

Heritage and Climate Change in Micronesia



A Report on a Pilot Study Conducted on Moch Island, Mortlock Islands, Chuuk, Federated States of Micronesia January, 2008

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Executive Summary

This study was conducted in order to establish research processes and protocols for the investigation of the impact of climate variability and change on cultural heritage in the coral atoll islands of Micronesia. The study was undertaken with the support of a small grant from the School of Arts and social Sciences, James Cook University, Australia, and in-kind support from the Historic Preservation Office, Chuuk, Federated States of Micronesia.

The research team spent four days on Moch Island in the Mortlocks, conducting formal interviews and participating in informal discussions with people about their experiences of climatic events and the changes they had observed on the island in relation to such events. The geographical location and stories associated with the culturally important places identified by people as being affected by climatic events were recorded and a preliminary map was produced.

The mapping exercise revealed Moch to be a cultural web of places constituting a land/seascape steeped in heritage significance. Analysis of interviews with key research participants demonstrated that people are deeply concerned about the potential loss of their home islands, significant places and place-based knowledge due to climate change. The research team was urged to return to Moch to document, record and safely store cultural knowledge for the sake of future generations. It was concluded that there was a need for a longer term study on Moch. In addition, comparative studies on heritage values in other parts of the State, which are more immediately affected by sea-level rise, are recommended as urgently required.

Acknowledgements

We would like to thank Tracy Meter, the Director of the Chuuk Historic Preservation Office, Doropio Marar (Historical Research Officer, HPO) and Samson Manuel, the Governor's Representative for the Mortlocks, for facilitating this Pilot Study and travelling with us to Moch. We wish especially to thank Doropio Marar for introducing us to his home island community and supporting this study through his research assistance. We also thank the community on Moch for hosting our pilot study and especially Doropio's extended family on Moch for their generous hospitality.

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1. Introduction

The key aims of the pilot study were to develop research protocols and methods that would enable further research on:

- The concept of global warming and how it is being taken up and interpreted at the local level by people living on coral islands at the forefront of climate change
- Local knowledge and empirical experiences of climate variability and climate change
- The social, cultural and political resources that may be available to small island States, and their residents, in the face of climate change.

The impetus for the study was a short reconnaissance fieldtrip made by Dr Rosita Henry in November 2006, to Weno, the capital of Chuuk State, where she met with Chuukese Government officers and local residents in order to gain an understanding of concerns they may have regarding climate change and its social impacts. Dr Henry met with Mr Tracy Meter, Director, Historic Preservation Office (HPO), Mr Ismael Mikel, Executive Director, Environmental Protection Authority (EPA), Mr Joe Konno, former Director of EPA, Mr Eric Paul, Disaster Coordinator, Federal Emergency Management Authority (FEMA). In addition she conducted interviews with four men from the outer islands of Chuuk state. All expressed deep concern regarding the impacts of climate change on their ways of life and on what the future might bring for them.

Mr Tracy Meter (Director, HPO) expressed interest in facilitating research that would investigate how climate change might impact upon historic sites and on cultural heritage more generally. In this context, Mr Doropio Marar, historical research officer (HPO), suggested that a research team return to Chuuk to conduct such a study on his home island of Moch. As a response to this invitation, it was decided to source some funds for a research team from James Cook University to return to Chuuk to conduct a pilot study on Moch, with the idea of developing research protocols, processes and a plan for research in other parts of Chuuk State and the Federated States of Micronesia more broadly.

The research team included Dr Rosita Henry, Dr William Jeffery and Ms Christine Pam (James Cook University), Mr Tracy Meter and Mr Doropio Marar (Chuuk HPO), Mr Samson Manuel (Governor's Representative for the Mortlocks), and Mr Enmud Yleisa (Chuuk EPA).



Fig 1: The research team (clockwise from top left): Mr Samson Yleisa, Mr Doropio Marar, Mr Tracy Meter, Dr Rosita Henry, Ms Christine Pam, Dr William Jeffery, and Mr Enmud Yleisa.

2. Literature Review

As Henry and Jeffery (2008) note, it is clear that small island states are at the frontline of vulnerability in relation to the potential adverse effects of climate change, including sea-level rise, rise in sea-surface temperature and increased intensity and frequency of extreme weather events. Indeed, climate models predict that low lying atoll states in the Pacific, and elsewhere, may become uninhabitable within the next 50 years (Pittock 2005:274). Most vulnerable are the countries that are composed entirely of low-lying coral atolls that rarely exceed 3-4m above present mean sea level (Barnett and Adger 2003). However, states that include high islands as well as low-lying atolls, such as the Federated States of Micronesia, also face disastrous consequences as a result of climate change. On the high islands human populations are concentrated in the coastal zone, making them vulnerable to sea level rise which ‘will exacerbate storm surge, erosion and other coastal hazards, threaten vital infrastructure, settlements and facilities, and thus compromise the socio-economic well being of communities and states’ (Mimura *et.al.* 2007:689).

According to Barnett and Adger (2003:322), atolls share common problems that render them particularly vulnerable to climate change. Geographical isolation, high population densities, restricted freshwater reserves, and economic vulnerability combine to exacerbate the adverse effects of accelerated coastal erosion, saltwater inundation and increased flooding associated with climate variability and extreme climatic events. Marshall (1979: 266) highlights, “when waves crash ashore on inhabited atoll islets, the greatest single casualty is the fresh water taro swamp which always lies at the center of the land”. Agricultural production is extremely susceptible to saltwater inundation, strong winds, and wave action, and in conjunction with the contamination of freshwater sources, lead to increased food insecurity and a prolonged recovery period.

Whilst Chuuk and other small island states in the Pacific are faced with more immediate socioeconomic problems, such as poverty, high unemployment, housing, education, and health care, climate change issues remain high on the political agenda. Certainly, climate science predictions concerning global warming are well accepted in the Pacific, with Pacific Island States responding by developing a regional framework for action on climate change, climate variability and sea level rise (2000-2004), superseded recently by the *Pacific Islands Framework for Action*

on *Climate Change 2006-2015*. Yet, there is also talk that already it may be too late to take any action at all. There has been wide acceptance of popular media representations among Pacific Islanders of their plight as victims of global warming and some states have strategically employed the media as a means to seek international recognition and assistance. Connell (2003) expresses concern about this, arguing that the acceptance of ‘doomsday’ predictions blinds people to more immediate, local causes of environmental degradation. Barnett and Adger (2003:329) suggest that acceptance of the inevitability of imminent disaster and ‘lost confidence in atoll-futures’ may be more of a problem than the physical impact of climate change itself, in that it may lead to ‘changes in domestic resource use and decreased assistance from abroad’. Importantly, as Farbotko (2005) argues, representations of Pacific Islanders as ‘tragic victims’ of global warming serve to erase any recognition of their agency, resourcefulness and resilience.

