

[Jarvis]: *No that was night-time and I heard it and I run out and it was 'ahhhh' and we evacuate from the house.*

[Christine]: *It must have brought back all those memories of 2002.*

[Jarvis]: *Yeah, 2002 and 2005. But myself, I expect it that there will be another wave which will be bigger than that.*

Although not 'bigger than that' the waves in 2008 and even the somewhat minor tidal surge warning which followed in 2009 presented as 'another wave' for many people, constitutive of the latest chapter in an ongoing story. Often it seemed these latest events evoked an embodied response which both stemmed from previous experiences and was influenced by an expectation of 'another wave which will be bigger than that'. For instance, during the tidal surge warning in 2009 the mother of the injured man described above (by Jarvis) was very worried for herself and her grandchildren, one of whom was the baby rescued from the wave in 2002. Unsure what would happen, she left her home in Inapwei and went to stay with family in Peimoch until the threat of a wave had ended. Similarly, Merym told me about her aunt Pila who was always frightened at the prospect of a wave; not only did she run shouting from the shore when the waves came onto the land in December, but during the tidal surge warning she stayed awake all night, sitting outside the house and watching the waves. Later, Pila told me repeatedly how she was very frightened of waves¹⁴³. She recounted the time 'in 1980 some' when she climbed high into a coconut tree to escape a wave and also shared a story (with her niece) about a young girl who was

¹⁴³ Interview March 2011

lost in the turmoil of a wave and then later found sleeping beside the path. These and similar responses seemed to further substantiate a shared community expectation and concern that the tides would continue to rise and ‘big wave’ events would become more common and more severe.

Even the people who know are confused

Significantly, as people discussed the changes they had noticed to the seasons and the tides and reached agreement ‘it was not like this before’, and as stories, experiences and emotional memories of past extreme events rolled together on the back of an increasing high tide and the latest big waves, there were not only grave feelings of concern but also a resultant sense of uncertainty among members of the community. Not surprisingly, these feelings of concern and uncertainty were especially heightened during high tide season when people were more likely to witness the changes and experience the impacts of tidal surge and big waves. Certainly the concern was understandable as people watched their land eroding, their food crops dying and their family members threatened by waves. However, it was the sense of uncertainty which seemed to accentuate the ostensible ‘unprecedentedness’ of the changes. This was apparent in my interviews, as many expressed bewilderment as to why these changes were occurring and/or claimed to ‘not know what will happen’.

Father Joseph told me that people began to notice changes in the sky in the 1960s and 1970s and these changes interfered with their ability to know the seasons through reading the sunrise and sunset, and through watching the waves on the water and the clouds in the sky¹⁴⁴. This was also evidenced by Satal, who said:

*High tide and low tide are very different, the current and the wind very different... Some specific people on the island were able to predict wind from this direction, this wind on this month, but not these days. Even the people who know are confused*¹⁴⁵.

¹⁴⁴ A similar emphasis on reading the sky and the clouds has been documented for the Samoan community (Lefale 2010: 323-328) and for Inuit peoples in the Canadian Arctic (Weatherhead et al. 2010: 524).

¹⁴⁵ Interview March 2011

Indeed, it seemed that Mochese forecasters – those people who were able to predict the weather through an understanding of the causal relationship between the sky and the sea as described by Hubert in chapter three – could no longer explain what was happening; that their knowledge of the weather was no longer reliable *because* of the changes¹⁴⁶. Certainly it was felt the changes eroded the reliability of local indicators and, as Roncoli et al. (2009: 91) suggest, this may have contributed to an increased reliance on weather forecasts from external sources. During my fieldwork this was particularly evidenced as people listened attentively to the radio for updates about the tidal surge as discussed in chapter three. Those with access to a radio were either in direct communication with their family members on Weno or waiting to hear the latest broadcast from the weather bureau in Guam. These weather forecasts are locally relevant given the location of a weather sub-station on Lekinioch in the Lower Mortlocks¹⁴⁷. Local weather data (cloud cover, wind direction and speed, temperature, rainfall and visibility) is collected from here three times a day (10am, 4pm, 10pm) and transmitted to the weather bureau in Weno and then to Guam. Weather forecasts are broadcast twice daily – more often during adverse weather events – and transmitted to the outer islands over CB or HF radio.

While Father Joseph, Satal and others recognised that the changes interfered with an ability to know the weather, it was also apparent that feelings of uncertainty, especially during high tide season, aligned with a perceived gap in the depth of knowledge available within the community to explain the changes in the weather, especially that special knowledge associated with navigators and other such ‘knowledgeable people’. Indeed, it seemed many of those knowledgeable people who would have most likely been relied on to explain what was happening with the weather had already died, and much of their knowledge had gone with them. In the next section I consider particular community reflections on knowledge and knowledge transmission in order to develop a deeper understanding of the feelings of uncertainty, the feelings ‘it was not like this before’ which effect particular climate change realities for the people of Moch.

¹⁴⁶ Crate (2008: 577) evidenced a similar sentiment expressed by Sakha elders of southern Siberia who observed changes in the climate and reported “they could not read the weather anymore”. See also Weatherhead et al. (2010).

¹⁴⁷ Local weather data (rainfall, temperature, wave height) is also collected twice a day (10am and 4pm) from Ta, Ettal and Namoluk in the Mortlocks.

‘I think just little bit stay’: community reflections on the transmission of knowledge

I am aware that, as Bloch (1990:186) argues, “much of knowledge is fundamentally non-linguistic” and is learned gradually through participation in everyday practical tasks. Certainly, this was my experience as I sat with Merym while she wove a pandanus mat; as I practiced pounding taro beside Liana; as I tried to follow Aprel as she made thatch from coconut palm leaves; as I watched food being shared between particular households; and as I learnt to wear two skirts instead of one and to practice the correct technique for sitting and squatting with modesty while I worked. I remember feeling frustrated when Merym or Liana (for example) would not *tell* me how to weave or pound, and embarrassed that it took me so long to ‘learn’ the dress etiquette (why didn’t someone *tell* me). I reflected on this as Merym told me she learned to weave pandanus by *watching* her grandmother; a skill “learned very gradually through imitation and tentative participation” (Bloch 1990: 186). The significance of ‘non-linguistic knowledge’ was further evidenced by Mary, who had lived in Weno and Guam and returned home to Moch to look after her grandmother. Mary made an explicit decision to bring her daughter Maya with her to Moch to complete high school – rather than have her attend a prestigious high school on Weno – because it was important for her daughter to learn about her culture, to learn how to live on Moch (e.g. ‘how to cook, pound taro and respect her brothers’). During my fieldwork I not only witnessed Maya’s proficiency at these tasks but also listened to Mary’s satisfaction that ‘she has now learnt everything’,¹⁴⁸.

However, there was also specific knowledge passed on through language, often ‘special’ knowledge shared with a few select people. For instance, in my discussion with Ason about fishing for *angarap*, he told me the ‘really true story’ about the time the chief of Soren Iluk was tricked into calling *angarap*. At that time the chief used the ‘strong’ words to call many fish into the inlet at the back of the island, enough fish to feed all of Moch every day for many days (*four or five days they keep spearing*). Then, on the day the

¹⁴⁸ My own daughter Jirin also commented on the behavior of Mary’s daughter at school; unlike many of the other girls, Maya would walk around a group of boys rather than through them. While Maya practiced traditional protocol here as taught by her mother, it was not a practice readily engaged by other girls at the school.

angarap were finished the chief passed away. I asked Ason if the chief passed on the strong words before he died. He said:

Yes. All that time, during that time, man always stay in the wuut [fáál]. Just went outside there to get breadfruit, go out for fishing, and brought everything to woman to make. Man cannot work, only brought the food and inside the uut they have to look like class for everything they have to learn; only men¹⁴⁹.

The ‘class’ Ason referred to was instigated to share special knowledge of *angarap* – including the strong words – with those selected to receive such knowledge. However, even though the strong words were passed on at that time, it was unclear whether they were still known by anyone from Moch living today¹⁵⁰. I was told *about* the words, and about how a person from Soren Iluk (the chief or another man or even a woman from that clan) would walk along the shore whispering the words while rolling leaves from the Afan plant between the palms of their hands, and how at dawn they would throw down the leaves into the water and then tell the people that *angarap* is coming¹⁵¹. However, as far as I know this was not performed during my fieldwork. In fact Satal, who was the oldest man from Soren Iluk at one *angarap* fishing event, explicitly told me how he replaced the belief in special words to call the fish with a new practice. He said when the fish were caught in the net and the men were waiting for him to take the first fish he asked them all to be quiet for a moment while he prayed to God to thank Him for bringing the fish. Satal was conscious of introducing a new practice which espoused a belief that the fish were from God, and that the success or failure of *angarap* could be explained through God¹⁵². Although, as Satal realised, others did not necessarily share this belief, it seemed the strong words of before – referred to by some as ‘magic words’ – were no longer used to call the fish; that the special knowledge of those words was ‘lost’.

¹⁴⁹ Interview May 2009

¹⁵⁰ There was a general feeling that no-one knows the words anymore.

¹⁵¹ One man from Soren Iluk told me he had read about this in a book he found at the College of Micronesia in Pohnpei.

¹⁵² According to Satal, while fishing for *angarap* on Saturday was a success (‘the fish are from the Lord’), there were no fish on Sunday because it was the Lord’s Day.

Particular categories of special knowledge mentioned during my fieldwork included *silielap*, *sowak*, *itang*, *wáátawa*, *lengupwe* and *péli*. *Silielap* refers to those who are highly skilled, those people recognised for their knowledge and ability to carve canoes, make fish hooks, weave mats and fans, massage, and build local huts and so on. Those people with the historical and cultural knowledge belonging to their clan (e.g. those who would have known the strong words to call the *angarap*) are considered *sowak*, a term also used for clan leaders. *Itang* refers to a special group of diviners and magicians with extensive knowledge of genealogy, sorcery and navigation (Gladwin 1970: 125; Peter 2000: 263). According to Gladwin (1970: 125), “their power, their knowledge, and an esoteric form of speech known only within their ranks set them apart from other men”. In particular, it was this quality of speech which drew attention from some people on Moch. For instance when asked about *itang*, Jarvis said:

*I think itang means ‘politics’ because they always [use] the words which are not fact or not true, they always playing with them. That’s what we call itang*¹⁵³.

Another man, Tomas, also emphasised *itang* speech; he told me his father could speak *itang* and had studied the language for over twenty years¹⁵⁴.

In contrast to the formalised ongoing learning of *itang* knowledge and speech, *wáátawa* are spirit mediums who are generally selected by a spirit of the dead to channel communication with the living (Dernbach 2005: 167-168; Peter 2000: 264). According to Dernbach (2005: 168), *wáátawa* are “institutionalized religious or medical experts” who perform ceremonial mediumship on most islands in Chuuk and the Mortlocks. Although this ceremonial mediumship came to an end in the 1940s, there are also those people who become spontaneously possessed; men, women or children referred to as *wáán anu* (Dernbach 2005: 168). As Dernbach (2005: 168) indicates, “this is important because it suggests a historical precedent for the type of non-ceremonial, non-purposeful, spontaneous possession that occurs in contemporary Chuuk”.

¹⁵³ Interview January 2008

¹⁵⁴ Fieldnotes July 2009

During my fieldwork there were at least two people on Moch identified as *wáátawa*, a young boy and a woman in her late 30s. Doropio introduced me to the young boy as we passed him near the shore at the back of the island¹⁵⁵. Doropio said the boy was ‘special’, that he dreamed of the old people who died a long time ago and that he knew their names. People became aware of his ‘gift’ after he told his mother about his dreams, and it was now accepted within the community that he could communicate with the dead and predict the future; ‘he knows when someone will pass away’. As further evidence of his ‘gift’, Maya told me the boy was often teased and called *anu* or ghost.

Lengupwe and *pélú* are the terms most readily used for those people with special knowledge of the seasons and the tides, waves and winds. *Pélú* refers specifically to the navigators, those who have endured many years of specialised training in an extensive body of local expert knowledge. Although astronomy forms the fundamental basis for this body of knowledge – especially knowing the position of stars as they rise and set around the horizon – it also includes:

Knowledge of the currents and other special conditions affecting travel between many island pairs; *etak* (ek-tack), the system used for keeping track of distance travelled; how to read several kinds of information from the waves; navigation in storms, including keeping track of position while drifting; navigation while tacking upwind; techniques for locating, even in the dark, passes through the reefs and various islands; forecasting the weather through an almanac of rising and setting stars (not the navigation stars) and the moon; sealife; star courses, and sometimes long sequences of star courses, for remote and occasionally mythological islands; and, in the past, spells of magic and divination and the taboos governing the work of the sea. (Gladwin 1970: 131-132)¹⁵⁶

Corresponding to Hubert’s account presented in chapter three, Gladwin (1970: 209-212) reports on a set of skills used by navigators to keep track of seasonal changes and to

¹⁵⁵ This boy was the only child I was specifically introduced to during my time on Moch (fieldnotes February 2009).

¹⁵⁶ Although Gladwin (1970: 144) concentrates on the navigators of Puluwat Island, his description encompasses those other islands of the Western and Central Carolines, including the Mortlocks, and contributes to an extensive literature on the role of navigators and the significance of interisland voyages of exchange (see also Goodenough 1951, 2002, Alkire 1989, D’Arcy 2006).

forecast the weather based on the positioning of specific stars at sunrise and sunset or on the days of the lunar cycle. Further, and according to Alkire (1989: 82), “the power navigators mediate potentially can save an island from ocean storms, high waves, or water spouts”.

While *pélú* referred specifically to those experts in navigation, *lengupwe* seemed a more ambiguous term, related somehow to divination and to those people knowledgeable of the ocean and lagoon. As Satal said:

*That kind of person, I hear but did not see or know one of them. Just heard people were talking about them long ago. Those kind of people they can predict what will be happening in the future. They can know something will happen, a waves, a problem, a fight, anything*¹⁵⁷.

The power attributed to both *pélú* and *lengupwe* may be evidenced through stories of burial practices from the past. For instance, I was told by one older man that those knowledgeable people of the ocean and the lagoon used to be buried close to the shore because certain waves would come onto the island to look for them. He was adamant this was just what happened in the past to prevent waves from coming onto the island; that it did not exist today. As well, Satal mentioned *pélú* were buried at sea (even further off-shore?); that the body was wrapped in a mat with rocks attached, taken out to sea and released into the water to sink below the waves. He also heard that those knowledgeable people were buried on the island with sharp things at their feet to stop them kicking the sand away, however he heard this *not as a real story, more like a rumour or an old story from long ago, long long ago story. Not sure if apply today or is still true today*¹⁵⁸. Although these stories are from the past, such practices could be interpreted as a means through which the community manages the authority and power of *pélú* and *lengupwe*. There is now a strong preference within the community to bury people close to their houses, including those recognised to have special knowledge, and there does not appear to be any longer an association between the death of a knowledgeable person and the waves.

¹⁵⁷ Interview March 2011

¹⁵⁸ Interview March 2011

Most significantly, it seems both *pélú* and *lengupwe* are ‘no more these days’. Indeed, according to Hubert it is possible that his maternal grandfather, Conrad (Lami) Sinem¹⁵⁹, was one of the last navigators for Moch, along with another man – older than Lami – named Sapas. Hubert explained these older men would have shared their knowledge of the weather and the seasons with certain people on Moch. He said Lami *has his own son, his own daughter, maybe that kind of people they have this knowledge*. However, these people are no longer alive and Hubert thinks that most of the knowledge has gone. He said, *I think just little bit stay*, referring to his own bit of knowledge and the knowledge of one other older man, the son of Sapas, who was still living on Moch and who may know the most because *his father [Sapas] is older than that man, that Lami*.

Although, as Hubert, Satal and others indicated, certain people still have some special knowledge of the seasons and the tides, waves and winds – *that knowledge come from our ancestor and passed down to certain people so we do rely on them sometimes*¹⁶⁰ – it seems the depth of this knowledge has not been passed on to the next generation. Given the uncertainty being expressed in the seeming absence of such knowledge (‘it was not like this before’), or more specifically in the absence of a local explanatory framework for the changes people were noticing on their home island, my concern here is with particular community reflections on the transmission of knowledge which, in the light of broader social change issues, may contribute a particular understanding of climate change realities for the people of Moch.

‘I take from my mother’s father’: relationships of knowledge

Hubert gained most of his knowledge about the seasons from his grandfather Lami. He recognises this man’s knowledge and his ability to predict the seasons and the weather:

*This man is my mother father. This the man who know most of the thing...in Mortlock. He gave me this word, this time, and everything during that time. He know most of the stars than all the people here on Moch*¹⁶¹.

¹⁵⁹ Hubert’s grandfather Lami died in 1986 when he was ‘99 or 100 years old’. Lami was the ‘older man’, the navigator others referred to when they recognised Hubert’s knowledge of seasonal matters.

¹⁶⁰ Interview March 2011

¹⁶¹ Interview May 2009

*Sometimes he talks about the changes in the sky, and the ocean too, because every year it happen, those changes. They know the time, they know the season. When he talk about that, the season come, I remember. I understand what some of the, ah, landmark or the symbol. I can see and it is there, the time of the season ...*¹⁶²

When Hubert was a young man – *that time I was sixteen years old or eighteen or twenty years* – he talked with his grandfather Lami many times about the ocean. In particular, he remembers travelling with Lami and his father and some other men on a sailing canoe to the neighbouring islands of Satawan, Kuttu, and Oneop¹⁶³. On these journeys Lami would talk about the ocean and the sailing canoe and Hubert would listen. Significantly, in relation to learning some of Lami's knowledge Hubert said, *before my grandfather die I ask him*. This imperative of *asking* for knowledge was more fully revealed later in my fieldwork, most explicitly through the memories of a younger man, Tomas, about his relationship with his father, and through fundamental elements of a particularly important narrative for the community of Moch, the flying canoe story.

Tomas is Meryn's brother and a high school teacher at the Moch School. During a meal we shared at the High Tide restaurant in Weno he shared his sadness at not having spent much time with his father who had died ten years earlier in October 1999¹⁶⁴. His father had been the paramount chief (*makal*) of Moch and also the *Catechista*, the community head of the Catholic Church on the island. He could speak *itang* – the old language usually spoken by chiefs within Chuuk – which he had studied for over twenty years and he could also understand the signs of things to come, signs from 'the birds, the waves and the clouds'¹⁶⁵. I asked Tomas whether any of this knowledge had been passed on to him and in response he told me about *mafel poch*; when you respect someone too much that you cannot tell

¹⁶² Interview March 2009

¹⁶³ At that time Hubert's father was the Catechist of the Catholic Church on Moch and travelled by sailing canoe to other islands to participate in church meetings.

¹⁶⁴ Fieldnotes July 2009

¹⁶⁵ Tomas gave me an example of his father's knowledge of the signs. There was a cycle of waves crashing onto the reef; a set of three waves followed by a calm silence and then another set of three waves. If one wave in only one set of three waves was very loud 'like a thunder clap', this would mean a tidal surge or tropical storm was imminent. This sound happened only once and was out of the ordinary.

them your needs. Tomas said he had respected his father so much he could not ask his father to teach him. Instead he waited for his father to tell him and subsequently he did not receive much of his father's knowledge. As Tomas emphasised, knowledge was not just given out; it had to be asked for.

This was a sad memory for Tomas and it seemed doubly fraught because as the oldest son, he not only could have asked but also at some level could have expected to receive some of his father's knowledge¹⁶⁶. Many men talked about receiving knowledge from their father and/or giving knowledge to their sons. For instance, Hubert not only recognised the knowledge he learned from his father, but was also keen to talk with me about the seasons so I could record his knowledge and he could give it to his two sons. Another man, the son of Sapas, said he had given his knowledge of good fishing spots to his son because he now felt too old to go fishing himself. Furthermore, during community fishing for *angarap*, it was a senior man from Soren Iluk *or his son* who would take the first fish, an important role especially in the past when the first fish would be taken to the *makal*. This was explained to me by Atel, the acting chief of Soren Iluk, with reference to the specific relationship term *afakúr*, meaning in this circumstance 'the son of a man':

*This is what we can do as leader of Soren Iluk. We can choose one from our afakúr, means the son of the man from Soren Iluk. We can do that. We can choose one of them whether his son, or [his] sons or [his] son or my son. We can choose either one*¹⁶⁷.

According to Nason (1970: 91), the *afakúr* relationship is a parent-child relationship whereby all members of one's father's clan are considered one's parents. More specifically, he states "*Afaker* [sic] is best translated as 'heir', since the children of a clan's men are the inheritors of the clan's properties *if it dies out*" (my emphasis). This is exactly what happened when the last man on Moch from Wité clan died. This man was from Weno and was married to a Mochese woman from Sór clan. I was told by Doropio and other

¹⁶⁶ As Gladwin (1970: 133) noted, the ideal relationship for the transmission of certain knowledge on Puluwat was father teaching son. Marshall (1972: 64) also refers to the difficulties in refusing a request by a 'close relative' on Namoluk.

¹⁶⁷ Interview June 2009

members of this extended family that he was a very knowledgeable man; he had knowledge to carve canoes and to build *fáál*, and knowledge of the lagoon and of the island of Moch. He was especially remembered for building the *fáál* at Ariow in 1964 using only traditional methods and local materials, and for resisting the trend towards using cement and tin in later years (see Figure 48). Following his death, the *fáál*, land, and knowledge of that Wité clan was passed on to his children belonging to Sór clan, including a small piece of land in Mechitiw village in Weno which has become an important place for people of Moch. Therefore, in spite of the existence of matrilineal clans, knowledge (and land) does get passed on patrilineally; in this case because the Wité clan had died out.



Figure 48: The traditional fáál for Sór clan at the place called Ariow (Photo: Christine Pam).

As Nason (1970:91) reveals, *afakúr* also refers to the relationship between a man and his daughters¹⁶⁸, and certainly it was pointed out to me that a particularly respected and

¹⁶⁸ Indeed, there seemed to be a certain equivalence here between the oldest son and oldest daughter. As Ason said; *our culture before, you don't have to say something bad our first daughter or first son* (Interview

knowledgeable man on Moch had passed some of his knowledge to his daughter. It was suggested that at least the knowledge given to his daughter would stay in the family rather than being taken by a son and passed ‘beyond the family’, i.e. to the son’s children who would belong to his wife’s family (clan). The expectation here that the son would pass at least some knowledge onto his own children further confirms the significance of the *afakúr* relationship.

However, there was also knowledge passed from one generation to another within the family or matriclan. For example, the secret words used in the past to call the *angarap* were known by certain men and women of Soren Iluk and were only taught to others within the clan. Furthermore, as I watched a young man who sat for days with his grandfather to learn to carve paddles for the canoe (see Figure 49)¹⁶⁹, I was taken not only by the significance of this relationship (also mentioned earlier by Hubert) but also by the potential for this to be recognised as a clan relationship, i.e. a man and his father’s father may be of the same clan because of a ‘traditional’ preference for cross-cousin marriage to keep land “in the family” (Marshall 1972: 67; see also Nason 1970: 92). Indeed within some families today this clan relationship between a man and his father’s father remained likely because of the continual intermarriage between specific lineages of two clans¹⁷⁰.

May 2009). Hubert also mentioned the first born daughter (*annééú*), saying ‘you love her the most’ (Interview March 2011).

¹⁶⁹ I am unsure in this circumstance whether he was the young man’s maternal or paternal grandfather.

¹⁷⁰ For example, Doropio is from a lineage of Sór clan. His father is Likilap and his father’s father is Sór. Also, Doropio’s father was from the same lineage of Likilap as Serino, and there were multiple marriages between these lineages extending a connection back to the daughter of the first Sór woman to come to Moch. As Serino explained, that daughter married a man from Likilap and they had three daughters and three sons; Serino is related to that man from Likilap.



Figure 49: Younger men watch as older men carve canoes (Photo: Christine Pam).

However, the priority given to sibling relationships within an *eterenges* or extended family lineage generally demanded the transmission of knowledge from the older women of the family and their brothers to the women's children. As Doropio, who is a member of the Sór clan explained, a particularly knowledgeable or esteemed man within an extended family would pass his knowledge to his sisters' sons. However, it was not customary to simply pass such knowledge to the eldest sister's eldest son. Rather, the man would look for the 'right person' for this knowledge. Doropio said, *yes his sister's son. But they just don't give it to anybody... they have to look at the person first and see they have a bit more responsibility*¹⁷¹. Thus, the knowledge that the three older men of Doropio's *eterenges* received from their well respected father (the last man of Wité clan) was expected to be handed to the younger generation of men within that *eterenges*, i.e. to these older men's sisters' sons (who are all members of the Sór clan).

¹⁷¹ Interview January 2008

‘We can choose’: negotiating the transmission of knowledge

Although Doropio named some of these younger men (including himself), he indicated it was as yet unclear who would be chosen to receive that knowledge¹⁷². This notion of choice was also evident in a previous conversation Doropio and I had with a man who worked for the Disaster Office in Weno. This man was from the outer island of Houk, and he began our conversation by telling Doropio about his esteemed uncle who had ‘special knowledge’¹⁷³. He said even though his uncle was reluctant to pass on this knowledge he would have to choose someone eventually, either himself or one of his brothers or cousins. This man wanted to be chosen to receive the knowledge and laughed when he said he was giving his uncle many gifts of food to ‘persuade’ him.

As suggested here, the special knowledge of this man’s uncle as well as the knowledge belonging to the older men in Doropio’s *eterenges* is highly valued and the transmission of such knowledge is carefully managed¹⁷⁴. Indeed, given the multiple relationships through which an older person can choose to pass on knowledge and an apparent reluctance to do so, it is likely in certain circumstances that the transmission of knowledge is a potent and strategic affair. For instance, the transmission of knowledge may indeed be a political decision by an older man to select a person most likely to ensure he will be adequately cared for in old age¹⁷⁵. This was further evidenced by Hubert who not only explained the value of knowledge but also revealed something about the management of his own knowledge. As he said to me:

¹⁷² Fieldnotes February 2009

¹⁷³ The man provided evidence of this ‘special knowledge’. He said ‘just last night’ his uncle who lived on Weno had heard three loud cracks of thunder and had felt someone had died on his island of Houk. The next morning his uncle heard on the radio that someone had indeed died on the island (Fieldnotes January 2009).

¹⁷⁴ Lefale (2010: 319) notes that in the Samoan context, traditional ecological knowledge is viewed as treasures to be guarded for a purpose.

¹⁷⁵ Here I draw on Goodenough’s (1978) analysis of property on Romonum Island in Chuuk Lagoon. On Romonum, property is often ‘gifted’ to one’s adult children and Goodenough (1978:46) likens this gift to old age insurance, sanctioning the care of the aged to their children. The ‘equivalence’ between knowledge and property is supported by Gladwin (1970: 129) who argues navigational skills and knowledge are considered ‘valuable property’ on Puluwat Island and Marshall (ASAONET 5/10/13) who indicates that special knowledge is seen as a kind of property by the people of Namoluk. See also Nason and Peter (2009: 278).

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‘Looked like he took it with him’: being ‘stingy’ with knowledge

As revealed above, among members of the Mochese community there was certain specialised knowledge explicitly recognised as valuable; knowledge which not only conferred respect but also required careful management to ‘keep it for oneself’. Hence, although it was possible to ask for such knowledge it was not just given out freely. Instead, there were often considerable efforts made to conceal and/or protect this knowledge so as to control and negotiate its transmission (or not) to others. While this could be understood as an astute political decision on the part of those with knowledge (e.g. Hubert just wanting me to ‘make it in Australia’), I was told on a number of occasions this was the older people being ‘selfish and stingy with their knowledge’. Certainly being ‘stingy’ with knowledge was a recurrent theme throughout my fieldwork, expressed by both men and women, always in reference to an older generation. However, this was not simply a sentiment belonging to those younger members of the Mochese community at the time of my fieldwork. As well, it was a means through which both younger and older people reflected on the knowledge of those who had gone before. For instance, Ason who was already an older man reflected on the knowledge of his father who was in his late eighties when he died. In particular, Ason realised what he could have learnt from his father went with his father when he died. He said ‘looked like he took it with him’, suggesting a perceived unwillingness on the part of his father to pass on knowledge.

However, probably most telling of a shared community reflection on the transmission of knowledge was the emphasis given to particular themes embedded within the much renowned Mochese story of the flying canoes. The basic story goes as follows. A man carved two canoes from the trunk of a breadfruit tree and when he finished, the canoes could travel to Chuuk Lagoon in one hour, or less than one hour. One day he asked his two sons to travel to Chuuk Lagoon to pick up some things. He told them not to change anything on the canoes. On their way back from Chuuk Lagoon the brothers disobeyed their father and changed something on the canoes to make them go even faster. They pulled up the sail and ran out very fast. They went up on the ocean and up into the sky and flew until they disappeared. The brothers did not make it back to Moch.

This was a favourite story for all of Moch, one of the first stories I heard and often recounted for my benefit, regardless of whether I had asked or not. People would ask if I

had heard about the flying canoes or would even relate their interpretation of the story to our topic of conversation. Although some interpreted the story in terms of the relationship between the father and his sons (referring to qualities of respect, disobedience and/or patience), the flying canoes story appeared to be mostly a story about knowledge. Indeed, my main concern here is the attention to ‘knowledge’ which seemed to permeate most of the commentary about the flying canoes.

Firstly, I was told the canoes were carved underground so others could not ‘copy’ the knowledge. As Hubert said, *I just heard that they dig the ground and put the canoe under because they don’t want someone to see*¹⁸⁰. Similarly, the son of Sapas said he heard from the old people that they had dug the ground and fenced off the area to hide what they were doing from others who might come and witness the carving of the canoe. Indeed, the place where one of the canoes was built was just outside his house and he remembered when he was young the rainwater would pool in this area, ‘just like a swamp’¹⁸¹. In this sense the land continues to embody the concealment of knowledge.

Secondly, I was told of the extreme act the man performed in order to avoid passing on his knowledge of the flying canoe. Apparently, when the flying canoes failed to return to Moch after a particular journey to Chuuk Lagoon, people came from the neighbouring islands to ask the man to teach them how to carve this kind of canoe. They came to Moch on sailing canoes filled with gifts to exchange for the knowledge. However, when they arrived on the shore and began to line up all the gifts, the man with the knowledge killed himself. As Lekila explained, the man had tied a string from his big toe to his ‘second nose’ (penis) and when the people came to ask him for the knowledge *then just push out his legs so hard and then pull out his second nose and that’s it, he died right there because he doesn’t want to give away that [knowledge]*^{182, 183}. When I asked Lekila if it had been difficult for the man to refuse the request for knowledge she said:

¹⁸⁰ Interview March 2009

¹⁸¹ Interview January 2008 (Doropio acted as interpreter for this interview).

¹⁸² Interview March 2011

¹⁸³ The manner in which the man killed himself is interesting; perhaps there is a symbolic connection being made between male reproduction and the reproduction of knowledge.

Yes, can't say 'no' so has to kill himself. Even nowadays, if you meet people from different place and talk to them, say 'yes, yes, yes'. That mentality is still practiced until now.

Finally, references to the flying canoes story often elicited an explicit commentary on the transmission of knowledge. For instance, when Jarvis told the flying canoe story he emphasised what he considered the lesson of the story, i.e. when he came to the part where people from the other islands asked for the knowledge he stopped and said, *Ok, end of the story. Now lesson [laughter], the end of the story... He suicide, he did not want to give the skills he have*^{184, 185}. Here, Jarvis not only pointed to the extreme act of suicide but also reflected on 'the end of the story' as a lesson about the loss of skills and knowledge as a consequence of 'keeping it for oneself'. He argued that *if the skill passed down to those generations and then now just use the canoe to fly to United States and Europe*. This was a sentiment shared by others who also told me if the knowledge to carve flying canoes had been passed down – not just the story – then maybe Moch would have its own 'aeroplane'. As Lekila clearly stated:

*Before, sailing canoes were able to fly back and forth between islands and if only people back then they would share things without keeping them maybe until now sailing canoes can still fly back and forth instead of these big ships*¹⁸⁶.

While there was a general feeling among those who shared the story with me that the specific knowledge of the flying canoes had been lost, the story also prompted a more general assessment of knowledge and 'our people', Mochese people; how 'they feel kind of selfish to pass to any people their knowledge', and how 'that's the way they are'¹⁸⁷. It seemed this quality of 'stinginess' was attributed to those practices surrounding knowledge, in particular choosing the right person for that knowledge but also the cultural imperative to say 'yes, yes, yes' to a specific request. Again, Lekila revealed:

¹⁸⁴ Interview January 2008

¹⁸⁵ The abrupt ending to Jarvis' story may indicate a reluctance to explain how the man committed suicide due to some gender embarrassment.

¹⁸⁶ Interview March 2011

¹⁸⁷ Interview January 2008 (Doropio acted as interpreter for this interview)

People were so stingy - let's say if I know something I would just pick whom to share with and then not even give away to anybody. I have to just give it to maybe my niece, my kids, and even to my brother's kids I cannot because they are from different clan.

Kavin, an instructor at the College of Micronesia also made this connection between 'stinginess' and choosing the right person for knowledge. Although Kavin lived in Weno, his home island was Tol in Chuuk Lagoon. He told me the people of Chuuk in general were stingy with their knowledge, and clarified this by saying that because knowledge was seen as powerful, people did not just give it away to anyone but were instead very careful who they chose within their family¹⁸⁸.

