Exploring Community Engagement in Climate Change Planning:

The Case in Samoa

By

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Abstract

Coastal communities within Pacific Island Countries (PIC) are vulnerable due to the rising and volatile nature of the sea as a result of climate change. Adaptation strategies and community-based approaches have increasingly been advocated for by environmental organisations, policy makers and researchers. Community-based approaches have, in turn, begun to promote the values of meaningful community engagement and integration of traditional ecological knowledge (TEK) into adaptation planning. This research explores the extent to which community engagement and TEK is utilised at both the national and local level adaptation planning in Samoa. An assessment of policies and plans assesses the national level context, whilst the community level context was explored through a study of the coastal village of Tafitoala.

A qualitative approach is employed in which semi-structured interviews were used to collect the perspectives of community members, government personnel, and Non-governmental Organisations (NGO) staff to provide a range of viewpoints.

Using Samoa as my case study, the research findings demonstrated that community ideologies and values, and community governance structures determine the efficacy of adaptation programmes. Findings also emphasised that although there is a vast amount of TEK used within local communities, documentation and verification of TEK is required in order for it be integrated more effectively into adaptation planning. Whilst the need for meaningful community engagement had already been identified by government and NGO agencies as a priority for effective adaptation, with agencies currently implementing strategies to encourage its integration, more is required for strategies to be strongly embedded into the practices of local communities.

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List of Abbreviations

CIM	Coastal Infrastructure Management Strategy
CDCRM	Community Disaster and Climate Risk Management program
DMO	Disaster Management Office
IPCC	Intergovernmental Panel on Climate Change
MNRE	Ministry of Natural Resources and Environment
NAPA	National Adaptation Program of Action
NPCCC	National Policy on Combating Climate Change
PACC	The Pacific Adaptation to Climate Change project
PIC	Pacific Island Country/ies
SDS	Strategy for the Development of Samoa
SIDS	United Nations Small Island Developing States
SPREP	Secretariat of the Pacific Regional Environment Program
TEK	Traditional ecological knowledge
UNFCCC	United National Framework Convention on Climate Change

CHAPTER ONE

Introduction

1.1 Background & Research Rationale

Anthropogenic greenhouse gases are already affecting global average climate conditions and climate extremes (Hergerl and Zwiers, 2007). As a result of the accumulation of greenhouse gases emitted in the past and their continuous effects on the climate system, the rate of global warming in the next few decades is projected to be substantially faster than in the last few decades (Meehl and Stocker, 2007). This has brought about the realization that a certain amount of global climate change will occur, regardless of future mitigation efforts, and societies need to take steps to minimize losses (Schroter *et al.*, 2005). To plan or prepare for potential climate change impacts, two broad responses are possible: mitigation or adaptation. Global efforts to deal with the problem of global warming have, in the past, concentrated on mitigation, with the aim of reducing and possibly stabilizing greenhouse gas concentrations in the atmosphere (UNFCCC, 1992). However with slow progress in achieving these changes, adaptation is now viewed as a necessary plan of action to respond to the vulnerability to anticipated negative impacts of climate change.

The islands of the Pacific are particularly vulnerable to climate change (Barnett, 2001) and action to reduce their vulnerability is now recognised by thier governments as a priority. Pacific Island Countries (PICs) are vulnerable to climate change due to their small size and low lying topographies (Pernetta, 1992). A climate change overview of the Pacific by the Secretariat of the Pacific Regional Environment Programme (SPREP) states that 'most islands are experiencing climate change impacts on communities, infrastructure, water supply, coastal and forest ecosystems, fisheries, agriculture, and human health' (SRPEP website, n.d). These impacts are likely to drive significant changes in the ecosystems upon which Pacific Island people depend for their livelihoods and culture. Many projects have since been implemented throughout the Pacific region, led and funded mostly by regional

organisations that look to address the various impacts of climate change. Samoa is one such country which has continuously been hit by extreme weather events, which have been associated with the impacts of climate change. Increasing efforts are being made to improve Samoa's resilience to withstand such events (World Bank Report, 2010).

In addition to the growing awareness of the need for crucial adaptation measures, the literature also indicates a growing belief that members of the communities must not be neglected when developing adaptation plans. Institutional support should be provided to support community agency for future implementation efforts to enhance long-term capacities for adaptation (Yamin *et al.*, 2005). In order for adaptation efforts to succeed, close collaboration is required between climate scientists and policy analysts as well as community members (Fussel, 2007). This belief grows alongside calls to increase efforts to integrate science with local and traditional knowledge in order to solve problems in which neither science nor local knowledge alone are sufficient to solve (Berkes and Jolly, 2002). This integration could potentially see higher levels of productive community involvement in the ongoing process that is climate change adaptation planning. Traditional knowledge and coping strategies to prepare for and respond to disasters are therefore important for adaptation success. These traditional sets of knowledge need to be understood by external organizations seeking to offer support to PICs to increase their long-term effectiveness (Fletcher *et al.*, 2013). However, little has been done to incorporate this knowledge into formal climate change mitigation and adaptation strategies (Nyong *et al.*, 2007).

Existing literature on climate change adaptation planning indicates that there is a need for locally specific research that includes the perspectives of local communities. With a growing number of adaptation projects being implemented in Samoa, exactly how community involvement could improve the effectiveness and sustainability of climate change planning projects has not been well researched. There is also a gap in literature that considers the linkages between traditional ecological knowledge (TEK) and adaptation strategies through locally specific research. To address this gap, this research aims to identify the ways, if any, in

which community engagement and local knowledge could contribute and improve the effectiveness of climate change planning projects. It also seeks to contribute more generally to the existing body of literature around community engagement.

Adaptation to climate change is highly context specific because it depends on the climatic, environmental, social, and political conditions of any given area (Fussel, 2007), hence the decision to carry out a study within one particular vulnerable community in Samoa. Findings from this place-based study could potentially assist other communities with similar conditions. It has been noted that focus on community-based research is underemphasized (Riedlinger and Berkes, 2001) and using outcomes of climate models and scenarios are often too broad for useful planning and adaptation at local scales (Jones, 2001). Riedlinger and Berkes (2001) indicate that the main reason for the lack of emphasis on community-based research is due to the lack of a framework to outline how traditional knowledge can contribute to climate-change research.

1.2 Research Aim and Objectives

The aim of this research is to: **assess local community engagement in climate change adaptation planning within a coastal community in Samoa, in order to identify opportunities to assist in improving the effectiveness of future climate change planning.**

To address this research aim, an assessment of community engagement will be carried out at both the national and local level. An assessment of policies and plans provides a national level context. Furthermore, community level context is explored through the study of the coastal village of Tafitoala.

This aim necessitates the following research question:

> **What are the barriers and enablers to community engagement and traditional ecological knowledge use in the climate change adaptation planning process within a Samoa coastal community?**

The research aim and question will be answered by fulfilling the following objectives:

Objective 1: To carry out a thorough literature review outlining the barriers and enablers of community engagement and traditional ecological knowledge use in adaptation planning, and the relationships between them.

Objective 2: To observe, document and interpret the nature of community engagement in climate change planning through a field study in Samoa, using the literature review to frame these investigations.

Objective 3: To identify potential responses based on interpreted findings and develop generalised conclusions and recommendations for practice.

1.3 Methodology

A qualitative methodology was employed for this research. The methods used for collecting, analysing and evaluating data for this research will be discussed here. Furthermore theoretical perspectives including positionality, reflexivity, and ethics are also included. Reflection on these theoretical perspectives help to frame the research process, by taking into account that the research process is a situated process, or as described by Shaw *et al* (2010), "…the research process is always "in the middle" of your own experiences and endeavours…" (p.19).

1.3.1 Positionality

Reflexivity is increasingly acknowledged as a necessary process in improving research quality (Darawsheh, 2014). Reflexivity encourages researchers to scrutinise and reflect on their own subjective knowledge and partiality they bring with them to the research, to allow for a better understanding of the inevitable intertwining of the researcher's position and the knowledge produced by the research (Finlay, 2002; Harraway, 1998). The need for reflection on one's

knowledge and biography is necessary as the research and the researcher cannot be separated. Therefore, it is inevitable that research will be transformed in some way by the positionality of the researcher (England, 1994). Put simply, the sort of knowledge created depends on who its makers are and how the makers affect the context in which knowledge is produced.

Some aspects of positionality, as discussed by Chacko (2004), include race, gender social class, political affiliation, religion, and age. Understanding and acknowledging my own positionality thus gives me the opportunity to reflect on how my position has influenced aspects of this research, including the aims, interview questions, and how the research was conducted and written.

The foremost aspect of my positionality is my Samoan heritage. I was born and raised in Samoa and the Samoan culture has largely influenced the way I observe and experience the world. An example of the influence of my environment growing up and its relation to my research is my identification with work advocating community engagement. This may be due to prolonged exposure to a culture that promotes community engagement in most aspects of life. Community units in Samoa are villages, and matters that may affect the village are usually discussed and resolved by village *matai* or leaders. It is for the long-term benefit of villages that village leaders remain well connected and communicate effectively with one another. From this, I believe that initiatives implemented within communities for community benefit, will ultimately need the involvement and buy-in from the community if that initiative is to prosper.

My age and status as a university student were both aspects of my subjectivity that dictated how I was to carry myself and speak when I approached the participants in this research, in accordance with accepted societal norms. Respect for elders in all aspects of everyday life is of high importance, sacred even, in the Samoan culture. I took great care to show respect in my approach to and communication with the participants. Showing the participants respect as elders helped build trust, allowing for greater depth in our dialogue during the interviews.

Being of Samoan descent and having knowledge of the Samoan culture and language afforded me an emic perspective on this research. This served my research in several ways, a major one was that research participants were more likely to view me as an 'insider', despite my being a postgraduate student studying in New Zealand, and were therefore more open to my questions. I was also aware of protocols and social conduct in various settings such as village gatherings and one-on-one meetings with a village chief or other members of the community.

Studies have cautioned that as a researcher, there are other factors that could work as a barrier despite being of the same ethnicity and cultural background, such as education and gender (Merriam *et al*., 2001). These factors were crucial to be aware of while interacting with participants, and efforts to further reflect upon my identity in relation to others were ongoing throughout the research process destabilising the notion of an 'all-knowing researcher' (Madge, 1992. p296). As a student studying in an overseas institution, I was cautious that I would be perceived not as a fellow Samoan citizen joining in their effort to respond effectively to climate change but instead as an outsider only trying to collect information.

Finally, it was important to recognise that although there is a need for reflexivity, it is a complex process. Despite efforts to reflect and analyse one's position as a researcher, it is not always possible to fully situate the research (Rose, 1997).

1.3.2 Methods: Case study

A case study research design was used to assess community engagement and TEK use in developing and implementing adaptation strategies within a coastal community in Samoa. A case study approach enabled me to develop a detailed description and analysis of the community of interest, within its specific contextual conditions. Creswell *et al.* (2007), notes that a case study approach allows for the exploration of a bounded system over time through detailed, in-depth data collection. For this research, it was used to consider the nature and extent of potential barriers and enablers of effective community engagement and TEK use in

coastal climate change planning processes, at the national and local level of Samoa. This was done through interviews of community members and officials that have been involved in climate change planning within a specific coastal community in Samoa.

The local coastal community selected was the village of Tafitoala, located along the southern coast of Upolu island, Samoa. The main reason Tafitoala was selected as the case study site is the village's slow erosion of its coastline, forcing a number of its families to relocate plantations and houses further inland. Furthermore, the village has previously received assistance through a project coordinated by the Secretariat of the Pacific Regional Environment Program (SPREP) in which integrated coastal protection measures were undertaken to help reduce these impacts from the sea. Together, these conditions allowed opportunity to assess the adaptation planning process whereby this village, together with project assistance, attempted to better adapt to impacts from the rising sea.