Yet in 2001, a Chuukese task force appointed to report on the impact of ‘unusual sea level rise and its adverse effects’ recommended that in order to adapt to global climate change it is important to:

Re-orient ourselves with our own traditions and cultural values to be the driving force on how we counter this onslaught of events. Our main problem stems from the loss of our values and the old ways whereas we take great pride in the things that we planted and reap from the ground as opposed to buying and relying entirely on cash (money) economy. (Billimont et al 2001)

Mimura *et al* (2007:712) in the report on small islands by Working Group II of the Intergovernmental Panel on Climate Change note that the use of traditional knowledge as a means for adaptation to climate change has been advocated particularly in relation to small island states¹. However, they call for further research on whether such knowledge can actually enhance ‘adaptive capacity and resilience’ given the dire future scenarios predicted.

With respect to technical measures, countries may wish to pay closer attention to the traditional technologies and skills that have allowed island communities to cope successfully with climate variability in the past. However, as it is uncertain whether the traditional technologies and skills are sufficient to reduce the adverse consequences of climate change, these may need to be combined with modern knowledge and technologies, where appropriate. (Mimura *et al* 2007:712)

¹ See Parry et al (2007) for case studies on ‘Indigenous knowledge for adaptation to climate change’ from the report accepted by Working Group II of the Intergovernmental Panel on Climate Change.

While Barnett and Adger (2003:333) argue that global warming means that the long-term sustainability of atoll countries are seriously at risk, they conclude that, ‘the challenge is to understand the adaptation strategies that have been adopted in the past and which may be relevant for the future in these societies’.

Similarly, Henry (2007) suggests “it is important to explore the socio-cultural resources that people have employed in the past and that they might strategically employ in the future in face of climate change”. Of significance here is the archaeological and historical evidence of past human resourcefulness in the face of life in a highly dynamic natural environment (Rainbird 2004, D’Arcy 2006). One of the strategies that people used in the past to deal with extreme climatic events was to turn to their kinship and exchange networks across the region. According to Rubenstein (2002:75), ‘Micronesian island communities accommodated to climate extremes and natural disasters through the development of social and political linkages between the more vulnerable coral atolls and the neighbouring high islands’.

However, as Henry (2007:17) notes:

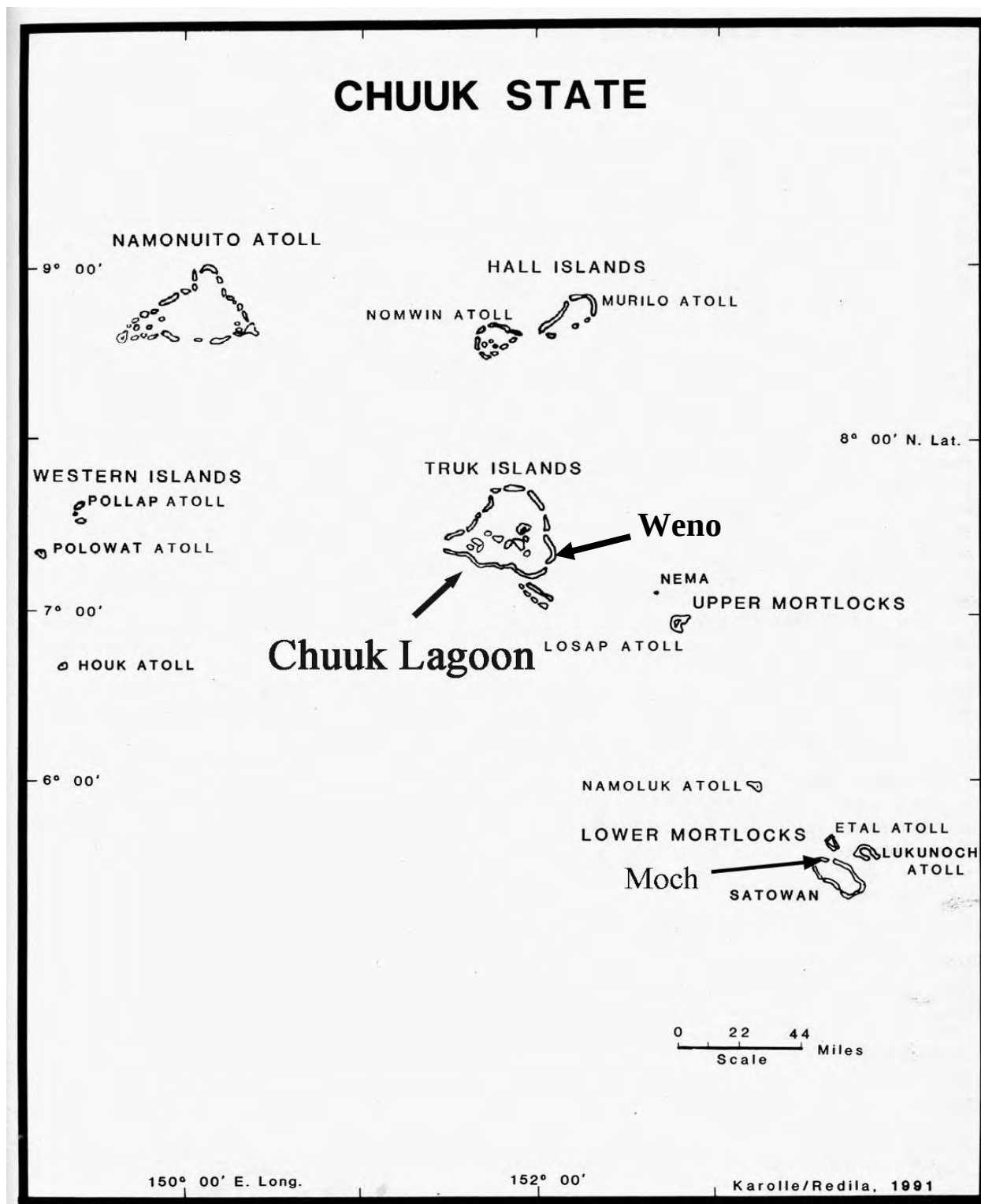
...while much socio-economic modelling has been done to try and estimate and quantify the damages from climate change, little research has been conducted on the creative human capacity to respond to and mitigate its effects. In Chuuk (as elsewhere in Micronesia), people have resourcefully responded through their land tenure regimes, economic and political institutions, and exchange networks in dealing with environmental change in the past. Perhaps they will continue to do so into the future. However, the ability of small states such as Chuuk to deal with the impact of global warming will require a global response and international recognition of the moral obligation to take responsibility for supporting those people and places that have been made most vulnerable by global warming, in a way that does not stifle local ingenuity and creative autonomy in facing climate change.