Therefore, within the context of the flying canoes story, the extreme act of suicide in response to a request for knowledge, even by people other than the 'right person', was not only interpreted as 'stinginess' or an unwillingness to share knowledge, but was also a reflection on 'the way Mochese people are with knowledge'¹⁸⁹. As Lekila emphasised, the man did not give away his knowledge *because otherwise people if they really share their knowledge, everybody nowadays they are capable of doing everything*. That is, if the man had really shared his knowledge the very power of that knowledge would have dissipated; for example, he may have lost the respect due to having that knowledge and/or the ability to negotiate his old age insurance with the 'right person'. In this sense, being stingy with knowledge appeared to be a culturally sanctioned strategy to negotiate the power and transmission of certain knowledge even as it also contributed to a shared feeling that knowledge was being lost.

¹⁸⁸ Fieldnotes March 2009

¹⁸⁹ Serino told another story about a man who had magic knowledge to make his model canoe go really fast and win races during the season for Nou Nou. This man was constantly being asked to share his knowledge and Serino said he eventually killed himself to keep his knowledge from others. As well, Lekila told of a man who gathered everyone of the clan – from his children all the way to the old man – in the local meeting hall and “just burnt that place and everyone dies right there. That’s how strong their feelings they want to die with what they have but they don’t want to share” (Interview March 2011).

'They don't care anything belongs to the old guy'

While the reflections on knowledge discussed above were directed towards those older people who were seen as being stingy with their knowledge, there is also a criticism directed towards the younger generation who, as Ason claims, *don't want to listen to the older one. They just go on their own*¹⁹⁰. This was not only evident in observations made by older people about the younger ones on Moch, but also suggested in the self-criticisms of some of those older people about their relationships with their elders. Furthermore, this criticism directed towards the younger generation is embedded within a particular commentary on broader social changes occurring within the community.

A failure to listen to the older ones is integral to Ason's explanation for some of the changes he identified to the practice of fishing for *angarap*. For instance, I was variously told by a number of people – including Ason, Atel and Satal – that the first fish speared in *angarap* should be either released back into the water so the blood will calm the other fish or taken to Leiras for the paramount chief (*makal*), and that one fish from each man should be placed on the reef between Weninek and Moch to be later distributed by the chief of Soren Iluk. Although both Atel and Ason acknowledged 'that doesn't happen now', people still commented that 'Ason did the wrong thing'¹⁹¹ and that 'it is traditional, it is custom and they have to follow the practice, they have to learn this'. Certainly, Ason lamented these changes – *again, our culture... look like we throw it away* – and in relation to the magic words for *angarap*, he said the old guy *tell me, I didn't want to know that*.

During my fieldwork I became aware of other circumstances where people were sorry they did not listen to the older ones. For instance, on one occasion Mary talked about her mother and her grandmother who were both respected masseurs on Moch and their skills were sought by people from other islands in the Mortlocks. In particular, Mary said these two women were known to be able to massage pregnant women to turn the baby ready for

¹⁹⁰ Interview May 2009

¹⁹¹ This comment referred to *angarap* in 2009 when Ason was the appropriate representative for Soren Iluk (as seen in the video, *Leset in Angarap*). On that occasion, Ason speared the first fish for *angarap* and then put that fish into his own canoe rather than leaving it in the water or taking it to the *makal*. At that time, even Satal considered this may be the one part of the video the leadership of Soren Iluk may want to edit. (N.b. this was not discussed further and the final video was approved by the chief of Soren Iluk).

birth. However, when Mary was younger she did not want to learn about massage and so this knowledge was not passed on to her, and subsequently she was unable to pass this knowledge on to her daughter. This played out among the younger ones in a similar way. When I was sitting with Mary and her sister who was weaving a fan from coconut palm fronds, I asked Mary's daughter Maya if she knew how to weave. Maya said 'no', and then quietly indicated behind Mary's back that she did not want to know. Later, Mary's sister's husband commented that only a few of the younger girls on Moch know how to make fans, and he stressed it was important for the younger ones to learn these skills.

Indeed, Hubert talked with me on a number of occasions about the need for 'traditional classes' at the school – to teach the youth how to make rope, string, spear, crow bar, fish trap, net, canoe and paddle, thatch roof, basket, hut, mat, fan, coral pounders, fibre for skirt, and jewellery – and as well, Kapa asked me to film a rope making demonstration at the school with one of the older men, a 'special teacher for the traditional class'. While the presence of the camera may have contributed to the atmosphere, this particular demonstration seemed strained and the students appeared to be distracted and not very attentive. To some extent this may indicate the status of 'traditional knowledge' based on the younger ones not wanting to listen to the older ones. However, the stilted formality of the lesson on rope making at the school contrasted greatly with the situated intimacy of gradual learning that was alluded to in reminiscences and that I witnessed between younger and older generations of extended families¹⁹² and this pointed to other aspects of social change implicated in the perceived plight of such knowledge¹⁹³.

For instance, the 'education explosion' in Chuuk which began in the 1960s has had various ongoing social consequences for island communities (Flinn 1992: 40)¹⁹⁴. Education induced rapid socio-cultural change, taking young people away from their home islands for

¹⁹² My observations here contrast with Nakashima et al. (2012: 95) who suggest the inclusion of traditional knowledge in formal schooling may assist intergenerational knowledge transmission. This is supported by Hubert's insistence on the importance of 'traditional classes' at the Moch School.

¹⁹³ Hezel (1992) presents an overview of social change in the Caroline Islands. See also Pelling and Uitto (2001) for an assessment of globalisation as the instigator of social change in island communities. See also Macintyre and Foale (2013: 407) for similar concerns in Papua New Guinea.

¹⁹⁴ Hezel (1973, 1979, 2001) has also written extensively on this issue.

long periods of time and enticing them to find employment off-island (Flinn 1992: 44). Certainly during my fieldwork, even the imposition of a school routine on the island seemed to effect the time available for younger people to spend with their elders, to learn the skills and to be given the knowledge. This was supported by a number of people – including Tomas and Hubert – who recognised that attendance at school and other educational institutions had interfered with their learning from the older ones¹⁹⁵. Yet Mochese youth are encouraged to complete high school and attend college, and many expressed a desire to find employment off-island to support their families. Therefore, while ‘traditional knowledge’ is highly valued and people may lament its passing, so too formal education is recognised as ‘good for family’, a strategy for the future as the community becomes increasingly engaged with a cash economy and remittances from those working off-island become necessary to sustain life on Moch (discussed in chapter two). These tensions are revealed on the island as certain youth are labelled ‘outsiders’, a somewhat deprecative term for those who have dropped out of high school or not completed their college education and yet may become recognised for their cultural knowledge and skill gained through a situated intimacy with their elders¹⁹⁶.

There were other reflections on the younger generation which emphasised social change within the community, such as a preference for the nuclear family and a focus on the cash economy (some of these have already been discussed in chapter two). As well, there were comments that ‘young people don’t know how to respect older people’. During a conversation with Merym and Tomas I was told about the respectful language of the old people that is no longer spoken by the younger generation, including themselves. They also pointed out that unlike today, children were expected to stay in their own village; that it was considered respectful to stay at home. Another woman – the Mochese Catholic nun I met on Sanchol – also mentioned changes in respectful behaviour that appeared to be condoned by both younger and older generations; ‘like an aunt who farted in front of her nephews or the nephews joking with their aunt about a rip in her shirt’. She said this would not have happened when she was young. Likewise, Lekila expressed her disappointment about the behaviour of children at the year eight graduation (see Figure 50). Certainly

¹⁹⁵ Hubert attended school in the 1960s, a period recognised as the beginning of ‘the education explosion’.

¹⁹⁶ For example, Lerinda was recognised by her sister Lekila as the one who knows (as discussed in chapter two).

during the speeches many of the students were talking, and some of the younger children were jumping up and popping the balloons that were decorating the hall. Lekila described this behaviour as ‘disrespectful and quite a change from how it used to be’. Although not stated explicitly, these reflections on the younger generation provide further insight into tensions which potentially disrupt the transmission of intimate knowledge, and consequently also impact the depth of knowledge available within the community to explain seemingly unprecedented changes in the weather and the tides.



Figure 50: Year eight students enter the community hall for their graduation (Photo: Christine Pam).

Discussion and conclusion

As revealed in Crate and Nuttall’s (2009) comprehensive volume on anthropology and climate change, anthropologists are increasingly encountering the ‘local’ effects of climate change. Whether we work among Inuit in Canada or Alaska, Sakha in Siberia, Quechua in the Andes of Peru, Pacific Islanders in Tuvalu or Samoa, Indigenous Australians in Arnhem Land or the Torres Strait Islands, apple growers in Northwestern India, or villagers in Tibet, “there are compelling similarities in the narratives, accounts, and

experiences of indigenous and local peoples who are already seeing and experiencing the effects of climate change” (Crate and Nuttall 2009: 9). Certainly within the literature there is a propensity among climate change researchers to document changes in the weather and the environment as local perceptions, observations, and/or knowledge of climate change, even in places deemed most distant from the influence of the scientific discourse itself (e.g. Byg and Salick 2009). Furthermore, and in direct relation to this chapter, Roncoli et al. (2009: 95) emphasise “where seasonality shapes livelihoods, climate change is often understood in terms of deviations from a cognized normative calendar”.

Taking this lead, I could easily frame this chapter as representing Mochese perceptions of climate change. I have evidenced a general consensus within the community that changes were happening to the seasons and the tides – that ‘it was not like this before’ – and that this awareness of change stems from an intimate knowledge of the normal order of things on Moch. It was suggested by a number of people that the changes interfered with an ability to know the weather, and this prompted feelings of uncertainty which further emphasised the apparent unprecedentedness of high tide and big waves. Moreover, the changes discussed in this chapter resonate with scientific observations of climate change, in particular with sea level rise and an increase in extreme weather events (see also Lazrus 2009a: 168-169).

However, it is not my intention here to represent Mochese perceptions of climate change. Indeed, I would argue that to do so imposes ‘climate change’ effects onto the community. While people talked about changes to the seasons, and expressed concern about an increasing high tide and more frequent big waves; pointed to taro pits destroyed by salt water inundation and showed me places where tidal surge and waves have damaged the seawall and eroded the land; shared stories and detailed experiences of high tide and big waves, and recalled emotional memories of past extreme weather events, they generally did so without specific reference to ‘climate change’. Of course it is significant that all of this usually occurred within the context of my positioning as a climate change researcher, and therefore must in some way begin to say something about the meaning of climate change for the people of Moch. However, to simply attribute ‘climate change’ here to Mochese perceptions would be a conflation on my part; a reflection of my agency as an

anthropologist and my own understanding of ‘climate change’ as a global scientific phenomenon.

Rather, in this chapter I am interested in the sense of uncertainty surrounding concerns that ‘it was not like this before’; concerns about environmental change, social change and the transmission of knowledge. Others have also argued for “a mix of changing traditions and changing weather” (Weatherhead et al. 2010: 524) when considering uncertainty and the concept of climate change (Vedwan 2006: 11-12; Lazrus 2009a: 126-127; Rudiak-Gould 2012: 51). Such feelings of uncertainty suggest the changes in the seasons and the weather observed by a majority of people on Moch may well be unprecedented in character. According to Lazrus (2009a: 169), “observations of change convey the limits of [local] knowledge – showing up where changes can no longer be accounted for according to local understandings”. While this may be the case, a focus on knowledge boundaries in the context of my thesis serves only to uphold the problematic distinction between local knowledge and global ‘climate change’ represented in the literature as local perceptions of climate change. Instead, I argue the uncertainty is crucial for questions of causality as people grapple to understand the changes that are happening on their home island and within their community. Therefore, in order to understand ‘climate change’ it is necessary to consider not the ‘local effects of climate change’ as suggested earlier by Crate and Nuttall, but rather the work being done within the community to make the concept of climate change meaningful and effective for the Mochese community. This work will be considered in the following chapter.

Chapter 5 ‘Word-by-mouth’: the epistemological process of making climate change ‘facts that matter’

Introduction

The previous chapter examined observations of environmental change expressed and experienced by people living on Moch as unusual weather events and as disruptions to the seasonal patterns of everyday life. Significantly, it was claimed these changes made it difficult for people to ‘know what will happen’, and the feelings of uncertainty were exacerbated by a realisation that many of those knowledgeable people who could explain what was happening with the weather had already died and taken much of their knowledge with them. As this uncertainty takes hold and people begin to wonder at the cause of such changes, a new explanatory framework is being brought into the community; that the globe is warming, the ice is melting and the seas are rising. In this chapter, I examine the ways in which scientific understandings of climate change are brought ‘home to roost’ amongst the community, or to paraphrase MacRae (2010: 45) more closely, how ‘climate change’ that has originated in scientific laboratories and been mobilised by the global media has come home to roost in places where it takes on meanings according to local interpretations and needs. In particular, I consider the ‘melting ice’ as a scientific phenomenon linked to climate change that is being actively processed ‘word-by-mouth’ among the people of Moch to make sense of unusual high tide and wave events, and the work being performed by specific Mochese people to facilitate a shared understanding of climate change facts that matter for the lived realities of the Mochese community.

An evening at Rús

One evening I sat with Merym and Lerinda on a mound of clean white coral in the moonlight at Rús. We were working together, each using a hard shell or special implement to scrape along the length of already dried pandanus leaves in order to soften them and make them flexible for weaving. As we worked, Lerinda and Merym talked. Lerinda told a story about her sister and sister’s husband who were living in New York; a priest had given up his front row seats to them so they could attend a special gathering for the Pope. Nearby, a small group of related men sat talking and joking under the lime tree. One of the

men, Lerinda's brother and Merym's 'sweet and handsome husband', playfully commandeered the role of supervisor, overseeing our work and generally being mischievous. After a while he wandered away and returned a little later with a cigarette. Meanwhile, a younger woman, a junior high school student from Kuttu who was sponsored by the family, started a fire and boiled some water for coffee. We then dunked biscuits in our sweet black coffee, sitting on the mound of coral in the moonlight.

While we were there, a young man came to visit. He was related to the family of Rús through his wife's sister who was married to one of Lerinda's brothers. This young man and his wife lived in Guam and had just arrived on Moch for a short visit, having travelled by small plane from Weno to Ta, and then by motor boat across the lagoon to Moch. As I was an unexpected presence at Rús, the young man was curious and asked me what I was doing there. I explained my research and then he asked what I thought about global warming. At first I responded by relaying to him the changes people here on Moch had noticed, the tides getting higher, the waves coming onto the land, and the disappearing beaches. However, this was not what he wanted to hear from me. Again he asked me the question, and this time I told him that I thought the big countries were polluting the atmosphere and that this was changing the climate. He was pleased to hear this and became very engaged in further discussion, both with me (in English) and with Merym, Lerinda and the men sitting under the lime tree (in Mochese). In particular, he told me what he had learnt in Guam, that the tectonic plates were shifting and that 'Guam will be on top of FSM'. The shifting of tectonic plates was then explained in Mortlockese, and this prompted an extended discussion which I found difficult to follow in detail. After a while this young man directed another specific question to me; 'what is the answer'? I responded, '*isi kelei*' (I don't know). Then, after a moment's hesitation and an explicit expression of reluctance to say anything about this ('but I will say it anyway'), he told me that the answer was in the bible. He said, 'the bible teaches us to be humble and this is the answer to always wanting more and bigger things'.

Even though this young man was neither from this place (Rús) nor one of the older men present, he initiated and directed the conversation and generally presented as being both confidant and authoritative. People listened intently to what he had to say, asked questions, and allowed him the space to elucidate a response based on the information he had gleaned

from sources in Guam and also on his interpretation of the bible. He was definitely the focus of willing attention and as such, rather than being cause for contention, his position of prominence appeared to be mutually constituted. He had access to information from outside and was willing to share it, and people here at Rús were willing to hear it.

Although my presence at Rús that evening certainly influenced the direction of the discussion, I wondered whether this created a unique circumstance for talk of global warming that would not have occurred otherwise. However, upon reflection I became increasingly aware of many other situations on Moch in which people talked and developed their understanding of global warming, regardless of my presence. As such, it became apparent that my presence at Rús that evening did not necessarily instigate an extraordinary event. Rather I was included as a participant in a meaningful social process whereby people accessed information and developed their explanations for the unusual events that seemed to be affecting Moch with increasing frequency every year. Indeed it was my experience of being at Rús that evening which impelled me to further examine how climate change was being constituted by the people of Moch.

‘He heard the ice berg is melting’: uncertainty and the story of the ice

As far as I was aware during my fieldwork, ‘shifting tectonic plates’ did not feature prominently as a talking point among the people of Moch. Apart from the young man who visited Rús, only Hubert mentioned this briefly to me; he was worried the geological plate of the islands of the FSM would slant and slide away into the water. However, there was another phenomenon linked to climate change that was being actively processed ‘word-by-mouth’ on Moch; ‘the ice is melting’. It first became evident that most people living on Moch had at least heard about this phenomenon through the multiple interviews I conducted early in my fieldwork in order to produce a seawall report for the municipal government (discussed further in chapter seven). As well as questions about the impact of the December tidal surge on the seawalls and shoreline of Moch, I also asked people about the changes they had noticed and the potential causes of those changes.

Given the context for the interviews as directed by the municipal government (as well as the time of year), it was not surprising that people focussed on the changes they noticed to the waves and the tides. However of particular relevance for this chapter, my questions

regarding the cause of such changes usually prompted some reference to the melting ice. For instance, I would ask people specifically why they thought the tide was getting higher and the waves were coming onto the land, and even though many of the interviews were conducted in Mochese (with the help of an interpreter), the majority of responses included the English word 'ice'. Indeed, by far the most common response to my question was some version of 'the ice is melting' or 'he heard the ice berg is melting'. This substantiated earlier findings from the pilot study which had hinted at the significance of the ice melting for people living on Moch (Henry et al. 2008). For example, in response to a similar question about the cause of an increasing high tide, one older person interviewed for that study was translated as saying:

To my own understanding and word-by-mouth from some people, the ice berg at the North and South Pole start melting and cause this sea level rise¹⁹⁷.

That the people of Moch talked a lot about the ice melting, especially at 'this time of year' referring to *leffang*, the high tide season, was certainly confirmed by the interviews and the many conversations I had with various people throughout my fieldwork. Significantly, people articulated a causal relationship between local changes ('high tide is getting higher') and a phenomenon beyond their immediate experience of living on Moch ('the ice is melting'). This is exemplified by the response of one older man, as interpreted by Doropio and recorded in my fieldnotes:

High tide is changing rapidly; it is almost the same level as the seawall. Every year it gets higher and this year was higher than the last years. The cause of the change is the ice melting. People are talking about this and he believes it¹⁹⁸.

Another man interviewed for the report told me the waves were stronger and the high tide was getting higher. He said that before when he heard about the ice melting he did not believe it but now, after the last big waves, he believes the ice is melting. Furthermore, in the context of high tides and big waves a few people not only attributed cause to the melting ice, but also said 'I have heard it is the global warming', or 'the ozone layer

¹⁹⁷ Interview January 2008

¹⁹⁸ Interview February 2009

change'. Still others referred to the effect of pollution on the weather, or told me that 'changes to the atmosphere cause the change in the water' or that 'the cause of changes is somewhere else but the effect happens here'.

However, although expressive of an understanding of change, this seeming readiness to *articulate* a causal relationship between local experiences and particular global phenomena was often accompanied by body language steeped with discomfort and embarrassment. For instance, when I asked people directly about cause, many shifted their eye contact, shuffled a little, smiled and/or gave a short self-conscious laugh when they said they had heard 'word by mouth' that the ice is melting. My questions about causality obviously unsettled many people; it was as if I was asking them to explain something that embarrassed them. There are various interpretations for this response; maybe they associated me with those 'bigger countries' responsible for global warming and did not want to hurt my feelings, maybe they felt compelled to say what they thought I wanted to hear (see Rudiak-Gould 2014a: 146), or maybe they did not really know the cause and subsequently could only tell me what they had heard.

When I asked Satal about the uncertainty embedded and embodied within people's responses, he said *it's a new knowledge to us and seems strange to us as we look at it, and I think that's why so many people would be in that way*¹⁹⁹. He distinguished between educated and uneducated people and suggested that some people, *those uneducated like myself and others, they might think it is a made-up story*. In this sense of a story, I was interested to understand the uncertainty expressed as 'hearing' about the ice melting. In a later interview Satal explained the difference between hearing and knowing; *ya rong* ('I hear' – to just hear, not necessarily to believe or know) and *ya kilei* ('I know' – to know and believe). He then said:

*Most of the Mochese, the maturity of the people they might be falling into that category of 'hearing' the ice is melting. Only few know for sure that the ice is melting – depends on those well educated people and those who are not educated*²⁰⁰.

¹⁹⁹ Interview June 2009

²⁰⁰ Interview March 2011

As Satal himself stated in response to my questions about causality, ‘he does not really know what is causing the tides to increase, but he has heard and studied about global warming’. Indeed, many people – both men and women – were hesitant in their responses, tending to qualify their understanding as ‘hearing’ about the ice melting ‘word-by-mouth’ rather than knowing and believing it to be so. This was further evidenced by my conversation with Freddie, the municipal representative for the village of Inapwei²⁰¹. Freddie noticed the high tide was getting higher and he was not sure why it was happening. He had also heard about the ice melting but again he was not sure; he said ‘people here on Moch talk about the ice, but just talk, talk, talk’. Then when he told me the melting ice was caused by the pollution of the air from factories, he qualified this by saying ‘he just think what he heard’.

However, even though Freddie ‘might be falling into that category of hearing the ice is melting’ (as suggested by Satal) and definitely expressed uncertainty about such ‘talk’, he still engaged the ‘story’ of the ice in an attempt to understand the changes he noticed to the high tide. In the same way, the ‘ice is melting’ was a story heard word-by-mouth by many people from Moch who also expressed varying degrees of uncertainty. Yet despite the prevalence of such uncertainty, it was a story readily engaged by a majority of the people I spoke with to explain the changes being experienced on the island, especially the increase in high tide which was a major concern ‘at this time of year’. It was a story which seemed to resonate with particular lived realities; a story that people had heard which could potentially make sense of an encroaching sea²⁰².

‘People are talking about this’: finding ‘facts’ about the ice

According to Father Joseph, people feared the changes to the sea ‘every day, every month’, and talk of the ice melting as well as an increasing awareness of ‘pollution and the effects of this on the weather’ (including an awareness of global warming, the ozone layer etc.) meant people were beginning to wonder about the causes and to re-evaluate their knowledge. Throughout the time of my fieldwork, which was predominantly (and

²⁰¹ Fieldnotes February 2009

²⁰² As Tomas said, people know that ice will melt in the sun and become water and so they can conceive of a connection between the earth warming, the ice melting and the seas rising (Fieldnotes July 2009).

intentionally) during high tide season, it was apparent that a ‘new knowledge’ story was being actively processed and disseminated among members of the Mochese community to explain the changes they were experiencing. For some it was a story linked somehow to ‘air pollution’, ‘global warming’, ‘the Kyoto Protocol’, ‘the greenhouse effect’, and ‘the ozone layer’, but mostly as I have evidenced, it was a story about high tide and big waves, and about the earth warming, the ice melting and the seas rising.

Just as talk of global warming and shifting tectonic plates occurred among the household of Rús, so too many people indicated they had heard about the melting ice ‘word-by-mouth’ through their engagement with others. Indeed, word-by-mouth appeared to be the principal means through which people living predominantly on the island of Moch became engaged with ideas linked to global climate change. Significantly for my thesis – and discussed in greater detail later in this chapter – people living on the island generally heard of such things as ‘the melting ice’, sea level rise and global warming from other Mochese people, especially those who either travelled regularly between Moch and Weno or who were living, working or studying ‘outside’ and had returned to Moch for a short visit or to live and/or work more permanently on their home island. Of those who brought talk of ‘the ice’ to the island, I was told by a number of men in particular that they had heard about it on local Chuukese radio and/or read about it in the Guam based newspaper, the Pacific Daily News (PDN) when they were in Weno²⁰³. A few people, including Kapa and Hubert, also listened to high frequency radio while on Moch, to radio stations such as Voice of America, Radio Australia, and the BBC World Service.

To a much lesser degree, ‘word’ of climate change was brought directly to the island by non-Mochese people, such as those who visited on government business (e.g. officers and representatives of state and/or national government departments), or volunteered at the Moch School (e.g. Peace Corps volunteers from the United States), or as in my unique case, stayed with the community to conduct research. Visiting government officials involved with disaster assessment and the distribution of food relief operated within a context of high tide and wave inundation and their presence on the island was related by some to climate change and the story of the ice (examined in chapter seven). Furthermore,

²⁰³ Rudiak-Gould (2011: 11) found local radio broadcasts were the most-cited source of information about climate change for Marshall Islanders.

the Historic Preservation Office, a State Government agency, was instrumental in implementing the pilot study on heritage and climate change which brought government officials and researchers – including myself – to the island. As well, a Leadership Conference held on Moch in 2008 brought government officers to the island to discuss a range of issues including a session on climate change. This conference explained the presence of the 2007 IPCC Climate Change reports – all three volumes – which Kapa left on his desk in the school office for me to use. However, most emphatically it seemed that ‘word’ of climate change from non-Mochese people came to the island with the Peace Corps volunteers.

‘There is a DVD from Peace Corps’

While conducting interviews for the seawall report a number of people on Moch said they had heard about ‘the ice’ from volunteers who had stayed on Moch during the past few years, and in particular had either seen or heard about ‘the DVD from Peace Corps’. This was a specific reference to the climate change documentary by Al Gore, entitled ‘An Inconvenient Truth’ (2006). As far as I could discover the DVD was first brought to the island by Aaron, a Peace Corps Volunteer who worked at the Moch School between 2006 and 2007, and then by another volunteer, Raelene who worked at the school in 2008. According to the Climate Crisis website (www.climatecrisis.net), this documentary became a global phenomenon in 2006 and certainly the estimated worldwide audience of five million people included members of the Mochese community.

Tomas told me he had seen ‘An Inconvenient Truth’ when Aaron was on the island. He said he liked the DVD – it had good examples and evidence of the impact of climate change – and he emphasised, ‘imagine New York City under water, imagine what this would be for Moch; it would be completely under water’. Likewise, Kapa thought ‘the Al Gore film’ was well researched with data going back to the late 1800s and he said it had simply reinforced his belief in global warming. Hubert said he had heard about ‘Al Gore making a video’ and especially that ‘the ice bergs are getting smaller and there are photos of this’. He also heard that an iceberg the size of a state in the USA had ‘broken away’ and he joked with me that he would like to see it float by the islands. Still another man said he had seen ‘the DVD from Raelene’ – he ‘really believed this and is very worried about it;

pretty soon the land will sink’ – and in response to my questions about their knowledge of the melting ice others simply said they had heard about ‘the DVD’.

Although the film ‘An Inconvenient Truth’ was brought to the island by Peace Corps Volunteers, much of the ‘talk’ that snowballed around ‘the DVD’ was the work of particular people within the community. For instance Kapa, as principal of the school, had organised a screening of ‘the DVD’ in the school library, specifically for science teachers but open for others to attend. During my fieldwork various people referred to this event. Johan, a teacher for the past 15 years, told me he was at the screening. He said people did not really think about the future until they watched ‘the Al Gore film’, and that seeing the film had prompted him to tell people, ‘if that will happen in big high islands of Hawai’i and New York then imagine what will happen to our own low islands’. As a result, Johan now teaches students about global warming ‘in a generalised way’ in his world geography class and indicated he would like to organise a workshop about climate change so teachers and students could present information to the community. Tomas, also a teacher at the school, attended the screening and went on to select relevant sections of the film to show to his eighth grade science students; he said some students were scared by what they saw.

Even those who had not seen the film were engaged in the talk. For instance, Hubert said he had heard about the DVD from those who attended the screening in the library:

[Christine]: *Did you see the Al Gore film?*
 [Hubert]: *No, I just heard about it. When I was here I heard that somebody show in the library.*
 [Christine]: *Did people talk about it afterwards?*
 [Hubert]: *I just heard, ‘ah, I saw that film about....’*
 [Christine]: *Do you remember what they told you about the film?*
 [Hubert]: *They are nervous, because they see the ice bergs and some of the lands are sink down, big wave²⁰⁴.*

Although my fieldwork was conducted a few years after this screening, there were clear expressions of concern embedded within the talk which still emanated from the documentary. This may not be surprising given the film has been promoted as “a

²⁰⁴ Interview March 2009

passionate and inspirational look at former Vice President Al Gore's fervent crusade to halt global warming's deadly progress” and as a “travelling global warming show... intent on alerting citizens to this ‘planetary emergency’ before it’s too late”

(www.takepart.com/an-inconvenient-truth/film).

Gore’s documentary mobilises a representation of ‘disappearing islands’ in the Pacific to emphasise the significance of warming temperatures and melting polar ice for a predominantly Western audience (Farbotko 2008a: 170). Farbotko is particularly critical of Gore’s manipulation of images of an apparently unnamed Pacific island in flood and his claim, “the citizens of these Pacific islands have all had to evacuate to New Zealand” (Gore 2006; cited in Farbotko 2008a: 170). As Farbotko (2008a: 171) reveals, the images used in the documentary are of Tuvalu and of course, all the inhabitants of these islands have not migrated to New Zealand. She argues Gore sidelines small islands – and the truth – in his quest to save the planet from climate change, effectively “erasing their very present and future in an influential documentary” (Farbotko 2008a: 171). She concludes, “For Gore, the disappearing islands are most useful if they have already disappeared” (Farbotko 2008a: 172).

According to Farbotko and Lazrus (2012:382), “Tuvaluans are being used as the immediate evidence of displacement that the climate change crisis narrative seems to require”. Certainly, as well as packaging climate science for public consumption, elements of Gore’s documentary are representative of a popular ‘constructive visibilism’ whereby frontline images and testimonials of a melting arctic or a sinking Tuvalu are used to make climate change visible to the ecologically oblivious (Rudiak-Gould 2013b: 128; see also Farbotko 2010). Rudiak-Gould (2013b: 128) suggests that this approach “hinges on the understanding that climate change is visible to frontline communities but invisible to sheltered urbanites and Westerners”²⁰⁵. Yet many people from the ‘frontline’ community of Moch tended to draw on ‘the DVD’ to make their own connections between the unusual tidal events they were experiencing and the concept of global climate change. Indeed, notwithstanding Gore’s ‘impassioned proselytising’ (Jasanoff 2010: 238) and his apparent

²⁰⁵ Farbotko (2010: 58) clearly contests the value of such ‘visibilism’ as “islanders are appropriated in the proof of a global climate change crisis”, “denied their own agency” and “fictionalised into victim populations”.

manipulation of representations of small islands to further his ‘crusade’, ‘An Inconvenient Truth’ captured the attention of people on Moch – especially those elements of the film which focussed on the melting ice and sea level rise – and contributed to making climate change meaningful (and visible) among the community.

Watching the melting ice

According to Tomas, the documentary ‘An Inconvenient Truth’ was influential and most likely responsible for the readiness with which people engaged the story of the ice to explain what was happening to the waves and the tides on their home island of Moch²⁰⁶. Given the marginality of Moch (and other low lying islands in the FSM) in terms of access to educational workshops and conferences on climate change²⁰⁷ and the somewhat limited coverage of climate change issues within the local media at that time, Tomas’ observation appears to be well founded. The *Pacific Daily News* (PDN) was the most commonly read newspaper among the people of Moch who said they accessed local media for information. A quick search for ‘climate change’ in the PDN archives resulted in approximately 145 articles between 1999 and 2013²⁰⁸, of which only 30 articles were published between 1999 and 2008, the period leading up to my fieldwork (www.guampdn.com). However the number of ‘climate change’ articles published in the PDN increased to 53 during the years of my research between 2009 and 2011, and to 60 articles in the years 2012 and 2013.

This increase in frequency was also reflected in *The Kaselehlie Press* (KPress), a popular Pohnpei-based newspaper. Although archival evidence is limited, KPress, which is only published every two weeks, has a dedicated portal for climate change on their website and reported extensively on the issue in their newspaper during 2013. Indeed there were 51 articles, many quite detailed, covering material of national, regional and international

²⁰⁶ Al Gore was already known as the (former) Vice President of the United States and this also seemed to lend the film a certain legitimacy among members of the Mochese community.

²⁰⁷ It is important to note that unlike the situation in the Marshall Islands where people from all atoll communities have attended climate change forums and workshops (Rudiak-Gould 2011: 11), the people of Moch have had extremely limited involvement in such projects. Apart from the community meeting organised to explain our pilot study research in 2008, there has been no climate change workshops presented to the community on the island.

²⁰⁸ Many of these articles did not provide detailed information about climate change.

significance including FSM climate change governance and policy, international aid for climate change adaptation, Pacific Islands leadership and representation at climate change meetings and the latest climate change science reproduced from the Intergovernmental Panel on Climate Change (IPCC), the National Oceanic and Atmospheric Administration (NOAA), and the National Aeronautics and Space Administration (NASA) (www.kpress.info).

It is possible to surmise that many of the climate change articles published in both the PDN and KPress could be read by some people on Moch as further evidence in support of their story of the melting ice (e.g. Beinecke 2012, O'Connor 2011, Riebe 2013, Potsdam Institute for Climate Impact Research 2013). This access to climate change related publications certainly appeared to be the case in relation to the final report from the pilot study (Henry et al. 2008) which was published on the internet in 2008 (www.islandvulnerability.org). A number of people referred to the report and expressed their concern about climate change. For instance, when I first met Jarvis again in 2009 he told me he had been excited to see the report and informed me the old Protestant Church discussed in the report had been intentionally demolished and the material used to rebuild a seawall to protect his family's land at Latipa. Merym also mentioned the report; she said 'people see the report from last year on the internet – people from Moch who live in the USA – and they cry for what they see is happening'²⁰⁹. There was also some evidence that certain people accessed publications through Micronesian Seminar (MicSem), a private non-profit NGO engaged in public education and located at Xavier High School in Weno; while I refer here to a specific article about education (Hezel 2001) that Kapa discussed with me, there have also been a number of articles published on climate change that may have contributed further understandings about 'the ice' on Moch (Hezel 2009, Namakin 2007).