1.3.3 Data collection tools

1.3.3.1 Semi-structured in-depth interviews

The main data collection tool used for this research was semi-structured in-depth interviews. This style of interview allows for the exploration and understanding of actions within specific settings and to examine human relationships (McDowell, 2010). The main reason for employing semi-structured in-depth interviews in this research data collection process, was to allow research participants to explain their experiences while feeling free to express the "complexities and contradictions" of their individual perspectives (Valentine, 2005. p110) and not be restrained by a rigid set of questions. An in-depth view is encouraged by the nature of semi-structured interviews, in which the interviews take a "…conversational, fluid form, each interview varying according to the interests, experiences and views of the interviewees." (Valentine, 2005). The use of this relaxed conversational process of interviewing allowed for a greater chance of engagement and trust from the

participant, hence the decision not to use a questionnaire or survey to collect information. The collection of in-depth perspectives also allowed for a more nuanced view of the barriers and enablers of community engagement and TEK use in the current process of coastal climate change planning within the selected community.

The interview site varied with each participant. Elwood and Martin (2000) recommend that attention be paid to interview sites when carrying out qualitative research, because the interview participant is not being interviewed in a vacuum. The context of their surrounding environment will have an effect on the participant's willingness to share their knowledge and experiences. The location for the interview sites were chosen in consultation with each participant in order to provide an easily accessible setting where participants felt comfortable.

As recommended by Boyce and Neale (2006), each interview was planned for and guided by an interview protocol and interview guide. Interviews were audio recorded so as not to miss out any interviewee comments, and then were transcribed later that day or as soon as possible. As noted by Dunn (2010), "The transcript should be the best possible record of the interview" (Dunn, 2010. p120). Therefore, to help ensure quality transcription, the recorded interviews, together with interview notes, were personally transcribed as soon as possible after the interview is completed.

Translation also had to be carefully considered to ensure that all participants got the chance to hear the questions and respond in the language they are more familiar and comfortable with – the hope being that this would elicit clearer responses. The meaning of the translated questions needed to be as accurately close to the English version as possible, while being simple enough for all participants to understand. To prepare against potential translation misunderstanding, the research information sheet, consent form, and interview questions were translated from English to Samoan by an official translator for the Parliamentary Office in Samoa. The translated Samoan documents were used by participants who preferred communicating in Samoan. Interview responses in Samoan were transcribed and translated to English by myself, focussing on

"meaning-based" translations rather than being "word-for-word" (Esposito, 2001. p572). The transcript translation from Samoan to English was necessary for easier data analysis.

I translated the Samoan transcripts to English myself, as I was limited by the availability of experienced or professional translators as well as the cost of hiring one. However, I was confident that my in-depth grasp of both languages as well as my technical knowledge of the subjects discussed meant that I was qualified and able to provide an accurate translation. To follow the "meaning-based" translation method as recommended by Esposito (2001), for each transcript I made sure to read the whole transcript through first to ensure understanding of the views being voiced and its overall context, before translating a sentence or a few sentences at a time based on its meaning as opposed to a word-for-word translation.

1.3.3.2 Electronic mail interview

In the event that participants were unavailable to participate in interviews due to having unavailable time or other extenuating circumstances, I conducted interviews over electronic mail. One of the key disadvantages of this mode includes the one-dimensionality of responses, as highlighted by Meho (2006). However, this mode of interviewing will mean the participant can respond in their own time, allowing for the opportunity of in-depth answers. My analysis of the response will be based on the text as obviously there will not be any non non-verbal cues, expressions or body language to provide greater depth of meaning as will be provided in the face to face interviews.

The original data collection plan was to focus on semi-structured interviews, however, one participant, who was not available to be interviewed face-to-face due to a very busy schedule was able to respond to research questions over electronic mail (email). Using e-mail as a data collection tool was convenient for my research in that it gave the participant the opportunity to respond at a time suitable for him at no cost.

1.3.3.3 Secondary sources

For the national level assessment, policy documents on climate change adaptation planning from the Samoan government were identified and evaluated. In particular, the research focussed on Samoa's Coastal Infrastructure Management strategy (CIM) and the more recent National Adaptation Program of Action (NAPA). Understanding policy documents around climate change adaptation provides an insight into the context of adaptation projects being implemented in Samoa and also illuminate the views and approaches of the government of the day, in particular, towards community engagement and TEK.

1.3.4 Research Participants

Participants for semi-structured interviews were selected from three participant groups: 1) members of the community in which a climate change project is being implemented – Tafitoala community members 2) government personnel involved in coastal climate change adaptation planning in Samoa –recruited from the Disaster Management Office, the Global Environment Fund office, and the Planning and Urban Management Agency and 3) personnel from locally based regional and international agencies involved in the coastal climate change adaptation case study project –recruited from the Secretariat of the Pacific Regional Environment Program and the United Nations office.

From the studies and projects on climate change adaptation projects already implemented in Samoa, it is clear that these different groups are all key actors in this process. Thus, having representatives from these different groups allowed for more perspectives to be collected and captured a more thorough understanding of the research case.

The recruitment process for interview participants identified the most relevant organisations (both government and non-government) in relation to climate change

adaptation work with the assistance of Victoria University of Wellington staff who have academic and professional networks established in Samoa. Additional participants were identified through a snow ball sampling technique (Atkinson and Flint, 2001) whereby participants or contacts made along the way would recommend others based on their involvement in climate change adaptation projects.

1.3.5 Data analysis and presentation of results

Upon the collection and transcription of interview data, 'member checking' was used to check the collected data for the adequate representation of opinions and meanings with members of the interview participants (Baxter and Eyle, 1997. p515). This method requires that participants check the transcript of their interview and provide feedback on my representation of their views as recorded. Selected interview transcripts were therefore emailed to interviewees for member checking.

Interview data was analysed using thematic approaches described by Cope (2010). The NVivo 11 program was employed to organise the collected data using analytic codes, which was developed to reflect important research themes. An analytic coding process was selected over a descriptive process, to allow for a greater opportunity to "dig deeper into the processes and context of phrases" (Cope, 2010. p283). The coding process was treated as a 'recursive' one, where codes, initially developed from the background literature could be changed throughout the research progress, as different patterns or relationships arise from the case study (Cope, 2010, p. 283). For example, initial codes developed before beginning the interviews were identified from literature and included themes such as

NVivo enabled me to identify patterns and themes within my data and draw these together with ease, organised the data in order that I could quickly search and locate research material, and assisted in visualising my research through the drawing of models and charts.

1.3.6 Ethical considerations

Ethical considerations are important in all research, and in qualitative research especially. Key issues here include participant privacy, ensuring participants are able to give informed consent, and ensuring no harm would come to any participant as a result of being involved in the research (Dowling, 2010). In order to mitigate any potential problems, research information was made available to all participants ahead of the interview time, and explained further if required by the participant. Baxter and Eyles (1997) emphasise that "There is also an ethical imperative to let participants know how their interviews are being used" (p515). Conveying the research aim and information clearly, the reassurance of participant confidentiality and ensuring informed consent before interviews contributed to gaining the trust of the participants. Furthermore, it seemed that the participants shared their perspectives more openly with the knowledge that they would be given the opportunity to check their interview transcript or summary, for correct representation of their views.

Additionally, Brinkman and Kvale (2005) highlight that the duty of a researcher is not only to respect the integrity of the research subjects, but also to take into account the cultural context of his/her research. These matters of ethical concern were strongly considered in this research process, and human ethics approval was sought and granted from the Human Ethics Committee of Victoria University. In saying that, it was also recognised that a researcher's engagement with ethical behaviour is an ongoing process. Ethical implications should continuously be considered throughout all activities within the research, and these considerations are ongoing even with ethics committee approval (Dowling, 2010. p.30-37).

1.4 Case study context

1.4.1 Location

This research was located in Samoa, focussing on the small community of Tafitoala, a village in the island of Upolu. Samoa consists of two large islands, Upolu and Savaii, and eight small islets, located halfway between Hawaii and New Zealand in the Polynesian region of the South Pacific. Samoa is a small country with a land area of 2,830 sq. km (World Atlas website) and a population of approximately 190,000 (Samoa Bureau of Statistics, 2011). About 70% of Samoa's population and infrastructure are located in the coastal area (PACC, 2012).

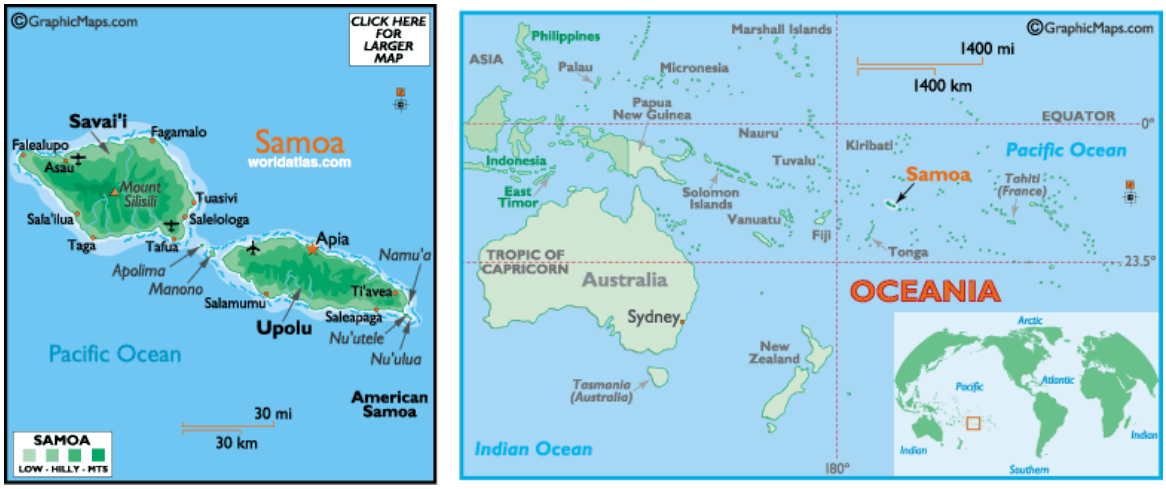

Figure 1:
Left, map of Samoa. Right, map of the South Pacific with Samoa in the middle
(Source: World Atlas. Retrieved from: http://www.worldatlas.com/webimage/countrys/oceania/ws.htm)

Tafitoala is a rural village, located approximately forty minutes from the town area. Villagers are reliant on subsistence fishing and farming. As is the norm with rural villages in Samoa, village life is in accordance with traditional Samoan customs and traditions (detailed below in section 1.4.3). The effects of climate change have significant impacts on every aspect of this community's lives – from housing to food security to earning an income.

Tafitoala has over the years witnessed the slow erosion of its coastline forcing a number of its families to relocate plantations and houses further inland. The coastal climate change adaptation project that was implemented in Tafitoala is one component of the Pacific Adaptation to Climate Change (PACC) project. Assessments of the community in the early phases of the project reported that the

villagers have moved plantations inland due to soil salinity, rise in sea level and flooding from storm surges. The villagers have reported that waves have become unpredictably high since the early 90's, making it look like 'king tide' season during high tides. King tides are extreme high tide events that occur when the sun and the moon's gravitational forces reinforce one another at times of the year when the moon is closest to the earth. Although king tides only occur twice a year, villager observations indicate that most high tides throughout the year now mirror levels of king tides.

The selection of a coastal research location was based on the knowledge that coastal communities are amongst the most vulnerable communities to climate change impacts (McGranahan *et al*., 2007; Dolan and Walker, 2006; Klein and Nicholls, 1999). Unassisted, many coastal communities are likely to struggle to cope with a challenge of the magnitude of the problem, and will need much guidance and support to anticipate the impacts of climate change and implement adaptation strategies if they are to sustain their livelihoods and quality of life (Marshall *et al.*, 2010).

1.4.2 Environmental context

Samoa's climate is typical of small tropical islands. The rainfall and humidity are usually high with distinctive wet and dry seasons. Temperatures are generally uniform throughout the year (ranging from 23 – 30°C daily) with little seasonal variation (Britannica website). Samoa is vulnerable to severe tropical storms which occur during the months of December to February, as well as long dry spells that coincide with the El Nino South Oscillation (ENSO) phenomena (PACC, 2009. p6). These vulnerabilities are particularly exacerbated during extreme events such as tropical cyclones.