3. Methodology

3.1 Preliminary Organisation

Dr William Jeffery is Maritime Archaeologist who has conducted long term research in Chuuk Lagoon in relation to his PhD research on the World War II wrecks. He is also a part time contractual employee of the FSM Historic Preservation Office and runs an Earthwatch programme documenting scientific and heritage matters. Dr Jeffery suggested that Dr Rosita Henry visit Chuuk State to investigate possibilities for building on this heritage research project. A short reconnaissance fieldtrip to Weno, the capital of Chuuk State, was made by Dr Henry in November 2006. During this fieldtrip, Dr Henry met with Chuukese Government officers and local residents in order to gain an understanding of concerns they may have regarding climate change and its social impacts. Government officers from the Historic Preservation Office, the Disaster Coordination Office of the Federal Emergency Management Authority, and the Environmental Protection Authority expressed concern about the capacity of the more vulnerable outer islands to maintain their current populations in the face of climate change. They especially conveyed concern about the limited capacity of Chuuk State to handle the socio-economic and political consequences of resettlement. In addition, Dr Henry conducted interviews with four men from the Mortlock Islands, a group of outer islands approximately 300km south-east of Weno (see Map 1). All expressed deep concern regarding the impacts of climate change on their ways of life and on what the future might bring for them.

There was general agreement on the need for further research on the impacts of climate change on the outer islands of Chuuk State. Mr Tracy Meter, Director of the Chuuk Historic Preservation Office expressed interest in facilitating a research project to investigate how climate change might impact upon historic sites and on cultural heritage more generally. Doropio Marar, of the Chuuk Historic Preservation Office (HPO), suggested that a research team from James Cook University return to Chuuk to conduct a pilot study on his home island of Moch.



Map 1: Chuuk State, FSM

3.2 Pilot Study

Discussions and negotiations between Dr Rosita Henry and Dr William Jeffery from James Cook University and Mr Tracy Meter and Mr Doropio Marar from the Chuuk HPO resulted in permission to conduct the pilot study on Moch in January 2008. The research team travelled by boat from Weno to the small coral island of Moch in the Mortlock Islands. The boat, the *Lien Pukial*, is owned by the Moch Municipal Council and is the major (and sometimes only) form of transport for Mortlockese people to travel between their home islands and Weno. Many people from Moch travel back and forth to Weno for employment and education possibilities, to access medical services, for summer holidays, and as a point of departure to other destinations. The *Lien Pukial* had been stranded in Weno for two weeks so there was an accumulation of freight and people eager to return to their islands (see Fig 2). On the trip from Weno, the *Lien Pukial* stops at the atolls of Namoluk and Ettal, before travelling on to Satawan Atoll where it stops at the islands of Moch, Kuttu and Satawan. Travelling to Moch on the *Lien Pukial* was an important part of the research as it enabled the researchers to observe the movement of goods and people by sea and the social and economic conditions that may constrain effective relief in response to climatic disasters.



Fig 2: The *Lien Pukial* loads before leaving for the Mortlocks

A public meeting was held at the community hall soon after our arrival on Moch. At this meeting the research team was welcomed by the Traditional Chief and by the Deputy Mayor. The research team was then introduced, the project was explained, and questions from the community were appropriately answered. Following the meeting we participated in a feast of fish, pounded breadfruit and taro, pork, coconuts, and taro cake.



Fig 3: Outside the community hall after the public meeting

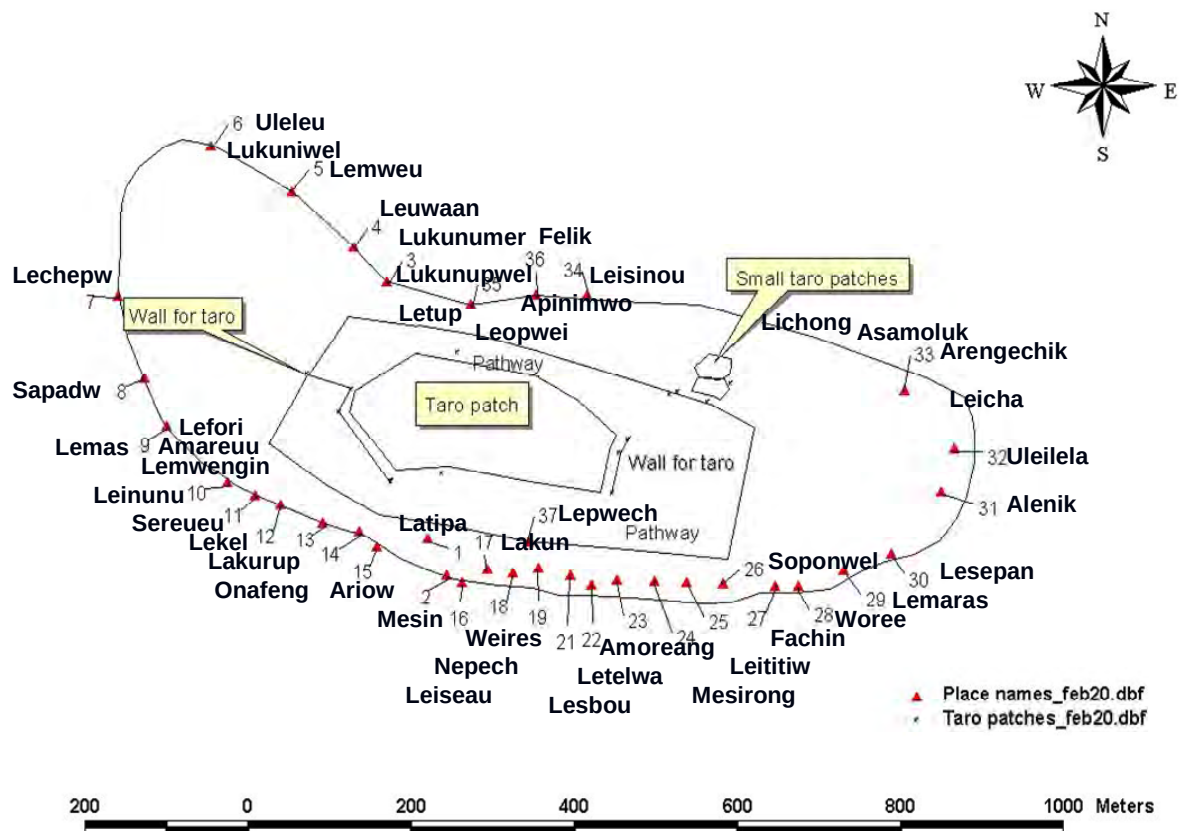
The research team spent four days on Moch. Our fieldwork consisted of formal interviews and informal discussions with people about their experiences of climatic events, the changes they have noticed on the island, and what the causes of these changes might be. The interviews were formally arranged through appropriate community channels by Mr Doropio Marar (see Fig 4). We conducted five formal interviews with three men and two women, all of whom were over 60 years old and considered to be elders of the community. The interviews were open-ended and semi-structured around particular themes relating to the causes and effects of climatic events and noticeable environmental changes on Moch. We interviewed people at their homes, and walked with them as they showed us the special places affected by typhoons, storm surges and 'high tide'. Interviews were also actively solicited by two younger men who were eager to share their



Fig 4: A formal interview with an elder on Moch

experiences of extreme climatic events and to show us the impacts of climatic events on their island places. Permission was granted to audio-tape the interviews. Informal discussions and conversations occurred regularly throughout our time on Moch and contributed significantly to the study. In particular, the narratives connected to the special places mentioned in the formal interviews were shared, and stories were told in the evening to the researchers, surrounded by an enraptured audience of young and old members of the household that hosted us.