Yet despite the potential and seeming engagement with such climate change related reports and articles, the significance of Gore's (2006) documentary – 'the DVD' – remains strongest in the volume of 'talk' it seemed to facilitate among the community. Certainly, people on Moch loved to watch DVDs more generally, and this may have contributed to

²⁰⁹ Fieldnotes May 2009

the influence of the film. Many families had access to a portable DVD player and would spend time huddled together in a room or seated on the floor of the cookhouse watching movies on a very small screen. Often when I visited Merym in Leseapan I would find her in her bedroom watching a DVD while she sewed²¹⁰. There were always others in the room with her, women, men and/or children laying on the bed or sitting on the few chairs squeezed between the bed and the door for the occasion. In my own household there was a period of time when DVDs were played regularly in the evenings for a young audience of family members, often until well after midnight, and once when Aprel and I visited a few households in search of flowers for *mwáramwár* I was left for a while with an older woman and her grandson who were watching ‘Superman’ on a portable DVD player. Then, a little later as Aprel and I passed through Rús I noticed Lerinda, her husband and her mother’s sister also watching a DVD in the living room of their house²¹¹.

As well as DVD movies which were avidly passed around among families, the video footage I took during my fieldwork was also in demand. I was often specifically asked to show the videos, especially my footage of the singing and ‘style’ competition between island communities at the Easter celebration on Satawan, the eighth grade and tenth grade school picnics, and the fishing for *angarap*. People would hear about the videos from others (word-by-mouth) and then arrange for me to visit their homes with my laptop computer. The video clips always attracted a diverse and animated audience, with women, men and children of various ages laughing and talking and oohh-ing and aahh-ing at images on the screen. Ason watched the fishing for *angarap* video clips twice, in the company of his wife, daughter and a number of young men at his house. At one point he paid particular attention to the position of the net, and throughout the screening readily

²¹⁰ In my fieldnotes (March 2009) I noted that Merym seemed to watch a lot of DVD movies. However, she also worked very hard and was the only woman I had ‘adventures’ with, such as swimming and collecting shellfish in the lagoon and taking a canoe to Weninek and Lelang to collect coconuts and pandanus leaves respectively. She told me once, proudly, that she was a ‘tom-boy’ when she was young.

²¹¹ Deger’s (2006: 64-65) description of everyday life in an Arnhem Land settlement in Northern Australia evidences the prevalence of such visual media in other remote communities. She found that televisions are “among the most highly valued and most common possessions” and are switched on day and night as people watch movies, soaps and sports. She also ‘evokes scenes from a warm afternoon’ where “men who sang at the ceremony grounds until late into the night settle in for the midday movie... Those who speak the best English translate bits of dialogue for others” (Deger 2006: 64).

engaged in the talk and laughter focussed on the people who appeared in the video. Everyone exclaimed loudly as Ason was seen to take the first fish, and cheered as the rest of the men rushed in to spear the fish. Ason commented, *Look like a war hey and Indian*²¹². On another occasion an older woman expressed her disappointment when she arrived at her sister's house too late to watch the videos, and once when Merym was weaving pandanus leaves at Rús, the video of the Easter singing that was being played at the house had attracted such a crowd and had been repeated so many times that she claimed to have had enough and asked me to turn it off so the audience would leave (see Figure 51).



Figure 51: Watching the video at Rús while Merym weaves pandanus. As I took this photo there were people sitting beside me and others standing outside looking through the windows (Photo: Christine Pam).

The fondness for visual media shared by many people in the community seemed to further substantiate Tomas' claim for the significance of Gore's (2006) documentary. As I have evidenced, many people on Moch had heard about the melting ice and within this context,

²¹² Interview May 2009

many had also either seen or heard about ‘the DVD from Peace Corps’. Images from the documentary of rising sea levels were compelling; climate change was made visible (Rudiak-Gould 2013b: 128) and as Hubert indicated, people who saw the film were nervous. Given the potency of such images as ‘New York underwater’ and in conjunction with what some people had gleaned from other sources it was not surprising that talk of ‘the melting ice’ was particularly prevalent during high tide season as people grappled to understand their experiences of high tide and tidal surge events. Indeed it appears that talk of melting ice and sea level rise, as it resonated with such experiences and was contextualised through ‘the DVD’, contributed greatly to these particular phenomena becoming the scientific ‘facts’ of climate change made most meaningful by the community. As my main concern is to understand how ‘climate change’ becomes socially meaningful for the community, I now turn my attention to the specific work that was being done by certain Mochese people to bring scientific explanations of climate change into the community and to facilitate a conversation between fact-finding and meaning-making²¹³.

The work that must be done: making ‘facts that matter’

Although some people may ‘just think what they heard’ about the melting ice, others put forward questions and pursued a deeper understanding of what they had heard. For instance, during a discussion about the best times for fishing and about the seasons for high tide and waves, Kenet, a retired teacher and respected son of one of the last navigators of Moch (see chapter four) mentioned he had heard about the ice melting and the greenhouse effect; he told me ‘Aaron from Peace Corps had a CD of Al Gore’. Kenet proceeded to ask me why the ice was melting, and then responded to my explanation about big countries, atmospheric pollution and an unprecedented rise in temperatures with the observation, ‘Australia is very big and Moch is very small low island and there are lots of these in the Pacific; the FSM, Marshalls, Kiribati’²¹⁴. Hubert, who talked extensively about the seasons and about an increasing high tide asked me why, if the ice was melting in the North Pole it

²¹³ According to Jasanoff (2010: 248), “When it comes to nature, human societies seem to demand not only objectively claimed matters of fact but also subjectively appreciated facts that matter. Environmental knowledge achieves robustness through continual interaction – or conversation – between fact-finding and meaning- making”.

²¹⁴ Fieldnotes March 2009

was only the small islands in the Pacific that were affected by sea level rise, and another younger man who had heard about the melting ice asked me if this was why the sea level was rising.

Given that I was not from Moch and Hubert had publically identified me as a ‘scientist’ on a number of occasions²¹⁵, these questions directed at me assumed that I would be able to provide a somewhat scientific explanation. Throughout my fieldwork I attempted to engage with these and similar questions as best I could, sharing my own understanding of anthropogenic climate change. Based on her research in Tuvalu, Lazrus (2009b: 240-241) discusses similar exchanges she had with people on Nanumea Atoll and suggests this “exemplifies the dissemination of knowledge in which anthropologists routinely engage”. I became aware that during such engagements I was participating in a social process – similar to my experience on that evening at Rús – whereby people accessed available knowledge ‘word-by-mouth’ from others to develop their understandings of what was happening on the island. As Lazrus (2009b: 240) suggests, the sorts of questions asked of me by Kenet and Hubert (and others) reveal efforts to triangulate between diverse ways of knowing; between their knowledge of the seasons, their observations and experiences of tidal events, and what they have heard about global warming and ‘the melting ice’.

This process of engagement I was involved in as an anthropologist is not unusual given that, “even in apparently remote places like Tuvalu, broader networks of knowledge inform understandings of and responses to climate change” (Lazrus 2009b: 240)²¹⁶. Just as a majority of people on Moch have at least heard about the melting ice, so too a majority of ordinary Marshall Islanders (as opposed to Marshallese elites and government specialists) have been exposed to scientific explanations of global warming (Rudiak-Gould 2011: 11). Rudiak-Gould (2011: 11) reports that Marshall Islanders have predominantly learned of climate change through local newspaper articles and radio broadcasts; various educational sessions, conferences and workshops “attended by ordinary citizens from all the country’s inhabited atolls, including the remotest outer islands”; and word of mouth which extended

²¹⁵ For example, after one public meeting Merym told me that Hubert, the main speaker at the meeting, had mentioned me in relation to the seawall report and had said that I was a scientist and I should know.

²¹⁶ See Rudiak-Gould (2011: 10-11) for examples of ‘remote’ communities throughout the world that are engaged with the scientific understanding of climate change.

the range of such information. Likewise, Tuvaluans discuss sea level rise word of mouth in online social media, at school, and in community councils, and access knowledge about climate change through journalists, documentary film-makers, researchers and non-government organisations (Farbotko 2008b: 11-12).

Other anthropologists interested in this field of research agree that local communities receive information about climate change through the media, non-government organisations and government agencies (Rudiak-Gould 2011: 9). While this may be the case, I suspect this reflects a research emphasis on cultural perceptions of change rather than the actual social construction of climate change as a meaningful concept within communities (see Rudiak-Gould 2011: 9). Given my emphasis on the latter, I have found that although the media, Peace Corps Volunteers, the Leadership Conference and even myself as an anthropologist may have played a significant role in the dissemination of information about climate change, it was the agency of particular Mochese people that was mostly responsible for bringing ‘climate change’ to the community.

Precedence for Mochese agency

The people of Moch as ‘outer islanders’ and atoll dwellers have long been considered cosmopolitan in their attitude towards and willingness to engage with people, places and ideas from afar (Hezel 1992: 205; see also Marshall 2004; D’Arcy 2001, 2006). As such, the particular agency I discuss below around making climate change meaningful was not necessarily unusual nor without precedence. An example of this can be found in a somewhat analogous historical situation in which the ‘new knowledge’ of Catholicism was intentionally brought to the community by a young Mochese man in the early 1900s. According to the story, a rosary prayer first introduced to Moch between 1907 and 1910 was not accepted by the community because the then paramount chief of the island (Sópwunupi clan) was Protestant. This chief had a favourite son called Tamari (Sór clan), a young man who was already showing signs of becoming a strong leader²¹⁷. In 1911 without his father’s permission, Tamari travelled by sailing canoe to Lekinioch Island where he and his crew converted to Catholicism. Tamari was baptised as Konstantine, and

²¹⁷ As evidence of Tamari’s leadership potential, Father Joseph told me that he later became the ‘chief’ of the municipality in the 1920s.

then returned to Moch with a crucifix to begin his Catholic worship amongst the community (see Figure 52).

However, as Doropio (in discussion with others) explained, this was not without controversy:

When they arrive here, people were at the shoreline waiting and they start give them a hard time. Just make fun of them... The protestant, 'Ok we going to see which one is more powerful' ... And because of the pressure they have on Moch they went up and put the crucifix and they do their worship in a house belong to a man named Domingo.

When Konstantine or Tamari arrive back, his father was mad and disappointed but there is nothing he can do because traditionally that his eldest son so there is nothing he can do besides just let his son do what he is doing. But competition between Protestant and Catholic at that time just started²¹⁸.

Apparently the competition remained strong until Tamari's father died and Tamari himself became chief of the municipal government in the 1920s. Doropio said, *that's when Catholic just dominate because he was the chief and he got the power to do whatever he do.*

²¹⁸ Interview January 2008



Figure 52: Today, the crucifix that Konstantine brought to Moch is kept in a side room near the main entry to the Catholic Church. It is brought out for special occasions such as the Easter celebrations and the Rosario (Photo: Rosita Henry).

Moch is now recognised as a predominantly Catholic community, although some of that ‘competition’ still remains. I found the people of Moch were genuinely proud of this history, especially that they had not been missionised like other islands but had actively sought to introduce Catholicism into their own community. Father Joseph emphasised such Mochese agency when he recounted the history of Catholicism during the annual special mass which I attended to celebrate the establishment of the Caroline Islands Diocese on the 3rd May, 1979. During his sermon he reminded the congregation it was Tamari who ‘brings the cross and starts to make *our* mass’²¹⁹. Similarly, Kapa made the comparison with how

²¹⁹ This was a major community celebration and greetings of ‘Happy Diocese’ were shared throughout the day. Each clan had been raising money for the Diocese during the preceding months and clan representatives donated that money during a community event held in Apulukuluk. A majority of the population also

Catholicism came to Lekinioch in the early 1900s – brought by missionaries from Pohnpei who were ‘blown by the wind on their way to Chuuk Lagoon’. Furthermore, claiming his Mortlockese identity as he travelled to Satawan Island as invited ‘family’,²²⁰ to attend the newly ordained Father Robert’s first mass on his home island, Kapa evoked the ongoing agency of Mortlockese people who continue to negotiate and institute their own practice of Catholicism. Kapa explained with much pride how Father Robert had negotiated permission with ministers in the United States to incorporate specific local practices recognised as being Mortlockese into his ordination service, including a procession of community members who delivered the bible to the altar at the beginning of the service and *mwáramwár* that were placed on the heads and around the necks of attending clergy and lay people. Indeed, it seems the work of Tamari to claim Catholicism for his community continues as certain Mochese and other Mortlockese people assert their ‘own mass’ in an international arena²²¹.

Just as Tamari played a significant role in the coming of Catholicism to Moch, and others who followed him continued to develop and assert a particular Mochese (and Mortlockese) religious practice, so too there were a number of people notably active in bringing climate change to the community on the island. As suggested by Hubert, these people were mostly teachers; those ‘more educated ones’ according to Satal. These people pursued the topic of climate change and performed particular work as individuals and through their involvement with institutions on the island to facilitate a shared understanding of climate change as a reality lived on the ground.

attended the special mass where the history of Catholicism and the resolve of Tamari were remembered. It was also significant that the Bishop of the Caroline Islands Diocese was a man from Moch.

²²⁰ Kapa explained this as an historical connection that has extended for generations between his family on Moch and Father Robert’s family on Satawan. He said he no longer knows the specific details of this connection, but it meant that his extended family could ‘just walk into the house’ on Satawan (referring to a vacant house belonging to Father Robert’s family) and stay there for four days during the Easter celebrations.

²²¹ As Flinn (2013: 16) states in her analysis of Pollapese Catholicism, “islanders are not passive converts but active players in in making Christianity their own”.

'I want to share you guys this story about the global warming'

I first met Jarvis in 2008 on my initial short visit to Moch to conduct research for the pilot study. At that time he lived in a plywood house in Inapwei village with his wife and two children, his wife's mother and his wife's brother, and worked as a teacher at the Moch pre-school. Jarvis was very interested in our study and readily engaged in discussions specifically about climate change. His concern about high tide and big waves²²² prompted him to say:

I wish this concern go to our Governor and our leaders to look what can we do. Especially those people from those other islands we really full understand that our islands is, you know, the tide will be going up because we heard that global warming, that's the north pole and south pole is already melted and effected those small islands. We need some help. We need somebody to share to United Nations²²³.

In particular, he recognised climate change as a problem *closest to our eyes*, a problem:

that's from those developing countries, those big nations and they make the pollution or whatever and then they just remain and enjoy their works...But here, those other islands, small islands in the pacific, they really affected²²⁴.

When I returned to conduct fieldwork on Moch and Weno in 2009 and then again in 2011, Jarvis was on study leave from his position at the pre-school in order to complete his teaching qualification at the College of Micronesia (COM) in Weno. Although I was unable to spend a great deal of time with him during these periods, it was clear from our limited meetings and discussions that his interest, passion and concern about climate change remained strong. For instance, when I was on Weno in 2011 I bumped into Jarvis at COM and immediately he showed me his essay on the topic of climate change. This was completely instigated by him and reflected his ongoing and deep concern for the issue. During our discussion he asked me for more information and we spent time together at the computer in the COM library researching the websites of such organisations as the

²²² In chapter four, I discuss how Jarvis and his family were affected by 'big waves' in 2002 and 2005.

²²³ Interview January 2008

²²⁴ Interview January 2008

Intergovernmental Panel on Climate Change (IPCC), the Alliance of Small Island States (AOSIS), the Secretariat of the Pacific Regional Environment Programme (SPREP) and the Small Islands Developing States Network (SIDS-NET).

While I was on Moch in 2009, Jarvis came to the island for a couple of weeks between his classes at COM. On one particular day he visited me at the house where I was staying and we sat on the porch and talked for a long time about global warming. Significantly, Jarvis not only initiated our meeting and the discussion, but also kept us intensely focussed on the topic of global warming for well over an hour and a half²²⁵. During this time we talked about many things – all (and I mean ‘all’) in relation to climate change – including the importance of education, the impacts of global warming (e.g. sea level rise and food security), adaptation strategies for the future (e.g. seawalls and evacuation), international aid, issues of governance, the need for strong political leadership, and the dilemma between science and religion. Our exchange was animated and critically engaged, at times personal and emotive, and apparently mutually satisfying; at the end of our talk Jarvis said, *see this is one of the good discussions*.

As we talked, Jarvis readily acknowledged his perceived role as bringing information about global warming to the people of Moch. He told me, *here on this island it's hard to access the information...That's why I always go to Weno, to look up computer and read new information*. He also said that some people would seek him out when he returned to Moch because *they know that me and Satal [another teacher], they know that we really well informed on this new issue, because we are really interested*. Jarvis described two specific occasions when he transmitted information about global warming word-by-mouth to distinct groups of people living on Moch. The first such occasion was described in the context of our discussion about the need for teachers to be well informed about global warming:

*I came out here last Christmas and take my vacation and
that's the time I start talking to peoples about global*

²²⁵ Soon after we began I interrupted and asked Jarvis if I could record our discussion. He gave permission and unless indicated otherwise, all the quotes on the next few pages are taken from this recording (Interview May 2009).

warming...*That's the time the sea level was rising* [reference to the tidal surge in December 2008]. *After that I came out here and I start talking about it. And I think there are more than ten men, we were sitting right next to the school building, and I start to talk to them. I told them...I want to share you guys this story about the global warming. You know what global warming is – that means... the warming of all the world. Ok, this is the warming; first the sea level rising, second drought, third flood and hurricane and whatever. All those things, if it happens once every three years and now it will happen once every one year, and if its twice a year , now it will be four times a year, and next year it will be more and more. And the sea level rise last years ago one foot, and after one year two feet high. And I start explaining because of this... we have to look at some other nation in the world, all the nations in the world they agree to stop the cfc, air conditioning, whatever, to donate to the greenhouse effects. And only one nation in the world disagreed with that. Guess which nation? I said, United States. And all the other nations they agreed. Ok, what we have to look at is European Union. EU distribute all the solar panels into the world and now we see it upon our schools. This is from EU. Now they trying to find a way to decrease the donation to the [greenhouse]. So this is the thing we have to think about, but as I want you to understand, if we stop the donation to the greenhouse and 300 years from the time you stop that's the time we will come back to normal. I explain it. What we have to understand right now is our future.*

Jarvis said he explained more to these men, *as much as I can explain*, and he felt:

they really understood because I explain them in my own language and I made them to understand...Some people they keep asking....Some people spread and others come and ask me is that true that this is what will be happening.



Figure 53: As Jarvis explained, men would often sit and talk on the cement ledge alongside the municipal building, ‘right next to the school’ (Photo: Christine Pam)

Later in our discussion, Jarvis described the second occasion, an event that had occurred just two nights prior to our discussion on the porch. This was during the month of May when large groups of village youth visit people’s homes to say the Rosary, to offer a devotional prayer to the Virgin Mary. Jarvis was quite animated in his telling of this event:

Let me tell you the story last night, yesterday night. There was a youth group, they came to my house with Rosario. They came over and they sing a song, Rosario, and after that they give to the family if anyone have any concern. Ok. I really keep in touch with what that lady said. The lady said we have to pray to God everyday and every night to ask him to help us with our problem here on Moch Island and in the world. We will ask God to decrease our problem. Especially our Virgin Mary, we have to ask her to help us with our problems. And [that lady] didn’t say what is the problem. And at that time I stand up and I say, I really get in touch with this message from that lady and I will talk to it in detail.

Ok, let me tell you this problem. The whole wide world, we have a problem. The problem with the world and the current issue in the world is the global warming. Our island will be sinking ten to twenty years from today. So, what I read in newspaper, in magazine, in any news in the world, all the world talk about this global warming. This is what would be happening in the global warming; typhoon would be increase, hurricane would be increase, sea level rising is up. This is what we are facing on our island, the sea level rising. Youth, you have to understand this. We are going to be dying twenty or fifteen years from now. I want to ask you, from tonight until the end of your Rosary ... I would like to encourage you and ask Mary to help us to get out from this trap. We are about to die of the sea level rising. I talk to it in public about the global warming. That was yesterday night, and I talk to them the detail and explain them where the problems coming from, how it's create the problems, what will be happen. I talk to them in the rosary... [laughter]

The laughter which followed his final comment suggested it might be considered audacious of him to talk about such things during a public event, or more specifically, a public religious event. He defended his decision to speak out, saying *I'm not scared to talk about this because they already distributed the world to know that this is a warning*. It seemed Jarvis was also 'not scared to talk about this' with the Governor of Chuuk and the President of the FSM. He told me he had asked the Governor many times on Weno about his plan for climate change, and that he would direct a question to the President during his up-coming visit to Moch:

I am planning attend when the president visit here because I will be ask question, 'what's your plan with us'. I will ask him, I'm not scared to ask.

Jarvis felt strongly it was his responsibility to share information about global warming – he said *that means I love people* – and he expected other teachers in particular to feel a similar sense of responsibility:

They suppose to. This is the reason why they call us teachers. We have to be teachers and light of the island and we have to... share things, whatever is good for them, and share future or whatever. Everything that would be good for peoples we have to share... This [global warming] is one of

the current issues in our islands. We have to share... this is my thinking.

However, when I commented that it seemed to be mainly teachers who bring information about global warming to Moch, he responded:

You know what the problem is with those teachers, they really, most of them, they don't well informed about global warming. What they need to do, they need to know more information of it; even they don't know where the gas coming from. Not like us we attend COM and our teacher teach me where the gas, what the effect, especially the cfc ...

Indeed, Jarvis was generally disappointed at the level of knowledge about global warming and felt no one else on the island was really concerned about this issue; he said *they really don't put in their heart*.

Certainly, Jarvis' declared passion and strident dedication to share his knowledge of global warming word-by-mouth with others appeared to be unsurpassed on Moch. However, rather than being on his own, Jarvis' engagement with the issue within his community seemed to epitomise the work that was also being done by other teachers to disseminate knowledge of climate change. As I was told by a number of people and as was evidenced through my research, 'it is only really the teachers on Moch who speak with people about global warming'.

'We have to be teachers and light of the island': teachers and preachers of climate change

Although Jarvis suggested most teachers were not particularly well informed about the science of climate change, many were engaged with the issue at some level, and more or less contributed to the dissemination of information word-by-mouth within the community. Some older teachers, like Hubert and Kapa, had first heard about global warming many years ago. As Kapa told me, he learnt of global warming at the University of Guam in the late 1980s when many people were questioning the knowledge of the scientists. He compared this to now, when 'about 95 percent of people believe what the scientists are saying'. Hubert learnt about the ozone layer and global warming in a science class he took at COM in Pohnpei in 1994. He distinctly remembered his teacher – 'a big woman from

Australia’ – and that as a result of her class he was able to make the connection between the ozone layer and the problems for his island, ‘the level of the ocean rise’. As I have already indicated, both Kapa and Hubert have maintained their belief in the issue of global warming and have been engaged in the dissemination of information and the promotion of discussion among teachers and other members of the Mochese community.

Other Mochese teachers – the next generation of teachers – such as Tomas and Satal have also been active around the issue of global warming. During the summer of 2008, Tomas worked with a specialist at the Education Department in Weno to realign the science curriculum with the new school text book; he developed suitable lesson plans based on the text book for the whole year for each grade from elementary school to high school. Over a late breakfast at the High Tide Restaurant on Weno, Tomas offered a critique of the new text book and expressed concerns for the teaching of global warming in schools. He said that, although the text book has information about global warming, climate change and weather that can be presented to all grades from elementary to senior high school, ‘it is not satisfactory’. In particular, Tomas was critical of the text book for lacking examples of studies that showed the effects of climate change. He said, ‘there is more information on the causes of climate change than on the effects’ and that ‘people need to see more on the effects of climate change so they will see what will happen’. He was also adamant that the curriculum should relate to the place where it is taught; ‘that science should be relevant to where people are living’.

Although it was unclear to what extent Tomas was able to influence the curriculum during his work with the Education Department, his passion to consider ‘the environment, the culture and the language’ where the curriculum was to be taught and his focus on impacts of climate change suggested he was engaged in such tasks while teaching science to high school students on Moch. Certainly, Tomas was keen to show his class *relevant* parts of the film, ‘An Inconvenient Truth’ because according to him, ‘it had good examples and evidence of the impacts of climate change’. Furthermore, Tomas recognised the importance of the internet on Moch to ‘cry out to the world’ about the impacts of climate change, ‘if not with words then with photos’. He said, ‘most people are not literate but they

can see the picture; pictures are an international language'²²⁶. Therefore, although he condoned global efforts to control carbon emissions (the cause of climate change), he was committed to getting the message across that there are people living on those small islands who may have to leave because of sea level rise. It was important for the community and the world to know about the impacts of climate change on Moch and he believed that 'one voice makes a difference'.

Satal provided another 'voice' making a difference on Moch, especially through his efforts to include global warming in the teaching curriculum for younger grades. During my research I spoke often with Satal, who was a science teacher in the elementary school and Senior Pastor for the Protestant Church on Moch. We first met through the pilot study in 2008 when he attended the community meeting and indicated he was keen to show us his small taro pit that was no longer productive due to saltwater inundation. He told us:

*Ten years ago when I was small boy I used to dig, to work,
and to eat from this taro patch. Right now, no more taro*²²⁷.

When I returned to Moch in 2009 and then again in 2011 I arranged to speak with Satal on a number of occasions, either in his classroom at the school, at his home in Eor village, or in the *fáál* which operated as the Protestant Church. We also collaborated on the production of a DVD entitled, *Leset in Angarap*, and often met spontaneously as we went about our daily activities. It was clear from our interactions that Satal was passionate about education and committed to his role as both Pastor and teacher within the community. He was aware of my research topic and subsequently we often discussed science and religion in the context of climate change, as well as his concern for conservation and the environment²²⁸.

²²⁶ This provides further evidence of the significance of visual media such as the DVD, 'An Inconvenient Truth'.

²²⁷ Interview January 2008

²²⁸ For instance, Satal explained to me the concept of *a mongo ngar* (people just take today and not think about tomorrow) and established a connection between the practice of *pwaaw* (tabu on trespassing and on gathering food and/or fishing on the reef) and the conservation of marine resources.

In the summer of 2008, Satal completed a geography class at COM as a requirement for his teaching diploma, the same class that Jarvis attended (referred to earlier). Both Satal and Jarvis were impressed by this class, especially by the knowledge of the instructor and the detail of the subject material; this was a class where they learnt about the science of global warming and were impelled to share their knowledge. However unlike Jarvis, Satal appeared more humble in his knowledge and in his efforts to ‘make a difference’.

When Satal returned to Moch for the beginning of the school year in September he brought with him information about global warming which he then shared with Kapa and other science teachers at the school. He specifically mentioned showing them a flow chart from the subject materials, which may not be surprising given that the flow cart summarised the relationship among three causes (air pollution, deforestation, and ocean pollution) and four effects (disease problems, sea level rise, coral reef bleaching and El Nino) of global warming that were explored in detail in his class at COM (see Figure 54).

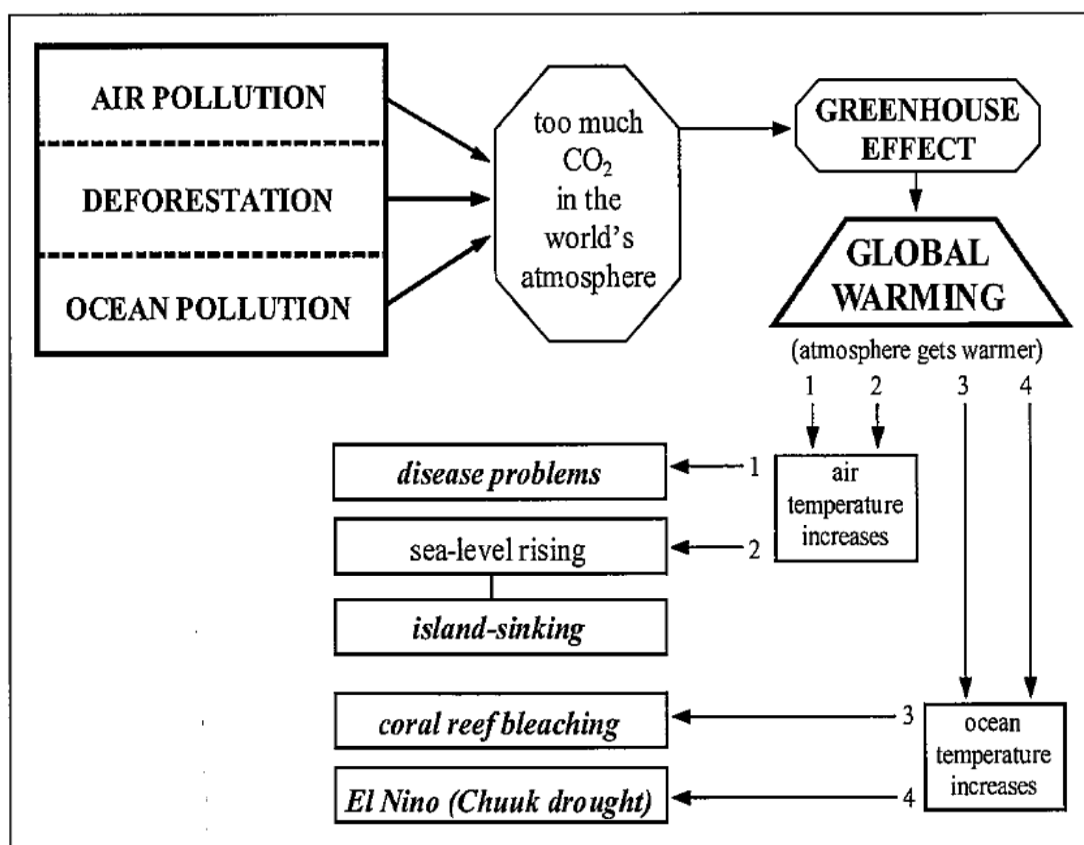


Figure 54: Satal specifically mentioned this flow chart from the COM subject notes.

Then, in discussion with Satal and five or six science teachers, Kapa decided it was important to introduce global warming into the teaching curriculum for the younger grades (i.e. grade four upwards). Satal told me that up until then global warming was only taught to students in the junior high school, and that it was especially important to begin teaching the younger grades because the island was already experiencing the effects of climate change. He said elementary teachers at the school supported the decision to ‘mention something about this in their classes’ and that he was asked by some to help them develop their lesson plans. When I suggested he provided valuable ‘expertise’ on the subject, he laughed and said, ‘maybe expert or maybe I mislead them’. Yet despite his modesty, Satal recognised teachers as the main source of information about global warming and undoubtedly, he played his part; he was instrumental in promoting discussion among teachers at the school and in changing the curriculum so younger grades were exposed to information about global warming.

‘Not like us we attend COM’

The emphasis placed on the role of teachers to share information about global warming was understandable given the ‘more educated ones’ living on Moch were generally those who had completed some study at COM or other tertiary institution and were employed at the school²²⁹. Furthermore, given teaching was one of only two majors offered through COM in Chuuk, most of the students who attended science classes at COM (i.e. those classes most likely to include information about climate change) were enrolled in a teaching diploma (e.g. ‘Science for Teachers’ is a requisite subject for pre-service teachers)²³⁰. As Jarvis indicated in reference to the class he took in summer 2008, *all the students really talk about it [global warming], but our class is mostly teachers so that’s why*²³¹.

²²⁹ Along with the Moch Municipality, the Moch School provided one of the few opportunities for employment on the island. Therefore, those people from Moch with some tertiary education who were not employed at the school or the municipal office often looked for work off-island to support their family. Flinn (1992: 99-100) discusses a similar situation for Pulap in the Western Islands of Chuuk, and also found that “the jobs and income accord teachers considerable prestige” (1992: 40). See also Hezel (1979).

²³⁰ The current focus on teacher education at COM is the result of a particular colonial history (Hezel 1995, Flinn 1992: 35-44).

²³¹ Interview May 2009

Certainly, teachers on Moch have been particularly active in bringing an understanding of global warming to the experiences of high tide and big waves within the community. The way this played out on Moch seemed to support a premise, espoused by college instructors, that the next generation would be the educators about climate change. Eston, the COM instructor who influenced both Satal and Jarvis, recognised the importance of teaching the younger generation so they might then educate others about global warming. During my discussion with Eston in his staffroom at the college campus in Weno²³², he intermittently engaged with students who had gathered in the room; at one point joking that they were too old to be prospective future husbands for my daughter and then later, more seriously, referring to them as the younger generation who would make a difference. He told me his students go home and tell their parents about global warming – they tell them ‘yes, it’s real’ – and that through their persistence (‘they don’t give up’), events such as tidal surge were beginning to be ‘placed’ within this new knowledge of climate change.

According to Jarvis, Eston was the main instructor of climate change at COM; *he is the one mostly talk about global warming*²³³. Eston first arrived in Weno as a Peace Corps Volunteer in the mid 1960s and apart from a few years living in his home of Hawai‘i, he has been committed to education in Chuuk since then. At the time of my research he was head of the Education and Social Science Division at the Chuuk campus and had been prominent in the development of curriculum for pre-service teachers, including ‘Science for Teachers’, ‘Global Warming: An Interdisciplinary Unit’, and ‘A Teacher’s Toolkit for Science in Chuuk’s Elementary Schools’. Eston told me he has been convinced of the reality of climate change since 1990 and he was intent on teaching students about the causes and effects of global warming. He proudly claimed to be the first person to distribute Gore’s influential documentary within Chuuk, and readily acknowledged his own influence on his students²³⁴. Certainly, Jarvis was impressed by the extent of Eston’s knowledge, and especially impressed with his passion about the issue of global warming because Eston ‘really’ talked about it and was obviously concerned; *he was crying in class*.