Records of cyclone events in Samoa indicate that the frequency has increased between the years 1831 and 2000, with potentially devastating effects on Samoa's economy which is traditionally dependant on agriculture and fisheries (PACC, 2009.

p. 6). The climate risk profile of Samoa showed that systematic changes in the average climate for Samoa by 2050 will have increased sea level by 36cm, rainfall by 1.2%, extreme wind gusts by 7% and maximum temperatures by 0.7°C (Hay, 2006). Significant improvement in understanding and projection of sea level change strongly indicates that global mean sea level will continue to rise during the 21st century (IPCC, 2014. p.62). Together, these projections could exacerbate coastal erosion, loss of land and property dislocation of coastal inhabitants.

1.4.3 Social context

Understanding the complexities of the social context of a typical village in Samoa is required for better comprehension of the research findings. Recognising the ideologies held by village communities was also crucial for reflecting on the findings. Here, the local governance systems and the village's dominant set of beliefs on kinship and religion will be discussed.

The dominant form of governance within village communities is based on a traditional system. During the period of colonisation in Samoa, efforts were made to adapt local traditional governance structures to a more modern structure, alongside that of the central government (Afamasaga, 2006). However, by the time of Samoa's independence in 1962, the traditional systems remained and these continue to be used. The village councils' authority and power were finally given recognition within the formal legal system in 1990 through the Village Fono Act 1990 (Agaiava, 2014; Macpherson, 1999). Thus, the majority of Samoa's people live within villages which have their own traditional authority, including the study site, Tafitoala village. In the context of the modern state, the traditional governance systems are central to maintaining order and it is through these traditional governance systems that central government initiatives are implemented in the villages (So'o, 2006).

There are two types of villages: the *nu'u mavae* (traditional villages) which are the more common type, and *nu'u le mavae* (non-traditional villages) comprised mostly of free-hold land (as opposed to customary land as in traditional villages). The main

difference in the two types of village is the governance structures. Non-traditional villages do not have a village constitution or village council and are usually located in close proximity to urban centres. The families live as individual households and make decisions based on the wellbeing of their own households as opposed to the wider community or village. A *nu'u mavae* has a clear governance structure with specific groups, each with a role to play in maintaining social order within the village community. Although there may be some slight differences in structure, most *nu'u mavae* will have broadly similar features and functions as outlined below.

Traditionally, the group which holds the highest authority in a *nu'u mavae* is the village council. Ultimately, the council is responsible for the village's wellbeing and makes its decisions based on the village *fa'avae* (constitution). Such constitutions are unwritten and based on customary practices and beliefs. The council is made up of the village *matai* (chiefs), and a *matai* can be either male or female, so long as they hold a chiefly title. Each family will have its own *matai(s)* to represent them in the council. The *pulenu'u* or village mayor is elected by the council to act as an intermediary between the village council and the central government. Central government relies on the local councils to implement government programmes and projects within villages, as it is the council rules that impact on local communities on a day to day basis, as opposed to central government laws.

Aside from the *matai*, there are other social groups that are essential to completing the traditional structure of the village. First, there is the *aualuma* (women's committee) whose main role is maintaining peace within the village. Other typical responsibilities of the *aualuma* include producing wealth for the family and village, usually by making Samoan artefacts, and addressing health, education and hygiene issues. The second group are comprised of the village *taulele'a* (untitled men). The main roles of the *taulele'a* are to implement and enforce the council's decisions, provide labour assistance for families within the village when in need, and provide food through farming and fishing activities. Together, these three groups form the local government body in a Samoan village. Amosa (2010) provides a clear illustration of this social structure, shown below in Figure 2.

Christianity is the dominant faith belief in Samoa. The way of life of most Samoans is largely affected by the interlinkages between the traditional systems led by the village council, and religion (Thornton *et al.*, 2010). The strong link between tradition and the church can be seen in the way that *matai* are often given high roles in the church. Thus, religion becomes entrenched in tradition, and from there, the church also has the opportunity to influence social issues within villages.

In summary, traditional practices through village councils have been crucial in the provision of peace, food, and general development of the villages. Village governance is undertaken almost independently from central government and local councils generally work to develop the social well-being of communities based on traditional practices. Macpherson (1999) emphasises the extent to which the communities in Samoa continue to live by these ideologies. "Today, 82 percent of Samoa's land remains in customary ownership…some 80 percent of the population lives in villages; and approximately 90 percent of the Samoan population claims, in the census, to live under the authority of a *matai*" (Macpherson 1999, p.89). Finally, Christianity has had a huge influence in Samoa and the church is now also an integral part of the village life.

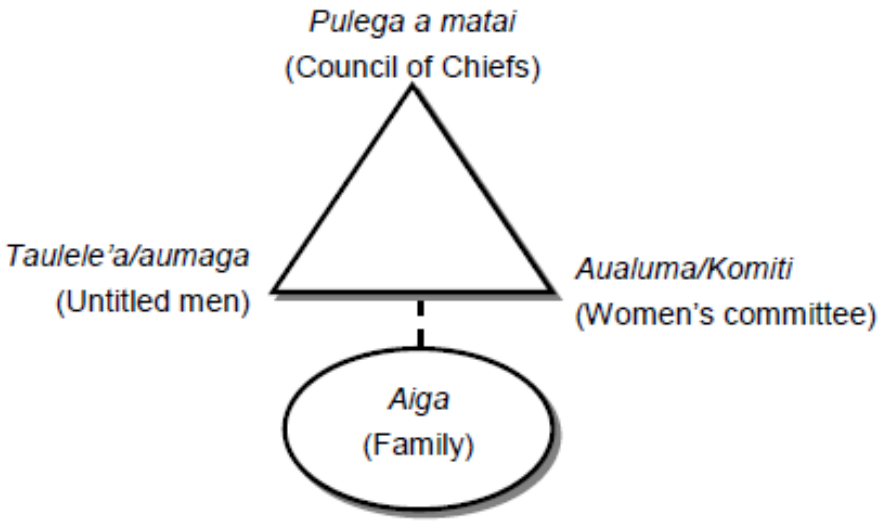

Figure 2:
Social structure within a traditional village in Samoa
(Source: Amosa, 2010, p. 1

CHAPTER TWO

Literature Review

2.1 Adapting to Climate Change in the Pacific

2.1.1 Climate change impacts on small islands

Studies on climate change adaptation in the Pacific suggest that Pacific Island countries are highly vulnerable to climate change and sea level rise owing partly to their small land masses surrounded by ocean, and their location in regions prone to natural disasters. Aside from sea level rise, other climate risks are also identified. "Current and future climate-related drivers of risk for small islands during the 21st century include sea level rise, tropical and extratropical cyclones, increasing air and sea surface temperatures, and changing rainfall patterns" (Nurse *et al*., 2014. p1616). Sea level rise can impact coastal settlements on small islands by affecting coastal infrastructure, water resources, tourism developments, and human health through climate sensitive health problems, including morbidity and mortality from extreme weather events (Nurse *et al*., 2014). Most Pacific Island countries are also un-developed, and it has been recognised that developing countries are often more vulnerable to the effects of climate change than developed countries (Mirza, 2003). This is due to developing countries having less capacity, in terms of available resources, to take adaptive measures. The need to implement adaptation measures in small islands therefore requires urgent action (Nurse and Moore, 2005) to allow these vulnerable coastal countries the chance to adapt to changes already underway and impacts that are expected to get worse (Tobey *et al.*, 2010). Adapting to climate change and understanding the values that drive adaptation decisions as well as adaptation limits, can only be understood in context (Adger *et al*., 2009).

IPCC identify some common barriers to climate change adaptation for small islands. These include: "inadequate access to financial, technological, and human resources; issues related to cultural and social acceptability of measures; a tendency to focus

on short-term climate variability rather than long-term climate change" (Nurse *et al*., 2014, p.1640). Although the literature highlights many barriers to effective adaptation measures, this research looks more closely at the process and extent of engagement between the local community members, practitioners, knowledge holders and decision makers, to assess how a collaborative approach would better enable effective climate change adaptation planning. This aligns with an IPCC assertion that "empowering communities and optimizing the benefits of local practices that have proven to be efficacious through time, and working synergistically to progress development agendas" provides an opportunity for effective climate change adaptation (Nurse *et al*., 2014. p1617).

2.1.2 Proposed coping strategies

What types of strategies are best able to reduce vulnerability to potential climate change impacts on coastal communities? Hale *et al* (2009) recommend ecosystem-based adaptation for marine and coastal ecosystems as a way for vulnerable coastal communities to effectively manage ecosystems, which they depend on daily. A major benefit of an ecosystem-based approach is its cost-effectiveness, where protecting 'green infrastructure' is prioritised over building hard infrastructure such as sea walls, which are more costly but may fail under severe climate conditions (Hale *et al*., 2009. p.23). Sovacool (2011) discusses the distinction between hard and soft adaptation paths. Sovacool identifies hard adaptation as including reliance on human-built infrastructure, to be complex in terms of depending on large technological systems, and capital-intensive. In contrast, a soft adaptation path involves the use of natural infrastructure or natural capital, and works to empower local communities by building on institutional capacity and community assets (Sovacool, 2011). Similar to *Hale et al*. (2009), a study which looked at the role of green infrastructure in the form of tropical coastal seascapes including mangroves, seagrass beds and coral reefs, concluded that maintaining the seascape could be the most cost-effective method of protection for coastal communities (Moberg and Rönnbäck, 2003).

In some cases, 'soft solutions' such as replanting of mangrove forests may be more suitable in the long run instead of the more commonly preferred hard measures (Dunn, 2009. p.224). Although soft measures or green infrastructure are commonly emphasised as the more effective adaptive tool for longevity, communities facing climate change threats often prefer hard adaptation measures (Sovacool, 2012).

Manning *et al* (2014) suggest that adaptation planning should centre on a dynamic view of climate risk as well as more effective and continuous social engagement (Manning *et al.*, 2014). A dynamic view is one which considers the inevitable increases or changes in community risk levels over time, as opposed to seeing climate risk as fixed.

Another concept is that of proactive adaptation. Tobey *et al.* (2010) describes this to be "strategic and aims to address the full range of coastal climate change hazards in ways that meet social objectives" (p.318). Smithers & Smit (1997) identify three dimensions of adaptation to climate: the nature of the disturbance stimulus; the properties of the system which may influence its sensitivity; and the type of adaptation which is undertaken. Understanding these dimensions helps to break down adaptation to enable strategic planning for climate change hazards, as required for proactive adaptation.

When planning for coastal climate change impacts, it is inevitable that there would be varying levels of concern about sea level rise among different stakeholders. Being able to discern the varying concerns would be assisted by greater engagement with local stakeholders, and there has been a growing trend and awareness of the need for coastal adaptation to be appropriate for local environmental and socio-economic conditions (Klein *et al.*, 2001).

The strength of each stakeholder's voice ultimately determines the adaptation response, and caution is given against the preference for hard responses such as sea walls to protect property. Manning *et al*. (2014) warns against societies increasing dependence on hard responses, for although they may provide short term relief from hazards, they have limited ability to cater for local environmental and social conditions. "What become temporary responses, such as further

development on low-lying land and a growing reliance on hard protection measures, could lead to maladaptation and entrenchment of risk. This would constrain adaptive capacity, especially in lower socioeconomic areas." (Manning *et al.*, 2014. p.585). The importance of contextual information in gauging the most appropriate response for each coastal area and its community is emphasised.

The literature then suggests that the nature of the disturbance or the climate change impact on vulnerable coastal communities cannot be controlled, but that the properties of the system and the type of adaptation undertaken to increase resilience to potential climate change impacts can be strengthened if driven by the local members or stakeholders within that system.

Climate change adaptation policies and plans have historically been focussed at the national scale (Tompkins, 2005), but attention to adaptation at the community level has grown in recent years (Adger and Kelly, 1999; Turner *et al.*, 2003). Measham *et al.* (2011) indicate that this growing emphasis on local adaptation stems from the prevailing opinion in the literature that the "impacts of climate change are experienced locally" and therefore 'place-based' approaches are required for effective adaptation and secondly, "local governance systems are often the responsible and legitimate entity for managing such impacts" (p890). Echoing this, Agrawal (2010) emphasises the critical role that local institutions have in climate adaptation, namely: structuring responses to local impacts; mediating between individual and collective responses to vulnerability; and governing the delivery of resources to facilitate adaptation.