The pilot study also involved a participatory mapping exercise conducted in conjunction with Moch community members. This involved an initial walk around the perimeter of the island to record GPS points of the shoreline and to meet with community members (see Fig 5). During subsequent mapping excursions, the GPS points of important sites and named places identified by community members were recorded. Historical events and place-based narratives of culture heroes and their movements across the land and seascape were mapped to particular places identified by research participants (see Map 2). Photography was also used to record these sites and places. Through this exercise, Moch Island was revealed to us as a cultural web of places constituting a landscape steeped in heritage significance.



Map 2: Named places on Moch



Fig 5: Dr William Jeffery (with Mr Doropio Marar) taking a GPS reading of the shoreline

3.3 Analysis of Results

Taped formal interviews were transcribed and collated. Responses to particular questions were arranged thematically and recurring themes were identified. During the study, researchers also took notes on informal interviews and conversations and documented ethnographic observations of 'everyday' life. These daily fieldnotes facilitated interpretation of the significance of the key themes identified in the interviews.



Fig 6: Informal discussions contributed significantly to the study

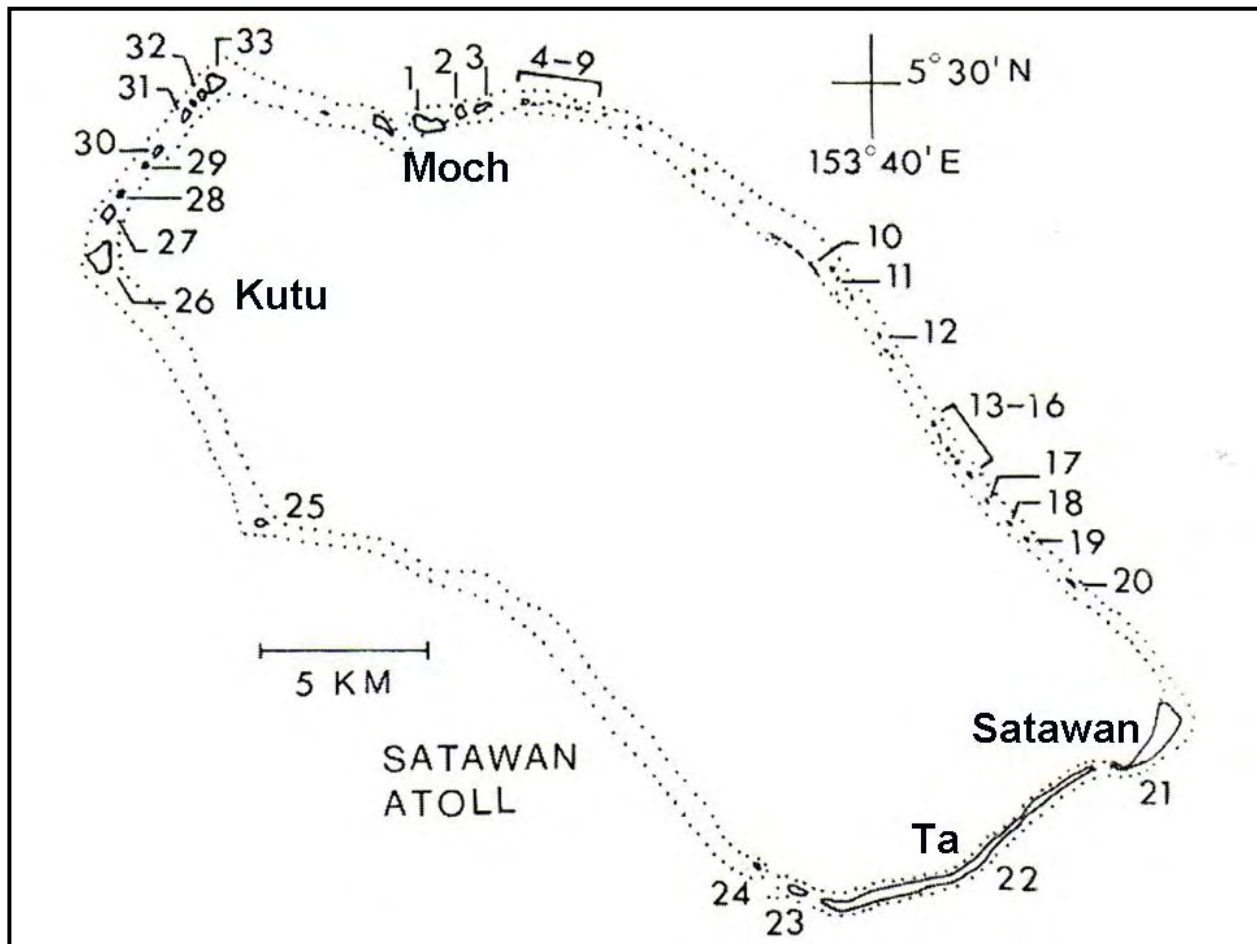


Fig 7: Formal interviews were recorded on Moch

4. Geographic and Demographic Context

4.1 Geography

Moch is one of four inhabited coral islands of Satawan Atoll in the Mortlock group of islands, Chuuk State, FSM. Whilst the atoll has a total area of 419km² (including the lagoon), the land area is only 4.6km². The four inhabited islands are Satawan, Ta, Kuttu, and Moch, with Satawan and Ta municipalities being statistically grouped with the "Lower Mortlocks", and Kuttu and Moch with the "Mid Mortlocks" (see Map 3).



Map 3: Satawan Atoll (Buden 2007)

Moch Island is a typical coral atoll island 0.28 square km in area. Moch has a flat topography, and whilst the exact elevation is not recorded, the maximum elevation of islands in the Mortlocks is 3-5 m above sea level (Buden 2007:416). The only source of water on Moch is rain which percolates through the coral soil and forms a freshwater lens which supports a central taro patch surrounded by breadfruit trees and coconut trees.

4.2 Demographics

Chuuk, with a population of approximately 53600, is not only the most populated state within the FSM, but is also the most densely populated with an average of 1094 persons per square mile, nearly three times the FSM national average. The population of Weno, the state's major urban and administrative centre located in Chuuk Lagoon, increased from 4367 in 1958 to 16121 in 1994. As there has been an ongoing trend of out-migration from the Outer Islands to Chuuk Lagoon since the end of World War II (Gorenflo 1995: 96-97, FSM 2002, Marshall 2004:114-117), it is not surprising that the percentage of the total population of Chuuk living on Weno has nearly doubled since 1930. This is compared with the Outer Island region of the Mortlocks where its proportional distribution decreased from 20 percent to only 13 percent of the overall population.