²³² Interview June 2009

²³³ Interview May 2009

²³⁴ For instance, when I talked with Eston about Jarvis’ particular response to building seawalls he pointed to himself and said ‘that’s me’, referring to his influence. Interview June 2009

In the staffroom next door to Eston there was another instructor who was also committed to teaching students about the science of climate change. During the period of my fieldwork, Kavin was working on his master's degree project developing a full lesson plan to teach grade eight students about global warming. When I spoke with him in 2011 he was finding it difficult to organise his time to finish the project. He told me his lesson plan included thirteen units covering different issues such as air pollution and deforestation, but that he still needed to include more local content to make the lessons relevant; he said it was important to ground the science in what was known and familiar to students. I asked Kavin why he focussed on global warming for his master's project and he explained, 'it is a pressing issue now and many people don't realise it is really going to happen'. He was concerned for the thousands of people living in the outer islands; as he pointed out, even if the islands did not go underwater, the salt water inundation would seriously affect access to food and water. He emphasised that without education this would not be understood until it happened; he said 'education is important to convince people of this'.

Kavin acknowledged that the causes of climate change and 'the consequences of this – the melting of the global ice' – was a difficult concept for people 'living here in the tropical Pacific' to understand. Since this was taught to all students enrolled in the teaching degree at Chuuk COM (the only full degree offered at this campus), both Kavin and Eston stressed it was the role of educators within their schools and communities to make the link between high tide and global warming. Therefore, notwithstanding the depth of the scientific information about global warming included within the curriculum at COM, this phenomenon of the ice melting and the seas rising seemed to take precedence for students in their class at COM as well as for those people mentioned earlier in this chapter who are living more permanently on their home island. For instance, one morning I was talking with Mochese students in the library at COM. When I asked a young woman if she wanted to return to Moch when she finished her studies she immediately responded, 'no, because the island is sinking'²³⁵.

²³⁵ In March 2009 I was unable to find any books specifically related to climate change in the COM library.

As Satal said, teachers are the main source of information and ‘this [the melting ice] is what is being taught today’. However, more than just simply ‘what is being taught’, the melting ice resonated with experiences of big waves, tidal surge, and saltwater inundation that teachers such as Satal and Jarvis bring to their class at COM. These are personal experiences as well as shared community experiences of unusual events (as discussed in chapter four). For instance, Jarvis was really concerned about global warming not only because his instructor was knowledgeable about science and really talked about it, but also because his own experience of big waves resonated with this new knowledge. As Eston explained:

It wasn't so hard to convince [Jarvis], you know when his house collapsed with the tidal surge and he happened to experience it – it was very visual, it was very tactile and he said for the few seconds before the tidal surge he heard it – he never heard the sound before – so he is combining all the sources of his evidence²³⁶.

Eston recognised the significance of this knowledge gained through experience; that the big wave event was a turning point in Jarvis' life:

I can see why he became a campaigner for that [global warming] and got the data from me... He say he was going to almost preach it; I think he did... He makes the effort to spread the stories, he may not be able to explain it scientifically but makes no difference; it's Chuukese talking to Chuukese, a friend, a relative...²³⁷

It seemed the ‘facts’ of global warming being taught to students were made meaningful through their experiential knowledge and cultural understandings and not necessarily because ‘science’ was accepted and understood as a valid knowledge system in its own right. Despite being respectful of this process, both Eston and Kavin expressed concern that student performance in science was very low; as Eston said, *I struggle to get science into their minds²³⁸*. Even students such as Jarvis and Satal, who were recognised for their

²³⁶ Interview June 2009

²³⁷ Interview June 2009

²³⁸ See Higashi (2007: iv). The low performance in science in the Chuukese education system was evident among students at the Moch School and supported by comments from a visiting science teacher. I was told

passion and intelligence by the COM instructors, struggled to comprehend the science of climate change. For instance, Satal claimed:

...well educated people, they might think of long term or what the scientists are saying these days, but those uneducated, like myself and the others, they might think that it's only a made up story and things like that²³⁹.

Furthermore Satal, who was identified as a committed and effective teacher²⁴⁰ – one of those teachers who would make a difference – found it difficult to fully understand the information provided in the COM study unit on global warming. As he indicated, he was concerned he may ‘mislead’ others with information about global warming. This was further contextualised by Eston who said:

[Satal] has the copy of ‘Global Warming’ [COM study unit] – so many pages or so – and he has told me he has gone through it and that it is difficult for him. He is very intelligent man but he says it is sometimes difficult...²⁴¹

While this contributed the impetus for Eston and Kavin to re-develop the unit to better support teachers – ‘to make it a real teachers guide’ – and for Kavin to pursue his master’s project, it also revealed the extent to which students had to work to make the science of climate change meaningful. This ‘work’ was further evidenced by both Satal and Jarvis who described intense discussions and debates that occurred among fellow students in their COM class. Satal was particularly forthcoming as he talked with me about his religious beliefs and *where the bible and the science are against each other²⁴²*.

many high school students simply memorised the lessons rather than understanding them, and some students answered test questions word-for-word from the lessons even though the examples used were different. In relation to teaching scientific method, laboratory equipment was minimal and the teacher was lucky to complete ten practical sessions in a year compared to twenty-six at the prestigious Xavier High School in Weno.

²³⁹ Interview June 2009

²⁴⁰ When I was in Weno, Kavin specifically asked me to take an information sheet on groundwater to Satal on Moch because he knows Satal will make good use of it in his classes and not just keep it at home.

²⁴¹ Interview June 2009

²⁴² Interview June 2009

‘The difference of what scientists are saying and what the bible is saying’

Satal acknowledged Jarvis’ ‘interesting’ contribution to discussions about global warming in Eston’s COM class and was himself influenced and challenged by the science. In particular, Satal told me he was confronted by Eston’s claim that in fifty years from now the low islands – such as Moch – will sink under the water, and he debated this in the class through his belief that God would never again destroy the world by flood. During our ongoing discussions Satal and I were able to further explore this seeming contradiction between the science curriculum as taught at COM and in Chuukese schools and his belief in God and the scriptures.

Satal told me he believed the science of climate change and that the science explained both the cause and effects of global warming; i.e. ‘what we do to contribute to global warming and what will happen from this’. He was convinced that global warming was the consequence of human behaviour; ‘this is what is going on in the world today, people misuse the world that God gave us and the consequence of this is global warming’. Satal also understood sea level rise as an effect of climate change and as a message from God that we need to change our behaviour; *I think it is a kind of warning, a message or a punishment... maybe for the whole world but the low islands are the victim of that*. In this sense, he saw no contradiction between his belief in science and his faith in God.

However, the scientific prediction that low lying islands will become uninhabitable due to sea level rise was a different story. As Satal explained²⁴³:

When I come to the place where I find that science and the bible are against each other then as a believer of God and the bible, I have to go for the bible. And according to this problem of global warming and what the predictions of scientist are saying today, I think that’s one good example of where the bible and the science are against each other. Because scientists are saying that the tide will keep going up and the islands will sink and maybe destroy our islands. But the bible, God himself promise in his word that the world will never be destroyed by flood, but by fire. So in this way... we can see the difference of what scientists are saying and what the bible is saying.

²⁴³ Interview June 2009

Indeed, based on his faith it seemed impossible for Satal to think that Moch would become uninhabitable due to sea level rise:

It just didn't fit to think about it as one day Moch will disappear under the water. Because it is already a place God set his people on and he promised his people that I will never destroy by flood. So based on that, I'm still uncomfortable if I should say that it will disappear.

Although Satal questioned whether his understanding of global warming would be shared by a majority of people within the Mochese community, his reflection on science and religion seemed significant given the influence of Christianity within the Mochese community and more specifically, the considerable role that most teachers at the Moch School performed within their church. While Satal was the Senior Pastor for the Protestant Church, many of the other male teachers held prominent and influential positions within the Catholic Church. For instance, Hubert was *Catechista* for the Catholic Church and a long-standing language teacher at the Moch School, and Tomas, Ivan, Falsun and Eneret were Ministers, Lectors and/or Commentators for the Church and teachers of either science, maths or world geography. Therefore, it was likely an understanding of global warming would be considered within the frame of a belief in God. However, while I found some teachers and students I spoke with at the school at times privileged their religious beliefs, Satal, Jarvis and others provided evidence that a scientific understanding of global warming was not generally excluded as people worked to make climate change meaningful.

Jarvis and I talked about the relationship between science and religion and he explained his understanding as follows²⁴⁴:

As I understand, science and religion, they are negative. They on their own. They never be agree with each other, they opposite... I suppose to say that I won't keep them separate but finally, they are separate.

²⁴⁴ Interview May 2009

They always be separate. In global warming we always talk about the islands sinking and whatever, but in religion they said no, we have to believe in God. The solution is up to God, but in science we still find a solution... I think we have to find a solution in science also, but we don't find it yet. But I think there is a solution in science.

Although Jarvis believed there was a scientific solution, he reflected on the meaning of science and religion for his community. While people listened to him when he talked about global warming, they tended to think high tide and waves are the same as disease and illness – messages from God about human behaviour. He said if they have strong faith then they believe that good behaviour will stop the high tide and yet he was frustrated that ‘they listen to the message but don’t change their behaviour’. Jarvis understood it was initially up to God whether there was a solution found – *in God at the beginning, we find a solution up to God... just give it to him... but in science next time* – and he posited the somewhat rhetorical question:

Why God send so many messages at the same time, global warming, sickness, drought, whatever? Those are, if God message, those are the message. This question is why God send so many messages at the same time?

As revealed earlier in this chapter, Jarvis engaged with this question and presented a solution for global warming – ‘Mochese to Mochese’ – in his speech during the *Rosario* when he encouraged the youth to pray to Mary for help to get out of this problem with the world.

On a number of occasions Hubert found it necessary to assure me that the people on Moch, including himself were not against science or my study on Moch. He told me there was a place for science and that science could teach us many things, especially ‘how universal things happen’. Hubert was a strong advocate for my research and readily expressed his concern about the impacts of climate change for the Mochese community. At one point he outlined a scientific experiment he would like to conduct to show people on Moch the effect of melting ice on water levels in a glass, but as he said, ‘no ice on Moch’. However, Hubert also explained that science and religion were separate things – he demonstrated this by indicating science in one hand and religion in the other – and that the knowledge of people was not the knowledge of God; he felt uneasy when people used knowledge like

they were God. He said it is our knowledge that burns a hole in the ozone layer and that God inflicts a punishment by making the ice melt. Hubert believed God was responsible for tidal waves, typhoon, earthquake, and diseases (e.g. HIV) in order to balance the Earth, as a punishment for human activities. He said high tide was a reminder, a message from God about people's behaviour – 'just like Noah and the flood' – and that God makes these changes and then the people of Moch must also make changes²⁴⁵. As catechista, Hubert talked about this during mass and prayers and as well, he said he 'just talk with people' generally.

The story of Noah and the flood from the book of Genesis in the Old Testament featured in other conversations as well. On one occasion I asked Atel about the increasing high tide and he said, 'it is just like Noah's time' and he pointed to how people were acting these days. On another occasion, shortly after the youth group visited Jarvis' house during *Rosario*, I asked two particularly devout high school students, David and Maya, about the event²⁴⁶. Although David had not been at the house for the *Rosario*, he clearly believed that sickness and sea level rise and 'a lot of other things' are a message from God about the sins of people. He recounted the story of Noah – 'a true story' – and concluded that the world would not be destroyed by flood again; 'next time it will be fire, only fire'. Maya also talked about this story. She had previously heard about global warming and sea level rise in her World Geography class and had been at the house during *Rosario*. She said she felt scared listening to Jarvis' speech – 'it made me want to run away' – and that the story of Noah was the only thing that made her disbelieve what she heard about global warming. She identified high tide and waves as the same as illness and sickness, as a message from God about sin. She believed the islands would not sink because God made a promise that there would be no more flood to destroy the Earth.

²⁴⁵ There are numerous references in the literature to the significance of the story of Noah for Pacific Islanders (e.g. Besnier 2009: 59; Mortreux and Barnett 2009: 109).

²⁴⁶ I had spoken with both David and Maya on other occasions about their faith, and in particular, David would often direct our conversations towards his belief in God. As well, my daughter Jirin spent time with both of them and spontaneously commented on their devoutness in comparison with other students she knew at the high school.

As indicated here, extreme weather events were attributed by some to a punishment from God for people's behaviour. According to Hubert, high tide and El Nino are all ways that God will show his power. He said they must ask God for forgiveness, and he explained the plastic bottles containing holy water that are hung from coconut trees close to the shore as a sign of faith; 'it is a defence, defensive water because it is holy. It defends from high tide, waves, and bad spirits'. Further evidence suggested that religious associations between human behaviour and adverse events such as unusual high tide may enfold other beliefs about causation. For instance, at one point, and in reference to Schneider's (1957) work on typhoons on Yap, I asked Satal whether there was any connection between social disharmony on Moch and the occurrence of big waves. He said:

I don't know whether we do have some association like that on the island. But the only thing some people have is something like if there is problem, 'awosukosuka' between people and among the people on the island then there will be some kind of punishment that will come. I think that is only thing that can be that association²⁴⁷.

Even though Satal claimed, *now it is related to God and punishment*, this association was differently demonstrated by Pila, Merym's mother's sister, a 'peculiar' older woman who had never married, did not attend church and generally stayed close to her home in Leseapan. During my interview with Pila she was very focussed on her fear of big waves²⁴⁸. She told me she cleans the place (Leseapan) and looks after her house because she is afraid; it seemed this activity offered her some protection against the waves, that it kept the waves away from her place. Pila was particularly worried about fighting and about people not keeping the island clean; indeed she made a clear connection between social trouble, people not doing their work, and the things that frightened her, especially big waves.

While it was unclear how Pila really understood this connection, there were other examples of unease within the community as a result of disharmony. In particular, I noticed that people would react to the cries of an impending cat fight; on one occasion a woman immediately sent two children outside to scare the cats away, and on another, a man went outside with a broom and used the handle to hit the cats and chase them away from his

²⁴⁷ Interview March 2011

²⁴⁸ Interview March 2011

house. I was told fighting among cats was considered a bad sign for households. As well, it was interesting to note that Pila's attention to her work to keep her safe from waves – cleaning the place and keeping her house clean – was reflected in the word used by Satal (*awosukosuka*) when he talked about problems between people. *Awosukosuka* refers to the trouble associated with interfering with another person's work; to be a nuisance; to cause a person to be beset or burdened with work (Goodenough and Sugita 1990: 415).

Furthermore, work was prominent in Hubert's thinking about what to do about high tide and big waves. He said, 'when we think about what to do, we need to ask God for forgiveness, do some prayer, *work* for a period of time for forgiveness, do some [work] *project*, make God feel happy with us'. Hubert also understood my research within this context; he said 'they ask God to help me when I am here on Moch, on this island. They know that at the end of the *project* I will help the island'.

It has been argued that Biblical exegesis – such as that expressed by Satal and others in relation to God and punishment, and the story of Noah – equates to scepticism about the scientific concept of climate change among some people in other Pacific Island communities, such as the Marshall Islands (Rudiak-Gould 2014a: 146) and Tuvalu (Paton and Fairbairn-Dunlop 2010: 292). Certainly on Moch, during one of my many conversations with Kapa, such explanations were critiqued within this framework.

Notwithstanding his personal faith in God, Kapa stated 'only those educated people who are smart and have an orientation towards science are proactive about climate change' and 'others, they just close their minds because they resort to the bible'. He had overheard both Satal and Hubert tell me there would be no more floods because of God's promise, and he reflected that 'God talks about the world and they think that God talks about Moch'. He said that 'this view of the world being Moch doesn't blend with the global knowledge of climate change'.

Yet, such Biblical exegesis as expressed by some members of the Mochese community did not necessarily translate into inaction or a denial of the science of climate change. As evidenced by Satal, while his belief in the Bible and his faith in God meant it was impossible for him to believe scientific claims about the future inhabitability of small low lying islands such as Moch, he simultaneously recognised and actively engaged with the impacts of climate change as revealed through the science (e.g. sea level rise) and he

espoused an understanding of its causes as anthropogenic. Indeed I would argue that ‘talk’ of the melting ice, in conjunction with the particular efforts of people such as Satal, Jarvis, Hubert and others, reflects the ways in which people living predominantly on Moch are open to the new idea of climate change and are actively engaged in work to make climate change meaningful within established community beliefs and cultural understandings and practices.

Discussion and conclusion

A recognition that communities are “drawing creatively from both local observation and scientific education to interpret and respond to climatic perturbation” (Rudiak-Gould (2013b: 129) has begun to infiltrate the climate change literature. Indeed, a full day session at the 2012 European Society for Oceanists’ (ESfO) conference entitled ‘Appropriating Climate Change: Pacific Reception of a Scientific Prophecy’ has culminated in a forthcoming edited volume of the same name (Crook and Rudiak-Gould n.d.). Rudiak-Gould’s (2011) call for more ‘reception studies’ to understand how communities ‘receive, interpret, understand, adopt, reject and utilize’ the scientific discourse of climate change has been cited as a significant shift from more conventional research focussed on cultural perceptions and observations of environmental change (Peace et al. 2012: 221-222).

While both ‘reception studies’ and ‘observation studies’ contribute to an understanding of climate change, the distinction serves to emphasise a critical point about the limitations of research that inadvertently perpetuates a problematic distinction between scientific knowledge and other ways of knowing²⁴⁹. For instance, commendable research that emphasises the value of ‘traditional’ local knowledge often determines such knowledge to be ‘authentically local’ only in the absence of ‘foreign’ climate science ideas (Marino and Schweitzer 2009; see critique by Rudiak-Gould 2011: 10 and Macintyre and Foale 2013: 415)²⁵⁰. Furthermore, work focussed on ‘traditional knowledge’ often positions such knowledge in ambiguous relationship with ‘western science’ – either as valuable and *complementary* or as conceptually *incommensurable* – rather than in active engagement

²⁴⁹ See Pam (2010) for a critique of the dichotomy between scientific knowledge and other ways of knowing.

²⁵⁰ As suggested by Hastrup and Olwig (2012: 10), “it seems unwarranted to attribute ‘the natives’ with a simple local view”.

with science (Leach and Fairhead 2002: 300-301)²⁵¹. Similarly, climate adaptation research that promotes the value of local voices and yet operates from a taken-for-granted understanding of ‘climate change’ as a scientific phenomenon, tends to reinforce a categorical boundary between the embedded scientific facts that are ‘climate change’ and the local knowledge and cultural perceptions of that ‘climate change’ that may influence adaptation (Agrawal et al. 2012, Kelman 2010: 615)²⁵².

Under such circumstances, the claim that “local observations and perceptions should be taken into account in efforts to understand climate change, its impacts, adaptation to it, and mitigation of it” (Byg and Salick 2009:157) – echoed as it is by many researchers – does not equate to an understanding of the idea of ‘climate change’ as constructed by local communities. This is significant given that, while there may be communities who have not heard about global climate change (e.g. villages in Eastern Tibet as described by Byg and Salick 2009), the scientific discourse has been disseminated throughout much of the world and many ‘far-flung’ communities are already engaging these new ideas as they grapple with the realities of a changing environment (Rudiak-Gould 2011: 10, Veland et al. 2013, Lazrus 2009b, Cruikshank 2001). Of interest here is the absence of mention of this level of engagement in studies where it is likely communities have heard about the idea of climate change (Turner and Clifton 2009, Crate 2008).

Certainly, during my fieldwork I found it impossible to consider local observations and experiences of environmental change (including ‘local knowledge’) without also considering the story of the ice (‘foreign ideas’) and the efforts undertaken within the community to process the science and make ‘climate change’ socially meaningful²⁵³. As I have shown, ‘the melting ice’ is being actively processed ‘word-by-mouth’ within the Mochese community. Most people living on the island have heard about ‘the ice’ and

²⁵¹ For example, Byg and Salick (2009) compare local observations of change among Tibetan villagers with scientifically recorded changes.

²⁵² Through his critique of the two ‘Great Divides’ between nature and culture and between ‘us’ and ‘them’, Latour (1993: 102-103) challenges those anthropologists ‘in the field’ who rely on universal facts of ‘nature’ upon which to interpret mere ‘cultural representations’.

²⁵³ Through his work with residents of Majuro in the Marshall Islands, Rudiak-Gould (2014b: 84) also evidences the “openness of ‘local’ ecological knowledge”.

many engaged in such talk, albeit often tentatively, to begin to make sense of their lived reality especially during high tide season. Whilst my positioning as a ‘climate change researcher’ may have influenced some of this talk, it was definitely a concept already being ‘worked out’ irrespective of my presence on the island. This was most obviously shown by a number of Mochese people who were studying the science and performing particular work within their community to facilitate a shared understanding of climate change.

While some anthropological research may comment on the reception of climate change science through education and through interactions with the media, government representatives and NGOs (Rudiak-Gould 2011: 9), and applied research may emphasise the role of education to make the science relevant to local communities (Kelman 2010: 608), the actual work being done by local people themselves to make climate change meaningful is mostly left unexamined. Yet, in order to understand climate change on Moch it is necessary to consider how people synchronise scientific knowledge with “the mundane rhythms of lived lives and the specificities of human experience” (Jasanoff 2010: 238); to understand how scientific knowledge is made relevant and given meaning or more specifically, how do the Mochese community come to *know* the ice is melting? As Lahsen (2010: 162) suggests, “Whether and how we react to scientific arguments highlighting the danger of climate change depends on whether we hear, understand and believe them”. Based on his work with the people of Marovo Lagoon in the Solomon Islands, Hviding (1996b, 2003) identifies processual attributes of people’s beliefs and knowledge in relation to the environment. In particular, he outlines several successive states that apply to the acquisition and validation of knowledge:

From initially hearing about (*avosoa*) something, one enters a state of knowing (*atei*). Accumulated knowing and further transmission of knowledge in social situations determine whether or not the higher level of believing (*va tutuana*, lit., imbue with truth) is reached. Through repeated verifying instances of seeing for oneself (*omia*), believing is transformed into the level of trusting (*norua*, lit., be convinced of efficacy) and into the personal state of being wise (*tetei*). (Hviding 2003: 53)

Hviding (2003:53) suggests such a ‘processual epistemology’ is generalisable to much of Oceania, and certainly my research reveals similar states of knowing as the people of

Moch process a particular climate change narrative to explain their experienced reality of high tide and big waves. As I have shown, the story of the ice is frequently transmitted through various social situations, predominantly word-by-mouth from teachers and preachers, and especially during high tide season. As a result, an accumulated knowing about ‘the ice’ becomes entwined with seasonal knowledge and practices such that unusual tidal surge and wave events are increasingly being experienced as a repeatedly verified instance of ‘seeing for oneself’ the effects of the melting ice. Therefore, while “seeing and knowing are understood as closely related” (Roncoli et al. 2009: 93) and evidence may well be constituted through ‘seeing with our own eyes’ (Tuckwell 2012: 315), it is apparent that ‘talk matters’²⁵⁴ to the processual truth value of knowing about the ice, including ‘the category of the people who assert it’ and ‘what it has to say about an environment and people’s place within it’ (Kalland 2000, as cited by Tuckwell 2012: 315).

Although it remains unclear the extent to which the majority of the Mochese community has come to *trust* knowledge of ‘the ice’, it is evident that people are in the process of producing and reproducing their lived reality from *all* of what they know and not through some artificial distinction between ‘authentic’ local knowledge on the one hand and foreign ideas on the other, and nor through some ‘cultural lens’ interpreted as merely perceptions and beliefs of an already determined matter of fact²⁵⁵. As indicated, heresay about the ice melting and the seas rising resonates with particular experiences and is becoming integral knowledge to an understanding of those seemingly unprecedented changes that are revealed through the very practical knowledge of living with the seasons. As Tuckwell (2012: 310) argues, scientific knowledge is only accepted as legitimate if it resonates with local epistemologies; that acceptance relies on its relevance to the ways in which people have come to know and understand the local environment.

²⁵⁴ In his analysis of gossip as political action on Nukulaelae Atoll, Tuvalu, Besnier (2009: 189) emphasises ‘the importance of talk as a vehicle for action’. He goes on to argue, “It is amply clear that talk both reproduces and produces its context” (2009: 191).

²⁵⁵ Latour (2004a: 232) argues, “Reality is not defined by matters of fact. Matters of fact are not all that is given in experience. Matters of fact are only very partial..., very polemical, very political renderings of matters of concern”.

My main concern has been the ways multiple knowledges, observations, and experiences are (already and always) brought together to make sense of a lived reality. As a result, I argue that recording Mochese observations of change is not sufficient to understanding climate change as a meaningful concept enacted by the community. While it may not be surprising that experiences of tidal surge and wave inundation lead people to focus on the scientific idea of sea level rise (see Rayner 2003: 287), it is the ‘epistemological encounter’ that demands attention – indeed the conversation between fact-finding and meaning-making (Jasanoff 2010: 248) – that reveals something about climate change, not as a ‘matter of fact’ or mere cultural perception, but rather as a relevant ‘matter of concern’ for the lived reality of the Mochese community. As a matter of concern – and of significance for my thesis – the story of the ice was narrated by many of the people I spoke with in conjunction with an expressed desire on Moch for bigger and stronger seawalls to protect the island from high tide and big waves. Even those who initially did not like seawalls now supported them because of the changes they were experiencing, and because they had heard about ‘the melting ice’. In this sense, the realities of climate change being worked out by people living on the island are becoming entwined with the community practice of building coral seawalls. In the following two chapters I consider seawalls on Moch, both as a cultural practice embedded with historicity and as a political strategy oriented towards a secure future in a world of climate change.

Chapter 6 Of coral, coral rubble and sand: making atoll islands inhabitable

Introduction

It was clear from my research that coral seawalls were the response when people thought of what they could do about high tide and big waves²⁵⁶. I was specifically told this by members of the community who reflected that people on Moch ‘only think with what is available to them’, that they tend to go with what is known. It became apparent that coral seawalls were ‘what is known’ to protect the land on Moch. These defence structures were built in the past, at least since the 1940s, and stories, memories, experiences, and ongoing practices continue to assert their logic and meaning in the present. In this chapter, I strive to better understand the Mochese community’s predilection for seawalls to protect their island from an ever increasing high tide. I examine the way people of Moch engage with coral in their everyday lives to build an inhabitable island. More specifically, I argue that, living in a world of coral, coral rubble and sand, an island *habitus* generates cultural practices oriented towards a relationship with coral, and this relationship engenders a ‘common-sense’ engagement with climate change as revealed through the building of seawalls.

In order to pursue this notion of island *habitus*, I present evidence from the archaeological, historical and anthropological literature to support the historicity of human-coral relationships fundamental to the human settlement and ongoing inhabitable of coral atoll islands. However, as revealed in this chapter, the presence of coral often evident within ethnographies of coral island communities is generally confined to a description or assessment of the atoll and island landscape. I address this scarce mention of human-coral relationships within the anthropological literature through a detailed study of coral and culture on Moch Island. Of course, it is not my intention in this chapter to essentialise a ‘traditional’ Mochese culture through espousing a continuity of practices over hundreds of years. Rather, I am concerned with revealing human-coral relations as an ‘embodied

²⁵⁶ This is examined in detail in chapter seven.

history' (Bourdieu 1977: 56) that resonates with the materialisation of seawalls as a sensible approach to climate change.

The building of inhabitable coral islands

Following his experiences on the infamous voyage of the HMS *Beagle* in 1835, natural scientist Charles Darwin formulated his theory of atoll formation based on island subsidence and the upward growth of coral reef; a theory that became known as the Subsidence Theory of Atoll Formation (Nunn 2009: 28). This, of course, is the classic description of atoll formation which is extensively reproduced, often accompanied by appropriate diagrams, in numerous texts across a broad range of disciplines (Nunn 2009: 28-29; Kirch 2000: 48-50; Alkire 1978: 3-5; Woodroffe 2008: 79-80). However, of interest here are the 'islands of reef rubble and detritus' that form on these atoll reefs. A general description of atoll island formation is provided by more recent geo-morphological studies (Kench and Cowell 2001; Kench et al. 2006; Woodroffe 2008; Bridges and McClatchey 2009). These studies variously describe coral atoll islands as a:

coherent accumulation of sand and gravel-size material derived from broken-down remains of corals, algae and other reef-dwelling organisms. The presence and morphological characteristics of islands, such as area and elevation, result from the balance between sediment supply, marine processes that transport sediments (for example, waves, currents and storms) and available space for deposition. (Kench and Cowell 2001)

In his book, 'Introduction to the Peoples and Cultures of Micronesia', Alkire (1977:5) draws on the work of Charles Darwin to describe the 'classic atoll reef'; a circular offshore fringing reef that surrounds a subsiding volcanic 'core island' that has disappeared below sea level. He outlines various marine processes, such as sea and storm erosion, responsible for the deposition of sediment along protected areas of the atoll reef, which may form a sand dune or may accumulate further to form an island. In his later volume, 'Coral Islanders', Alkire (1978:3) begins his first chapter entitled 'Coral Islands' with a quote in which Darwin describes the sense of astonishment experienced when confronted by atolls; 'these vast rings of coral-rock'. Alkire includes a diagram to demonstrate Darwin's theory about the formation of coral islands and atolls (1978:4-5), and a flow chart that traces the

potential development of coral islets into more densely vegetated coral islands capable of supporting human occupation (1978:15).

Whilst Alkire recognises the importance of Darwin's contribution to atoll research, his focus on cultural ecology attends to coral islands as inhabited places. As such, he outlines in some detail various factors that influence the potential development of inhabitable coral islands, including size, elevation, seasonal distribution of rainfall, and the frequency of adverse climatic events such as droughts, tropical storms and typhoons, and suggests other variables crucial to the introduction of vegetation, such as the relative isolation of the island, the prevailing winds and ocean currents, and the flight patterns and habits of birds (Alkire 1978: 15-18). Finally, he suggests that perhaps the most important variable in the development of an inhabitable coral island is the presence of human communities (Alkire 1978: 18).

Indeed, according to Alkire (1978: 21), 'Throughout the Pacific, [humans have] been influenced by and [have] been altering the coral atolls and islands for at least the past 700 to 800 years'. This relationship between humans and coral islands is supported by archaeological, anthropological and historical evidence collated by Rainbird in his book, 'The Archaeology of Micronesia' (2004). Rainbird (2004: 94-95) draws on evidence to examine various theories put forward to explain human settlement and subsistence patterns during initial colonisation of coral islands in Micronesia. He argues that, rather than people simply 'founding' the islands and existing on a maritime economy until the later arrival of agriculturalists, people were more likely to either carry subsistence items with them and begin to develop a broad subsistence base immediately upon arrival, or to prepare or 'seed' an island prior to permanent human colonisation²⁵⁷. Significantly, Rainbird (2004: 95) suggests the human settlers:

actively set about altering the landscape in order to create the conditions they perceived as suitable for settlement and subsistence. Their aim was to alter the very nature of the landscape, by manipulating the vegetation so as to cause erosion and thereby lay the foundations for the subsistence

²⁵⁷ Nunn et al. (2007:397) also suggests the general agreement among observers for 'deliberate voyagers of colonisation' rather than the 'discovery' of most Pacific Island groups.

systems... This approach to the landscape by the initial settlers would be responsible for creating conditions of high sediment transport and the progradation of the shoreline onto the reef flats... This was the *habitus* of the settlers; it was an application of their habitual experience of island landscape alteration...

Here I am interested in Rainbird's focus on the concept of *habitus* to understand the earth-altering activities of islanders to enhance the potential of islands for human settlement and subsistence (1995a: 100). He argues, "islanders of the Pacific have a long history of effecting changes in their local environment... and this is part of community historical consciousness and passed through generations in the *habitus*" (Rainbird 1995a: 100). He suggests different human interactions with island environments (e.g. hill erosion and coastal progradation versus hill terracing) perhaps reflect a different ancestry for the earliest human inhabitants as revealed through the *habitus* (Rainbird 1995a: 107).

Thus, *habitus* resides within our practical engagement with the world as 'embodied history', generating the reasonable and common-sense behaviours which are possible and which are likely to be positively sanctioned because they are immediately logical given a particular set of objective conditions (Bourdieu 1977: 54-56). That is, among those who share the same *habitus* there is a harmony between practical sense and objectified meaning such that a common-sense world is produced (Bourdieu 1977: 58). Ingold (2000: 162) also refers to this when he states:

In the course of people's involvement with others in the practical business of life... people acquire the specific dispositions and sensibilities that lead them to orient themselves in relation to their environment and to attend to its features in the particular ways that they do.

With this in mind, I now turn to the archaeological, historical and anthropological literature to present evidence for coral atoll islands being actively altered and managed landscapes. My intention here, and throughout this chapter, is to substantiate the historicity of human-coral relationships in the ongoing making of inhabitable coral atoll islands.

Archaeological evidence for an altered coral landscape

Pacific archaeologists, in collaboration with geomorphologists and other natural scientists, have accumulated substantial evidence of human induced changes to island ecosystems (Kirch 2000: 59)²⁵⁸. Much of this research has focused on high island transformations by human settlers, in particular on practices of forest clearing and burning related to swidden or shifting cultivation, on practices of coastal management and coastal progradation, and on the extinctions of endemic flora and fauna, especially birds (Kirch 2000:59-61, Kirch 1997: 37, Steadman 1997, Rainbird 1995a: 101; for a critique see also Nunn 1990: 128-130 and Nunn 2001:13-15). For instance, examples of practices of coastal management gleaned from archaeological evidence include the construction of a prehistoric settlement on artificial fill adjacent to the small island of Lelu on the fringing reef surrounding Kosrae (Rainbird 1995b: 139). Evidence from this site reveals an extensive area of artificial landfill – an area between 27 and 40 ha, and between 0.6 and 1.0 m in depth – which increased the availability of coastal lowlands for human settlement on the high island of Kosrae (Rainbird 1995b: 139).