Also in relation to local governance systems, Warwick *et al*. (2016) discuss the need to understand social capital when looking at the adaptive capacity of a community. Main indicators of social capital identified are community diversity, leadership, collective action, support services and governance (Warwick *et al*., 2016) and implies that the governance system of a community contributes to the extent to which that community is able to effectively adapt.

This increased attention on community level adaptation has resulted in community-based or non-government organisations increasingly being seen as the most

appropriate implementers of adaptation work (Rojas Blanco, 2006). Experiences by such organisations could provide valuable insight into strengthening coping strategies within local communities.

2.1.3 Adaptation and disaster preparedness

Recent climate change adaptation literature has highlighted the strong and inevitable link between climate change adaptation and disaster risk reduction. This link appears to be as crucial for climate vulnerable communities such as those identified in the PICs, making the consideration of adaptation and disaster preparedness relevant for this research. As highlighted above, when describing projections of cyclone events and sea level rise in Samoa, records have shown that both have increased in frequency and level, a trend which is predicted to continue.

Mitchell & van Aalst (2008) explain differentiating features of disaster management and adaptation. Coping with and managing the impacts of an event that has occurred, such as a high intensity cyclone, will usually be classified as disaster management action. Considering the conditions of such an event in the *long-term* after adjusting to changes in mean climatic conditions is a known feature of adaptation (Mitchell & van Aalst, 2008).

Disaster risk management is defined as:

> "the systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters" (International Strategy for Disaster Reduction, 2004. p.17).

The Online Climate Conference produced the book "Climate Change and Disaster Risk Management" after its fourth meeting, to encourage consideration of disaster risk management within mainstream adaptation to climate change (Leal Filho, 2013). Thomallo *et al.* (2006) emphasise the need for a common approach between

climate adaptation and disaster risk reduction because in isolation stressing that the different research communities will have limited success in assisting communities to adapt to climate change impacts. A study carried out in Papua New Guinea also supports this need for integration of climate change adaptation and disaster risk reduction. Their findings highlighted the need for the consideration of disaster risk reduction within the context of wider sustainable development policies whilst considering all the interrelated factors affecting a community (Mercer, 2010).

A prominent reason in the literature for the previous trend of considering climate change adaptation and disaster management in isolation may be the result of differences in the perception of the nature and timescale of the threat. Disasters are an extreme threats that are observed over a short time with devastating effects. Climate change on the other hand is experienced over a much longer time frame and therefore may not seem like a threat.

> "Disasters caused by extreme environmental conditions tend to be fairly distinct in time and space and present a situation where the immediate impacts tend to overwhelm the capabilities of the affected population…Most impacts of climate change, meanwhile, are much more difficult to perceive and to measure" (Thomallo *et al*, 2006. p.41).

Although there is a perceived difference between the two areas, both climate change adaptation and disaster management affect social, environmental, and economic processes of a country and its communities.

The importance of linking the two factors is evident in international policies and mandates. Examples of policy documents and directions which encourage this link include the 'disaster reduction strategies' in the UN Framework Convention on Climate Change (UNFCCC, 2007a, para 1(c)(iii)); a conference in 2002 organized by the UNDP on 'Integrating Disaster Reduction and Adaptation to Climate Change'; and a briefing note in 2008 by the United Nations International Strategy for Disaster Reduction, titled 'Climate Change and Disaster Risk Reduction'.

The literature suggests that to enable the integration of adaptation and disaster risk management involves a change in mind-set from a mind-set that considers managing for climate disasters as they occur, to one which recognises that in order to adequately prepare for potential climate disasters, a longer term consideration of climate change is required (Schipper, 2009). Schipper (2009) states that a mindset which considers "the role of climate change adaptation as the process that strengthens the resilience to future events, and the traditional disaster risk management approach of focusing on only one event at a time", replaced by a mind-set that recognises it as a "collection of hazard events, in the context of accumulated disaster risk, which requires a long-term perspective in disaster risk reduction (Schipper, 2009. p.27). Furthermore, a policy level response is required. This is because the fragmentation of adaptation and disaster policy and legislation is an obstacle because projects most often need to be framed according to policies and legislative guidelines formed by international agreements (Gero *et al*, 2011).

2.2 Community Engagement

Coastal adaptation must be an inclusive process if it is to remain sustainable (Glavovic *et al*., 2015). Reflecting on a number of coastal adaption case studies, Glavovic *et al* (2015) emphasise that coastal adaptation processes need to be considered in context. They write that adaptation:

> …needs to be founded on respect for and reconciliation of the divergent ethical, emotional, spiritual, and relational perspectives on and connections to the coast, and the different knowledge(s), understanding(s), and underlying norms that frame the moral and practical justification of alternative adaptive pathways (p.524).

Simply put, it is to the benefit of adaptation responses that all stakeholders affected by climate change and coastal adaptation process, including members of the local community, are engaged throughout the different stages of the process.

The literature provides a range of discourses on the engagement of local communities in the process of climate change adaptation, but there does not seem to be an agreed-upon definition of 'community engagement' (Tindana *et al*., 2007). Defining 'community' can therefore be complex. In the context of this paper, community is used to mean 'community of place', defined by Edwards *et al*. (2000) to be "a group of people sharing specific geographic and social contexts for activities" (p.292), as well as belonging to a cultural, ethnic, or regionally defined group (Leach *et al*., 1997). A community would commonly be a village in the context of Samoa.

The discourse around community engagement in climate change planning is often constructed around its barriers and enablers, and these will be discussed below. A crucial benefit of community-based approaches to building resilience to climate change occurs when local communities are able to work with development partners and identify risks themselves, thereby addressing vulnerability issues using local knowledge (van Aalst *et al.*, 2008; Mercer *et al.*, 2009). This could potentially lead to increased community ownership of climate change adaptation initiatives and increase the feeling of responsibility to sustain implemented initiatives.

Similarly, Yamin *et al.* (2005) highlight two main reasons to advocate more meaningful engagement of local communities when preparing for climate disasters. Firstly, human societies have adapted to climate variability and other changes for many years now, and much of the knowledge on how to cope with this variability is embedded into the fabric of social structures operating at the community level. Secondly, understanding and strengthening the agency of communities is imperative as much adaptation will be undertaken at the local level. An approach which aligns with a policy trend that values the knowledge and capacities of local people would therefore be of value when attempting to reduce the vulnerability of communities to climate change impacts (Allen, 2006). Improved engagement with local communities may also influence how readily knowledge is transferred between community members and officials or climate scientists. In turn, this could assist with the issue across the Pacific of limited transfer in knowledge about climate change science (Dunn, 2009).

Efforts in the Pacific to build upon the resilience or the adaptive capacity of exposed communities have begun in many Pacific Island countries already. There have been reported cases of climate change planning projects (SPREP website (a), n.d) being implemented and policies and Acts (SPREP website (b), n.d) being put into place to enable action throughout many Small Island Developing States (SIDS). Gero *et al.* (2011) provides some case study examples of successful participatory or community based initiatives that look to address either climate change adaptation or disaster risk management. One case study was the Local Level Risk Management project launched in Navua, Fiji, an area susceptible to severe flooding in which the project aimed to further develop the community's understanding of the pre-existing flood early warning system. The success of the project was largely attributed to the strong collaboration amongst stakeholders in which the local community was well represented. Another study looked at the work carried out by the Samoa Red Cross in reducing the vulnerability of local communities based on the specific needs of the local people. Their approach was to use a participatory assessment tool designed to allow communities to identify their own vulnerabilities and capacities, and then enabled to take an active role in developing measures to enhance their capacities. For example, requiring communities to describe their usual practices, systems and norms that relate to disaster risk (Gero *et al*, 2011). Close collaboration between officials and the local community can work to enhance effective public processes at the local level, which in turn could help build awareness, capacity, and agency on climate change, and support planning and decision-making (Sheppard *et al.*, 2011).

2.2.1 Barriers

Inclusive community engagement processes may at times be the non-practical option if it is seen as too time consuming and requiring more resources to implement. Few *et al.,* (2007) illustrate this by identifying that there are "practical and conceptual difficulties in securing broad-based public engagement in the process" (Few *et al.*, 2007, p. 49). The nature of climate change and its potential impacts are usually discussed as being very urgent and in need of being addressed

in a prompt manner. A more community-based approach where community stakeholders are engaged may not be considered by some project initiators as the best option due to time constraints.

Also, there is the danger that some agencies may pursue community engagement for the sake of seeming more participatory, but are not seeking a meaningful form of inclusion (Few et al, 2007). The growing awareness of participatory and more inclusive methods amongst project planners, as well as the general public, has increased expectation that these methods will be utilised in project planning. Also, there are now many different modes of community engagement. Selecting the most suitable mode for each community context though, requires careful consideration as each mode will have varying abilities to support active participation (Few *et al*, 2007).

Other identified barriers to local community engagement include: the overwhelming scale of the problem, uncertainty of the potential impacts, scientific abstraction, and the predominantly global nature of the available modelling and scenarios (Sheppard *et al.*, 2011). Further studies have highlighted problems from within the communities themselves. For example, Agrawal and Gibson (1999) note that even for discrete and localized communities, the range of stakeholder interests is highly heterogeneous and does not lend itself to consensus. Therefore, assuming the homogeneity of members and interests within a community will not allow for an effective planning process, though it may be considered more time effective.

Having a project labelled as “community-based” must also be analysed further in order to understand the level of community engagement and the interest groups being represented. This is to ensure that “community-based” projects represent the interests of the affected community, especially if there are competing interests from other stakeholders. As noted by Adger *et al*. (2003), “it is necessary to distinguish adaptation by who is undertaking it and the interests of the diverse stakeholders involved” (Adger *et al.*, 2003, p. 8). This indicates that failing to understand the interests of the different stakeholders involved has the potential to create conflict. Power plays between different stakeholders might remain hidden, which could compromise the effectiveness and sustainability of the project at hand.

Meaningful involvement of local community members in the planning process of projects could help minimise the potential for unintended misdirection of priorities.

While the literature has shown that the nature of climate change calls for an inclusive and iterative process of decision making (Tompkins, 2005), it may not always happen that way, no matter the positive intention. This is illustrated by Storbjörk and Hedrén (2011) through a case-study looking at planning for coastal erosion. In an attempt to increase efficiency, the planning process was limited to a specialised few, resulting in inadequate contact, knowledge exchange and learning among key stakeholders at the local level (Storbjörk and Hedrén, 2011).

At the other end of the scale, barriers to effective community engagement may be unintended though effort is put into involving local communities in the adaptation planning phase of a project. For example, projects looking to involve local communities have the potential for unintended forms of disempowerment to creep in (Dynes, 2005). When community-based initiatives place greater responsibility on the shoulders of local people without necessarily proportionately increasing their capacity to formulate initiatives according to community understandings and priority, this can lead to lack of community buy-in and failed adaptation attempts.

2.2.2 Enablers

Recognizing the community as a significant stakeholder in environmental management increases the chances of engagement in climate change planning. Integrated coastal zone management (ICZM) is an approach coastal communities worldwide have increasingly turned to (Falaleeva *et al.*, 2011). This identifies 'inclusiveness' as necessary to achieve effective coastal management, and acknowledges that unless decisions made through participatory processes are integrated into management practices, the effectiveness of stakeholder involvement in ICZM will remain low. Recognizing local communities as relevant stakeholders would therefore enhance collaborative communication among stakeholders and assist in unifying differing views in how best to manage

adaptation initiatives through coordination of agendas, values and priorities in adapting to climate change impacts (Storbjörk and Hedrén, 2011).

Adger *et al* (2013) offer insight into culture and how it interacts with climate change adaptation, emphasising that the cultural values of a community shape how that community supports adaptation initiatives and motivations to respond to them. Understanding the culture and values of a community is therefore an enabler of community engagement, in that it may gain the support of the local community for adaptation plans through a planning process that considers community culture and values.