Moch is included in the Outer Island region of the Mortlocks. Whilst approximately 85 percent of those people born on Moch remain living on the island, over 90 percent of those living elsewhere reside on Weno, with the remaining few living on other islands in the Mortlocks. Despite this migration of people to Weno (or because of it), the population of Moch has increased from 278 in 1930 to 837 in 1994, and then to 854 in 2000. However, the current population of Moch is in dispute, with locals claiming it to be higher than the official figure taken from the census material (FSM 2002). The 1989 census report states that Moch is the most densely populated municipality in Chuuk (FSM 1992).

There are about 100 households on Moch with an average of eight to nine related persons per household. Houses are distributed between three villages, Inapwei, Peimoch, and Eor, and are concentrated on the lagoon side of the island. Most of the houses were built after 1970, with an apparent flurry of building activity between 1970 and the early 1990s, possibly as a result of the

adverse effects of Typhoon Pamela in 1976. There are only about 20 houses on Moch that are complete concrete constructions. Whilst most houses have concrete foundations, only 65 percent have outside walls of concrete. Metal sheeting, plywood, thatch, and local wood form the outside walls of many houses, and metal sheeting is the dominant roofing material (see Figs 8 and 9). As there is no piped water source on Moch, people rely solely on their own rainwater tanks and wells. Cooking occurs on open fires outside of the house, often in cooking huts or shelters. There is no central electricity supply on Moch. Some households have access to a small solar power system and/or a generator. Whilst solar power is used to provide lighting and operate a CB radio, the cost of fuel limits the use of the generator to special events and an occasional DVD screening. CB radios, owned by only about 18 percent of households, are the only form of direct communication with Weno and other islands. (FSM 2002)



Fig 8: Different structures: plywood and sheet iron (left) and local wood and thatch (right)



Fig 9: A concrete house with sheet iron roof

As is the case for all Outer Island regions of Chuuk, subsistence activities remain the primary way of life on Moch. The main subsistence activities include fishing, horticulture (taro, breadfruit, coconut), and small animal husbandry (pigs and chickens). For those households with an income, the average income for 1999 was US\$4071.

5: Analysis of Interviews and Ethnographic Observations

5.1. Climate change understandings

5.1.1. CAUSES OF SEA LEVEL RISE

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 rise.

Sea level rise was a major concern for all of the people interviewed. In response to the question about the cause of sea level rise, most of the interviewees said that they heard it was caused by the ‘ice melting’, generally with specific mention to the ice at the North and South Poles. We were also told that the people on Moch talk a lot about the ice melting and that even older people know about it. All except one of the people interviewed recognised the term ‘global warming’. One person initiated the discussion of ‘global warming’ during the interview, and three of those people interviewed linked the concept of global warming with global issues and human activities such as pollution, airplane smoke, the ozone layer and greenhouse gases. Responsibility for global warming was placed on ‘big countries’, ‘big machines’, and ‘big nations’ by two of the interviewees.

5.1.2. ENVIRONMENTAL AND SOCIAL CHANGES ON MOCH

High Tide

Look at that island over there. You see there, there is a tree, coconut tree and other kinds of trees that’s already in the water. So what can we do. That was only after a few years.

According to the people interviewed, the coastline of Moch is changing rapidly. Most people spoke about the erosion of beaches and land, the submergence of coastal vegetation, and the destruction of seawalls (see Fig 10). All of the participants noticed tidal changes, and there was a

strong emphasis placed on the increase in height and prevalence of 'high tide'. There was also mention that the high tide season between January and March now extended through to the summer period (mid-year), and that the frequency and damage caused by high tide has increased. Seawalls were often relied upon to evidence 'high tide'. In contrast to earlier times, waves now come all the way up to the top of some seawalls, and there is ongoing work by some people to increase the height of their seawalls. One person interviewed spoke about the disappearance of the beach after the seawalls were built in the late 60s and early 70s.



Fig 10: The erosion of the shoreline

Subsistence

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.

All of the people interviewed were concerned about the impact of high tide and saltwater inundation on their subsistence crops. In particular ‘there is big changes at the taro patch’, both on Moch and on the adjacent uninhabited islands. The impact of high tide on the common taro patch in the centre of Moch was a concern for some people interviewed, and others mentioned that they are no longer planting taro in the common patch on the uninhabited island adjacent to Moch. We were also shown an example of a smaller taro patch on Moch that is no longer productive due to saltwater coming up from the ground. Other crops, such as breadfruit trees, coconut trees, and pandanus are destroyed by typhoons, big waves, and high tide, and according to one participant there are now fewer fish on the reef.



Fig 11: A healthy taro patch (left) and one affected by saltwater inundation (right)

Special places

This place, this is a site for the warriors, Mochese warriors. Brave men. They live in this mans house they call Letup. And this site was affected during the Pamela and 2002 tidal waves, big waves.

Some people were worried about the impact that high tide and wave inundation has had on certain special places deemed important to the history of the island. Many of these places are well known by the people of Moch as sites for the great warriors that made a settlement on the island. We were told that the shoreline of the place called *Amoreing*, the site of the men's house where the warriors met before going to war, was already affected by high tide and wave action, and that the place called *Letup*, also a site for Mochese warriors, was affected during Typhoon Pamela and the 2002 waves (see Fig 12). Other special places mentioned by those interviewed include *Litrup*, where the giant starts to eat people, the current meeting hall which is the set place for the paramount chief of Moch, and two places connected to the flying canoe story.



Fig 12: We are told about this place named Letup, a Mochese warrior site

When we heard about typhoon warning we went to the church, all the people.

Every research participant talked about the importance of the church during extreme climatic events (see Section 4.2.3 Buildings and Structures). The tangible structure of the Catholic Church dominates contemporary heritage values and associated historical narratives constitute intangible heritage values that were emphasised during our research. The first crucifix brought to the Island was identified to us as a valuable heritage object, embedded in narratives of the conversion of Mochese people to Catholicism.



Fig 13: (Clockwise from above): The original crucifix from Lukunoch, the contemporary Catholic Church, and the original Anglican Church.

According to one participant, there has been a rapid increase in the population on Moch since the late 1990s and this impacts the ability of the island community to be self sufficient. A person who lives on Pohnpei and visits Moch every year has also noticed that the population on the island is increasing, and that there appears to be an increase in the proportion of younger and older people to those of middle age. One of the interviewees noted that younger people do not respect the elders like they used to maybe 30 years ago, and another noted that there are lots of rapid changes for culture or custom, and also for religion.