Further, evidence from Chuuk Lagoon suggests that, whilst a build up of sediments on fringing reefs during periods of ‘natural’ coastal progradation 3000 to 1000 years ago may have made such environments attractive to human settlers, in some places these sediments have been actively used by settlers as a substrate for filling and creating further habitable land (Rainbird 2004: 170). Even in relation to the recent phenomenon of coastal transgression, Rainbird (2004: 172) highlights the significance of ‘habitual practices’. He suggests that whilst transgression on ‘unmaintained coasts’ may be indicative of a rise in the normal fluctuations of sea-level or the result of sea-level rise associated with global warming, it could also be related to the cessation of traditional practices of coastal management²⁵⁹. For instance, in relation to current coastal transgression on Polle Island in

²⁵⁸ See Fitzpatrick (2007: 85-87) for a review of the contributions archaeology has made to island studies within the interdisciplinary research approach of historical ecology, “which attempts to understand long-term human-environmental interactions”.

²⁵⁹ A similar sentiment is also expressed by a group of Marshall Islanders as they returned to their island of Rongelap after nearly a generation of absence due to nearby nuclear tests in the 1950s. Bridges and McClatchey (2009: 143), who observed the returned islanders “reactions to how nature had responded to the lack of the regular, intensive human interactions”, found that all of the Rongelap men interviewed, ‘without

Chuuk Lagoon, Rainbird favours an explanation based on a rupture in traditional practices. He states:

Habitual practices, which would traditionally maintain the coastal flats, have been significantly affected by appropriation of a western (mainly American) cash economy. Because of these changes, the coastal lowlands are not being maintained and consequently the sea is reclaiming the space it had enjoyed prior to human intervention. (Rainbird 2004: 172)

Whilst focused on the coastal lowlands of the high islands of Micronesia, this evidence strongly supports the significance of human activity for the creation of inhabitable island places.

The paucity of archaeological evidence for human settlement on atoll islands has been noted by a number of researchers (Rainbird 2004:163, 225; Kirch 2000: 181; Weisler 2001, cited in Rudiak-Gould 2013c). As explained by Rainbird (2004: 163), “the small land area, poor coralline soils and vulnerability to environmental catastrophe have in the past led archaeologists to believe that atolls are also impoverished archaeologically”. However despite such reservations, archaeological investigations on various atoll islands in Micronesia have been carried out since the mid 1960s, and have intensified during the last few decades. Significantly for this thesis, evidence from archaeological investigations on atoll islands reveal the alteration of the island landscape by human settlers and the extensive use of shell and coral for durable material culture.

In the Carolinian atolls, archaeological fieldwork on a number of atolls has identified the presence of shell adzes and scrapers, shell necklaces, coral food pounders, coral enclosures, ‘stone-lined’ wells, coral platforms and coral slab graves, as well as the modification of island interiors for the pit cultivation of giant swamp taro (Rainbird 2004: 164-165). Archaeological excavations on atolls in the Marshall Islands evidence earth ovens, the construction of taro pits, shell artefacts, fish traps and possible turtle enclosures on the reef, quarried slabs of coral rock, house foundations of coral rubble, coral

exception’, noted the “productivity of the land had plummeted” and both native and introduced plants were in dire need of management.

pavements, and coral slab-lined graves (Rainbird 2004: 227-231). Whilst the archaeological evidence from atoll islands for some coral features mentioned above does not pre-date the historic period, suggesting “little evidence for traditional coral/coral limestone construction” (Rainbird 2004: 229), historical accounts from expeditions in the late 1700s and early 1800s make mention of coral-stone built tombs (Rainbird 2004: 229) and marked grave-sites enclosed by ‘stone’ walls (Hezel 1983: 54). Further, in 1873, an impressive new church on Pingelap Island was built with plastered walls of coral (Hezel 1983: 248), and a German report of the 1907 typhoon refers to the school building on Satawan Island erected from coral blocks (Fritz 1907, cited in Spennemann 2007: 4). Dernbach (2005: 122) also recounts a description of the construction of a new church on Lukunor Island in 1921; a church built of coral stone by the entire community, with “girls and boys carrying coral stones on their heads, and men balancing them on their shoulders”.

Historical accounts also evidence the use of coral stones as weapons. In particular, coral stones were thrown at Spanish sailors on board the ship, *San Lucas*, which was voyaging in the Pacific in the mid-1500s. On one occasion, during an altercation with islanders from the atoll of Pulap, two Spanish sailors and three islanders were killed. A third sailor embroiled in the encounter “turned the canoe around and made for the ship amid a hail of stones hurled by the islanders in nearby canoes” (Hezel 1983: 26). Moreover in 1722, the earliest detailed account of Micronesian people written by a Jesuit missionary of his eight months ‘fieldwork’ among atoll islanders refers to rock-throwing contests. Apparently, along with spear-hurling, these rock-throwing contests were performed for recreational purposes; for people to pit their strength and skill against one another (Hezel 1983: 53).

Most remarkably, archaeological evidence from the Polynesian Outlier, Kapingamarangi Atoll, reveals the main inhabited island of Touhou “was almost completely an artificial creation” (Rainbird 2004: 243). According to archaeological evidence, the first ‘transient occupation’ of Touhou was a small sand cay a little above sea level. Over about 700 to 1000 years, the sand cay was built up, with the aid of seawalls for sand and gravel retention, to a substantial islet four metres above sea level (Rainbird 2004: 243; Kirch 2000: 180). According to the people of Kapingamarangi, Touhou was transformed into an inhabitable island by the original ancestor, a priest named Utamatua (Lieber 1994: 5). Accompanied by gods from his homeland, Utamatua defeated the sorcerer already living

on the island and, assisted by these gods, transformed the sandy cay into a residential island. Further evidence for the creation of artificial islands comes from Melanesia. In his book, 'The Island Builders of the Pacific', Ivens (1930: 59-60) describes in detail the processes used by Lau-speaking people in the Solomon Islands to build the 33 artificial islands inhabited at the time of his fieldwork. The islands are built from coral rocks collected from the floor of the lagoon, either lying loose or broken off with the use of an iron bar, and transported on rafts to the site of the island. These coral rocks are preferred to either the coral found on the reef or the rocks found on the coast; they are a better shape, stronger, and resistant to weathering "even after a hundred years" (Ivens 1930: 60). The islands are built to a height to "keep out high spring-tides", and when the rock walls and other rock-work is finished, the 'floor' of the island is covered with sand collected from the beaches or the reef. A variety of trees are then planted to bind the coral stones, to provide food, and to preserve religious associations (Ivens 1930: 52, 60-61). Notably, and based on his fieldwork, Ivens (1930: 58) suggests this modern way of building artificial islands cannot differ that much from past building practices.

Finally, based on archaeological evidence Kirch (2000: 181) attests "atoll islets are consummate man-made [sic] environments" and that "humans have extensively modified the physical and the biotic environments of atolls". He highlights the digging of taro pits, the enriching of atoll soils, the construction of seawalls for sand retention, the purposeful introduction of plants, and the presence of human-associated animals (Kirch 2000: 181). Kirch (2000: 182) also mentions the extensive and expanded use of shell and coral in atoll societies, including adzes, fishhooks, containers, and food pestles and pounders. Indeed, of his personal experience of Arno Atoll in the Marshall Islands where he supervised an archaeological survey in 1980, Kirch seems somewhat overwhelmed by the sheer presence of coral. He describes, "Everything underfoot consists of coral in one form or another: coral reef, coral boulders, coral sand. There is no other kind of stone" (Kirch 2000: 181). He then goes on to say:

On such tenuous heaps of coral and sand rimming productive lagoons and extensive reefs, the early Micronesian colonizers worked out a set of cultural adaptations enabling them not only to survive but also to live a satisfying life. (Kirch 2000: 181)

Anthropological evidence for the significance of human-coral relationships

Despite the seemingly significant and intimate engagement between people and coral to build inhabitable islands, this relationship has not been given much consideration in the anthropological literature, either within studies of specific coral island communities or within the ecological anthropology of Micronesia more broadly. According to Alkire (1999: 81), the relationship between environment, subsistence activities, and society was a focus of research for several anthropologists who came to Micronesia at the end of World War II. Mostly affiliated with the US naval government or the US Commercial Company (USCC), these anthropologists were primarily concerned with practical questions of survival following the devastation of the war²⁶⁰. Initially, this involved cooperation with researchers from other disciplines to produce twenty island specific reports for the USCC's Economic Survey of Micronesia (Alkire 1999: 83). Alkire (1999: 83) suggests this interdisciplinary cooperation "fostered an approach that later developed into a more specifically labelled ecological perspective". In particular, Alkire (1999: 83) highlights the work of anthropologist Leonard E. Mason who authored two of the USCC reports and developed a "lifelong career interest in the interaction of environment and culture in Micronesia".

Mason's emphasis on the importance of environment, along with his collaboration with a number of geographers and his interest in cultural ecology, suggests he may have considered the interrelationship between people and coral. In his early study of Arno Atoll in the Marshall Islands, published in the ecologically focussed Atoll Research Bulletin in 1952, Mason (1952: 3) describes the atoll as follows:

Some of the islands are little more than rises of sand above the coral reef, supporting only beach scrub and perhaps a few coconut trees. Other islands, such as Arno and Ine, are several miles long, as much as half a mile wide, and heavily forested in the interior.

He briefly discusses island inhabitation and land ownership, and the natural resources available to support the subsistence needs of people living on the atoll, including rainfall,

²⁶⁰ See also Kroll (2003) for an overview of the scientific research carried out in Micronesia during the immediate post-war period.

food plants, domestic animals, and marine life (Mason 1952: 5). Coral is mentioned only in the context that “the soil of coral atolls is generally not good” (Mason 1952: 5).

Following this publication, Mason, along with fellow anthropologist Alexander Spoehr, contributed to the anthropology chapter of a multi-disciplinary handbook for atoll research, also published in the *Atoll Research Bulletin* (Fosberg and Sachet 1953). Both consider “the ecological approach to the anthropology of coral atolls” (Spoehr 1953: 109), and separately posit a framework for a comparative investigation of atoll cultures focussed on human-environment relationships; specifically on the relationships between the abundance and variety of natural resources available on atoll islands and population size, density and demographics, economic activities, land tenure, and social and political organisation (Spoehr 1953: 109-110; Mason 1953: 111-114)²⁶¹. Spoehr (1956) draws on some of these human-environment relationships of atoll cultures to support his broader examination of ‘cultural differences in the interpretation of natural resources’. For instance, he states:

The people of a pacific atoll must of necessity exist within the limitations of an atoll environment. It is true that as taro-raisers the Marshall Islanders have challenged the natural limitations of their atoll environment by excavating large pits in the coral lime sands of the atoll islets and, by creating humus, through filling these pits with decaying vegetable matter, are able to raise taro. This is a small-scale example of how one society has successfully challenged environmental restrictions (Spoehr 1956: 95).

In a later publication focussed on agriculture on Tarawa Atoll in the Gilbert Islands, Mason (1960) also alludes to the human disturbance of coral to dig wells and pits, and the human development of fertile soils from coral sand. Indeed the quality of the soil on atoll islands seems to be the most common mention of coral in many of these early ethnographic studies. For instance, in his study of the high and low islands of the Eastern Carolines, Murphy emphasises the striking difference in soil types. In particular, he states that atoll islands, made of coral fragments, coral sand and limestone, “can hardly be said to have a

²⁶¹ Indeed, the Coral Atoll Program (CAP) was established in 1950 to investigate the needs of people living on low lying atoll islands. Between 1950 and 1955, CAP organised an intensive ecological examination of five atolls involving a total of forty scientists working together in large interdisciplinary teams (Kroll 2003: 36-37).

real soil”, and “will not support agriculture at all in the ordinary sense of the word” (1949: 428). Yet, according to Murphy (1949: 428), from the distant past, islanders have built up ‘artificial soil’ in depressions to cultivate swamp taro. Working on Puluwat Island, Gladwin (1970: 23) similarly contrasts the small coral islands with “the richer volcanic soils and more generous resources of everything” of the high islands of Chuuk Lagoon. Nason (1970: 27-28) comments that on Ettal Island, the organic component of the coral atoll soil “is heaviest in the artificially prepared taro bogs where man [sic] has introduced quantities of organic matter”. Somewhat more ambiguously, Marshall (1972: 12) contrasts the high islands of Chuuk, known as *cuuk*, literally meaning ‘mountain’ with Namoluk and the other outer islands, known collectively as *fánáápi* or ‘sandy islands’ (see also Goodenough 1966: 102-103; Peter 2000: 263). Marshall (1972: 16) goes on to say that atoll land area is usually “small and limited in environmental diversity”, a sentiment expressed throughout the literature focussed on atoll islands (e.g. Lessa 1950: 16; Lawrence 1992: 264; Lazrus 2009a: 46).

Yet, despite the brief mentions of ‘coral’ in these texts, it is possible to read between the lines for the significance of a relationship with coral, a relationship which is not only necessary to make fertile soils but also to build inhabitable atoll islands. For example, in Nason’s presentation of ‘traditional’ culture on Ettal, the significance of a relationship with coral is revealed through the prestige associated with “the neatness of the taro garden, its size, and the quality of the organic mulch the man had developed” (1970: 133-134). According to Nason (1970: 134), “Men on Etal [sic] in their forties and fifties spent an average of approximately 25 to 40 hours per week in their gardens, and exhibited a great deal of pride when someone complimented them on their gardens or its produce”. Likewise, Marshall (1972: 8) states “the two most critical and cherished resources for an atoll community are people and land”. He reveals that on Namoluk Island, taro swamps are not only the most desirable of land resources to own, they are also ranked more highly than owning sections of the reef (Marshall 1972: 89-90). Indeed, given the dependence of atoll islanders on the cultivation of taro, their ‘boss’ food crop (Murphy 1949: 436), taro swamps are the epitome of land (Alkire 1989: 80) and as such, evidence an ongoing practice of engagement with coral from the time of human settlement.

In an early review of the anthropological material for Micronesia, Fischer and Fischer (1957: 71) also mention the soils of coral sand and humus on low lying islands. However, in contrast to other studies, they also specifically identify coral rock, coral gravel and sand as useful natural resources. They point out the use of coral rock in local stone ovens, as food pounders, and as flooring in local huts and living areas (Fischer and Fischer 1957: 93, 104), and the use of coral boulders to construct fish weirs (ibid: 99) and build walls. Indeed, according to Fischer and Fischer (1957: 97), a wall of coral boulders was built around the entire circumference of Ngatik Island to keep pigs out of the residential area; “pigs are kept on the beach outside the wall while people live on the inside in the center of the island”. Other researchers refer to the construction of ‘stone walls’ and fish weirs as well. For instance, Marshall (1972: 87-88) comments on the use of stone walls as boundaries between named plots of land on Namoluk Island and the construction of 31 named fish weirs on the surrounding reef. Lawrence (1992: 269) mentions the “large permanent fish traps of coral blocks” constructed on reef flats in Kiribati, and Nason (1970: 129) refers to the clan ownership of fish weirs and the associated communal fish drives on Ettal. He also recounts a narrative of war whereby the paramount chief of Ettal is gifted a large named fish weir located on a neighbouring atoll as recompense for his support of Moch Island in a battle with Kuttu Island (Nason 1970: 103).

Furthermore, Lieber’s (1994) comprehensive study of fishing on Kapingamarangi Atoll evidences the use of fish weirs made of one foot high coral rock walls. The actual placement of these coral rock walls is paramount, and “depends on an intimate knowledge of the migration habits and preferred routes of particular fish” (Lieber 1994: 87). Kapinga fishermen also maintain piles of coral rock built on the inner and outer reef in order to catch fish by netting. According to Lieber (1994: 71), the coral rock piles are between four to eight feet in diameter and two to four feet high, depending on their placement on the reef. These rock piles “were constructed in layers with larger stones and boulders on the bottom and progressively smaller stones placed on top of the larger ones” (Lieber 1994: 71). As well as an intimate knowledge of fish behaviour, it is possible to surmise from Lieber’s description of these particular fishing activities the significance of a familiarity with the coral features of the atoll. This familiarity is further revealed through the profusion and complexity of names designated to places on the inside and outside of the reef and in the lagoon. As Lieber (1994: 49) found:

the names do more than just designate (kinds of) places on the reef. They are reference points for locating places in the lagoon and ocean... So between the reef areas, coral heads, passes, and islets, there is no important place inside or outside the reef that is not known and mapped.

Coral is not only used for building boundary walls and fish weirs, it is also foundational to the construction of various buildings. Fischer and Fischer (1957: 105) discuss the use of burnt coral lime, sand, and coral boulders for solid wall construction, a technique supposedly introduced by early missionaries (see also Dernbach 2005: 122). The two types of wall construction identified by Fischer and Fischer (1957: 105) are poured lime and shaped coral boulders:

The cement formed from the lime and sand may be poured into wooden forms into which unshaped boulders are also set, or it may be used as a mortar with shaped coral blocks.

Whilst the walls of shaped coral boulders are stronger, the walls of poured lime are faster to construct as they do not need to be dressed. Given that lime, an essential component of wall construction, is generally made by burning large amounts of branch coral collected from the shallow water of the lagoons, Fischer and Fischer (1957: 105) emphasise these types of solid walls are most practical “where supplies of sand and coral are readily available”; which typically means on the low atoll islands. Whilst these types of wall construction were often used for building community structures such as churches, schools and municipal buildings, the same local materials are used in the construction of both local and modern houses. Students from the Community College of Micronesia document the use of coral sand and gravel for house construction on atoll islands:

Although a modern style home requires imported materials, some things used, such as sand and gravel for a concrete floor, are found in abundance on Ngatik. (Ashby 1985: 178)

The actual building of a thatch roofed house takes a lot of time and effort. In addition to about ten men who will be asked to help, the builder will also invite women and girls to weave the thatch. Wood is obtained from trees on the island and a locally made string is used in place of nails. The floor

is covered with gravel and sand from the beach. (Ashby 1985: 183)

An examination of more recent ethnographic studies of atoll island communities reveals a similar approach to coral as that presented in the earlier literature. For instance, in relation to their recent work in Tuvalu, both Farbotko (2008a) and Lazrus (2009a) briefly mention Charles Darwin and the formation and classification of the atolls. Farbotko (2008a:84) draws attention to a Royal Society expedition to Tuvalu at the turn of the Twentieth century to test, and subsequently prove, Darwin's subsidence theory, and Lazrus (2009a:41) juxtaposes an excerpt from Darwin's 'The voyage of the Beagle' (1909), which poetically describes the origin of atoll islands, with that of a Tuvaluan origin story. Similarly, Chambers and Chambers (2000: 91), who also having conducted fieldwork in Tuvalu, began their chapter entitled 'Coral and Sand', with a quote from Darwin about reef building processes. Whilst they outline the atoll-building process in order to explain the limitation of atoll soils, they also point out that atoll soils have:

supported human populations for some two thousand years.
They even offer a potential for intensive horticulture,
provided work is put into composting, garden sites are
carefully selected, and suitable plant species are grown.
(Chambers and Chambers 2000: 92)

Similarly, Lazrus (2009a: 8) and Farbotko (2008a: 84) mention the settlement of the islands up to two thousand years ago and comment on the poor coralline soils. Farbotko (2008a: 85) mentions the 'sandy soils and coral debris' of the atoll islands and the significance of taro as a food crop, "grown in deep pits in Tuvalu's coralline soils". Lazrus (2009a: 46, 79) states the coralline soils of the atoll islands are poor and the thin layer of naturally occurring organic material is supplemented with artificially produced 'compost' to enhance productivity. Fish and other marine resources are also identified as important sources of food, caught on the atoll reefs, in the lagoons, and in the open ocean waters (Farbotko 2008a: 85, Lazrus 2009a: 47, 49). Indeed, the productivity of the coral reef environment is often referred to in the literature. For instance, Lieber (1994: 3) comments for Kapingamarangi Atoll:

It is a productive lagoon for fish in its deep waters, at its
many coral heads, on the reef margins, reef flats, inter-island

channels, islet shores, and two deep passes at the southern end of the reef.

Yet it is the poignant work of Carucci (2004) on Enewetak and Ujelang Atolls in the Republic of the Marshall Islands which implicitly captures the intense engagement between people and coral to build inhabitable islands. In 1947, as a result of the United States nuclear testing program, the people of Enewetak Atoll were moved to the more isolated and resource-poor atoll of Ujelang. Within this context, Carucci examines the relations between people and place, or more specifically, the relations between land, labour, and identity. He emphasises that, for Enewetak people, identity is manifest not only in clan membership, but equally “in the family land that is the realization of generation upon generation of continuous occupation that has made untended earth into soil through toil” (Carucci 2004: 417). Indeed, he states the land of Enewetak not only represents “the collective labor of generations of people who have worked the land, transforming it from bush into inhabitable space” (Carucci 2004: 417), but is also embedded with the physical substance of all those who have worked the land and since died.

Given such a communal history of engagement over hundreds of years, it is not surprising that the move to Ujelang was experienced as an extremely traumatic event (Carucci 2004: 420). In contrast to Enewetak, Ujelang was “nothing more than a wild bush-atoll” (Aluwo, cited in Carucci 2004: 420); a marginal environment; an island covered with coral rubble and rocks from a severe typhoon in the 1860s; a foreign place devoid of communal history. These were small islands extremely unsuited to agriculture and subsistence fishing. Yet upon their arrival, and for the following 30 years, Enewetak people set about ‘burning rocks’ and planting food crops. Large coral rocks were rolled into fire pits to split them into smaller pieces; “within the village space, thirty years of burning reduced the chunks of coral to fragments one to eight inches in diameter”, and outside the village “years of labor transformed these rocks from small boulders to chunks from six inches to two feet in diameter” (Carucci 2004: 426). A small garden was achieved near the village, and coconuts, pandanus, and breadfruit trees were planted in great numbers on the atoll islands. However, despite such efforts to transform the atoll and make themselves into ‘the people of Ujelang’, people generally lived an impoverished life suffering not only the limitations of the environment (food shortages, famine and illness),

but also the cultural ambivalence of living in a place where they ‘did not know anything’ (Carucci 2004: 422, 425). As Carucci (2004: 421) states:

they could not, in the course of thirty-three years, develop the fully grounded history that, over hundreds or thousands of years, had embedded them in the soil, the wave patterns, and the atmospheric conditions of Enewetak.

Human-coral relations: coastal mining as productive engagement

Carucci’s analysis of land, labour, and identity on Enewetak and Ujelang Atolls exemplifies the significance of generations of earth-altering activities to make islands inhabitable. These can be understood as relational activities of belonging, the kinds of activities which forge a connection between land and identity and materialise a place to fully inhabit with intensity – to belong²⁶². Although generally not explicit within the ethnographic material, all of the practices mentioned above suggest an intense engagement with coral; an engagement made more apparent when read in conjunction with the archaeological and historical evidence presented earlier in this section.

However, whilst the subsistence based practices such as making fertile soil and fishing in the lagoon, may be seen to exemplify the knowledge and careful use of resources necessary to “claim a living from these small islands composed, quite literally, of coral rubble and sand” (Chambers and Chambers 2000: 92), other practices of engagement with coral attract concern, especially within the contemporary context of climate change. For instance, Lazrus (2009a: 46) considers the extraction of materials from the reef, such as sand, gravel and coral boulders. Whilst these materials may be used for the construction of buildings, grave sites, airstrips, seawalls, and so on, she emphasises the “great environmental costs” of such practices; the potential increase in erosion and susceptibility to storm damage, and the disruption to the integrity of the porous coral structure of the atolls and to the freshwater lens (2009a: 46). Lazrus’ concern for the extraction of coral material from the reef is reflected in a comment by Chambers and Chambers (2000:92):

²⁶² Here I refer to Bachelard (1969), as discussed in the work by Henry (1999: 338).

Without the protecting acres of reef, there would be no island, no place for plants to lodge a foothold or for people to settle and live for thousands of years.

This commentary expresses a legitimate concern for the integrity of the reef, especially given the significance of the reef for subsistence lifestyles as well as the contemporary demand for reef resources to develop and protect island communities. I will discuss the details of this commentary further in the following chapter, however I want to draw attention here to the recognition of local coastal mining practices as potentially adverse anthropogenic processes of biophysical change (Lazrus 2009a: 190). Whilst not to ignore the potential adverse effects of the biophysical changes associated with such practices, I want to emphasise inhabited atoll islands as intensely managed landscapes, landscapes which have been co-produced through an engagement between people and the atoll environment²⁶³. As Carucci (2004: 418) suggests for the people of Enewetak Atoll, “landscape and humans enliven one another”. As such, and in light of the discussion in this chapter, I would suggest that, rather than consider coastal mining practices and subsistence practices as divergent processes of change, both types of practices are embedded with an island *habitus* oriented towards an engagement with coral; an island *habitus* which has contributed to making islands inhabitable.

Although this is not an exhaustive review of the ethnographic material for atoll island communities, it certainly shows that coral has been somewhat invisible in the literature as the substrate from which everyday life happens. As the consideration of coral is mostly confined to brief descriptive comments or assessments of the atoll and island landscape, it becomes necessary to ‘read between the lines’ in order to ascertain the significance of an engagement with coral for making islands inhabitable. In the next section of this chapter I will present a detailed study of coral and culture on Moch Island in order to substantiate my argument for an island *habitus* oriented towards a productive engagement with coral.

²⁶³ Rainbird (1995a: 97-100) offers a similar critique of archaeologists who interpret human-induced environmental changes of islands as ‘environmental degradation’. Rather, he suggests that environmental change “can enhance the potential of the island for human subsistence and settlement”, and that such transformations must be a combination of natural and cultural actions (1995a: 99).

Coral and culture on Moch Island

Moch can be conventionally described as a typical coral atoll island, but such descriptions fail to recognise the intense sociality of people and coral. As revealed above, social science researchers may allude to the significance of coral for atoll island communities through an examination of island settlement processes or various subsistence practices, such as the use of land and marine resources, and the mining and harvesting of coral. However, it appears that a relationship with coral itself is rarely a focus of investigation²⁶⁴. Yet an overwhelming feature of the Moch community is the prominence of coral as a substrate for life and a resource for dwelling²⁶⁵. Indeed, it is impossible to be on Moch and not notice the foundations of coral that sustain all aspects of dwelling. Not only does coral form the land of the island and enable the formation of a freshwater lens beneath the surface, both of which support the prolific growth of vegetation, it also surrounds the island and the lagoon as coral reef which provides a rich environment for fish and other marine life. People on Moch are actively engaged with this coral landscape to create and maintain their dwelling place. They add organic matter to make fertile soil (*pwel*), they dig pits to grow swamp taro and wells to access freshwater, they clear vegetation to construct paths and houses and cookhouses and volleyball courts, they carve coral pounders to prepare food, and build canoes to fish on the reef. In so doing, the identity of being Mochese is entwined with these practices of dwelling – practices embedded in relations with coral.

Coral reefs and taro swamps

As previously stated, Moch is surrounded by coral and coral reef (see Figure 55). The back of the island, known as *iluk*, faces the open ocean. It is protected from the ocean swell by a narrow beach, a small inlet, an extensive coral rubble reef flat (*alang*) and a live coral reef (*óch*) that drops off steeply into the ocean. The front of the island faces the lagoon, surrounded by a beach, a narrow reef flat predominantly of *puru* (consolidated rock) but also of seagrass, sand (*pei*) and small coral pieces (*fouma*), and a live coral reef that drops

²⁶⁴ Coral and coral reefs are generally the focus of study for marine biologists rather than anthropologists and this is especially apparent within such institutes as the Centre of Excellence for Coral Reef Studies (CoE) in Townsville, Australia. The impact of this for the Mochese community will be briefly considered in Chapter seven.

²⁶⁵ Following the ideas of Ingold (2000), the concept of dwelling is considered in chapter two.

off into the lagoon. The coral reefs that surround Moch and the neighbouring small islands sustain populations of pelagic and reef fish which provide an everyday source of ‘meat’ for the Moch community, supplemented with octopus, lobster, clam and turtle whenever possible. Men fish from canoes in the deep water of the lagoon, or paddle out through the Pukial channel into the open ocean close to shore. It is not unusual to see more than 30 canoes on the lagoon, or to see men, generally in pairs, spear fishing on the lagoon reefs or walking with mask and spear out to where the coral reef meets the ocean.



Figure 55: An aerial view of Moch Island, showing the extensive coral rubble reef flat and small inlet at the back of the island (bottom of photo), the narrow reef at the front of the island, and small coral heads in the lagoon (Photo: Christine Pam).

During traditional fishing for *angarap* men in canoes rely on the named reef, *fun penepin*, to mark their position in order to successfully herd schools of fish towards the shore (see chapter three). At other places on the reef, coral is actively re-positioned to facilitate the use of fishing nets for catching *mamachuk*, or to build fish weirs for use during the summer season of low tide. Indeed, whilst women rarely seem to interact with the reef, one older woman, Pila (Merym’s mother’s sister) waits patiently every year for the calm waters and

low tides of the summer season so she can venture safely onto the reef to repair and tend her fish weir. Also, in the inlet at the back of the island, not far from the shore, a small circular enclosure of coral has been built to contain and grow clams.

The ‘landscape’ of the reef is known intimately by those who fish regularly in the lagoon, on the reef, and in the open ocean waters. Tomas, who often fished in the lagoon and on the outer reef, talked about a special fishing place, a place to catch *mamachuk* during the night and *angarap* during the day. He was intensely aware of the formations of this place which were conducive to successful fishing. He said, at this place called Lemai there used to be a long gentle sandy slope from the small island of Weninek into the lagoon, and this allowed for the successful netting of ‘many many fish’. However, he has noticed a change in the ‘landscape’ – there is now a severe drop-off from the end of the gentle slope into the lagoon – and is worried the fish will come off the slope and escape into the deep water instead of being caught in the net. As suggested here, a familiarity with the atoll landscape is also revealed through the naming of places on the reef and in the lagoon.

Certainly the names of the small islands close to Moch are common knowledge, and many people, including men, women, and children visited them regularly to collect firewood, pandanus leaves, coconuts, and coconut crabs, to check on their breadfruit trees and taro crops, and to picnic during the summer season. However, whilst most people would know the names ‘up to the thirteenth island’ (see Figure 47)²⁶⁶, it was mainly the older men who knew the more distant places in the atoll. As shown in the Satawan Atoll map (see Appendix B), many coral heads in the lagoon and places on the fringing atoll reef have been named. Through a process of triangulation, these named features become reference points of familiarity, especially in relation to the location of good fishing spots. During an overnight picnic on Sanchol, ‘the eighth island’, my daughter and I were invited on a fishing trip with Timmy, a boat operator known for his ability to navigate ocean and lagoon waters. Timmy relied on the alignment of named places on the atoll reef, along with

²⁶⁶ In conversation with me, people would often count the closest of the small islands that stretched between Moch and Satawan, and most were able to tell me the names of the islands up to the thirteenth island. When I asked a specific question which related to these small islands, such as where the eighth grade picnic was going to be held, the answer would generally include both the name of the island and the numbered position of the island leaving from Moch (e.g. ‘the eighth island’).

the inhabited island of Oneop in a neighbouring atoll, to find his fishing spot in the deep water of the lagoon²⁶⁷. This was quite an exacting task, and at one point he lifted anchor and moved the boat ten to fifteen metres backwards to correct his position. Similarly, when sharing the early drafts of the Satawan Atoll map with Kenet, an older fisherman on Moch, he relied on the names already on the map and their alignment in order to provide names for some of the coral heads in the lagoon.

Significantly, the coral reefs that surround Moch and the neighbouring small islands are embedded within the sociality of Moch as an island community. Specific *alang* and coral reefs are owned by particular *eterenges* or extended families and are attached to histories of clan relations. Key members of an *eterenges* actively managed their coral reefs through the cultural institution of *pwaaw* which invokes a ‘taboo’ period during which people are not permitted to either enter or fish on the reef. I was told that *pwaaw* may be instigated as a sign of respect for a relative who has passed away, or as a means to conserve marine resources for use in the summer season, when oceans are calm and people like to take their holidays or picnic on the small islands²⁶⁸. People sometimes made *pwaaw* by displaying a tree branch or coconut frond on a known marker of a particular place, such as on *faun karar*, a boundary rock for Ta Ruanu, a group of four small islands that belonged to Satal’s *eterenges*. However, mostly people now made *pwaaw* by informing the municipal government which then broadcasts this to the community; sometimes, as I discovered, by attaching a printed notice to a tree on the main path. Even when there were no *pwaaw* restrictions, permission to fish and utilise resources from coral reefs must be sought from the owning *eterenges*.

Even though women rarely ventured into the water of the lagoon, and certainly did not fish from canoes or spear fish on the coral reefs, they were intimately involved with the sociality of reef ownership and management. For instance, in order to visit Apuson, a neighbouring small island surrounded by a coral reef designated as *pwaaw*, I was told it was necessary for me to get permission to travel across the reef from a specific woman; the

²⁶⁷ See also Lieber (1994: 49).

²⁶⁸ In addition, during a conversation about turtle conservation Satal referred to *pwaaw* as a way to conserve for the future. See Hames (2007) for a review of the debates surrounding traditional practices and conservation.

oldest woman of the owning *eterenges* who was living on Moch. Even though this woman then sent me to speak with her nephew, it was significant that the first person I was directed to speak with by others on Moch was an older woman of the *eterenges*. Some women were also confident in their knowledge of the histories of reef ownership and actively engaged in discussions and re-told stories that promoted their particular histories as public knowledge²⁶⁹. Disputes of reef ownership would often arise and further contribute to the networks of relations that constituted Moch as a coral reef community.