Understanding culture as an enabler is also linked to understanding of place attachment, another interest area discussed in the literature in regards to preparedness to natural disasters. Place attachment is described by Mishra *et al* (2010) as the emotional bond that exists between individuals or groups within a community and their physical environment. This study found that the level of preparedness for natural disasters was determined by the type of place attachment held by those within the community. Those who are attached to their place for economic reasons and have lived in that land for many generations, tended to be more prepared for disasters. On the other hand, those who held a place attachment due to religion, did not seem to influence level of disaster preparedness (Mishra *et al*, 2010). Wolf *et al* (2009) also suggests that understanding place attachment may help to determine the level to which community members will participate in climate change adaptation processes. Such studies aid adaptation planning by giving indications of factors that may enhance community engagement and support.

2.3 Traditional Ecological Knowledge

Engaging local communities in climate change planning may result in knowledge sharing, in which traditional ecological knowledge held by local communities may complement science (Riedlinger and Berkes, 2001). The contribution of local and

traditional knowledge to understanding climate change in some regions of the world is well-documented (Dolan and Walker, 2006). Traditional ecological knowledge (TEK) consists of the body of knowledge, beliefs, traditions, practices, institutions, and worldviews developed and sustained by indigenous local communities in interaction with their surrounding environment (Berkes, 2004; Gómez-Baggethun*et al.*, 2013) and having the strength of being dynamic in nature (Gómez-Baggethun and Reyes-García, 2013). This dynamic nature means TEK may change over time based on observations or learned experiences, from which adaptive practices can be adjusted accordingly to reduce community vulnerability.

While discussing adaptation and the uncertainty of knowledge of future climate change, Adger *et al* (2009) asserts that a mental map of knowledge about possible future climates is required. This mental map might be influenced by 'the deep climatic past', 'the present or recent experience of weather', and 'the anticipation of future climate' (Adger *et al*, 2009, p.342). Some communities may hold TEK that could contribute to this 'mental map' through observations of the climatic past and recent experience of the weather. This mental map could therefore be seen as knowledge that can assist in anticipating future climate, based on experiences of past and present climate behaviour.

IPCC continues to support the incorporation of indigenous knowledge in adaptation planning, but emphasise that this is not an easy process. This is due to insufficient evidence to determine the effectiveness and limits of this knowledge (Nurse *et al*., 2014). More studies are therefore required to gain more evidence of the potential benefits of traditional ecological knowledge, and what the barriers and enablers may be in incorporating this knowledge into climate change adaptation planning.

A growing awareness of TEK amongst policymakers and scientists is reflected in Principle 22 of the 1992 Rio Declaration on Environment and Development, which states that:

> *Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional*

> *practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development* (Report of the U.N Conference on Environment and Development, *Rio Declaration on Environment and Development*, 1992).

An example of TEK in effect can be seen in a New Zealand study (Manning *et al*., 2014) that tries to identify community perspectives on rising sea level. This study discovered the recognition amongst community members that it was strong social-cultural relationships shared between the community members and the land that helped the community withstand and adjust to climate change impacts (Manning *et al*., 2014). International examples of TEK illustrated through the literature are wide ranging in type and location, and include: local knowledge of certain species cycles and seasonal cycles of rain and sun in British Colombia to recognize anomalies (Turner and Clifton, 2009); knowledge of stockbreeding by a local community in southwestern Spain to cope with flooding (Gomez-Baggethun *et al*., 2010); knowledge of spatial and temporal characteristics and dynamics of vegetation communities by farmers in southwestern Kalahari used to alter management practices accordingly (Thomas and Twyman, 2004); and knowledge of resources and ecosystem dynamics of a watershed area held by a rural community in Sweden assisted to build ecological resilience (Olsson and Folke, 2001).

There is less documentation of TEK use from within South Pacific countries. An example found is the use of a seasonal calendar in Samoa for subsistence activities such as fishing, predominantly based on the observations of local environmental changes (Lefale, 2010). A small village study in Samoa concluded that there is a need to combine different knowledge systems in order to understand the impacts of climate change (Flores-Palacois, 2015). In recognition of the traditional systems in the Pacific, the Climate Change and Development Community of the Online Pacific Solution Exchange have called for the "incorporation of traditional knowledge into national planning in order to address climate change impacts, and

to balance modern technology and science with such traditional practices in the PICs" (Fletcher, 2013, p.4).

Although these studies highlight the use of TEK by vulnerable communities to increase their adaptive capacity, it cannot be assumed that all local communities will hold TEK that may assist in climate change planning, or that TEK and associated practices are as relevant in the present climate as they previously were. For example, a study of the archaeological records of the Pueblo peoples in the high desert of Southwestern United States suggests that previously, the Pueblo people were able to use a mix of strategies to adapt to drought conditions, but as drought conditions became more prolonged and intense, their traditional strategies became less effective which led to famine, social conflicts and ultimately migration for many (Blinman, 2008).

Another call for caution when trying to include TEK in adaptation initiatives relates to considerations of power. For this to work well, project managers need to be mindful of relationships among and within all stakeholder groups of the adaptation initiative. This is similar to ensuring the interest of the target community groups are well represented, and not hidden underneath the interests of those with power or as Lazrus (2005) cautions, "…that hollow claims to incorporate local knowledge…can serve to perpetuate power differentials" (p.10).

2.3.1 Barriers

Huntington (2000) highlights two barriers to TEK being more widely accepted. Firstly, there is continued inertia in favour of established scientific practices and the need to describe TEK in Western scientific terms. This can be seen in the important role of the IPCC, which is to assess the science related to climate change (IPCC, 2013a) using scientific, technological, and socioeconomic information on climate change (IPCC, 2013b). Secondly, TEK in most cases is not formally recorded or written down, which is usually a requirement if it is to be incorporated into planning scenarios (Huntington, 2000). This is similar to the view that not having

formal documentation of TEK leads to questions of the reliability or legitimacy of the knowledge.

Berkes (2009) illustrates that *how* TEK is viewed can be a barrier. Distinguishing between TEK as *content*, where information that can be passed on from one person to another, as opposed to TEK as a *process*, a way of observing, discussing and making sense of new information (Berkes, 2009. p.153) would allow more value to be gained from TEK. This thought is also noted by Turner (2009) who identifies that TEK can be practical knowledge as well as embodying "philosophical perspectives and modes for transmission of information and worldviews" (Turner and Clifton, 2009. p.181). In other words, TEK can be more than just a body of knowledge. So, although TEK may be incomplete or even irrelevant in some adaptation planning scenarios, the process or the way in which local TEK is produced, passed on, and utilised could be of use to climate change planning through the adoption of a different 'worldview'.

2.3.2 Enablers

Reisinger *et al.* (2011) in writing about New Zealand experiences of adaptation, discusses the importance of the communication of climate science, a process made more effective when following a 'bottom-up' approach early in the planning process and involving all relevant stakeholders including local residents and pressure groups. In such cases, communicating knowledge is usually seen as a one way process, i.e. knowledge is shared *from* climate specialists, consultants, government planners and engineers etc., *towards* local residents and groups. In contrast, valuing the growing awareness that local communities themselves also have considerable knowledge about local vulnerabilities and climate extremes appears to be crucial in turning scientific "top-down" information on climate change into practical measures that are likely to be supported by the local community (Reisinger *et al.*, 2011, p. 308). Grounding coastal climate change planning at the community-level and involving local-knowledge systems allows for

scientific views of environmental changes to be framed in a local context (Dolan and Walker, 2006).

Secondly, documenting TEK may allow for TEK to be more accessible to policy makers and planners, and therefore be more likely to be considered and incorporated into climate change planning, but this can be a long and difficult process (Huntington, 2000). Lazrus (2005) suggests that 'problem sharing' and 'state intermediaries' are required between local and global knowledge and practice, in order to remove the boundaries which separate science from other forms of knowledge.

Taking a more "pluralistic view" of examining and understanding the environment or having broader willingness to consider the relevance of TEK may reduce conflicting views on TEK and scientific knowledge (Riedlinger and Berkes, 2001. p.326; Huntington, 2000). Riedlinger and Berkes (2001) suggest a framework for incorporating traditional knowledge in climate-change research. Traditional ecological knowledge may contribute: local-scale expertise; climate history; research hypotheses; community adaptation; and community-based monitoring (Riedlinger and Berkes, 2001). Similar to this view, Thomas and Twyman (2004) argue that by attaching value to both scientific as well as traditional views of the environment, the resulting 'hybrid knowledge' (p.216) allows for a more meaningful assessment of environmental change.

2.4 Summary of Literature

Literature on community engagement and the incorporation of TEK into climate change adaption planning has illustrated that it is a complex process. Many factors are considered when planning for climate change impacts along coastal areas where communities are located, and the perspectives and knowledges of the local community may at times be less of a priority as compared to other factors such as the urgency of potential climate change impacts, the available scientific evidence, or the amount of the funds available.

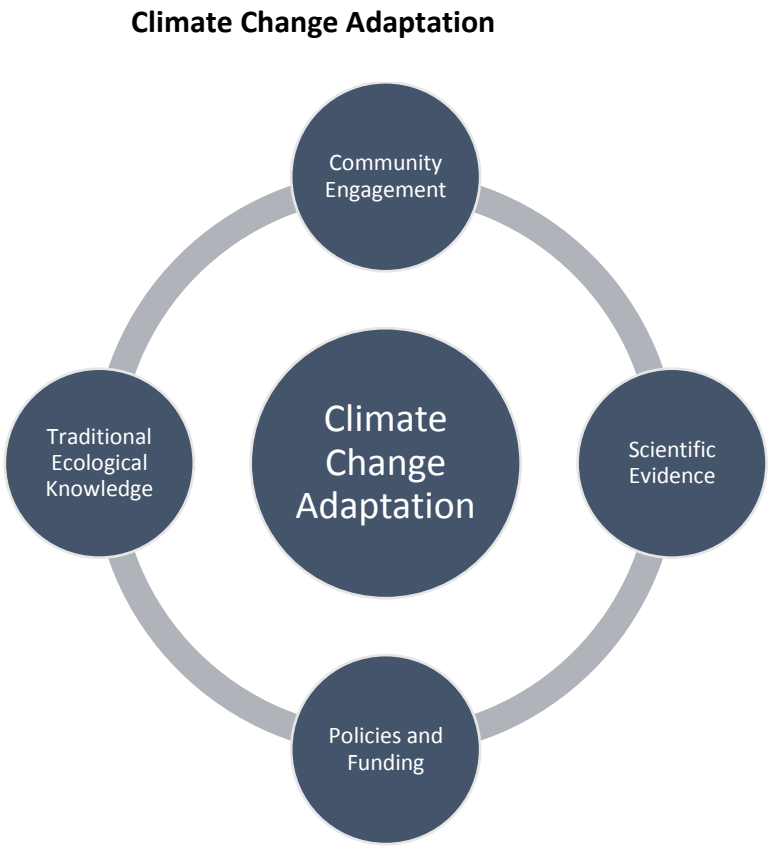

Figure 3:
Theoretical Framework for effective climate change adaptation planning

As illustrated in Figure 3 above, literature on this research topic emphasises the inevitable link between: communities that are vulnerable to climate impact, their knowledge of the changing environment around them; the science of climate change; and the policies and funding which determine the adaptation activities to be initiated. This framework will be used to explain the inevitable interconnectedness of policy, science and communities in the process of planning for climate change.

While this research focuses on community engagement and TEK, it is recognised that all aspects of the framework are required to enable effective climate change adaptation planning. This is further explained by Yamin *et al.* (2005) who highlight that although community knowledge is essential, it only provides a base from which to learn – it is based on information about past climate which may not correspond

with future challenges. The link between communities and climate scientists is therefore crucial to fill this gap, because knowledge of future climate change resides mainly in formal scientific structures. And lastly, communities, community TEK, and science need to be linked to national and international policy structures. Literature indicates that working to incorporate all these four aspects would result in greater support adaptation projects to climate change. It is this theory that will be used to discuss community engagement and TEK use as it emerges from the field.