5.1.3. FEELINGS OF ANXIETY AND LOSS

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

Evacuation

In the deepest of my heart I really need to move out from this place... Seems like if I stay that means I suicide myself here. Because I expected it to be happen again.

All of the people interviewed told stories and recounted memories of their experiences of Typhoon Pamela and/or the ‘big waves’ in 2002. These memories, in conjunction with their empirical knowledge of the continual increase in height and frequency of ‘high tide’, contributed to expressions of anxiety for the safety of their families living on Moch. There was a general expectation that ‘big waves’ will get bigger and that the island will need to be evacuated some time in the near future. Indeed, some of the elders interviewed expressed concern for the next generation of people on Moch who they see as the ones most likely to have to contend with evacuation. Whilst one person is already planning to leave the island with his family because, as he says, staying on Moch is ‘suicide’, other people say they would only leave if all of the people on Moch were to be evacuated or if they received ‘word to evacuate’ from the government. There was general concern expressed about the level of support that people on Moch could expect from external sources in the face of evacuation and where their families could resettle if and when they have to evacuate.

A sense of loss

That's my late husband over there, laying to rest....if we leave, waves just come and destroy and there will be no history.

It is going to be very sad for me just to borrow land from someone.

People were concerned about the loss of subsistence practices in the face of climate change, especially the ability to produce and eat their own taro and breadfruit. Some of the participants specifically mentioned that these crops, 'their foods', would be missed if they had to evacuate the island, and another person said he would miss fishing and the possibility of passing down his knowledge of secret fishing spots to his children. Evacuation would mean leaving the land and sea-based places that are owned on Moch by particular families and clan groups. People interviewed were concerned about the possibility of no longer being a 'landowner' in places of resettlement, and also about leaving those relatives who are buried on their land on Moch. One participant said that whilst he would miss the island, he could never forget his experience of the 2002 wave.

5.2. Contemporary practices in relation to climate conditions and in response to climatic events

5.2.1. SEAWALLS

Seawalls are a prominent feature of the island and involve ongoing building and maintenance using clumps of coral that are either dry-walled or reinforced with cement. According to the people interviewed, seawalls are built on Moch to protect the coastline from erosion by tidal and wave action, and to mitigate the effects of 'high tide', storm surges, and big waves that occasionally inundate the island (see Fig 14). We were told that the building of seawalls was a new practice introduced on Moch during the late 1960s and early 1970s, although it is unclear whether the decision to build seawalls was a community initiative or a state proposal. Whilst individuals generally build and maintain their own seawalls, the concrete walls that have been built around the eastern and western ends of the central taro patch were built by the whole community with money from the Trust Territories (see Fig 15).

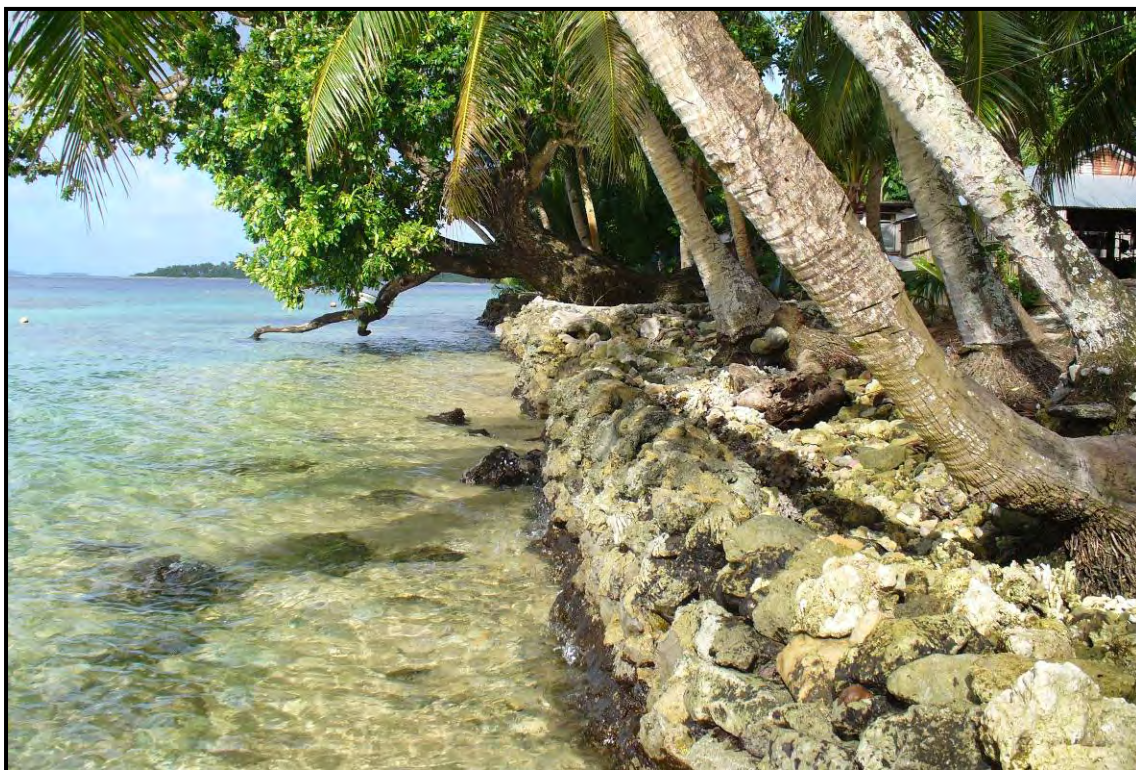


Fig 14: A well maintained seawall



Fig 15: Concrete wall protecting the central taro patch from saltwater inundation

5.2.2. PRAYER, HOLY WATER AND ROSARIES

Catholicism is the predominant religion on Moch, with 95% of the population identifying as Catholic. In order to protect the island community from ‘high tide’, big waves, and typhoons, some of those interviewed said they pray and hang rosaries and bottles of holy water on trees along the shoreline (see Fig 16).



Fig 16: A bottle of holy water hanging from a coconut palm on the shoreline

5.2.3. BUILDINGS AND STRUCTURES

During the past, the Catholic Church was the main concrete building on Moch used by the community for protection during typhoons and big waves. Indeed, all of the people interviewed mention the church as a place of refuge from the winds, rain, and big waves associated with Typhoon Pamela in 1976. During the 2002 big wave event, one participant explained how people stood on the raised earth walls that surround the central taro patch in order to escape from the incoming waves. The newly built community hall and school building provided further protection and longer term shelter for those whose houses was damaged by the waves (see Fig 17). More people on Moch are now building their own concrete houses (see Fig 18). One person we spoke with, whose house was badly damaged in the 2002 waves, is in the process of building a new house with concrete floor and walls. He hopes it will be strong enough to protect his family during future climatic events.



Fig 17: The school building on Moch



Fig 18: Concrete house construction

As warnings of extreme climatic events do not always reach the people of Moch in time for extensive preparation, the strong communal buildings and the raised earth around the taro patch are the essential elements of a response strategy. However, people live with the ongoing reality of these events and engage longer term preparation strategies that include the construction of stronger homes.