Likewise, women on Moch rarely ventured into the taro patch – it is hard, muddy, and itchy work mostly carried out by men (see chapter three). Men invest time and energy to cultivate their taro patch or to dig new pits (see Figure 56). These new pits are more than one metre deep, and when finished organic material, especially banana leaves and coconut fronds, are layered on the bottom to develop fertile soil and contribute to the swampy conditions necessary for growing taro.



Figure 56: Work in the taro pit is hard and muddy (Photo: Christine Pam).

²⁶⁹ See chapter two for the details of a discussion between women at Rús about reef ownership.

The harvesting of coral from the reef

People also actively harvest coral from the reef, particularly in the form of *pei*, the fine beach sand, *fouma*, the slightly larger pieces of broken branched coral, and *fau*, the much larger pieces of coral that tend to form the broad rubble reef flat or *alang* on the ocean side of the island (see Figures 57 and 58). *Pei*, *fouma* and *fau* all feature prominently in everyday day life on Moch. People regularly sit on the beach and collect *pei* and *fouma* to be used in the construction or renovation of houses, meeting houses, or wells. Whilst I was on the island, even the junior high school students were involved in collecting *fouma* for the construction of the new school bathrooms. This material is collected in rice sack bags and carried on the shoulders of men, or pushed in wheelbarrows to the place where it will be either used immediately or stored in a mound for future projects. In particular, mounds of *fouma* appeared across the island, generally in close proximity to construction projects which proceeded when people had access to funds to buy building materials from Weno.



Figure 57: Collecting bags of sand for the construction of a house at Latipa (Photo: Christine Pam).



Figure 58: Collecting *fouma* from Inapwei (Photo: Christine Pam).

Fouma is used in the local ground oven or *uum*, to contain the heat and cook large taro or banana cakes that are prepared for special occasions. Indeed, during preparations for my daughter's fifteenth birthday, a very large coconut and banana cake (*amaten uuch*) was baked in the *uum*. Two sack bags of *fouma* were collected from the beach near Lechup, a place connected to our household through Kapa's sister. The *fouma* was piled on top of a tightly packed mound of wood and coconut husks burning in a 25cm deep circular hole in the ground. Once the flames that eventually escaped through the *fouma* died down, the mound was flattened and the baking tin placed on top. Many layers of breadfruit leaves were used to completely cover the tin and then dirt was pushed up the sides to trap the heat. Sweet taro and banana leaves were then used to cover the oven mound, and finally a blue tarp weighed down by heavy pieces of wood. This process took nearly a whole day, and then the cake was left in the oven overnight, or more specifically, until the early morning just before sunrise. Certainly after such effort, there was excitement at dawn as we used a torch to check the cake; it was perfectly cooked and very delicious.

Fouma is also used as the flooring material in the cookhouse, replaced intermittently as food scraps and cooking residues dirty the floor, and in houses and clan meeting houses that do not have a cement slab. The whiteness of the fresh *fouma* on the floor is aesthetically pleasing, and certainly the new clean floor of a cookhouse was admired and treated with care – we left our sandals at the door as we would when entering a house and the floor was covered for some time with a tarp to protect it from getting dirty. *Pei* and *fouma* is also used in other ways to distinguish space and create a similar aesthetic of ‘cleanness’ (*limach*); it is placed on the ground to create clean clear living spaces around houses, to define neat edges to the church and municipal buildings, to revitalise the main path around the island, and to delineate a burial site until a family can afford to construct a cement grave. While I was on Moch, a group of young men were working in the church grounds, sweeping, weeding, and collecting sacks of *fouma* to place around the edge of the building. This ‘cleaning’ was a part of their activity for Lent, along with their involvement in the Easter performance.

This aesthetic of ‘cleanness’ also translates into practices of weeding and clearing the vegetation on the island to reveal the coral and soil underneath. The main path around the island is regularly weeded, and a special effort is made by each village to clean the path prior to an important social event. For instance, when the community received news of an impending visit by the President of the FSM, there was much planning and excitement; not only did people organise to make gifts, perform dances, and prepare food, they also began pulling out weeds along the path to make it clean for an anticipated presidential walk around the island²⁷⁰. At another time, weeding the path was used as a community service or punishment imposed on the couple of men who were in ‘gaol’ for drinking offences. Also while I was on Moch, year ten students raised money for their school picnic by cleaning the area between the house I was living in and the neighbouring house (see Figure 59). As a result, bushy vegetation that provided me with some valued privacy was removed and I was able to see clearly the neighbours as they washed at the well and worked and socialised around their house – and subsequently they could also see clearly into my room. My attention was directed towards the weeding effort by those people living in the surrounding area, and again, the effect of such ‘cleaning’ was admired.

²⁷⁰ Despite the activity and feelings of anticipation within the community, it was very unclear when this visit would actually occur, and certainly the President had still not visited by the time I left the island in July 2009.



Figure 59: Year ten students raised money through the social transaction of *sata* by cleaning this area (Photo: Christine Pam).

This desire for cleanness was further evidenced when I accompanied a group of families on a weekend picnic to Sanchol, a smaller island near Moch. This island had not been visited for nearly a year due to the surrounding reef being designated as *pwaaw* on behalf of an old man who had passed away. I was told that there was a lot of cleaning to do on the island – a year of vegetation growth and debris from the recent tidal surge meant it was not possible to see through the vegetation to the other side of the island or to walk from one side to the other through the centre. Certainly walking on islands that have not been extensively managed or have been impacted by adverse weather events was arduous. The overgrowth on the small islands of Apuson and Aferen made it very difficult to visit the taro pits affected by the recent tidal activity in December (see Figure 60); so difficult that the women who accompanied me to Aferen remained on the beach whilst I traipsed through the mass of vegetation with a related young man. It seemed that few people tended these islands, and a dilapidated old hut once used by a family to stay on Aferen to work their land stood testament to this neglect.



Figure 60: Overgrowth on the small island of Apuson (Photo: Christine Pam).

Therefore, just as the use of *pei* and *fouma* nurtures a clean living space, the weeding and clearing of vegetation and the exposure of coral soil establishes a dwelling place (i.e. Moch is a dwelling place and the small islands of Apuson and Aferen are not). This reflects Besnier's (2009) comparison of domesticated and undomesticated space on Nukulaelae Atoll in Tuvalu. According to Besnier (2009: 35-36), in contrast to the village where society is elaborated, the beach, the bush, and the taro swamp are unsocialised areas, "potentially polluted and polluting, hidden and illicit, undomesticated and antisocial". On Nukulaelae, the beach serves as the community toilet, the bush as a place for malevolent spirits and the illicit drinking of coconut toddy, and the taro swamp as a place for sexual activity beyond prying eyes. Whilst I do not claim to know exactly what goes on 'beyond prying eyes' on Moch, Besnier's analysis does resonate with a Mochese aesthetic of

‘cleanness’, or maybe more specifically, a desire for cleared space or for clarity (Bloch 1995: 65-66)²⁷¹.

For instance, a section of bush on the outside of the island was quite dense and distant from residential areas. Whilst it is unlike the thickness of the bush on the small island of Aferen, it still presented as an undomesticated space, as a space separate from the village. This bush frequently prompted nervous concern among the women and girls who would ‘jog’ with me and my daughter during the evenings; they told me it was because they are afraid of ghosts²⁷². Even on moonlit nights, torchlight always accompanied our forays along this more bushy section of the path, and whilst the nervousness was palpable, the women also seemed to exude a daring at being in such a potentially unsafe place. Whilst the distinction between the village and the bush may have been accentuated in the dark of the night when vision was limited and ghosts may be nearby, it was apparent that the people of Moch weed and clear vegetation, and use *pei* and *fouma*, to maintain this distinction and assert their presence on the island. That is, without these established practices of engagement with coral, it was possible the sociality of their island could be lost to the ghosts or the antisocial and elicit behaviour which may flourish in the bush and the taro swamps.

Fau, the larger pieces of coral, are also used by people to nurture a dwelling place. *Fau* is irregular in shape and varied in size from roughly that of a fist to anything as large as a cement building block or even larger. It is collected from the reef or *alang* and either carried by hand or transported in canoes to the shore where it is placed in wheelbarrows and pushed to wherever it is needed. Certainly *fau* has multiple uses on Moch; it is buried in the ground in lines to create borders along paths, around gardens, and even sometimes

²⁷¹ Here I draw on Bloch’s (1995: 65-66) discussion of ‘clarity’ among the Zafimaniry of eastern Madagascar. He emphasises the central value of clarity, both aesthetically and in its association with pleasant living conditions, and suggests the Zafimaniry may interpret the cleared rice valleys as “a sign of living humans having finally successfully made their mark and attached themselves to the unchanging land” (1995: 75).

²⁷² Other places were noted for the presence of ghosts, including among the breadfruit trees near the school, in the bush near the taro swamp, and out on the reef in the lagoon. One young man told me the reason people did not sit on the roof of the school building (which offered a wonderful view of the lagoon) was because they were afraid of the ghost. I also suspect this restriction related to the ‘hiddenness’ of being on the roof; another place beyond prying eyes.

between households, and to demarcate the fire place area in the cookhouse. Since it is heavy, it is also enlisted in the production of preserved breadfruit (*mar*), used to weigh down the many layers of leaves and tarp material placed over the buried breadfruit in order to protect it from weather and rodents. During my fieldwork, two pieces of *fau* were tied together and slung over the roof of Kapa's local hut to hold down loose sheets of iron folded over the apex to provide greater protection from the rain (see Figure 61).



Figure 61: Working on the roof of Kapa's local hut (Photo: Christine Pam).

One particular type of *fau* is of specific interest, and both men and women look out for it on the reef. It is noted for its strength and is carved into bell-shaped coral pounders used to prepare breadfruit and taro. The pounders themselves are also called '*fau*'; *faunmaai* are larger pounders used by men to pound breadfruit, and *faunpwula* are smaller and used by women, and sometimes young men, to pound taro²⁷³. Pounded breadfruit and taro (*kkón*) are highly valued foods on Moch, and intimately entwined with Mochese identity (see

²⁷³ According to Mac Marshall (pers. Comm.), these pounders are called *fěwúnpwpo*.

chapter two). Indeed, *kkón* is not only transported to family members on Weno, but also packed into eskies, boxes and suitcases and sent to family living in Guam, Hawai‘i and the mainland of the US. Given the strong association between Mochese identity and *kkón*, it is not surprising that a newly carved pounder is much admired. Indeed, on one occasion I entered a neighbour’s house where a newly carved pounder was the centre of much attention; literally positioned on the floor in the middle of the room surrounded by four or five admiring women. This pounder was bought for fifteen dollars by the household we lived with, and was gifted to my daughter when we left Moch at the end of my fieldwork. It was a special gift; these pounders are cherished tools kept in a safe place inside the house, often in a locked room or cupboard.

‘Oror’: the building of seawalls on Moch

Apart from the bell-shaped pounders, *fau* is used predominantly on Moch to reclaim land and to build *oror*. *Oror* are piles of strategically placed coral predominantly used as retaining walls in the construction of wells and taro pits, and as seawalls to protect the land from lagoon currents and ocean waves. Even a large turtle enclosure has been built with *oror*; approximately two metres square and two metres deep, and built immediately behind the seawall to benefit from tidal flows. It is also likely that early missionaries in the region developed the use of *oror* for the construction of houses and churches (Fischer and Fischer 1957: 105). This is evidenced by the walls of the old protestant church in the place called Mesin, which as they crumbled or were demolished, revealed a lime-mortar exterior and coral interior (see Figure 62). People also remembered the huge fires, at least twelve feet in diameter, which were used to burn *fau* and *fouma* to make lime²⁷⁴. This was mixed with sand to make lime-mortar and then used as a ‘plaster’ or ‘glue’ in the construction of the church, houses, and seawalls. Although people on Moch now mostly use cement and cement blocks to build their houses, churches and wells, *fau* remains the predominant material from which seawalls are constructed.

²⁷⁴ This appears to be a similar practice to the burning of coral rocks to make islands inhabitable, as described by Carucci (2004: 426).



Figure 62: The remains of the old Protestant Church at Mesin (Photo: Christine Pam).

Indeed, '*oror*', a generalised term for the particular process of piling coral, is now often used interchangeably as a term for 'seawall'. *Oror* or seawalls have been built on Moch for many years, at least since the time of the Japanese administration in the 1940s and certainly more extensively since the 1970s. Whilst seawalls have been built at places both along the front (*wenen*) and back (*iluk*) of the island, there are distinct differences in both the form of the seawalls, and the sociality that they produce. At the back of the island, seawalls are generally constructed without the use of cement by individual families to protect their particular places from the ocean waves (see Figure 63). These sections of seawall are relatively short (twelve to twenty-five metres in length) and vary in height and quality; at some places the seawall is a solid structure of coral one and a half metres high or more and up to one metre wide, at other places it is a narrow wall of coral less than one metre high, and at a few places there is either a low wall constructed of coconut trunks buried upright in the sand or no seawall at all. Hubert remembered building his first seawall at Leuwan, his wife's place at the back of the island soon after they were married in 1975. The seawall was then destroyed by Typhoon Pamela in May 1976; he said

Typhoon Pamela ‘blew all the coral away... There was nothing left’. Since then he has repaired or re-built his seawall many times, something he does ‘every year in May’.



Figure 63: A short seawall at the back of the island at Leiche (Photo: Christine Pam).

Whilst the timing of May was not strictly adhered to, the attention demanded by these seawalls usually translates as a seasonal commitment to re-build, repair or maintain the integrity of the structure (see chapter three). Such a commitment requires an investment of labour over many weeks during the summer low tide season to collect and transform mounds of coral rubble into sometimes exquisite structures of coastal defence. Certainly during my stay on Moch, many of the seawalls at the back of the island were in various stages of being re-built following the damage caused by the tidal surge activity in December 2008. At Lemwou, an older single man worked diligently on his seawall by himself and had finished re-building by May (see Figure 64). His seawall, one and a half

metres high and one metre wide, was covered with fine coral and sand and planted with young coconut trees²⁷⁵.



Figure 64: Re-building the seawall at Lemwou (Photo: Christine Pam).

In general, I observed that much of the rebuilding of seawalls was carried out by younger family members or with the social transaction of *sata*²⁷⁶. One household relied on younger members of their extended family to begin to re-build their seawall, and then used *sata* with the senior high school class to continue the work over the following summer ('it costs five dollars or ten dollars'). Mary, who had only recently moved into her new house at Feluk at the back of the island when I visited in 2011, was planning to use *sata* to build her

²⁷⁵ The seawall at Lemwou was built by the same man who carved the breadfruit pounder mentioned earlier in this chapter. I think his completed seawall was also deserving of much admiration and awe – a truly exquisite 'sculpture' of coastal defence which was still intact when I visited two years later. This brings to mind Ingold's (2012: 434) realisation that "the experienced practitioner's knowledge of the properties of materials [in this case coral]... is not projected onto them but grows out of a lifetime of close engagement in a particular craft or trade".

²⁷⁶ The term *sata* is derived from the English word 'charter' (Marshall, pers.comm.).

seawall. She told me the *alang* adjacent to her place belongs to a related *eterenges* so it would not be difficult to access *fau* to build her seawall. Indeed, most families living at the back of the island invested effort into building a seawall to protect their place, and there was some suggestion that those who did not build a seawall were not properly looking after their place; according to Hubert, ‘it is because they don’t care or it is hard for them to get the big coral’. Significantly, the resources used for building seawalls at the back of the island were mostly local, predominantly *fau* collected from the reef and *alang*, and the labour of extended family members, either through a *sata* arrangement or otherwise.

In contrast, much of the seawall along the front of the island was made from coral and cement and had been a long term community affair. During the late 1970s and early 1980s municipal government funds (‘Congress money’ or ‘CIP money’) were used to pay for labour and bags of cement in order to construct the seawall along more than two thirds of the length of the island. I was told the first section of seawall was built from Sapetew to Mesin (Weirong), and then later extended from Mesin to Eor village (see Figure 11). Many people on Moch, both men and women, remembered being involved in this seawall project, collecting the coral, building the seawall, and most importantly, receiving a payment for their labour²⁷⁷. However, the high cost of cement and the difficulties associated with accessing funding has limited the possibilities for ongoing repair and maintenance, and subsequently large sections of the seawall, damaged over time by strong currents, waves, and tidal surge activity, lay slumped and broken along the shore (see Figure 65).

²⁷⁷ Besnier (2009: 60) mentions a similar situation for the people of Nukulaelae Atoll. In the early 1980s, working on the seawall was “something that all young able-bodied men did for the better part of their waking hours, receiving a daily wage of 25 cents, paid out of the development grant that the central government allotted to the Island Council” (ibid: 60).



Figure 65: The broken seawall along the front of the island at Onefeng (Photo: Christine Pam).

In certain places where land erosion was severe and the lagoon was encroaching on people's houses and cookhouses, individual families, like those living at the back of the island, did their best to repair and maintain the seawall and reclaim the land. *Fau* were collected and thrown behind sections of broken seawall to replace the land taken by the sea, and when cement was available, small sections of seawall were repaired. Indeed, the walls of the old Protestant church at Mesin (Weirong) were demolished specifically to use the coral pieces to repair a section of seawall at the neighbouring place of Latipa where a house was threatened by tidal surge activity. In this situation, the people from Latipa (also the original owners of the land at Mesin) approached Moch representatives of the Protestant Church to ask permission to demolish the walls of the old church (all that was left remaining of the structure) and use the coral for the seawall. Permission was granted and cement and coral were used to repair the seawall in the hope of protecting the house at

Latipa and also the land at Mesin where a new Protestant Church would be built in the future²⁷⁸.

Interestingly, this seawall activity was also timed to coincide with the inauguration ceremony for the Moch Mayor, Serino Sinem, a senior man of Latipa. This event in early 2009 prompted Serino's family on Moch to clean up the place and take care of the seawall; there was a desire to present a repaired and well maintained seawall rather than one broken and collapsed on the shore. Such a focus on seawall aesthetics was also apparent two years later in the flurry of activity to prepare Moch for the inaugural senior high school graduation ceremony and the centenary celebration of the arrival of Catholicism on Moch. Preparations for these two events included a strong emphasis by the municipal government on repairing sections of the seawall, especially at Ariow, the place where distinguished guests and other visitors would arrive on Moch for the ceremonies. On occasions such as these, and the proposed presidential visit mentioned earlier, it seemed significant for the municipal government and the community to present Moch as a successfully and intensely inhabited island – as a place worthy of attachment and belonging – and that fundamental to this were practices of engagement with coral, such as attending to seawalls, weeding the main path, and spreading clean *fouma* around the houses, the church and municipal buildings, and the village areas.

An island 'habitus' oriented towards coral

All of the community practices and activities mentioned above rely on an intimate everyday engagement with coral. When considered in conjunction with the archaeological and anthropological evidence presented earlier in this chapter, these practices appear to have historical community relevance which suggests their continuity or more specifically, their embodied historicity. This embodied relation became particularly evident to me during an incident on Moch involving a four year old boy. During a tense altercation with a group of much older children, this young boy reached down to the ground without taking his eyes off the group, picked up a handful of *fouma*, and threatened to throw it at the

²⁷⁸ It is worth mentioning that within a few weeks this newly repaired section of seawall at Latipa was again damaged by tidal activity.

offending group²⁷⁹. Whilst this action may not be unusual among children generally, it was the sheer ‘taken-for-grantedness’ of *fouma* in the behaviour of the young boy during a moment of defiance which revealed an intimate engagement with coral. I was particularly struck by the apparent seamless extension of self to include coral that was embedded within the boy’s action. As Ingold (2000: 186) suggests:

Children... grow up in environments furnished by the work of previous generations, and as they do they come literally to carry the forms of their dwelling in their bodies – in specific skills, sensibilities and dispositions.

Therefore, the boy’s reach for coral comprised an orientation to the conditions of life worked out by previous generations which generated behaviour in the present that was immediately logical and which contributed to the on-going production of a common-sense world shared by the people of Moch. It is this I refer to when I argue for an island *habitus* oriented towards an engagement with coral; indeed, an embodied historicity that resonates with the materialisation of seawalls as a sensible approach to climate change.

‘Seawall is the only thing we can think of’

Although it was clearly apparent that coral seawalls were common-sense among the Mochese community, it is important to note that the building of seawalls is reflected upon and is not without contention. In 2011, I travelled to Moch on the *Lien Pukial* with a woman who last visited her home island in the year 2000 to attend the celebration for the completion of the newly built Catholic Church. Later, at her house in Mechitew village on Weno I asked her about the changes she first noticed during her visit to Moch. Her immediate response was ‘seawall’, and in particular she referred to the collapsed and broken seawall at Ariow and Latipa. During our conversation she remembered the sand beaches which were present on Moch when she was young – something she misses now – and attributed the loss of these beaches to the seawall; she said ‘seawall and sand don’t get along’²⁸⁰. This relationship between seawall and sand was articulated by others who felt

²⁷⁹ This reminded me of the historical accounts of stone throwing as documented by Hezel (1983).

²⁸⁰ Certainly, during my fieldwork various people shared with me their fond memories of sand beaches and it seemed they were highly valued and now deeply missed by many people on Moch (see chapter four for more detail).

‘the tide and the currents built the island and maybe seawalls change the currents and take the beach away’.

People were intimately aware that the currents and waves make the island – even the ancestors told them this – and subsequently there was a level of uncertainty about the use of seawalls because they are understood to interfere with these processes. It was suggested by Father Joseph that *ororlom* (local seawall, seawall from the past) were less intrusive than more ‘modern’ cement seawalls; that *ororlom* absorbed the power of the waves and caused less sand erosion. He said even though there was *oror* built in the 1940s (‘in Japanese times’), the modern cement seawall built in the early 1970s caused stronger currents and ‘this is when the sand erosion began’²⁸¹. I was also told that now, because of the currents, it was harder to collect *fouma* on Moch – people needed to travel to the small islands instead – and a number of people noticed a decrease in the amount of small reef fish close to the shore.

There was also some concern about the harvesting of coral from the reef; this changed the structure of the reef and the shoreline, reduced the general abundance of fish, and limited the effectiveness of the reef as a barrier to the ocean waves. In particular, Satal was concerned that the reef may no longer be able to protect the island from the ocean waves because people collect *fau* from the reef flat (*alang*) to build seawalls. Hubert told me the big ocean waves caused *alang*; that the waves damaged the live coral growing at the edge of the ocean (*óch*), and then picked up the broken dead coral (*fau*) and carried it onto the reef flat. He distinguished between *óch* (‘alive’, ‘where the fish are’, ‘go there for fishing’) and *fau* (‘they are dead’), and said, ‘*alang* means it is dead’. People also referred to live coral as *fau mi manaw* (explained variously as ‘the fish are feeding there so it is alive’) and dead coral as *fau mi me*. Given this distinction between live and dead coral, I asked

²⁸¹ This was supported by other people I spoke, including Curtis Jameson who worked at the Disaster Coordinating office (DCO) and was also from an outer island community in the Mortlocks. Curtis said *it was back in the early 70s they brought in concrete seawalls to the islands but even before that just a pile of rocks, nothing too really solid. ‘Oror’, it’s different from cement seawalls. It’s interesting because in some parts of the islands you can see all those oror made way back in the 60s and 50s, they still sustain, they are still there. But the solid concrete seawall, I don’t know, somehow they break, but those oror they remain* (Interview April 2011).

whether people only collected *fau* for seawalls. While Hubert implied that people should only collect *fau* for seawalls, others acknowledged that live coral was also taken and that this was a significant problem. For instance, Satal commented on the seawall project that was underway during my visit in 2011:

*I saw them one day when first started the seawalls they also collect those lively ones. It is a very big problem, great problem. Just take whatever they think will fit in those seawalls*²⁸².

He said the live reef was very important for the fish and as protection for the island. Another man also said people collected both live and dead coral for seawalls; ‘they only collect what is closest to them, what is easiest’. He was concerned that people did not think about what was ‘in front’, in the future, saying ‘they should be careful what they take, especially because if coral is taken for seawall it may be ten years or so before it will grow again’. In addition to the concerns about ‘seawall and sand’ and the taking of coral from the reef, there were also a few people on Moch who did not support building seawalls at all. Jarvis in particular was quite vocal about this. He said he relied on his experience to determine that seawalls would not protect the island:

The seawall has not worked, it's not safe... it's not make the islands keep any longer...

*Rebuild it, rebuild it, rebuild it... you think it is necessary to have a seawall around the island? No, for me, no, we have that experience*²⁸³.

However notwithstanding these concerns, it was clear that seawalls were the response when people thought of what they could do to protect the land from high tide and big waves²⁸⁴. As evidenced in this chapter, seawalls or *oror* were built in the past to protect the land, and ongoing practices and rememberings (and relations with coral) continue to assert their logic and meaning in the present. For instance, a woman in her early forties

²⁸² Interview March 2011

²⁸³ Interview May 2009

²⁸⁴ Further evidence for this is provided in chapter seven.

remembered when she was seven or nine years old hearing her grandmother talk about getting a seawall because ‘pretty soon the land will wash away’, and a man in his thirties who was not sure why the seawall was built along the front of the island thought ‘maybe there were changes and erosion and so they want to protect the land’. Even the low ‘seawall’ of coral and cement around sections of the central taro patch was built to protect the taro plants from salt water inundation. Indeed most evidently, the logic of seawalls is revealed in the statement, ‘we cannot stop the waves but we can protect the land’. While many people (as was suggested to me) may ‘only think with what is available to them’, even those who reflect on the processes and consequences of building seawalls mostly realise seawalls as ‘what is known’ to protect the land on Moch (even if, according to some, only temporarily). Therefore, in a world of climate change, on a ‘vulnerable’ island of coral, coral rubble and sand, it makes common-sense – as some people have reflected – that within the community ‘seawalls are the only thing we can think of’.

Conclusion

As I have shown, there is a ubiquitous relationship between people and coral on Moch as evidenced through the ongoing practices of everyday life to build an inhabitable island. In this sense, such ‘building’ activities can be understood as “the constitutive acts of dwelling” (Ingold 2000: 195)²⁸⁵ whereby the life world of Moch is continually brought into being through the enactment of human-coral relations embedded within the *habitus*. Given such a life world, it is not surprising that coral seawalls are being built by the Mochese community to protect their island from big waves and high tide. As this suggests, it is not that seawall structures in themselves are inevitable on Moch, but rather that they are materialised through a shared embodied historical relation between people and coral that makes them practical, sensible, and meaningful; in the words of those from Moch, seawalls are ‘the only thing we can think of’. Indeed it can be argued that, just as the four year old boy reaches for coral to defend his position among a group of older children, the people of Moch reach for coral (as they have done for generations) to protect their island home from a seemingly ever encroaching sea.

²⁸⁵ See also Heidegger’s (1971:160) assertion that, “only if we are capable of dwelling, only then can we build”.

Scientific predictions of climate change, in particular sea-level rise, along with local experiences of high tides and big waves have contributed to the desire on Moch for bigger and stronger seawalls to ‘make the island powerful and stay alive’. Community leaders say the main concern for everyone on Moch is to stop their island from washing away, and seawalls are identified as the most important thing, otherwise there is only evacuation. The Moch municipal government takes this concern seriously, and a visionary plan for Moch prioritises seawalls as a ‘sensible’ adaptation strategy. In the following chapter I examine the actions taken by the municipal government to better protect the community from future tidal activity and wave events associated with climate change.

Chapter 7 Reaching for coral: community action for a ‘sensible’ climate change strategy

Introduction

In this chapter I consider community and municipal government efforts to position ‘seawalls’ within the climate change discourse and to assert a presence and leadership in a world of climate change. Given the long-term engagement between people and coral evidenced in the previous chapter, it is not surprising that the people of Moch reach for coral to protect their island from a seemingly ever encroaching sea. As I have discussed in earlier chapters, building seawalls has become an established practice on Moch over many years, both as an ongoing family responsibility and as a community and municipal government affair. However, as the unprecedented frequency and intensity of high tide and wave events recently experienced on the island (discussed in Chapter four) becomes embedded within a new story of climate change (discussed in chapter five), the seawall is being reconceptualised as a climate change project by the Moch municipal government and by members of the Mochese community. In this chapter I examine the ways in which ‘coral’ and ‘climate change’ are put to use by the Mochese community, and the tensions that manifest ‘in conversation’ with the global governance of coral reefs as a ‘natural’ ecosystem highly vulnerable to the effects of climate change.

The ‘seawall report’

During my first days in Weno, Mayor Serino Sinem talked about his visionary plan for Moch which prioritised seawalls; he was looking for grants to fund seawall projects, and was considering the possibilities of getting big cement blocks to build wave breakers on the reef (‘like those used at the port’), or bringing soil and sand from the big islands as landfill. Serino had already talked with political representatives at the state and national level about the situation on Moch and had requested cement to repair, maintain, and build seawalls. However, it was necessary under Compact 2 to submit an application for funding to the government, and both Serino and Mike Olap, the State Government Representative for the Mid-Mortlocks, suggested to me that a ‘seawall report’ would be a useful document to support their submission. Soon after I arrived on Moch I received a message from Serino

that he would like to receive a report about the seawalls within the next few weeks. This message, which coincided with a tidal surge warning on Moch (discussed in Chapter three), was given to me by the Deputy Mayor, Hubert Kiauol, who then offered the names of 14 men he suggested I talk with about seawalls. Other names were added to this list, either through my own curiosity about certain places, suggestions made by Doropio and others, or specific requests by people who wanted to be interviewed for the report. Over a period of a few weeks, Doropio and I visited 21 named places along the shoreline of Moch and interviewed 24 men and six women about the impact of the December tidal surge and wave activity on their seawalls and shoreline. This research resulted in a report entitled, ‘The Impact of Recent Tidal Surge Activity on the Seawalls and Shoreline of Moch Island’ (Pam and Marar 2009), which has been used to support the ongoing efforts of the municipal government to secure funding for a seawall project to protect the island against the action of high tides and big waves.

A national emergency response plan: support and condemnation

Early on the 9th December 2008, the National Weather Service in Guam issued a coastal hazard message for Majuro, Kosrae, Pohnpei, Chuuk, Yap and Palau. Specifically for Chuuk and Pohnpei, the message warned of northerly swells of 12 to 14 feet and surf heights of 15 to 18 feet for north-facing shores. The warning suggested people ‘avoid exposed reefs and beaches ... especially those facing north and east ... since dangerous rip currents are likely’. As stated earlier in chapter 1, reports of severe damage as a result of this unusual high tide and tidal surge activity prompted the Governor of Chuuk, Mr Wesley Simina, to declare a State of Emergency on the 26th December 2008. A State of Emergency was also declared in Pohnpei (19th December), Kosrae (24th December) and Yap (26th December), and as a result the President of the FSM, Mr. Emanuel (Manny) Mori declared a National State of Disaster on the 30th December 2008²⁸⁶.

²⁸⁶ The impacts of the tidal surge activity were not confined to the FSM. As Rudiak-Gould (2013c) reports, the Marshallese government had already declared a state of emergency on the 24th December in response to three wave events between the 9th and the 15th of December that flooded several neighbourhoods of Majuro and effected food crops and infrastructure on a number of outer islands.

The Governor of Chuuk activated the Chuuk State Emergency Task Force, and called an urgent meeting for the 27th December to ‘execute immediate action plans in response to the Declaration of State of Emergency’ (Simina 2008, pers. comm.). Members of the Task Force included directors and officers of various government departments and agencies, including the departments of health, marine resources, education, agriculture, transport and public works, and the Environmental Protection Agency, the Disaster Coordination Office (DCO)²⁸⁷ and the Chuuk utility and weather agencies. The Task Force announced the establishment of six assessment teams to immediately travel to each region in the state to assess the damage caused by the tidal surge (Elimo 2008, pers. comm.). Assessment teams No. 1 to 5 visited the Chuuk Lagoon Region, including the Southern Nomoneas, Northern Nomoneas, Inner Faichuk, Outer Faichuk and the islands of Paata, Polle and Oneisom. These teams departed from Weno and consisted of eight officers each from the various state government departments and agencies listed above. Assessment team No. 6 visited outer island communities in the Mortlocks and Northwest regions, and involved both State and National government officers; the leader being from the National Office of Environmental Emergency Management (OEEM). The team departed from Pohnpei to the Mortlock Islands on board the patrol boat *FSS Micronesia (2)* on the 1st January, 2009. As part of the FSM President’s Emergency Relief Plan, the patrol boat also carried approximately 490 sacks of rice to provide emergency relief to the outer islands (FSM 2009d).

Indeed, having declared a National State of Disaster and signed a Presidential Emergency Declaration, President Mori was able to appropriate National Government resources to fund the emergency response plan developed by the National Emergency Task Force. Immediately he vetoed a Congressional Act to appropriate \$1.4 million from the general fund of the FSM – money targeted for the purpose of funding public projects and social programs in the FSM – and simultaneously called a special meeting of Congress for 5th January 2009 to address the needs of the relief and recovery efforts. In a letter to the Speaker, President Mori wrote, ‘I therefore call upon each member of Congress that we all join hands to develop the most effective and coordinated approach to stave off the ongoing suffering of our people’ (FSM 2008b). During the special meeting, Congress decided to

²⁸⁷ The Disaster Coordinating Office (DCO) was generally referred to as ‘the disaster office’.

override the veto and as a result, the President issued a decree that allowed him to spend money from the general fund ‘to cover consumables like fuel and food relief supplies for the next three months, travel for the assessment and relief teams, planting materials for replenishing the food supply in the damaged islands, and the personnel costs associated with implementing this plan’ (FSM 2009b; Jaynes 2009). Disaster relief funding was also requisitioned from the Disaster Assistance Emergency Fund (DAEF)²⁸⁸, and the US dispatched teams from the Federal Emergency Management Agency (FEMA) and the Agency for International Development (USAID) to support the assessment teams on the ground and to provide ‘the usual’ operational and financial assistance (FSM 2009c)²⁸⁹. Relief funding was also received from ‘Development Partners’ including the People’s Republic of China, the Chinese Red Cross, Japan, and Australia.