CHAPTER THREE

Findings

This chapter is divided into two sections. The first section outlines research findings derived from secondary sources which examine how Samoa has responded to climate change at the national level. These findings were sought through an analysis of Samoa's national policies and plans related to climate change adaptation. Secondly, findings derived from the field at a local community level are outlined. As discussed in the Methodology section, information from the field was collected from research participants through the use of in-depth semi-structured interviews, with the exception of an e-mail response from one participant.

For the interviews, the nature of climate change adaptation and the process of that work within the coastal community of Tafitoala village were explored. Interviews were conducted with staff from government organisations, non-government organisations (NGOs) and community representatives of Tafitoala village. Government and NGO participants provided insight into practices and lessons learnt from planning and implementation of adaptation projects. Community representatives provided perspectives of community life dealing with climate change by the sea, and on the planning and implementation process of the Pacific Adaptation to Climate Change project in their village. Fifteen people were approached to be interviewed for this research of which eleven consented and were subsequently interviewed. Of the eleven interviewed four were government personnel, four from NGOs, and three from the Tafitoala community.

The research aim was addressed by asking the participants questions which sought to answer the following research question:

> *What are the barriers/enablers to community engagement and traditional ecological knowledge use in the climate change adaptation planning process within a Samoa coastal community?*

The views conveyed by each participant provided insight into the various types of barriers and enablers to community engagement that exist in the climate change planning process, as well as barriers to the collection and use of TEK in adaptation projects.

The types of issues faced when approaching participants varied with each group. The availability of government and NGO personnel was largely determined by their work schedule including duty travel. The availability of the Tafitoala participants was determined by the individual schedules of the participants which was based on the types of role each participant held in the village. According to village requests, the interview meetings could only take place when the village mayor or the *pulenu'u* was available. Therefore, interview times with the village participants took that request into consideration.

3.1 Understanding climate change adaptation planning in Samoa – a national level analysis

This first section reviews secondary sources on climate change adaptation planning in Samoa. A critical aspect of this review highlighted the large amount of adaptation planning work already in motion in communities. This work has been made possible through the development and implementation of various policies and projects. An assessment of the most relevant policies and projects will be discussed here, providing further understanding of the Samoan government and NGO approaches to adaptation planning.

3.1.1 Introduction

The Samoan government, together with NGOs, have been visibly active over the past ten years in assisting communities to better adapt to climate change impacts. Their actions include the establishment of various policies and guidelines, funding applications from international donors, and the implementation of adaptation

projects nationally, with special consideration for communities situated along the coastline. Adaptation project documents indicate that the policies and Acts put in place by government have helped to inform adaptation projects. Samoa's decision to ratify the United Nations Framework Convention on Climate Change in 1994 (UNFCCC website, Status of Ratification of KP) and the Kyoto Protocol in 2000 (PACC, 2009. p.8) can be considered the starting point of the country's significant policy development on climate change.

This section will briefly discuss some leading policies and plans as well as projects within Samoa that are working to better prepare communities for potential climate change impacts. Leading polices and plans to be discussed are the Strategy for the Development of Samoa, the National Adaptation Plan of Action, and the Coastal Infrastructure Management Plan.

Three major projects will also be outlined here. They are: Enhancing Resilience of Coastal Communities of Samoa to Climate Change project; the Climate and Oceans Support Program in the Pacific (COSPPac); and the Community Disaster and Climate Risk Management (CDCRM) program. These major projects were often talked about or referred to by officials interviewed who are carrying out climate change work. As well as these major projects, other relevant smaller projects are also briefly outlined. Understanding the scope and types of adaption projects already underway in Samoa helps to identify areas where this research may provide some assistance in project effectiveness.

3.1.2 Increased focus on Community Engagement in Government Level Planning and Projects

In Samoa, the *Strategy for the Development of Samoa* (SDS) is the overarching document that guides all development and provides a framework on national policy priorities for key development sectors. Efforts to address climate change challenges in Samoa have progressively influenced the country's policy making, including the development of the SDS. For example, in the 2008 – 2012 SDS, the climate risks

faced by Samoa were included in the SDS for the first time, and disaster management and coastal infrastructure management (CIM) were specified as priorities for the relevant Ministries (Strategy for the Development of Samoa, 2008). These efforts are further emphasised in the current SDS plan, 2012-2016 (Strategy for the Development of Samoa, 2012).

The SDS, 2012- 2016, has four priority areas. Priority area 1 is the *Economic Sector*, 2 is *Social Policies*, 3 is *Infrastructure Sector*, and priority area 4 is the *Environment.* Within these priority areas are key outcomes which further break down strategic areas that need to be addressed and key indicators to monitor progress. Under the priority area 4, the *Environment*, the two key outcomes are 'Environment Sustainability' and 'Climate and Disaster Resilience'. The Climate and Disaster Resilience key outcome has various strategic areas, and in relation to community engagement, it is specifically noted in the SDS that:

> "*government and responsible agencies will emphasize the importance of strengthening awareness and consultations on climate change and disaster risk management at all levels, so as to improve community engagement and understanding of future potential impacts and proposed adaptation and risk reduction*" (Strategy for the Development of Samoa, 2012. p.20).

The SDS 2012-2016 does not go into further detail as to how exactly community engagement may be strengthened, but having this emphasis on community consultations is a positive indication for increased levels of community involvement in adaptation planning.

The *National Adaptation Program of Action* (NAPA) developed in 2005, is the key document for the identification of the most urgent and immediate adaptation needs from the adverse impacts of climate change. It was launched with the vision "*To achieve a high level of community capacity for adaptation to adverse impacts of climate change*" (MREM, 2005, p.16). It lay important groundwork for existing climate change policies in the country as it provided a detailed account of the

current risks and vulnerabilities as well as identifying future priority areas (Wong *et al*., 2013). Within NAPA, one of the nine sectors identified as highly vulnerable is "village communities". Threats to village communities identified in NAPA include loss of land due to erosion from the sea; inundation of land and sedimentation; and damage to community assets by storm surges, tropical cyclones and severe flooding (MNREM, 2005. p.12). NAPA ensured the involvement of local communities in its planning phase, through the adoption of a *consensus approach* for the prioritisation of adaptation activities.

> "*The consensus approach involved major stakeholders and community representatives gaining maximum support from the communities through a series of country-wide consultation workshops. Review, debate and consensus discussions relating to adaptation activities enabled strengthening of community and government partnerships as well as public and private sector partnerships. The faa Samoa (the Samoan way) formal decision making procedure was utilized to attain effective agreement in their adaptive capacity experiences and resulted in ranking of community-based needs*" (MNREM, 2005. p.22)

The approach utilised by NAPA illustrated its attempt to focus on protecting the livelihood of communities, as declared above in its vision. The NAPA report also promoted the development of Samoa's climate risk profile and the launch of the *National Policy on Combating Climate Change* (NPCCC) in 2007. The NPCCC establishes a regulatory framework to facilitate the country's response to climate change.

In terms of financial support and projects, the Ministry of Finance has been working closely with the World Bank and the Asian Development Bank under the Pilot Programme for Climate Resilience (PPCR) aiming to integrate climate risk and resilience into the nation's development policies and planning. One of the earlier projects which addressed climate change planning was the Samoa Infrastructure and Asset Management (SIAM) project. The SIAM project developed the *Coastal*

Infrastructure Management Strategy and Plans (CIM Plans) in 2001, which provides a series of national and local priorities for coastal management. It is noted that many of the solutions identified in the CIM Plans were developed by the villagers themselves (Daly *et al.*, 2010), and were thus community driven. Daly *et al* (2010) assessed the SIAM project and stated that "the CIM Plan approach provides a way of linking across a number of frameworks in a way which provides for community involvement and ownership" (Daly *et al.*, p279). Local principles for coastal management were highlighted in the strategy, with policies encouraging the "establishment of local committees", to "provide opportunities for community leaders to network", and to "ensure that villagers participate directly in CIM Plans" (Beca International Consultants, 2001. p12-13).

Enhancing Resilience of Coastal Communities of Samoa to Climate Change project has a strong community-based approach, especially in the early stages of project implementation. The program emphasises that strengthened community ownership of coastal adaptation reduces community risk to climate impacts. Details of consultations made with the communities illustrated that villagers are involved throughout the vulnerability assessment phase, through to the end stages of planning, in which a formal agreement is then signed between the village and government (Adaptation Fund, 2011. p. 25-31).

These policies and projects indicate Samoa's intent to raise the adaptive capacity of its communities using a community-based approach. This is in line with some recommended climate change coping strategies as discussed in the literature which increasingly focus on greater and continuous social engagement (Manning *et al*, 2014), proactive measures which take into account the full range of climate change hazards and social objectives (Tobey et al., 2010), and the use of measures that involve local stakeholders and are appropriate for local environmental and socio-economic conditions (Klein *et al*., 2001). Ultimately, Samoa's direction in climate change planning seems to be in line with discussions in the literature around recommending community level adaptation coping strategies as opposed to the national level (Tompkins, 2005).

3.1.3 Increased acknowledgment of TEK

TEK is also being increasingly acknowledged amongst climate adaptation projects and programmes. The *Indigenous Approaches to Disaster Risk Reduction partnership* between Massey University and the National University of Samoa was launched in 2015 upon the completion of the Small Island Developing States (SIDS) 2014 conference. This Partnership aimed to 'integrate traditional forms of knowledge and indigenous approaches to facilitating disaster risk reduction and social resilience within regional and national emergency response and disaster management strategies/policies'. This conference therefore advocated that TEK through its various forms, if integrated into disaster management planning, is able to support communities and TEK holders to build their resilience to climate change.

Further building on this call to integrate traditional forms of knowledge and indigenous approaches in raising the resilience of communities, the *Climate and Oceans Support Program in the Pacific* (COSPPac) is currently undertaking major work within four PICs to try and combine traditional knowledge with conventional forecasts. This is in an attempt to produce a valuable forecast product for improved decision making, risk management and disaster prevention (Bureau of Meteorology, 2016). In Samoa, COSPPac is currently working on establishing ongoing traditional knowledge data collection and monitoring. This is a significant task because TEK in Samoa had previously never been systematically captured, verified and stored. This undertaking is thus significant not only in its recognition of the value of TEK in climate change planning, but also in the storage of TEK that may over time be lost.

When dealing with building resilience of coastal communities to climate change impacts, especially coastal communities, both literature (Leal Filho, 2013; Thomallo *et al*., 2006; Mercer, 2010) and the experience of those working in Samoa's environmental agencies highlight the inevitable link between climate change and disaster risk management. This approach has also been adopted by the Samoan government and is illustrated in projects such as the Community Disaster and Climate Risk Management (CDCRM) program. The CDCRM program is a government

initiative developed in 2011, and stresses the importance of the role of communities in preparing for climate disasters. This is due to government realisation that it is the village members who are the first responders to manage the emergencies at the household and community levels, thus their capacity to be prepared will significantly impact on how their households and communities cope with disasters. This project emphasises the importance of local community knowledge of their environment, and uses this knowledge to establish vulnerability assessments and finalise disaster preparedness plans.

Other studies highlight locally formed solutions to climate change impacts that have been explored by at-risk communities, solutions which include community entrepreneurial ones. For example, the establishment of sustainable enterprises by women and families through the help of Women in Business, a nongovernmental organization founded by Samoan business women (Gray *et al.*, 2014; Hiller-Garvey, 2010). Women in Business help to create niche markets for largely subsistence farmers in climate-threatened communities, and products from local farmers are sold with the guarantee that their farm products have been grown traditionally i.e. organically. Income gained by local farmers through such enterprises help to strengthen resilience of communities dealing with climate change impacts on a daily basis.

3.1.4 Conclusion

Together, these coordinated policies and projects show that Samoa is attempting to have an integrative approach to addressing climate change, a positive move as the IPCC has highlighted that coastal adaptation efforts to address climate-related risks will not be effective if they are reactive and standalone (Mimura *et al.*, 2007). In summary, it is apparent from the policies and projects being implemented that there is growing recognition from government and non-government organisations that climate change adaptation initiatives are urgently required. It is also clear that

a community-based approach is acknowledged within policies and strategies to be a key principle in addressing coastal climate adaptation.