5.2.4. MANGROVES

Whilst there is only one small clump of three mature mangrove trees growing on the shoreline, some people on Moch are attempting to grow mangroves in coastal areas prone to the effects of high tide and wave inundation (see Fig 19 and 20).



Fig 19: Small clump of mangrove trees

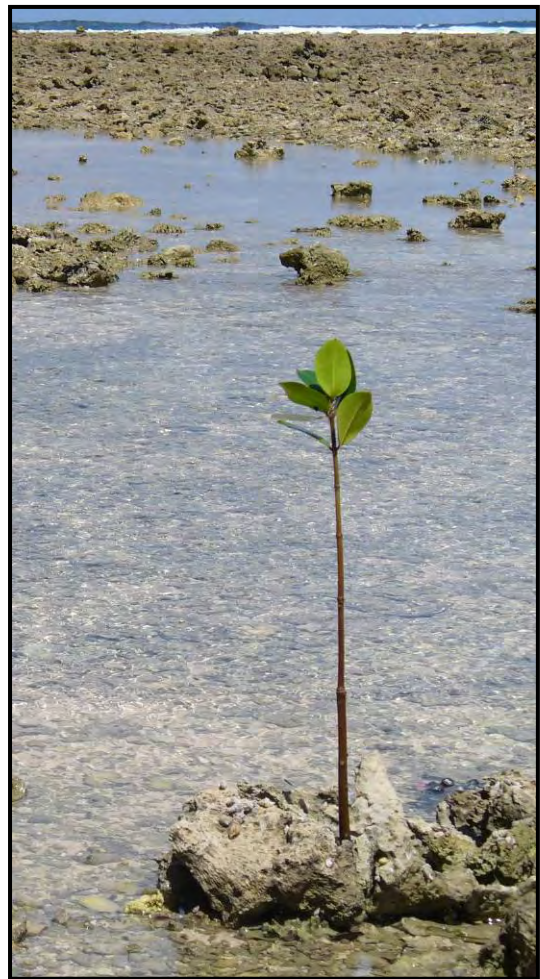


Fig 20: Mangrove seedlings planted
in the coral on the shoreline

5.2.5. SOCIAL CAPITAL

All of the elders interviewed have children living away from Moch, mainly on Weno, but also on Guam, Hawaii, and the mainland of the USA. We were told that their children have generally left the island to pursue work and education opportunities that are not available on Moch. Certainly there are limited possibilities for paid work on Moch, and schooling is only available up to year 10 of high school. Those that leave Moch to complete high school may also go on to further study or find employment that prevents them from returning to their home island. Whilst most families on Moch seem to have children and other relatives living away from the island, the 'everyday' reliance on these relatives is minimal. Whilst some people on Moch receive parcels from their children who are living away, one participant expresses the seemingly shared sentiment that 'most of the time just rely on Moch'. However, during times of need the elders said they would ask for support from their children who are living elsewhere. Indeed, a person who is living and working on Pohnpei says his family on Moch writes to him if they need something and he sends whatever he can afford. The elders placed an emphasis on the support offered by their children and other relatives who are living on Weno. Some families on Moch maintain daily radio contact with family members on Weno, and the boat that is owned by the Moch Municipal Council operates a regular service between Moch and Weno, transporting people and goods back and forth between the two islands. This reveals a particular connection between Moch and Weno based on familiarity and regular contact.

Whilst clan relationships suggest the possibility of hospitality and support, people much prefer to stay with close clan members and family. This not only draws people more often to Weno than to other places away from Moch, but also facilitates support on Moch itself. We were told by one participant that family members living in a different village on Moch provided his immediate family with support following the 2002 waves that affected one part of the island more than the other. Also those with stronger concrete houses are able to offer shelter to those whose houses are more likely to be damaged by such events. Whilst there may also be some support from neighbouring island communities such as Kutu and Etal, these communities are generally affected by the same climatic event and are likely to be experiencing food, shelter, and water shortages themselves.

5.3. Expressed needs in face of disaster

During our stay on Moch people identified a number of areas where they would require support in the face of climate change:

- support and materials to build seawalls to increase height above sea level of the island;
- in the event of any necessity to evacuate, support to resettle in a place where they would be made welcome;
- further research to document, record and safely store cultural knowledge for the sake of future generations;

In addition, we were requested to relay their experiences of climate and its impact on their island to the global community, including the United Nations, as well as their own state and national governments.

6: A Cultural and Social Landscape: Heritage Analysis

Cultural heritage is not limited to material manifestations, such as monuments and objects that have been preserved over time. This notion also encompasses living expressions and the traditions that countless groups and communities worldwide have inherited from their ancestors and transmit to their descendants, in most cases orally. (UNESCO)

Even in the very brief trip to Moch we were able to record with the help of key research participants a home island rich in significant heritage places. The landscape revealed itself as a container of knowledge carried in place names and place narratives associated with the exploits of ancestral heroes.

In one example, we were told the story about the two flying canoes, carved from a breadfruit tree that took ‘months, or even a year’ to cut down using clam shells. The canoes were carved underground to stop others from watching, and when they were finished they could fly to Chuuk Lagoon and back in less than one hour, the same journey that took us 22 hours one way on the *Lien Pukial*. The man who carved the canoes asked his sons to go to Chuuk Lagoon to get some things. He advised them on flying the canoes and told them not to change anything. The sons disobeyed their father’s advice and the canoes disappeared up into the sky. We were shown the place where one of the canoes was carved underground. The land is sunken in this place, and one older man remembers rainwater collecting here like a swamp, even after the surrounding land had dried up.

While mapping the island 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’. While we have not yet done detailed ethnography on Moch, Ward Goodenough (1978: 172) discusses the extent and importance of named places on Romonum, an island in Chuuk Lagoon. According to Goodenough (1966:95), “every plot of land and natural feature bears a name”. The land tenure system on Romonum constitutes a complex social institution that evidences the importance and significance of named places. The named places are owned by members of particular lineages, and various forms of ownership, property transaction, and group organisation connect people to specific places and ensure their access to land and food. The connections between people and

place constituted through group organisation and the land tenure system are significant for the continuing care and welfare of island people and clan groups.

Similarly, Mac Marshall (2004:38-9) discusses the connection between people and land on Namoluk. He notes that:

Namoluk kinship and marriage is grounded in land...To survive on an atoll one must have access to land, for it is the source of food...This equation of land with food is explicit in the way chon Namoluk refer to land ... 'food: to eat'...As is common throughout Micronesia, and in many other parts of the Pacific, kinship is commingled with land. Just as with shared blood, to share land with someone is ipso facto to share kinship. This equation of "mud and blood" is pertinent here because it helps us understand the passionate attachment that most Namoluk 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.