Assessment Team No. 6

Between January 3rd and January 5th 2009 the joint assessment team No. 6 visited eleven islands in the Mortlocks Region; Satawan, Ta, Oneop and Lekinioch in the Lower Mortlocks, Moch, Kuttu, Ettal and Namoluk in the Middle Mortlocks, and Nama, Piis-Emwar and Losap in the Upper Mortlocks. The resultant Assessment Report, dated January 8th 2009, reported that all islands visited in the Mortlocks were devastated by the tidal surge, with 80-90% of their staple food crops, especially taro, totally damaged and expected to take years to recover. Common health problems experienced throughout the Mortlocks and attributed to the tidal surge were also documented, including respiratory infections, skin diseases, eye infections, gastritis, intestinal parasites and ear infections. The report recommended the rehabilitation of food crops, the provision of seeds and seedlings, short term food relief, and preventative health measures to avert the outbreak of diseases.

Curtis Jameson, a man who worked in the Governor’s Office and the State Disaster Coordinating Office (DCO) in Weno, was a prominent member of Assessment Team No. 6. I interviewed Curtis on a number of occasions during my fieldwork about the DCO and

²⁸⁸ In 2008, the DAEF was being established in accordance with the Amended Compact. Both the US and FSM governments agreed to deposit \$US200000 into the fund annually (FSM 2008c).

²⁸⁹ I was told there is generally a request for FEMA to assist during a disaster.

the assessment process. He told me it was a very quick assessment visit and the team only spent a few hours on each island. He said they lived on board the boat for days ('up and down ladders in rough seas'), and would call ahead to each island to request the municipal government to delegate two people to show the team the most affected areas. On the basis of this assessment, the team discussed the damage and reached a consensus on the percentage damage for the whole island. Much of the report writing was carried out on the boat and was finalised when the team returned to Weno. Curtis said a comprehensive assessment report for all the regions of Chuuk State was then collated and forwarded to the national government (OEEM), where the final National Report was completed and sent to FEMA, and then to the US Ambassador, USAID, and to the FSM President.

In a later interview it became clear that the declaration of a State of Emergency in Chuuk State was not unusual²⁹⁰. As Curtis said, *if I remember, Governor declared State of Emergency 06, 07, 08, 09, 10, every year. 2009 we got the food relief assistance, 2010 nothing, 2011 we haven't done any assessment*²⁹¹. He said nearly every year the DCO receives reports of damage from the municipal governments of island communities. These reports are collated by the DCO and forwarded to the Governor who may declare a State of Emergency and may subsequently request the President to declare a National State of Emergency. While Curtis worked at the DCO and had been involved in the emergency assessment process many times, he was frustrated because *the national government does not communicate well with the state government*. In relation to the state of emergency, he complained that while the assessment was a joint effort between state and national governments, he had not received a copy of the final National Report months after it had been completed. Moreover, there appeared to be increased pressure from the national government for assessment reports to provide visual evidence of damage (i.e. photos, videos etc.), and *until this happens, process gets stopped*. He was also critical of the lack of funding for the ongoing work of the DCO that had resulted in only one full-time employee and no money available for projects in 2011.

²⁹⁰ See Keim (2010) for the description of a tidal surge event that impacted the islands of Lekiniuch and Oneop in 2007.

²⁹¹ Interview April 2011

The food relief program

FEMA has had a long history of providing assistance to the FSM during disaster, and it seemed the US agency played a significant role in the emergency response in early 2009. Certainly many people referred to FEMA in discussions surrounding this event, although there was some confusion about the recent transferral of responsibility within the US for disaster relief, mitigation, and reconstruction assistance from FEMA to USAID (FSM 2008c; IOM 2010). Curtis informed me that FEMA operates three programs of assistance; the Feeding Program, Individual Assistance, and Public Assistance²⁹². He said Public Assistance was only available to island communities severely affected by disaster – that is, 50% damage to housing and infrastructure, and displaced families – and that is why the assessment reports were based on the Food Program focussed on taro and crops. Therefore, while he was interested in ‘pushing through the national government’ a collective plan to evaluate erosion processes and damage to infrastructure so that communities could access support under the Public Assistance program, these issues were not considered in the assessment reports.

As indicated above, the President decreed emergency funding to purchase food relief for communities impacted by the disaster²⁹³. ‘Food relief’, predominantly sacks of rice, was provided by the assessment teams immediately after the tidal surge and then two to three months later by government officers from OEEM as part of the emergency response plan. During April, the national government ship, The Voyager, was loaded with sacks of rice in Weno to be transported to outer island communities, and certainly there was much excitement on Moch when the ship arrived in mid-April with hundreds of sacks of rice. A horn blew about 7.15am on that morning to announce the arrival, and there was much activity throughout the morning as men and youth helped to unload the ship. Pallets of rice

²⁹² Hanlon (1998: 174-183) discusses the ‘politics of feeding’ and the issue of dependency in Micronesia.

²⁹³ Food relief has a long history in the Mortlocks. Although it has been entangled with colonial histories and Trust Territory politics, it has also been an essential element of disaster recovery efforts. This was especially the case following Typhoon Pamela in 1976 and the Good Friday typhoon in 1907. These typhoons seriously damaged or completely destroyed major food crops, private dwellings, and community buildings on islands throughout the Mortlocks, and the typhoon in 1907 was responsible for many deaths (Marshall 1979; Spennemann 2007).

were lowered over the side of The Voyager into small motor boats and transported to the steps in the seawall near the municipal building. Here, individual sacks of rice were passed along a line of young men to the window of the municipal building, passed through the window, and stacked in piles of 100 in the community hall. There was much laughter and play associated with this work; attempts were made to pass the sacks quickly without dropping them, and there were cheers when a load was completed. A representative of the national government from the ship, along with Serino's older brother, managed the unloading and the counting, and finally there were 768 sacks of rice in well ordered piles in the community hall. Hubert, as Deputy Mayor, signed the paperwork, and then he and Serino's older brother organised the distribution of rice within the community.

The amount of relief provided was determined according to the population of the island. I was told of a formula used by the municipal government to determine the distribution of rice within the community; there was to be one sack of rice per person, including those who had just left on the *Lien Pukial* to Weno and those who would return to Moch on the next trip. The sacks of rice were divided into villages based on population – Inapwei, 229; Peimoch, 140; Eor, 225 – and then carried on shoulders, in wheelbarrows, or on motor boats to households across the island²⁹⁴. People were delighted to receive the rice, and during the afternoon there was much friendly talk and/or analysis of the distribution among neighbours and families. For instance, Kapa organised for a couple of young men to carry six sacks of rice to the porch of his house in Loulak. When Jirin and I returned to the house, Aprel touched each sack in turn and named it for the people of our household. When people passed by or came to visit (investigate), this process of naming the sacks of rice was repeated, and similar information was shared about other households. Jirin and I were included in the household of Loulak, and this was emphasised by many people who were eager to tell me, 'you have two sacks of rice'²⁹⁵. Satal explained this in the context of 'cultural sharing'; he said this is the way things are done here, 'it's our culture'.

²⁹⁴ The remaining 174 sacks were placed in a store room at the school.

²⁹⁵ Students being sponsored and boarding with families on Moch were not included in the distribution of rice; they were included in the population of their home island.

‘People think we are starving’: the call for ‘seawall relief’

As documented in the report of Assessment Team No. 6 – and evidenced during my fieldwork by many people from Moch²⁹⁶ – salt water inundation as a result of the unusual high tide and tidal surge activity in December 2008 negatively affected the productive capacity of taro swamps on Moch and also completely destroyed taro swamps on neighbouring small islands. Consequently, the need for food relief was readily acknowledged within the community ‘because if the taro patch dies there is not enough food’, and the dependence on this rice was clear in the expressions of concern as it was slowly depleted over the subsequent weeks. Certainly, during June I was often told the ‘food relief is getting close to finishing’, and there was increased talk about how expensive the sacks of rice were in the shops in Weno. However, despite the seeming desirous focus on rice, many people on Moch expressed dissatisfaction with the officially organised assessment process and with the emphasis on food relief as the mainstay of the national government’s emergency relief plan for the outer islands²⁹⁷. I heard common complaints that the assessment team only visited Moch when it was nearly night time; that they only stayed for a few hours; and that they only assessed the impact of the tidal surge on the central taro patch²⁹⁸. Some people were upset they did not have the opportunity to talk with the assessment team, and others protested that there was no community meeting organised to ask the people of Moch what was needed. All of those interviewed for the seawall report felt that a full assessment of the impact of the tidal surge should have included an assessment of damage to both food crops (taro and breadfruit) and the seawalls; they clearly stated that as well as food relief there was also an immediate need for ‘seawall relief’ to protect the shoreline.

²⁹⁶ See chapter four for more details.

²⁹⁷ Dissatisfaction with the assessment process was not confined to this event. I was told that in 2007 the assessment team ‘didn’t even come to Moch’. At that time they only included three islands in their report – Lekinioch, Oneop and Kuttu – and only actually went onshore to Lekinioch and Oneop. The people of Kuttu were upset about this and reported the assessment team to the government. Then in December 2008, the assessment team visited all the islands in the Mortlocks.

²⁹⁸ Satal also pointed out that the assessment team did not dive in the ocean to look at the damage to the reef. He said the reef was damaged by the waves and this affects the meat supply for people. Therefore, ‘rice is not a good response because, what about meat/fish’.

The community had heard about the food relief – Moch will receive 800 sacks of rice – in early February, from a congressman who was campaigning on Moch for the upcoming election. People were critical of this ‘main response from the national government’. Hubert said, ‘this is good for eating but not good for the life of the island’. He was concerned that ‘many people think we are starving’, and said ‘we need a big meeting so they will hear what our concerns are rather than assume we are starving’. Hubert said that at such a meeting he would say, ‘we need cement and rice... that cement is good for seawalls, otherwise there is only evacuation’. In addition, a woman from Lemongun told me ‘food relief is not good, is not what will fix the problem’; and as noted in my fieldnotes, a man from Leiche said:

Traditional food is everywhere for us, from relatives and distant relatives, easy access. But the seawall is a bigger issue... Really don’t have to focus on food relief... need to pay more attention to the shoreline because while we eat food our shoreline is eroded every year and this is not a good response to the assessment²⁹⁹.

This sentiment was shared among many people on Moch who felt that ‘with food relief we can eat, but when there is a disaster again there is no protection for the shoreline’.

There was a common call for ‘seawall relief’ emanating from the community. Generally this referred to a need for cement to build stronger seawalls, but it also encompassed other strategies to protect the land. I was told that the ‘seawalls used to be good without cement, but the currents are getting stronger and more powerful and cement is necessary’. It was felt that people already had access to coral – ‘just need to get permission from those owners of places to collect coral and this will not be difficult’ – and subsequently they only needed cement to be able to build their own ‘good quality seawall’ to protect their place from high tide and big waves. There were ideas about how to improve the quality of cement seawalls – by digging them into the sand, building them twice the width, or using iron rods (rebar) – and some people identified a need for, or actively sought, more ‘outside’ advice on the matter³⁰⁰. As well, a number of people referred to the large cement

²⁹⁹ Fieldnotes February 2009. See chapter two for more about the sharing of food among relatives.

³⁰⁰ During a conversation, Jasen supported Jarvis’ position that ‘seawalls are not a good idea’. However, afterwards Jasen expressed his uncertainty and asked me whether seawalls were a good idea or not; he said

blocks used at the airport and the dock in Weno ('wave breaker'), and suggested these be placed on the reef to break the waves (see Figure 66). As one man said, 'this is good quality... it needs a whole community response and that's traditional'. Overall, there was a strong consensus within the community that rice was not sufficient to respond to the disaster and that 'seawall relief' was necessary for the future of the island.



Figure 66: Wave breaker near the dock, Weno (Photo: Christine Pam).

The 'seawall project': a municipal government intervention

As people living on Moch attend to the seasonal maintenance of seawalls and espouse the need for 'seawall relief' to protect the land from high tide and big waves, community and municipal government leaders living off-island in Weno mobilise to engage with state and national governments to procure funding for a 'seawall project' to better protect the community from future tidal activity and wave events associated with climate change. A

he asks this because of what the ancestors say – that currents and winds made the island – and because of his father. In the past, Jasen's father built a coral seawall but it was perpendicular to the land (groin) and in 'the best place for the currents'. Jasen said the groin had resulted in the accumulation of sand but that the effects were interrupted when people moved the coral to fish for *mamachuk*.

funding proposal for the reconstruction of the seawall around Moch Island was submitted to the national government in late 2009, was still pending when I returned to Weno in 2011, and remains unsuccessful to date. The ‘Fund Proposal on Seawall for Moch Municipality’ specifically targets money (\$250 000 US) from the European Union Foreign Aids Program to the FSM to cover the costs of constructing the seawall, including building materials (cement, rebar, etc.), aggregate and sand (purchased locally), transportation (freight from Weno and/or Pohnpei), labour, and administration and project management.

Within the proposal, small low-lying coral islands are identified as ‘undoubtedly the ones really vulnerable to the effects of [climate change]’. It clearly states that “climate change is threatening the security and sustainability of life on Moch Island and in the Mortlocks Region”, and documents concerns for food and water security; for the potential destruction of infrastructure that supports the welfare of residents and nurtures the development of future leaders of the region; and for a “worst case scenario that is feared if one day the island will completely washout to the sea”. It also stresses that families have already migrated to Weno, Guam, and elsewhere “claiming their fear and insecurity to continue living in such places that are so vulnerable to the effects of climate change”. As stated in the proposal, the Moch municipality ‘pins its hopes’ on being awarded funds to design and build a seawall around the entire island. It claims the present seawall, built in the late 1970s and early 1980s, was only designed to prevent land erosion from the effects of high tide and tidal surge that were ‘normally experienced’, and not to contend with the results of climate change that are ‘much worse or incomparable’:

The seawall was built with a design that apparently could not withstand the intensity and the velocity of the new natural phenomena, and is no longer serving its purpose. Therefore, it is only imperative and very crucial to rebuild and reinforce the seawalls around the island with a better design that will be strong enough to withstand and prevent the catastrophic effects of the kinds of sea surge and high tide that have been experienced since recently, and which are believed to be the results of the climate change³⁰¹.

³⁰¹ In particular, the unusual tidal surge in December 2008 is recognised in the proposal as a result of the climate change; as ‘unprecedented in magnitude’, and ‘by far the biggest and worst that ever took place’.

The proposal engages with the global politics of climate change and astutely petitions for funding:

The industrialized countries are the ones that significantly contribute to the cause of the global warming, which in essence resulting in climate change or rising of the sea level. Therefore, with the reconstruction of the seawall around Moch Island and funded by the grants from the European Union will be very loud and clear at the international forum that the European Union is actually doing whatever that can be possibly done to help the small coral islands around the world that are already affected by the effects of the global warming.

However, ultimately the proposal argues ‘on a humanitarian level’, that a reconstructed seawall with a better design “guarantees a future with hope for the thousands of atoll-island dwelling residents in the Mortlocks”.

The funding proposal for the seawall was part of a ‘package of fund proposals’ written by community leaders to meet the priority needs of the Moch Municipality, which included requests for funding from the Japan International Cooperation Agency to reactivate the ice plant on Moch and to replace the engines of the municipal boat, the *Lien Pukial*. In addition, another ‘package’ requested funding assistance from the state government’s proportion of the FSM Infrastructure Fund for the purchase of land and the construction of new school facilities on the island. Although the funding proposals were submitted to state and national governments in late 2009, they continued to be the primary focus for discussion in the leadership meetings that happened regularly while I was in Weno in 2011. These meetings were held at the High Tide Restaurant over lunch, and were usually attended by six to eight prominent Mochese men living and working in Weno, including the mayor of Moch, other elected government representatives, a judge, a lawyer, and a successful businessman³⁰². Although a couple of these men were younger, mostly they had left Moch in the 1960s and 1970s – when they were twelve or thirteen years old – to continue their education, and had never returned to live on their home/island.

³⁰² According to Jarvis, ‘they are the ones with vision for Moch’.

Mayor Serino was the driving force behind these meetings, and was recognised by those in attendance as ‘the reason things are happening on Moch’. Certainly during my fieldwork, there was much talk at his home in the evenings about ‘making things happen’ for his plans for Moch, and he was constantly engaged in the political manoeuvrings seemingly necessary to progress the funding proposals through the government bureaucracy. Although Serino acted in accordance with the ‘proper protocol’ (i.e. submissions ‘must go through the Governor of Chuuk’)³⁰³, he was often frustrated by the process, complaining the government departments ‘do not do their job’; that he submits the proposals but they ‘get stuck’ in layers of bureaucracy, that they are held up or not sent on to the appropriate department. Consequently, Serino (and others) committed time and resources into organising and attending meetings, lobbying government officers, and strategising to facilitate the movement of various proposals through the bureaucracy, both at a state and national level. On one occasion, Serino’s brother had to do the leg work between departments to finalise a new position for the Moch School; he said ‘maybe if I didn’t follow it up today it would still be stuck, sitting in the out-tray or something like this’. On another occasion, Serino used a chance meeting with the ‘secretary’ of the national government’s Research and Development office to discuss the funding proposals that had already been with the government for well over one year, and it was suggested that the municipal government should ‘re-submit their proposals’³⁰⁴. Although as a result, plans were underway for Moch leaders to travel to Pohnpei to re-submit the proposals, Serino was frustrated and concerned that he had ‘written the proposals and sent them to government and then they seem to get lost’.

This frustration was especially pertinent given the extent to which Serino felt the Moch municipal government had conformed to the new requirement for written proposals to

³⁰³ Curtis Jameson from the DCO receives proposals for mitigation projects. He said, *there are some municipalities write a proposal, but still has to go through the state [government]... once it is submitted if it is for mitigation disaster I just look at it, review it and if the proposal is good I write up the [support] letter. And then the Governor signs and then it goes through the Foreign Affairs to certain funding sources. Normally every time we submit proposals, Foreign Affairs will review and if it doesn’t meet criteria then send it back and tell us what to do* (Interview April 2011).

³⁰⁴ I was told that this man’s parents were from Moch and Oneop. It was understood that he was the only reason that the proposal for the ice plant had progressed.

access funding for municipal projects³⁰⁵. While the seawall and other infrastructure currently on Moch were realised in part through the municipality's share of Capital Improvement Project (CIP) Funds that were available under the First Compact era³⁰⁶, I was variously told that 'money for projects like in the first compact are not available now', and that 'the second compact was signed and the amount of money available to municipalities was nothing'. Under the new compact individual municipal governments were expected to apply for funding – 'to make a proposal' – which was not a simple task given the apparent lack of availability of people able to write the funding proposals³⁰⁷. This was understood to seriously limit the ability of municipal governments to access funding. Therefore, Serino was upset that he had 'done what the government says' and still he 'hears nothing'. In particular, he was frustrated that a decision about the seawall proposal was being delayed because 'the national government want to assess all outer islands for mitigation possibilities before they decide'.

In light of his attempts to access funding for seawalls, Serino was also critical of the National Government's re-acquisition of money to fund the State of Emergency; he said that prior to the State of Emergency this money was made available to the various regions through the FSM Congress to meet specific needs identified by individual municipal governments. This was a reference to the FSM Congressional appropriation of \$1.4 million for public projects – "an amount equal to \$100,000 per Senator in the FSM Congress in order to fund projects in each of the Senator's home states" (Jaynes 2009) – and the

³⁰⁵ There also appeared to be increased pressure from the national government for assessment reports to provide visual evidence of damage (i.e. photos, videos etc.) and, as Curtis Jameson from the DCO explained, *until this happens, process gets stopped* (Interview April 2011). Certainly the 'seawall report' provided photos of damage to the seawalls and shoreline of Moch, and this was noted when Serino (and others) submitted the report to the Congressman and to national government officers while in Pohnpei in May 2009.

³⁰⁶ CIP funds were a form of US assistance made available to the Trust Territories from the late 1960s. While the amount of funds increased dramatically during the first years of the Compact of Free Association in the late 1970s and early 1980s (Hanlon 1998: 169), this money was supposed to be earmarked for development projects to stimulate the economy (Hezel 1987). Serino acknowledged the mis-use of some of these funds but emphasised that Moch was 'not too bad' because the municipal government purchased the *Lien Pukial*, built the school and the municipal buildings, and established the ice plant.

³⁰⁷ This was identified as a problem by people I spoke with on the islands of Moch, Ettal, and Kuttu. As well, when Curtis Jameson from the DCO discussed funding for mitigation projects, he said *I believe there is money out there but there is no one to help us out in writing proposals* (Interview April 2011).

controversial Presidential decree to spend this money on the emergency response plan³⁰⁸. As one man on Moch told me, ‘when the President called a state of emergency he recalled some of that money to assist the islands after the disaster; seems that the money is to go towards food relief’. Given the focus on food relief within the emergency response plan, this reassignment of Congressional funds was seen to limit the possibilities available to the Mochese community to access funding for seawalls through state and national government sources.

250 bags of cement

However, notwithstanding the frustrations expressed by Serino about the funding process, a small seawall project was underway on Moch during my visit in 2011. Serino had managed to secure support for the project from a congressman and from the DCO, and as a result, a total of 250 bags of cement were on the way to Moch on board the *Lien Pukial* and the *Voyager*. Although it is possible that the procurement of this cement was two years in the planning – given Serino was engaged in negotiations with the Congressman in 2009 – the focus for this project was to repair the seawall at Onefeng and Ariow where distinguished guests and other visitors would arrive to attend the inaugural high school graduation and the centennial celebration of Catholicism on Moch (see chapter six). Serino used skype to communicate with Moch about the project and he directed the Deputy Mayor, Hubert Kiauol, to organise ‘outsiders’ to start collecting coral for the seawall while they were waiting for the cement to arrive. The coral and sand was sourced locally with the permission of reef owning *eterenges*; for instance, Serino said his older brother had given permission for coral to be collected from his family’s reef near Aferen. Although work had not started on the seawall project while I was on Moch³⁰⁹, there was much talk about it beginning ‘next week’; it was understood that this was a ‘municipal project’ and that

³⁰⁸ This move on the part of the President was debated within the FSM. In particular, see the MicSem Discussion Forum in response to the Jaynes (2009) article for some of the debates around this issue, especially about the contested value of Congressional ‘pork barrel legislation’ and the President’s ‘rice bucket’ (<http://www.micronesiaforum.org/index.php?p=/discussions>). The use of congressional funds for development projects, and the notion of ‘pork barrel’ appropriations have been discussed in the FSM for many years (see Hezel 1987; also <http://www.micsem.org/pubs/conferences/frames/tstporkfr.htm>).

³⁰⁹ I travelled to Moch on the *Lien Pukial*; on the same trip that delivered 100 bags of cement to the island for the seawall project.

people would be paid to work on the seawall. When I returned to Weno this project continued to be a point of discussion, over skype with people on Moch and at the leadership meetings.at the High Tide Restaurant. Given the political processes and the uncertainties involved in making such a project happen, I was pleased to receive photos of the work in progress after I had returned to Australia; and also pleased to hear that the seawall at Onefeng was completed in time to welcome distinguished guests into the community of Moch (see Figures 67, 68, and 69).



Figure 67: Women working on the seawall project; carrying coral and pushing wheelbarrows (Photo: Akapio Raymond).



Figure 68: Men working on the seawall project; using canoes to transport coral from the reef near Aferen (Photo: Akapio Raymond).



Figure 69: The completed seawall at Onefeng (Photo: Akapio Raymond). This can be compared with the ‘before’ photo of the broken seawall at Onefeng (see Figure 65).

‘This century is for seawall’: the materialisation of hope

Embedded within the seawall proposal is the shared sentiment, expressed by many people within the community, that the seawall represents a secure and sustainable future, one in which ‘inhabitants will feel safe and secure living on their island and will not consider emigrating somewhere else, even with the threat of the climate change’. Even those who initially chose not to build seawalls now supported them because of the changes they were experiencing to high tide and big waves, *and* because they had heard about ‘the melting ice’. Indeed, Hubert’s concern for an increasing high tide prompted him to proclaim, ‘this century is for seawall. It is the most important thing for the island. It will make the island powerful and stay alive’. The municipal government’s effort to procure funding for a seawall project to better protect the island community from future tidal activity and wave events further substantiates a relationship between the desire for seawalls and the ‘catastrophic effects of climate change’. It is apparent that seawalls are becoming the ‘things that matter’ for a ‘future with hope’ for the Mochese community. While seawall structures are ‘what is known’ to protect the land against big waves and high tides (in the past and the present), they are being transformed in the process of living with new climate change realities; that is, seawalls, like all materials, ‘carry on’, undergoing continual modulation and “overtaking the formal destinations that, at one time or another, have been assigned to them” (Ingold 2012: 435). For the Mochese community, seawalls ‘carry on’ as the materialisation of an emerging interrelationship of hope for the future, knowledge of climate change, experiences of high tide and big waves, and the desire to sustain life and to stop the island from washing away³¹⁰. In this sense, seawalls are not simply a technological fix to protect the land. Rather, within the milieu of ‘climate change’, they are transformed as a site of agency and as a holding place for the hopes and dreams of the community to remain living on their island³¹¹.

³¹⁰ In their paper ‘Materialising Oceania’, Bell and Geismar (2009: 4) focus on materialisation as “an ongoing lived *process* whereby concepts, beliefs and desires are given form that are then *transformed* and *transforming* in their social deployment”.

³¹¹ As Malpas (1999: 1) suggests, “the land around us is a reflection, not only of our practical and technological capacities, but also of our culture and society – of our very needs, our hopes, our preoccupations and dreams”.

‘Politics is the possible of everything’

The level of harmony between the local call for ‘seawall relief’ as the ice melts and the seas rise and the more ‘distantly local’³¹² leadership voice for the funding of a ‘seawall project’ for mitigation purposes presents a seemingly cohesive community action for a ‘sensible’ local climate change adaptation strategy. It can be argued that such a strategy represents the intersection of ‘local’ and ‘global’ concerns, that the people of Moch appeal to the global discourse of climate change in order to legitimate their requests for funding to construct the seawall (Lazrus 2005). While at some level this may well be the case, such a local-global framing of this action by the Mochese community potentially ignores the work being done within the community that makes ‘climate change’ meaningful (see chapter five). Given that, as Eriksen reminds us, ‘globalisation is always local’³¹³, then the discourse of climate change does not essentially belong to ‘global actors’ but is always being worked out in the very localness of everyday life – in this case among the people of Moch, but also among a community of scientists as discussed later in this chapter³¹⁴.

Furthermore, to pursue an understanding of Mochese agency through a global-local framework can contribute to the problematic argument identified by Lazrus (2005); that “climate change provides developing countries with a ‘Trojan horse’ to sneak onto development agencies’ agendas and receive more aid”³¹⁵. Unfortunately, this feeds into

³¹² The term ‘local’ is often used to refer to those who represent the voices of Pacific Islanders, especially those involved at national and international levels (e.g. government representatives, AOSIS). While this may be considered ‘local’ within the literature, my argument is that such a focus potentially overrides the voices of those who live predominately on Moch, and those more ‘distant locals’ who live off-island but maintain a strong commitment to their community.

³¹³ https://www.youtube.com/watch?v=TFzRKjOhLmw&list=PLGve6BxyFHNUyy5wMGtALVynORYp_ocEQ&index=23

³¹⁴ Of course, relations of knowledge and power are at play here, and these will also be discussed later in this chapter.

³¹⁵ For example, in an article in the conservative newspaper, ‘Human Events’, Patrick Buchanan writes about the climate change meeting in Copenhagen in 2009. He identifies Ethiopian Prime Minister Meles Zenawi as a ‘Third World con artist’ intent on bamboozling Western leaders out of billions of dollars in the name of climate change (<http://humanevents.com/2009/12/18/shakedown-in-copenhagen/>). This also reflects Bankoff’s (2001: 22) argument that Western aid policies divide the world between donor and recipient nations.

already established representations of a ‘handout mentality’; as Dawn Tuiloma-Palesoo from Fiji writes, “when disaster strikes, many communities in our island countries tend to sit back and wait for handouts” (<http://www.sivglobal.org/?read=82>). In a volume of essays dedicated to the anthropologist, Robert Kiste, this ‘handout mentality’ was identified as one of the main reasons that Kiste ‘moved on’ from his research with Bikini Islanders in the 1960s. As Lal (2004: 20-21) reports:

[The Bikinians] had become skilled at representing their grievances and demands to the international community, and by reciting a sorry tale of neglect and damage and injustice, they sought to have the Americans shoulder the responsibility for their welfare...and [Kiste] found that dependant, handout mentality disconcerting.

It is also apparent that the assignation of ‘MIRAB’ (Migration, Remittances, Aid, and an urban Bureaucracy) to the economies of island communities implicates a ‘handout mentality’ (Connell 2013: 160), and that a willingness to apply for government money is seen to “further reinforce the ‘handout’ mentality of a people long accustomed to looking to Washington to pay all their bills” (Hezel 1977)³¹⁶. Certainly, a commendable emphasis on ‘independence’ for small island communities has – inadvertently perhaps – assumed a ‘handout mentality’ in contrast to attempts to promote ‘sustainable economic development’³¹⁷. Again, the tendency here is to ignore the agency of small island communities, such as Moch, that are working hard to sustain life on their home islands.

The proposal for the seawall project is not simply an isolated request for (climate change) funding to build a defence structure to protect the land (as has been the practice for a number of generations). Rather, the determination to build the seawall is entangled with the desire to ‘extend the time that Moch will be inhabitable’. Indeed, seawalls are embedded within community and family plans for the future; for the opportunity to

³¹⁶ See Marshall (1979: 270) for the relationship between dependency and disaster relief. In this paper, Marshall also provides a detailed analysis of the politics of disaster relief

³¹⁷ Hanlon (1998: 222-224) argues that the Compact of Free Association draws the government into conventional approaches to economic development that conflicts with cultural values and has implications for the goal of self-sustainability

continue to ‘dream the impossible’, to develop a ‘civic centre’³¹⁸, to see the island “moving ahead” (Flinn 2013: 17). Such dreams brought forth the school and municipal buildings, the ‘hurricane shelter’ (aka the Catholic Church), the municipal boat, and the new police sub-station. They realised the consecutive achievement of computers, solar power, and satellite dish for the school (and the community); sustained the passion for building the new Protestant Church at Mesin; and supported the plans for the ice plant, the *Lien Pukial*, and the school dormitories (see Figure 70). Such dreams also encouraged plans for the future, ‘the next plans’, such as a third floor of classrooms for the school and ‘to use concrete blocks for the municipal building – to make it stronger for big waves’. Hubert said it was important to have these plans for the future, for the younger generation to keep the momentum.



Figure 70: ‘Dream the impossible’: an EU inspection of the newly installed solar power system on the roof of the school. Note the stairs to the roof in anticipation of a third floor (Photo: Christine Pam).

Of course, these ‘dreams’ envisage (and have always envisaged) the funding support of national and international governmental agencies and subsequently, such actions may lend

³¹⁸ Within the ‘package of funding proposals’ Moch Island is being promoted as the ‘civic and commercial center and the central transportation hub’ for the Mortlocks.

credence to accusations of a ‘handout mentality’³¹⁹. However, these strategies for the future are also the realisation that ‘politics is the possible of everything’. People within the community are strategic in their engagement with a bureaucracy that they know is expected to govern vulnerability in a world of climate change³²⁰. However, this is but one strategy in a raft of possibilities that are activated by the community in a quest to sustain life on the home/island. Here I refer not only to those practices of mobility that have been commandeered under the categories of ‘migration’ and ‘remittances’, but also to those practices of engagement with coral, coral rubble, and sand that make for an inhabitable island home (see chapters two and six).

Significantly, the Mochese community mobilises people and coral *and politics* to sustain their lifeworld. For instance, Serino was determined to source funding for a seawall, and was willing to engage with bureaucracy and the political landscape of ‘climate change’ to promote the concerns of his community. Indeed, there was intentionality on the part of Serino and the other leaders of Moch to substantiate the connection between a belief in seawalls to protect the land and the potentially adverse effects of climate change³²¹. As Jarvis said, this is what Serino must do; *that’s his job, to represent what people want*³²². If, as Jackson (1996: 11) argues, “human life is an active relationship with what has gone before and what is imagined to lie ahead”, then the actions of Serino – and the people of Moch – to remake their ‘seawalls’ over to new climate change realities is effectively what happens to the belief in seawalls “when it is invoked, activated, put to work, and realised in the lifeworld” (Jackson 1996: 11). Therefore, while this exudes the pragmatism embedded within the saying, ‘politics is the possible of everything’, it also upholds the ‘truth’ of a

³¹⁹ For instance, Hezel (1977) suggests “the people of an island press for Congress of Micronesia funds to erect a seawall, conscious only of the money that will make its way into their pockets, but unmindful of the damage to their sense of community...”.

³²⁰ I refer here to the “exercise of political authority and the use of institutional resources to manage society’s problems and affairs... especially regarding susceptibility to harm and disaster risk (Lazrus 2009a: 106). As Lazrus (2009a: 107) suggests, the governance of vulnerability relies on “the legitimate and participatory exercise of political authority”.

³²¹ In 2011 I was requested to write a letter of support for the seawall proposal. I asked if I should discuss climate change in my letter and was told, after some consideration, ‘only if it is in support of the proposal’.