3.2 Local level analysis

This section outlines research findings discovered through semi-structured interviews. Interview participants included personnel from government ministries, personnel from non-government organisations, and community members of the village of Tafitoala.

3.2.1 Disruption to subsistence activities

As discussed in Chapter Two, coastal communities are particularly exposed to sea level rise, both in terms of current and future risk. Sea level rise can impact coastal infrastructure, water resources, tourism developments, and human health through climate sensitive health problems, including morbidity and mortality from extreme weather events. Hence, the consequence on coastal communities is both immense and immediate.

The vulnerability of Tafitoala villagers to the sea and its increasingly unpredictable pattern was discussed by each community participant when asked about their observations of the climate.

> *"Times have changed. Back when I used to fish far out in the deep areas of the ocean, the tides were not as volatile. We would go out to sea and stay there for a whole week before returning, and the tides would be ok. Nowadays, you can't stay out that long because the tides are unpredictable now"*
> – Participant I (Community representative)

The comment above illustrates the impact of the unpredictability of the ocean, due to climate change on subsistence living activities of community members. Participant I, was over the age of 60 years and had been fishing for many years. The

participant commented on the changes of sea and tide behaviour observed whilst fishing in Tafitoala. Subsistence activities that the Tafitoala villagers engage in on a regular basis include fishing, farming of crops in plantations, and the collection of plant materials for various purposes, such as preparation of food, weaving fine mats and other handicraft, and for building shelter. The fish that is caught, as well as the plant crops harvested, are required foremost to feed families and any excess may be sold for a small profit. Participants stated that almost all the families in their village live a subsistence lifestyle which binds them to the land and sea. Another community participant's observations highlight the changes in weather and sea behaviour and the threat of this to the subsistence way of life.

> *"They want to live near the sea, where they can get food um…especially fish and seashells. Not only for food ah…but also to sell*" – Participant K (Community representative)

Community participants also discussed the impacts that the changing sea had on many of the families, prior to the PACC project being implemented. They spoke of the houses being severely damaged and of cases when evacuation of their homes was required due to rough and rising seas.

> *"The extent of sea level rise used to be very obvious before the construction of the sea wall [constructed by the PACC project]. And the waters used to reach way inland, reaching the houses"* – Participant J (Community representative)

Also, they had learned that they could no longer predict the sea tide behaviour, as their parents and grandparents had done in the past. The implications of this are great, in terms of the applicability of TEK. It highlights the fact that certain types of TEK that had previously been useful for their parents in their everyday life, are now inapplicable. Changes in the weather and sea patterns have rendered irrelevant some of the traditional knowledge of the community, such as the knowledge of the best location and time for fishing.

3.2.2 Potential ideological impacts on responses to climate change

The manner in which the participants explained the behaviour of the sea and its impact on the families along the coast, highlighted an interesting response by the community which has bearing on the implementation of climate related responses. When speaking about the changes, for example, of the higher than usual tides, interviewees seemed to be more matter-of-fact about their observations rather than concerned. This was noted from the participant's facial expressions and tone of voice when describing sea level rise impacts. A possible reason for this manner may be a reflection of the community's ideologies. It is known that Tafitoala village, like most villages in Samoa, has strong faith-based beliefs. Their belief in God may explain their acceptance of the observed changes, as something that is out of their control and in the hands of God. This aspect of community ideology was observed by an NGO interviewee Participant G, on visits out to many communities to speak about climate change.

> *"So when you're bringing in a scientific concept, you're saying it's because of greenhouse gases and global warming that's causing the severity of the impacts of tropical cyclones, droughts and others, um…religious communities might come back and say oh this was already predicted in the bible"* – Participant G (NGO representative)

Another reason for acceptance could be a sense of inevitability of the changing climate patterns, especially in relation to the sea. For example, having observed the impacts that sea level rise has had on many families over many years, the community may now deem those changes too extreme for any action to be taken, especially by them. If they do view the change in climate as something that cannot be changed, they might be more inclined to accept the changes and learn to cope with it instead of trying to resist it.

> *"There is nothing much we can do when the tides rise and the waters reach our houses. The only thing we can do is*

leave our houses and go inland and wait for the waters to recede" – Participant J (Community representative)

The response by Participant J is representative of the responses by community participants, when asked about coping strategies used to minimise the impacts of sea level rise in their community. Again, the community responses highlight the perceived strength and destructive nature of the sea proving too much for the families living beside the coast, leaving them with the feeling that no action by the community will be sufficient to withstand the coastal impacts.

The need for assistance to prevent further damage to homes was raised by the participants during the interviews, and links to the above thought that the communities perceive the changes in sea behaviour to be too great for them alone to resist. When asked about community actions that have been most suitable to minimise the impacts felt by the homes located along the coast, the community participants spoke of difficulties and their inability to withstand the sea. They also confirmed that it was they who sought out assistance from the government for a sea wall as they could not see any other way.

The feelings held by the community, whether they were of helplessness or acceptance of the sea and its impacts, will have an effect on the efficacy of climate change adaptation projects implemented within the community. A point provided by government participants emphasises this. When asked about the inclusion of community perspectives in adaptation projects, Participant B and D discussed the preference coastal communities had for structural measures, as opposed to the use of soft or traditional coping strategies. For example, government and NGO interviewees noted that when communities sought help for adaptation measures, it was usually help to build a sea wall along the coast. Softer measures such as coastal replanting to reduce erosion were rarely requested. It seemed coastal communities would often reach a point of understanding that traditional coping strategies are no longer able to prevent destruction caused by the rising sea.

"There is always a challenge, because our villages, they always prefer structural measures. They always prefer that,

> *but we try to make sure that we consider and incorporate other...you know, soft solutions, soft solutions which it can include ecological or traditional ecological preventative or adaptation measures"* – Participant D (Government representative)

Literature has suggested that to ensure community support for adaptation projects, community buy-in for the project is required (van Aalst *et al.*, 2008; Mercer *et al.*, 2009). In a case where the community is more inclined to accept the changes they have observed as the will of God and therefore unable to be changed, then attitudes might not be as receptive or supportive of adaptation projects. On the other hand, if the community feels helpless themselves but views outside assistance as a way to better their situation, then adaptation may be welcomed and supported.

3.2.3 Community self-organisation strategies

Government and NGO participant responses also emphasised the way in which a village would organise itself, forming various committees, each with its own purpose and area of focus. An example provided from one village was the formation of a committee to take care of the water supply by maintaining pipes and checking the water quality. Another was set up and allocated monitoring of fisheries resources and another to plan for disasters and implement the strategies in the time of a disaster. Expectation from the villagers is placed on these committees to perform their allocated tasks. This form of governance gives each village member a specific role to focus on through their roles within a committee.

> *"What surprises you is that a lot of them have already set up committees that look out for things like that. So, they have a good understanding of what's required when a disaster happens, so they have committees to look after things like that. They have committees to ensure there is food security,*

> *they have committees to ensure the environment is clean"* – Participant C (Government representative)

It was noted that the community participants themselves did not emphasise the formation of their village committees as a coping strategy, although upon asking, it was confirmed that they have indeed formed committees, each with its own role. It seems they did not view that act as a coping strategy.

Not only have village committees allowed for monitoring of community resources and planning for disasters, Participant B also notes their role in promoting community safety through longer term adaptation decisions. For example, prohibiting villagers from building new homes on or close to the coastline.

> *"To some extent um…some villages have gone into restricting people in the village from doing certain things, all because of the safety, all in the interest of public safety. That is one thing that committees can come up with, your own control measures. To not allow those in the village to build homes beside rivers or near the coastline because of potential flooding. Some villages have done that, they prohibit people from building or residing near rivers, flood plains, next to coastlines"* – Participant B (Government representative)

Another form of community organisation is the allocation of customary land for various adaptation purposes. An example within Tafitoala village is the allocation of land to plant mangroves, to expand the existing mangrove area for a larger buffer zone from the sea. Community participants stated that the decision to expand the mangrove site was based on a communal need, and the families with nearby land therefore supported the allocation of their land for that purpose. Thus no compensation from government was required or requested for by the community as the result of the community support. The planting was also carried out by the villagers themselves. How a community organises itself and its willingness to support adaptation initiatives thus makes a big impact.

Instances where a community has been less self-organised in addressing adaptation concerns were also discussed by some participants. The importance of community land issues were highlighted as one of the most contentious. An example of a land issues is the unwillingness of landowners to have any necessary infrastructure such as seawalls erected on their lands, despite their appeal to the government for such infrastructure. In those instances, the community seemed to be more interested in what they can get out of a potential project, as opposed to how they can support it, despite the community request for that support.

3.2.4 Village structures and engagement

Various barriers to community engagement were discussed by government and NGO participants, of which governance was a commonly mentioned concern.

> *"But...everything is covered under governance…it depends how good or bad that village governance system is. Because communities don't function individually, it functions as a whole part"* – Participant B (Government representative)

Village governance was discussed by representatives of both government and non-government personnel. As discussed in Chapter Two, there are two kinds of governance structures within Samoan villages: the more common traditional structure, and the non-traditional structure held by villages closer to the town area. Responses from participants highlighted some concerns with both structure types, with some responses indicating that there are pros and cons to each type.

> *"In communities, there's always…it depends what kind. There's a structured one and there's a non-structured one. So, if it's a structured one it's very easy to work with…it's easier in terms of organising, because there's one voice and everyone listens you know*" – Participant F (NGO representative)

Identified here by an NGO participant is the influence that community social structures or forms of governance may have on that community's ability to effectively participate in adaptation projects.

With regard to the traditional governance structure, the government and NGO participants noted the benefit of these in aiding community engagement throughout project planning and implementation. Similar to the view of Participant F, the other participants agreed that communication with village members is made easier when the communities have stable internal governance structures, as is the case within traditional villages such as Tafitoala. Interview responses indicated that stable governance enables easier access to the community and increases the likelihood of participation across the village.

With the urban and non-traditional villages, barriers to community engagement discussed by participants include difficulties in coordinating meetings and garnering interest and participation in project initiatives. Although there may be a *pulenu'u* appointed by the government to be present in the village, getting the village to participate in projects as a community is more difficult to manage because there is no village council. Each family generally functions as an individual unit as opposed to functioning collectively.

The danger of families functioning as individual units is explained further by a NGO participant, citing an example in times of natural disasters.

> *"But if they mobilise themselves in the moment, they mobilise themselves in the family unit and not as a community. Which is why in some cases, weaker family units who don't have proper housing or doesn't have enough resources, they are the ones who are much more vulnerable to the impacts. With a community based response, when the information is received from NDMO or the national met service, whoever is the decision maker or the chiefs at the community level, they will be able to allocate specific roles for different village groupings for them to look after. And*

that's where everyone will be protected instead of a family oriented sort of response" – Participant G (NGO representative)

Participant G spoke from an experience assisting with a project which aimed to work with communities to strengthen their ability to use and apply meteorological data and information and to develop appropriate plans to address climate change and disasters. Lessons learnt highlight the need for greater community cohesiveness to support adaptation initiatives in raising the adaptive capacity of communities.

3.2.5 Village structures and representation

Government and NGO responses highlight the impact of village governance types on the level and quality of community engagement. It is clear from responses that the traditional form of governance structure enables easier access to the community. In addition to that, some government and NGO participants advise that care must be taken to ensure all parts of the community are represented during meetings and consultations.

"The biggest barrier would be the inability of all members / groups of the communities to freely express themselves and voice their opinions. They are often drowned out by the authoritative nature of the community, where leaders / village chiefs often have the last word and are not given the opportunities for those most vulnerable to voice" – Participant H (NGO representative – email response)

It is noted, for example by Participant H as quoted above, that having a structured hierarchy has the potential for stronger voices to drown out voices of those lower in the governance structure.