In earlier work, Marshall (1999:125) argues that it is impossible to fully understand Micronesian kinship without attending to the meanings of land and food in these societies. 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. Not only does the preparation and distribution of food grown on shared land define who kin is, such food also represents the kin group at community events such as weddings, funerals and major holidays.

During our short field trip we similarly noted the importance of food (particularly taro and breadfruit) to people on Moch. Our visit not only contributed to the exchange of food and supplies between Moch and Weno (see Figs 21 and 22), but also to the distribution and sharing of food between kin who shared land on Moch. One of the themes that came out of our interviews was that if people had to leave their island, they would miss their food – while they could eat taro from another place, taro from their own island is important. That is why people transport food stuffs grown on Moch to Weno and elsewhere, even though these same foods are grown there.

This intimate link between land, food and kinship and the value of the principles of reciprocity, generosity and balance in terms of sharing the produce of the land and sea is expressed in the



Fig 21: Taro and bananas travel between Moch and Weno



Fig 22: Coconuts and breadfruit travel between Moch and Satawan

Mochese myth of an ancestral Giant called Imailuk of Sowmoch Clan. We were shown places associated with this story. Imailuk ate all the food on Moch and then started eating all the people. He consumed all the members of his clan, except for his brother who escaped to the uninhabited island of Apuson, which lies beyond the island of Afren, between Moch and Kutu. The giant followed, and his footprint can be seen on the reef between Moch and Afren. Fishermen on Apuson saw the giant coming for his brother and prepared a trap. They cooked a big feast of fish, breadfruit, and coconut, and when the giant arrived they kept feeding him until he was so full that he fell asleep. Once he was asleep the fishermen tied his hands and feet to a breadfruit tree. They heated basalt stones on the fire and poured these hot stones down the giant's throat until he died. The place where the giant struggled is now the taro patch on Apuson.

The centrality of named places, as evidenced by Goodenough, reflects the sentiment of attachment to place that Marshall found on Namoluk. Marshall (2004:10) suggests that “humans

imbue particular places with names, with a history, and with emotional attachment”. We found a similar attachment to named places on Moch, expressed, as mentioned earlier, through place based narratives that hold historical knowledge and meaning. Indeed, one person on Moch told us that if waves destroyed the island then there would be no history. Certainly the naming of space, be it land or sea, brings such space into social existence as places imbued with meaning. Named places on Moch may be as little as 20 feet long by 10 feet wide, and we are told that the names carry a lot of secret meaning and a lot of history. While most adults on Moch know the names of places and their surface meanings, the underlying meanings, are often hidden.

Although people live in an extended universe, a connected sea of islands and there is a concern with and focus on seascapes, the boundary between land and sea remains marked. Land is highly valued and people actively work to nurture the land, the taro patches, and to protect their islands from the encroaching sea. The practice of building sea walls has become common practice since the 1970s (as remembered by one informant). Yet there are also intangible means that people use to keep the sea at bay and to protect themselves from high tides and storm surges. For example, the practice of hanging holy water and rosary beads on the foreshore.

Cultural heritage, we argue, is anchored in place, even in a region such as Micronesia, where great fluidity and movement (of people, objects and ideas) has created a rich and dynamically transforming seascape. It is their *particular* home islands that provide the fundamental basis for people imagining and practicing the flows of connection that link them to others in a wider social world. People’s sense of identity is rooted in the particular islands that have sustained and nurtured their ancestors for generations. It is this strong sense of being anchored to place, we suggest, that allows people to travel far from their island homes. It is from these places that those who sail forth take their bearings. As Joachim Peter, the Director of the College of Micronesia, who is from the Mortlocks, writes:

The phrase “point of departure” has special significance in islands with deep and active seafaring traditions. It refers to both metaphorical and physical spaces from which seafarers launch their journeys. In Chuukese traditions of seafaring, this point is called “Muir”, steering point, and also connotes “home” or “island”. Travellers set their course by using the point of departure, or home/island, as a guiding point. (cited in Marshall 2004:133)

7: Findings and Recommendations

7.1 Findings

- Research participants expressed concern that their way of life, history and place-based knowledge of Moch would be lost in the event of evacuation and requested that the research team record and preserve oral history, narratives, genealogies and other aspects of cultural heritage for future generations;
- Mochese and other peoples of the Mortlock Islands are actively engaged in making sense of and interpreting what they have heard regarding scientific predictions of climate change;
- While not actually living in fear, many people are concerned about the possibility of future evacuation as a result of sea-level rise and related food insecurity. Yet evacuation was considered a last resort and a number of research participants said that they would only leave the island if the whole population was forced to move *en masse*;
- All the research participants referred to kinship networks across the region and engaged in practices of exchange within these networks. This network provides an essential means of social and economic support;
- People are actively and continuously building and maintaining sea walls and they clearly considered these to be a necessary and effective response to high tide and sea level rise. They called upon financial and other support to build stronger and higher seawalls in the face of impending sea level rise related to climate change;
- One research participant expressed doubt about the effectiveness of sea walls and recalled that after people began building sea walls, the beaches that he had played on as a child, began to disappear;

- We mapped one place where mangroves seedlings had been planted as an alternative means of future protection of the shoreline;
- We documented taro patches that were healthy, but were also shown patches that had been destroyed by salt water inundation. We were told that the common taro patch on the adjacent uninhabited island was no longer productive due to salt water inundation.

7.2 Recommendations

- That outer islander knowledge and concerns about climate change be recognised and incorporated into national and regional responses;
- That heritage values are taken into account when documenting the social impact of climate events;
- That existing social strengths and adaptive cultural practices inform the development of policy and response planning associated with climate change;
- That social support networks are mapped across the region so as to document social capital and assess resilience of communities in the face of climatic events;
- That further research is conducted on oral histories, narratives, place-based knowledge, social practices and cultural heritage values that people fear will be lost due to climate change factors;
- That comparative studies of other islands and island groups are conducted to assess different local understandings of and responses to climate change;
- That comparative studies of other islands and island groups are conducted to assess local level vulnerabilities and resilience to climatic factors.

Appendix A: Satawan

The research team made a short supplementary visit to Satawan Island at the southern end of Satawan Atoll (see Map 3). We were accompanied by the Governor's Representative for the Mortlocks, Mr Samson Manuel, who is from Satawan Island. We were shown effects of wave action on seawall structures and changes to the shoreline that had occurred over the lifetime of research participants (see Fig 23). In particular, we were taken to a Japanese gun on the foreshore which, according to our informants, had been approximately 20 meters inland when first installed. Currently, at high tide, the waves reach the base of the gun (see Fig 24).

We were shown a number of other WWII sites (including the Japanese era power station, bunkers, guns, and tanks). These had become integrated into the cultural landscape of Satawan and part of everyday life activity.



Fig 23: High tide breaches the seawall on Satawan



Fig 24: The sea encroaches on the gun



Fig 25: Farwell from Satawan

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