³²² Interview May 2009

belief in seawalls for an imagined future. This understanding not only challenges the so-called ‘collusion’ between the local and global, and the ‘Trojan horse’ argument directed at communities such as Moch, it also paves the way for a new conversation around climate change that will be examined further in the following section.

Seawalls and the ‘real reef’: power and influence in a world of climate change

Serino is aware that the FSM President is ‘non-committal’ about seawalls and he is ‘thinking about evacuation as the land gets smaller’. Serino said he should ‘find somewhere for the people of Moch’, and once they have a place he would ‘move maybe five families at a time to get established and adapt to a new place’. He said he would prefer to do this over time and ‘adapt’ rather than wait until it was essential to move³²³. Again, Jarvis identified this as Serino’s job; *to look forward what his people will do to feel good, to feel satisfied*. While this is another example that ‘politics is the possible of everything’, as both Serino and members of the community recognise it as his job to decide about evacuation³²⁴, I am concerned here with the realisation that the Mochese community is unlikely to garner widespread support for the seawall project. Certainly, the support provided so far is minimal, and even that is tainted with disapproval. As Curtis from the DCO said:

I hope Serino comes up with good design. I would like to help them out in as much as I can but personally, I don’t like seawall – but I would like to help them out because the Governor has asked me to help them out. But they just have to come up with a good design³²⁵.

Curtis explained further:

I think some people now understand the effects of seawalls if design not properly done. Compact one... the most common

³²³ This seems to support Rainbird’s (2004: 94-95) notion of ‘seeding’ an island and the general agreement within the literature for ‘deliberate voyagers of colonisation’ (Nunn et al. 2007:397) which are discussed chapter 6.

³²⁴ Here, people look towards the municipal government for assistance and direction. However, while this may be articulated, extended families continue to mobilise their own plans for the future (see chapter two).

³²⁵ Interview April 2011

projects were seawall and outboard motor. And now, seawall no longer. I mean still some people want seawall, but the Department of Agriculture done a little bit of public education about changing the concept of seawall to mangrove.

Certainly, the planting and protection of mangroves and other shoreline vegetation – along with the conservation of a healthy coral reef – feature within climate change adaptation strategies developed by government departments, regional intergovernmental agencies, and non-government organisations³²⁶. The Chuuk government’s Department of Marine Resources is invested in the ‘Micronesia Challenge’, “a shared commitment to effectively conserve at least 30% of the near-shore marine resources and 20% of the terrestrial resources across Micronesia by 2020” (<http://themicronesiachallenge.blogspot.com.au/>)³²⁷. The ‘Micronesia Challenge’ is an ambitious conservation programme funded by The Nature Conservancy (TNC), a “leading conservation organization working around the world to protect ecologically important lands and waters for nature and people” (<http://www.nature.org/ourinitiatives/regions/asiaandthepacific/micronesia/howwework/>). In accordance with the ‘Micronesia Challenge’, the Department of Marine Resources is implementing a number of projects, including mangrove conservation in Weno, the protection of a proper spawning site in Chuuk Lagoon and a turtle and bird nesting site in the northwestern islands, and various reef and fish management sites. As well, the department has also secured funding for a marine environment protection project aimed at preventing dynamite fishing in the lagoon (see Figure 71)³²⁸.

³²⁶ The front cover photo of the IPCC’s Fifth Assessment Report for Working Group II, entitled Impacts, Adaptation, and Vulnerability (IPCC 2014a), features the planting of mangrove seedlings in Tuvalu. See Wortel (2010) for a comprehensive report on the biodiversity status, trends and threats in the FSM.

³²⁷ As stated in the website, “the Micronesia Challenge is a commitment by the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, Guam, and the Commonwealth of the Northern Marianas Islands to preserve the natural resources that are crucial to the survival of Pacific traditions, cultures and livelihoods”.

³²⁸ Kavin, a teacher at COM, reviewed funding proposals for environmental projects received under the small grants programme of the United Nations. He said the successful projects were focused on mangrove and reef protection, as well as food security issues.

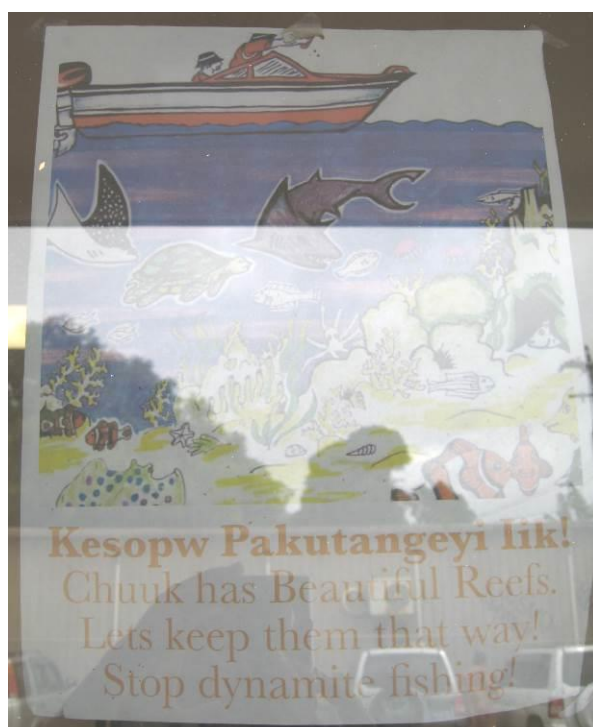


Figure 71: A poster in the window of the Telecom office which reads; ‘Chuuk has beautiful reefs. Let’s keep them that way! Stop dynamite fishing!’ (Photo: Christine Pam)

The Nature Conservancy, along with the Micronesia Conservation Trust, also funded the production of a toolkit “to support community based climate adaptation in Micronesia” (Micronesia Challenge 2011). The toolkit, entitled ‘Adapting to a Changing Climate’³²⁹, was developed in collaboration with community members, resource managers, local conservation organisations, and climate change experts in the region to reflect local needs to overcome the challenges of adapting to climate change. According to the toolkit, a ‘healthy Micronesian atoll community’ includes intact mangroves and/or other vegetation and ‘healthy coral reefs’, to protect and stabilise the shoreline and to provide a barrier against tidal surge and waves respectively (see Figure 72). Elements of a ‘threatened community’ include environmentally damaging types of coastal development, such as seawalls, and coral mining practices. The establishment of a ‘Locally Marine Managed Area’, and the planting and protection of mangroves and other coastal vegetation are recognised as ‘the best way’ to prepare for climate change. Although coastal protection is listed as a possible adaptation strategy, the toolkit recommends that ‘hard options’ made of

³²⁹ The toolkit can be found at www.cakex.org/sites/default/files/SMALL%20Booklet%20FINAL.pdf

coral and cement be designed by engineers and experts to minimise the further erosion of beaches.



Figure 72: 'A healthy Micronesian Atoll Community' with healthy intact coastal vegetation and seagrass beds (3 and 4) and a healthy coral reef (5). Source: Page 7 of the toolkit, 'Adapting to a Changing Climate' (www.cakex.org/sites/default/files/SMALL%20Booklet%20FINAL.pdf)

Another climate change adaptation project within the FSM was climate proofing Kosrae's coastal road. This was a demonstration project of the Pacific Adaptation to Climate Change (PACC) programme, implemented by the United Nations Development Programme (UNDP) in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP) (<https://www.sprep.org/pacc/fsm>). Although the improved road was completed in 2014, the project team continues to promote climate mainstreaming and has contributed to the Kosrae Shoreline Management Plan. This comprehensive management plan has developed eight key strategies to increase the resilience of communities, with a particular focus on the built environment including that:

A strategic approach is adopted for the ongoing provision of coastal defences. These should be considered only where it is a sustainable long-term option, or where it is accepted as a transitional approach to protecting areas over the short to medium term to enable relocation strategies to be implemented. (Ramsay et al. 2013: 43)

The plan outlines a number of problems associated with constructing seawalls (Ramsay et al. 2013: 41-42), and identifies practices of removing sand and coral rubble from the reef flat as detrimental to “the coastal protection function of the natural environment” (Ramsay et al. 2013: 25). Fundamentally, the plan establishes ‘a different pathway for the future’ with an emphasis on preventative measures rather than on impact reduction such as the construction of seawalls (Ramsay et al. 2013: 14; see Figures 73 and 74). This emphasis is supported by local non-government organisations, such as the Conservation Society of Pohnpei (CSP), the Chuuk Conservation Society, and the Island Food Community of Pohnpei. These groups incorporate education about climate change into their conservation projects; for example the Climate Change Pandanus Project aims to “enhance food security, provide income, empower women and promote resilience to climate change by planting pandanus along the shorelines of two low-lying atolls of Pohnpei” (<http://www.kpress.info/index.php/site-map/206-let-s-go-local-occupied-the-weekend-on-pingelap>).



Figure 73: An awareness poster from 1999, developed by the Development Review Commission, now the Kosrae Island Resource Management Authority (KIRMA). Source: Ramsay et al. (2013: 24).

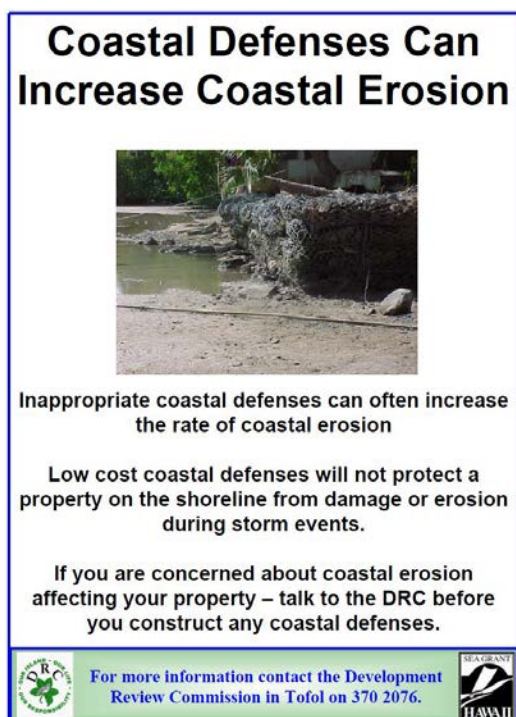


Figure 74: An awareness poster developed by the Development Review Commission, now the Kosrae Island Resource Management Authority (KIRMA). (<http://www.kosrae-environment.org/wordpress/about/> accessed January 2011)

As indicated in these examples, a conservation ethic and the pursuit of sustainable economic development are foundational to the direction being taken within the FSM to adapt to the impacts of climate change³³⁰. Indeed, Hviding (2003: 63) refers to the ‘multitude’ of non-government organisations working in the region “on a special mission of conservation and sustainable development”. While the work being done to protect the reef and to educate communities, and the efforts to institute climate mainstreaming in government departments through the development of a shoreline management plan are commendable, my main concern is with the embeddedness of scientific knowledge within these strategies for conservation and climate change adaptation, and in particular the construction of coral reefs as a natural environment under threat (Richmond et al. 2007)³³¹.

³³⁰ The FSM Ambassador to the United States presents a strategy with four pillars to delay the possibility of climate migrations; mitigation actions to reduce climate pollutants; adaptation to climate change; conservation of natural resources; and sustainable development (FSM 2013).

³³¹ Indeed, as early as the late 1940s and early 1950s attempts were made to establish a conservation goal for Micronesia through the Pacific Science Board (Kroll 2003: 37-44).

Contested nature

While members of the Mochese community, embedded as they are within a coral land and seascape, readily harvest coral to build seawalls to make their island safe from the impacts of climate change, the corals they use are taken from the fringing coral reef, a ‘natural ecosystem’ identified by a scientific community as highly vulnerable to the effects of climate change. Indeed, according to marine scientists, the world’s coral reefs are in deep trouble (Hughes et al. 2010). The survival of coral reefs is threatened by climate change-related stressors such as an increase in sea surface temperatures, an increase in the frequency of extreme weather events, and an increase in levels of atmospheric CO₂ and the consequent acidification of the marine environment (Donner et al. 2005: 2251; Wilson et al. 2010: 894; Wong et al. 2014: 378-379). Further, it is suggested that human impacts on coral reefs, such as over-fishing, sedimentation from development, mining, harvesting, and breakage, may compound and exacerbate the effects of climate stresses on reef systems, at least on a local scale (Hughes et al. 2003: 929; Lazrus 2009a:59; Bridge et al. 2013: 528; Nurse et al. 2014: 1635). According to Bunce et al. (2009: 213), “coral reefs at the core of small island social-ecological systems are globally threatened and face collapse”

According to the climate change literature, the degradation of coral reefs due to these multiple stresses translates as an increase in the vulnerability of atoll island communities to the adverse effects of climate change (Cinner et al. 2012).

It would seem the world’s largest concentration of coral reef scientists can be found in northern Australia, at the Centre of Excellence for Coral reef Studies (CoE) (<http://www.coralcoe.org.au/>). Established in 2005, the main goal of the CoE is to “provide and communicate the scientific knowledge that underpins the sustainable use of the world’s coral reefs”. In order to achieve this goal, the centre now has a membership of 66 chief investigators and research fellows, and almost 200 postgraduate students (enrolled in 2013), many of whom also contribute to management agencies and non-government organisations around the world. Indeed, the CoE has implemented an ‘internationalisation strategy’ that has resulted in collaborative links with 342 institutions in 49 countries³³². In 2013, the centre was awarded a second cycle of funding of \$28million for 2014-2020, and

³³² High profile members of the CoE who have ‘successfully taken their research to the world’ have featured in professional development workshops to support other academics to internationalise their research.

in conjunction with various other cash and inkind support, operates on an annual budget of approximately \$10 million (<http://www.coralcoe.org.au/publications/annual-reports>).

It can be argued that the CoE comprises an extensive, albeit relatively new, coral reef community that in some ways reflects certain elements of the Mochese community. Certainly there are shared practices and beliefs that establish a connection among community members, whether they are located at the centre's research facility in northern Australia or elsewhere in the world. Irrespective of location, comprehensible research practices are performed in 'local' places by teams of scientists' intent on contributing to and benefitting from the ongoing legitimacy of the 'community centre' There are obligations to support the community – for instance, through research efforts, seminar attendance, and the production of peer-reviewed publications – and to participate in community events such as the annual International Coral Reef Symposium and the Great Barrier Reef Foundation's Bommies Award³³³. Most significantly, members of the CoE must submit proposals for funding in order to sustain their livelihoods; livelihoods which are inextricably linked to research practices that are dependent on coral reefs. It is important to note that, while coral reef scientists readily acknowledge the 'goods and services' of coral reefs for 'other' communities (Cinner et al. 2012), they tend to ignore their own coral reef livelihoods (perhaps in an attempt for scientific 'objectivity'). Yet the intimacy of such livelihoods has contributed to the view that, in order to understand the 'real reef' it is necessary "to try to become like the marine biologists who know the reef in all its splendour and terror and mystery" (Woodford 2010: 2)³³⁴.

While the efforts of coral reef scientists to secure funding for their research is evocative of 'politics as the possible of everything'³³⁵, it is unlikely that their actions will be associated

³³³ The Bommies Award recognises "talented young researchers with exceptional skills in science communication, who will act as future ambassadors for the Great Barrier Reef" (<http://www.barrierreef.org/our-research/bommies-award>).

³³⁴ This is further supported by Tuckwell's (2012: 312) assertion that "scientists continue to maintain a 'cognitive authority' as experts in mainstream public discourse".

³³⁵ See Minnegal and Dwyer (2008: 78) for a comment on scientific experts' use of 'climate change' to justify budgets.

with the ‘handout mentality’ often attributed to ‘similar’ efforts by the Mochese community to sustain life on their home/island. Furthermore, the scientific discourse emanating from the CoE (and other research institutes) not only constructs the ‘real’ coral reef as a threatened ecosystem³³⁶, it is also well represented within the assessment reports of the IPCC and is subsequently in a powerful position to inform policy decisions regarding adaptation strategies to climate change. Certainly, as I have evidenced for the FSM, this science influences the preferred approach to the issues faced by atoll island communities as a result of tidal surge activity and wave events. Consequently, the Mochese community is unlikely to realise their hope for a seawall project to protect the island from the future impacts of climate change. It is not that scientific understandings of coral reefs or the marine processes of island formation are foreign to people on Moch. As discussed in chapter six, people are aware that currents and waves make the island and that the use of seawalls interferes with these processes. In addition, people notice the stronger currents and the disappearance of beaches due to the construction of the seawall along the front of the island, and they connect this with a decrease in the number of small reef fish close to the shore. People also understand that harvesting coral from the reef changes the structure of the reef and the shoreline, reduces the general abundance of fish, and limits the effectiveness of the reef as a barrier to the ocean waves. However, given that concerns are ‘socially embedded’ (Trigger et al. 2010: 1070), it is not surprising that – in contrast to the CoE ‘coral reef community’ – the people of Moch manipulate coral as a means through which to imagine a secure future in a world of climate change. Indeed as I wrote in my fieldnotes, Hubert spoke adamantly that:

Even though when the seawall came it affected the currents. They become more powerful and affect the smaller fish. We can’t now turn back to having no seawall. We need bigger and stronger seawall. Even though there will be no smaller fish, we need seawall for people, need to protect people not fish. We cry for relatives, not fish.³³⁷

³³⁶ Within conservationist and ecological discourse, humans are often identified as a threat to nature (West 2005: 639; Trigger et al. 2010: 1062). While this seems to permeate the debate surrounding the impact of human settlers on the atoll environment, Nunn (2001) warns against an uncritical assumption that human settlement resulted in massive environmental degradation.

³³⁷ Fieldnotes March 2009

A conversational opportunity

Although the Mochese community is unlikely to realise the seawall project as a successful ‘climate change story’ (MacRae 2010: 35), there are other examples whereby communities have made their projects fit with a more powerful and dominant discourse of climate change. In an article that asks what anthropologists can say about climate change, MacRae (2010) presents ‘a (different kind of) climate change story’ from a village community on the island of Bali in Indonesia. In this story, MacRae (2010: 43) analyses ‘realities lived on the ground’ (Milton 2008: 58), and documents the work that has been done over a fifteen year period to merge “a waste management project, then a recycling project, a compost project, and finally a climate change project”. Significantly, a decision to seek funding to expand the compost project, in conjunction with an awareness of greenhouse gas production and the possibility of carbon credit funding, resulted in the project being “gradually reconceptualised and repackaged as a successful climate change project” (MacRae 2010: 41).

Within this climate change story the community organisation was able to align its needs with a mitigation strategy supported by the United Nations Framework Convention on Climate Change (UNFCCC). Somewhat comparatively, the IPCC posits the benefits of a combined mitigation and adaptation strategy for small island communities based on the planting and conservation of mangroves as a carbon sink (Nurse et al. 2014: 1641)³³⁸. Clearly the gathering of coral from the reef to construct a seawall to adapt to climate change does not align with this strategy – or with the scientific discourse surrounding coral reefs and climate change. Yet the Mochese community *is* engaging with this discourse – through their efforts to make climate change meaningful within the community and through the remaking of seawalls as a climate change project. Furthermore, and in light of Latour’s (2004b: 103) argument, the Mochese community make seawalls and climate change a ‘matter of concern’, meaning “it agitates, it troubles, it complicates, it provokes speech, it may arouse a lively controversy”, and it is this that creates a new conversational opportunity.

³³⁸ See also Lipset (2013, 2014) for a story about mangroves, the carbon trade, and a community in Papua New Guinea.

Conclusion

As MacRae (2010: 48) points out, climate change works globally “in a confusion of meanings, interests and agendas”. Certainly, while coral and climate change have been ‘put to use’ in particular ways by the community of Moch, they are also well established phenomena within a powerful scientific discourse which, in collaboration with the intergovernmental politics of climate change, has produced a dominant understanding of coral reefs as a ‘natural’ ecosystem highly vulnerable to the effects of climate change. Even though atoll island communities have engaged with coral for hundreds of years to materialise a home/island worthy of belonging, certain ‘sensible’ practices, such as taking coral from the reef, do not adhere to the global vision of coral reefs as an ecosystem in need of protection. In contrast, under the guise of ‘global climate change’ – and embedded within the framework of the IPCC – it can be argued that coral reef scientists have successfully aligned their knowledge and practices with the work of climate scientists and with the politics of global governance, accruing power and influence in a world of climate change. Given that such diverse livelihoods are dependent on coral reefs, ‘friction’³³⁹ is inevitable but only if Mochese efforts to position ‘seawalls’ within the climate change discourse is made visible and taken seriously as a ‘sensible’ adaptation strategy and as a matter of concern (otherwise, there are only ‘matters of fact’ – a failed funding submission somewhere in the Pacific and a threatened coral reef ecosystem). Therefore, I argue that the highly contested ‘nature’ of coral reefs must be examined, and that the actions of the Mochese community actually present an opportunity for a ‘new conversation’ to further realise climate change as both scientifically factual and socially meaningful (Jasanoff 2010: 238).

³³⁹ Here I refer to the work of Tsing (2002) and to the application of her work by Toussaint (2008: 47) and MacRae (2010).

Chapter 8 Conclusion

My aim throughout this thesis has been to produce an ethnographic study of ‘climate change’ in order to present the fullness of the circumstances from which the atoll island community of Moch comes to act and to assert a position in a world of climate change. While climate change research within the social sciences has flourished over the last decade or so, this research has been dominated by the concepts of ‘resilience’, ‘vulnerability’ and ‘adaptation’, often manifest in the study of local socio-cultural knowledge and perspectives for the development of effective adaptation strategies to the impacts of climate change. While such studies may introduce and champion the value of local knowledge and local voices about climate change, there has been little attention paid to local voices as active producers of climate change knowledge. This is not simply a reflection of the tendency within such research to integrate a limited conceptualisation of culture and of what constitutes the social, but also of the pre-eminence given to ‘climate change’ embedded within research as a universal ‘matter-of-fact’. As Raffles (2002: 327) points out, “immersed in their own discursive communities, many researchers already know climate change before they ever [meet] it”.

Throughout this thesis I have attended to the ways in which climate change is being worked out in practice within the Mochese community; in ‘realities lived on the ground’. I trace the processes of fact-finding and meaning-making instigated through the realities of life on a coral atoll home/island, and I examine the socio-cultural and political meanings that shape the production and use of knowledge as the community contends with a world of climate change. As outlined in chapter one, my being positioned as a climate change researcher came to be embedded within my research. While I did not actively set out to promote myself as a climate change researcher, people often engaged with me through my association with ‘climate change’. It was also fortuitous that my fieldwork coincided with unusual weather events – especially the unusual tidal surge event in late 2008 but also the Japanese tsunami in 2011 – that further established my being on Moch in terms of the action of high tides and big waves, significant aspects of climate change realities for people living on a low-lying coral atoll island. As a result, I was provided with a very different research context and/or opportunity from which to pursue an ethnographic study

of climate change. Indeed, I argue that my awareness of this positioning was crucial, enabling me to be immediately present within the social processes of meaning-making which gives climate change force within the community of Moch.

As a ‘different kind of climate change story’, I narrate – through ethnographic detail and analysis (Narayan 2012: 8) – the determination of the Mochese community and the municipal government to assert their presence in the global debate on climate change. As discussed in chapter seven, a local desire for bigger and stronger seawalls ‘to make the island power and stay alive’ works in conjunction with a more distantly local municipal government effort to procure funding for a ‘seawall project’ to better protect the community from future tidal activity and wave events associated with climate change. This level of agency on the part of the Mochese community to secure the future of their home/island was evident throughout my fieldwork, especially through coral seawalls being reconceptualised as a ‘sensible’ adaptation strategy for new climate change realities. However my analysis of these ‘realities on the ground’ indicates that, unlike MacRae’s (2010) climate change story, the Mochese community is unlikely to align their desire and action for seawalls with the global governance of coral reefs as a ‘natural’ ecosystem highly vulnerable to the effects of climate change. In further reference to MacRae (2010), as an anthropologist *I can say* that the tensions that manifest in this lack of fit with the global discourse are worthy of further consideration as a conversation between diverse epistemic communities.

While my analysis in chapter seven may in itself heed the call for anthropologists to conduct research from “the grass-roots level upward” (MacRae 2010: 49), I argue that the action on the part of the Mochese community – to realise their hope for coral seawalls to sustain the home/island – is indeed embedded within a much deeper story about fact-finding and meaning-making; and it is this deeper story that comes to light through my ethnographic research. Simply stated, the story may be summarised as something like this:

While there is always high tide in December, people observe with much apprehension that each year the tide is getting higher and the waves come over the seawalls and onto the land. They tell me the seasonal calendar of waves and tides is no longer clear and express concern regarding a perceived increase in the frequency of extreme tidal surge events that

destroy seawalls and threaten subsistence. People on Moch are worried; they do not want to see their island become water. This uncertainty prompts a re-evaluation of knowledge, and subsequently, many people on Moch are beginning to articulate a relationship between these adverse changes and the global discourse of climate change. More specifically, people tentatively attribute an increase in high tide to the ice melting in the north and south poles, a phenomenon they have heard is somehow linked to pollution and the warming effect this has on the weather. For those with access to information through the media or educational institutions, this phenomenon is related to global warming and climate change and is understood as a threat for the future of the island. It is predominantly these particular people who bring ‘climate change’ home to roost amongst the people and the community of Moch. Coral seawalls are what are known to protect the land, and given the emphasis on high tide and big waves for new climate change realities, it is not surprising that they are prioritised within community actions for a ‘sensible’ adaptation strategy.

However, this is not a simple story, and any misinterpretation of it as such is likely to be a reflection of my own challenge to present the ethnography in a coherent and cohesive thesis. It is crucial here to recognise that embedded within my thesis is the fundamental understanding of knowledge as a social product – as “the messy, contingent, and situated outcome of group activity” (Turnbull 2000: 215) – and that knowledge of ‘climate change’ in particular does not unfold with a ‘systematic global logic’, but rather is an emergent encounter that unfolds “in a confusion of meanings, interests and agendas” (MacRae 2010: 48; see also Arif 2012). Indeed, in accordance with Jasanoff (2010), this thesis actually reveals the simultaneous making of climate change realities, whereby the scientific facts of global climate change are made socially meaningful by and for the community of Moch. Furthermore, in the chapters of this thesis I have shown that an emphasis on the processes of knowledge making not only resists the tendency towards simplicity, but also the tendency to embed problematic distinctions between local and global and between local knowledge and scientific knowledge within the framework of social science research.

A minor tidal surge event that impacted the island early in my fieldwork was instrumental to my understanding of climate change as it was being worked out within the community. As I discuss in chapter three, the experience of this ‘unusual’ event stimulated a reflection on the ‘normal order of things’, on the tides and the waves and the winds, and on the

season for breadfruit and the season for fishing. Despite the prevalence of climate change research about seasonal knowledge within the literature, it is significant that I did not initiate this discussion with the Mochese community. Instead, in the days following the tidal surge this was a topic of conversation taken up with me by a number of people; and most tenaciously by Hubert Kiauol who directed my attention towards the seasonal calendar for Moch. Throughout my fieldwork Hubert asserted the significance of his knowledge of the seasons within the context of both my research topic about climate change and the unusual tidal surge events being experienced by the community. Although, in accordance with Hubert's insistence, I documented knowledge of the seasons, I was also encouraged to understand the meaning of such knowledge embedded within a lived reality. As my study of the seasons in chapter three shows, Mochese seasonal knowledge unfolds through the intimate, lived activities of everyday life and is fundamentally relational, emergent in talk, subsistence practices, work, travel, holiday activities and other forms of sociality (Raffles 2002: 332). However, what is most fundamental here is Hubert's affective claim for a particular association between local seasonal knowledge and global climate change, and more specifically, that unusual tidal surge and wave events are beginning to be aligned with an understanding of climate change.

My account in chapter four of the changes being experienced and observed by many people within the community indicates a general consensus that changes are happening to the seasons and the tides. However, notwithstanding my ongoing discussions with Hubert, this awareness of the changes was not generally articulated with any specific reference to 'climate change'. Of course my positioning as a climate change researcher may be implicated here as a connection with the issue, but in any case, I resist the tendency to represent these observations of change as 'Mochese perceptions of climate change'. While such a trend is apparent within the literature, I argue that such an approach imposes 'climate change' onto the community and leaves little space for understanding the multiple knowledges, observations, and experiences being brought together to make sense of a lived climate change reality.

Simply recording Mochese observations of change is therefore not sufficient to understanding climate change as a meaningful concept enacted by the community. Thus, my analysis in chapter four attends to the feelings of concern and uncertainty that seemed

to take hold as people wondered at the cause of the unusual weather events and environmental changes they were experiencing. While the uncertainty seemed to challenge the existence of a local explanatory framework, this was often conflated with local concerns about social change, and particularly about the transmission of knowledge. For example, community reflections on knowledge suggested that the uncertainty was exacerbated by the realisation that many knowledgeable people have already died and have taken much of their knowledge with them, either because they were stingy with their knowledge, or because the younger ones did not care to listen. Of course, the uncertainty also suggests that the environmental changes being observed may well be unprecedented in character. However, I am not convinced by claims that this simply conveys the limits of local knowledge, a claim that would seem to uphold the problematic distinction between local knowledge and global climate change. Instead, as I have demonstrated further in chapter five, the uncertainty is crucial for questions of causality as people grapple to understand the changes they are experiencing. Therefore, rather than indicating the limits of knowledge, I argue that such uncertainty creates a space for people – and the community – to process and to come to terms with a new explanatory framework; that the globe is warming, the ice is melting and the seas are rising.

Most people living on the island have heard about ‘the melting ice’ and many evoked ‘the ice’ in attempts to make sense of their lived reality, especially during high tide season. As my research in chapter five clearly demonstrates, ‘the ice’ was a concept already being ‘worked out’ in the community irrespective of my presence and positioning as a climate change researcher. This reflects the extent to which ‘far-flung’ communities around the world are already engaged with new ideas about climate change as they grapple with the realities of a changing environment. While the call for ‘reception studies’ to understand this engagement is welcome, my research about the story of the ice as it takes hold within the community shows that such studies must attend to the idea of climate change as constructed by local communities rather than simply focus on the role of education, the media, or NGOs to make the science relevant to local communities. Here I make another critical point about the limitations of research that inadvertently operates from a taken-for-granted understanding of ‘climate change’ as a global scientific phenomenon – that the actual work being done by local people themselves to make climate change meaningful is generally left unexamined.

Given that “the crises of globalisation can only be studied with local processes as a point of departure” (Eriksen n.d.: 7), it is imperative to understand how climate change is made relevant and given meaning in ‘realities lived on the ground’. As I have shown throughout my thesis, an ethnographic study of climate change reveals not only local observations and experiences of environmental change (represented as ‘local knowledge’ within the literature), but also the story of the ice (‘foreign ideas’) and the work being performed within the community to process the science and to make ‘climate change’ socially meaningful. Significantly, the people of Moch are in the process of producing and reproducing their lived reality from *all* of what they know and experience, and not through some artificial distinction between local knowledge on the one hand and scientific knowledge on the other, and nor through some ‘cultural lens’ interpreted as merely perceptions and beliefs of an already determined matter of fact. Furthermore, and in conclusion, I argue that through a focus on knowledge making and emergent ‘global realities’, the actions of a ‘local’ and ‘marginalised’ community can be taken seriously as talking back to an authoritative voice on ‘climate change’, and that this is foundational to an open and ‘proper’ conversation necessary for living creatively in a common fragile world of climate change.

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Appendix A: Information Sheet



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INFORMATION SHEET

PRINCIPAL INVESTIGATOR	Christine Pam
PROJECT TITLE	The Global Discourse of Climate Change and Small Island States
SUPERVISOR	Dr Rosita Henry
SCHOOL	Arts and Social Sciences, James Cook University
CONTACT DETAILS	Christine Pam School of Arts and Social Sciences James Cook University Townsville 4811, Australia Phone: 07 47814808 Fax: 07 47814064 Email: christine.pam@my.jcu.edu.au

This research will be conducted in Chuuk State in the Federated States of Micronesia. The project is about how climate change and global warming effects the everyday lives of people living in outer island communities in the Mortlocks, and how these communities relate to the climate change policies and practices of state and national government departments. My key research aims are to understand:

- How people living in outer island communities understand the science of climate change;
- The policies and practices of government departments in response to extreme climatic events and future predictions of climate change;
- How outer island communities engage with state and national government policies on climate change;
- The social, cultural and political resources available to outer island communities in the face of climate change.

In response to findings from a short study on Moch in January 2008, an important objective of the research project is to document, record and safely store cultural knowledge for the sake of future generations.

I will live on Moch for six months and travel to surrounding island communities in the Mortlocks. During this time I would like to conduct interviews with people about climate change issues, participate in community activities and events, and document oral histories, stories, and genealogies. I will also spend time in Weno and Pohnpei in order to interview government officers and discuss/observe government policies and practices related to climate change. In order to better document the impacts of climate change and to record particular places and practices important to island life, I request permission to video-tape and/or audio-tape the interviews and to video-tape and/or take photographs of community activities and events. Interviews should take approximately one hour, although it is possible to extend this time or organise a follow-up interview if you request it.

The outcomes of the research project will be:

- A detailed record of life on Moch to be safely stored for future generations;
- Publically accessible information to be stored at an appropriate location identified by participants;
- Reports on the social impacts of climate change for municipal councils and government offices;
- Conference presentations and the publication of journal articles to inform the international community;
- A thesis to complete my studies at university.

If you have any concerns regarding the ethical conduct of the study, please contact Tina Langford, Ethics Officer, Research Office, James Cook University, Townsville, Qld, 4811. Phone: 4781 4342, Tina.Langford@jcu.edu.au

Appendix B: Map of Satawan Atoll