The likelihood of the traditional governance system to affect representation of the different perspectives within a community is high due to the level of authority held

by village councils. The council makes the final decisions for the village. The level of representation of various groups within the community is therefore dependent on the council's values and direction for the village. One participant defines good governance as being inclusive, stating that:

> *"Governance affects inclusiveness. Because governance…it should be socially inclusive, women are supposed to be part of it, women's committee are supposed to be part of it, the youth, untitled men should be part of it. If governance is not good, those other parts of the community won't be a part of it [adaptation planning] or have a say and contribution"* – Participant B (Government representative)

Some government and NGO participants discussed instances whereby agencies whilst working with communities to implement adaptation projects noted the potential of governance to minimise representation of all voices within a community. To counter this, project organisers may employ strategies during meetings with the wider community, such as holding discussions in smaller groups, so that those who may not have been comfortable to voice an opinion in front of the whole community, may gain the confidence within a smaller group.

> *"We've changed how we do things…we break them up into groups. It's more effective and we get more information if we break them into groups. Especially because sometimes untitled men wouldn't, you know they're always cautious about speaking out in a bigger group"* – Participant D (Government representative)

3.2.6 Community dis-interest in climate change programmes

An important idea communicated by many of the government and NGO participants, is the growing dis-interest amongst communities towards climate change adaptation programmes. This has come about as a result of climate change

being integrated into many Ministries and agencies, which in turn has seen a number of different programmes being rolled out by different groups at the same time. Consequently, they have come to feel overburdened with similar messages and programmes, leading to an expression of dis-interest by communities towards adaptation programmes and initiatives which in turn have made it more difficult to gain their support and acceptance.

> *"Because that's one of the biggest issues that we're facing right now. Various agencies will go out to communities at different times and talk about climate change, but it's the same subject, and it becomes very fragmented. For SGP [Small Grants Programme], we believe that we have to go together as one, because communities can get sick of listening to the same message over and over from different people"* – Participant F (NGO representative)

This lack of organisation by government ministries and NGOs indicates that the communal responsibility and unity that had proven to strengthen village organisational efforts as previously outlined, is not reflected at the national or government level.

3.2.7 Wealth of TEK

Both groups of government and NGO representatives emphasised the relevance of TEK in adaptation planning, while highlighting through their experiences, the wealth of TEK they have observed in effect while working in communities.

> *"A lot of the communities in Samoa as well as other Pacific Island countries, they still employ and utilise traditional knowledge, in the sense of the prediction of hazards as a method of early warning system…they have, they are heavily reliant on traditional knowledge that has been handed down through many years, generations, and through the word of*

mouth and employed in various aspects of their lives" – Participant G (NGO representative)

Literature has indicated that adaptation planning has tended to emphasis scientific knowledge over TEK (Huntington, 2000), but many government and NGO participants responded that both TEK and scientific knowledge are required to plan the best adaptive strategies.

Types of TEK ranged from the uses of various plants, to the behaviour and location of fish, to reading natural warning signs for cyclones. TEK on ecological changes may prove extremely useful in informing what is being lost and damaged by climate change, thus providing an unrecorded ecological history. It seemed that TEK was essential to the everyday lives of community residents, and the utilisation of TEK on a daily basis may explain the continuity of this knowledge with villages. But the relevance of some aspects of TEK may be minimised as the changes in climate observed become too rapid.

Assessing where TEK can be incorporated in the planning process to maximise project effectiveness is already underway. Many government and NGO participants acknowledge that TEK is crucial in providing a clearer picture within any setting, including the historical climate events and processes that have taken place in each community.

"It's all about reduction of disaster risk, disaster and prevention. And to do that, you have to have baseline information of what's out there" – Participant B (Government representative)

To attain a clearer contextual picture, responses highlighted that TEK and perspectives held by each community were sought by government and NGOs in adaptation planning, to allow for better place-specific strategies. These responses indicated the value which many projects co-ordinators placed on the knowledge and perspectives held by the villagers, to improve adaptation initiatives.

"They [communities] are very crucial, like I said, the

> *interventions that we do are for all the local communities, protecting livelihoods, enhancing resilience to climate change. We consult them and they have the answers, they have some of the ideas"* – Participant A (Government representative)

3.2.8 TEK- not documented

Although TEK was noted by many participants as being prevalent in types and uses throughout Samoa, many also note the lack of TEK documentation. These participants emphasise that in order for TEK to be utilised effectively, it first needs to be documented and monitored. This is required to confirm reliability of TEK indicators that may have changed behaviour over time as a result of climate change.

> *"One other barrier that I know is the lack of data and um…if you look at one specific um like the ulu [breadfruit]…the ulu tree is one indicator that has been seen in Samoa where quite recently that the way the ulu fruits or bear fruits has changed…when you wanna really check how the ulu uh has changed its seasoning and fruiting, you need at least ten or thirty years of data to really see how that has evolved over the last thirty years. But as we know in Samoa, that data does not exist…"* – Participant G (NGO representative)

Up to now, the lack of TEK documentation and data has made integration of TEK into adaptation planning a challenge. Interview responses indicate that TEK is not able to be used if it is not documented and monitored for accuracy. The wealth of TEK is therefore viewed as having a lot of potential to provide a better understanding of contextual factors, but it needs to be in a format which would allow for it to be integrated with the more commonly used scientific knowledge.

Interview responses revealed some progress being made in TEK documentation. Progress is being made through the Climate and Ocean Support Programme for the

Pacific (COSPPac), a project also mentioned in Chapter One, as one of the ongoing adaptation projects within Samoa. COSPPac works with PIC partners to develop tools and information about climate, oceans and tides. In talking about COSPPac, the participants that are involved with the project discussed one of the main project aims, which is to integrate scientific knowledge with TEK, to produce valuable forecast predictions.

> *"We [the project implementers] want to build the capacity [of Meteorological staff] so that…they will be able to bring the science and understanding from their formal training, but also find ways that they themselves will be able to merge the science with traditional knowledge"* – Participant G (NGO representative)

Linked to this is the identification by some participants of the role language (jargon) and technical knowledge has in becoming a barrier to community engagement. It seems that the way in which those living within the communities understand climate change, may not be conveyed using terms that are typically associated with climate change. Consequently, when it comes time to incorporate community perspectives and knowledge into the planning process, project managers may need to fill this gap and act as the middle man, to understand and interpret community knowledge.

For example, in an attempt to give communities the best chance to voice their concerns and propose adaptation plans for their own communities, some adaptation programmes funded by the Global Environment Fund (GEF) will give the task of proposing an adaptation plan to the community themselves. But the difficulty in this is when the proposals need to be written and formatted with the agency's criteria. In such cases, the communities will struggle to write the proposals in English and use relevant technical terms that agencies will usually look for before providing funding.

> *"It's to do with translation of technical terms into the language that they're used to. So it's basically the language*

barrier. So, myself and a couple other people who are dedicated to helping people out there in the vulnerable areas, we help write proposals for them because that's the barrier they see as well. Is that all of this project planning, it's all in English, all in technical terms, all in fancy terms" – Participant A (Government representative)

3.2.9 Government-led adaptation

Responses from the interviews also illustrated participant perspectives on the roles of government, NGOs, and the community, in adaptation planning. Perspectives on societal roles were revealed during the interviews as a natural flow-on from discussions on extreme events of climate change and how the different groups of society can and should act to raise adaptive capacities of communities.

Community participants were generally in agreement that adaptation initiatives should be led by government through relevant government agencies. It may be that communities thought this was due to the fact that government holds more resources and therefore is best placed to lead adaptation initiatives. For example, a community participant asserted that government intervention is required if they, as a community, are to remain on the same lands, because only the government will have the resources necessary to assist them. The feeling of helplessness could then be seen to foster a feeling of reliance on the government, to assist in adaptation.

Constant referral to the role of government also suggests that communities view government as a familiar authority with jurisdiction over all communities in Samoa. Furthermore, NGO participant responses indicate that government jurisdiction give relevant government agencies the ability to normalise climate change action throughout its different agency sectors. Thus, government is able to centralise and coordinate all national adaptation work. These actions were seen as necessary for a more efficient avenue for widespread adaptation. It was explained that this would be possible if all sectors integrate adaptation strategies within their normal sector

plans, while a selected ministry ensures strategy coordination. In large, government and NGO participant's responses on this issue acknowledge the need for government to play a principal role in adaptation planning and implementation.

> *"I think it's central, the government still has to play a central role with climate change planning, and a lot of agencies within government already do that. That's our role"* – Participant A (Government representative)

Responses by community participants also highlighted that communities understand the rapid rate of climate change. They emphasise the need for urgent action and the inability of communities to adapt on their own. This was due to their observation of the rapid rate in which the climate is changing, and impacting on the safety and wellbeing of the villagers.

> *"Our village is not safe when the waters rise and burst towards the village. These are all climate change impacts that we experience. When the sea bursts, the waters overflow into our village and into our homes. At the moment it is uncontrollable"* – Participant I (Community representative)

Participant I's mention of the sea as a now uncontrollable threat indicates a helpless state of mind. They seemingly view the rate of change to be much quicker than their ability to adapt.

Responses also pointed to the government ability to strengthen community capacity to adapt, through capacity building trainings. Such initiatives are emphasised as crucial to better prepare communities to be effective first responders to any climate impact that may strike. Other responses indicated the need for better analysis of scientific evidence to adequately support adaptation programs, a need which could be met by the government, either through its personnel or a private contractor.

Lastly, government participant responses highlighted a further consideration taken

by the government in adaptation planning, which is to link plans to policies at the local, national, and international level. This is another aspect of the government's central role in adaptation that is identified as crucial to attaining necessary action from international agencies in providing assistance. This is linked to the responses which recognise the role of government to continually search for funding. Funding was noted by participants as essential for ongoing implementation of adaptation initiatives as needed by communities, especially for adaptation action identified as more costly. Examples given include the building of protective infrastructure such as sea walls, and mass relocation of communities inland due to sea level rise. Another example given on a larger scale is the fight by smaller countries for loss and damage as a result of climate change, to be addressed at the international policy level. This role of government shows how a push for policies created with an international focus can filter down and benefit a community such as Tafitoala.

> *That's basically the role of the government itself, is to make sure that we put in place those systems and processes, and…also to secure resources. That's critical…one of the key things that is coming up, following the Paris declaration, the Paris meeting, is loss and damage. Because Pacific island countries, and the Small Island States throughout the world, they fought really hard building up to the Paris meeting, to address loss and damage as a result of climate change"* – Participant D (Government representative)

In summary, responses indicate that government should lead adaptation responses due to three main reasons. The first reason is government is thought to have the most resources. Secondly, it is a familiar authority. And thirdly, villages understand the rapid rate of climate change and think government can act quickest. This thought may be linked to the first reason of government being well resourced, and therefore should be the most effective authority to respond to climate change impacts. Responses by government and NGO personnel indicated that the government acknowledges its role in adaptation planning to be a central one, and has therefore taken the steps to set in motion processes to address climate change adaptation at the national level. This is

evidenced by policies, plans and projects being rolled out as the government puts more and more resources towards adaptation initiatives.

3.2.10 Listening to community voices

Whilst it was clear that government and NGO participant responses largely agreed with community participant responses in terms of the government's role to initiate adaptation programs, all participant groups also highlighted the role of communities.

> *"Oh yea definitely, they [local communities] play a big part. I mean all of us, we go to the back [rural villages] and then we come back and we live in Apia. But those are the people that actually manage their own locations, their villages, and those are the people we have to go through"* – Participant C (Government representative)

The role of communities as knowledge holders and the need for that knowledge to be shared is increasingly being acknowledged by government and NGO agencies. An example was provided of the Community Disaster and Climate Risk Management Programme (CDCRM). CDCRM was a project that was developed in 2011 as a government initiative aimed at standardizing the delivery of any disaster risk management program at village level and to improve the village community's capacity to manage short to long-term risks. The main output from each village is a village disaster and climate risk management plan. The need for effective community engagement and incorporation of local knowledge is emphasised, from the beginning to the end of the process.

> *"Each village or community must have a disaster management [plan] of their own. It won't be the same for every village because it depends on their geographical, geological, geotechnical profile. It's their assessment...it's a self-evaluation of themselves. We only take the lead to*

> *facilitate, but they're the ones whose supposed to come and do this, because they're the more experienced...they know what happened to them daily, weekly, monthly"* – Participant B (Government representative)

To gauge the views of the community on the planning and implementation of adaptation projects, specifically the PACC project, community participants were asked to discuss the process of project development which included the project meetings and consultations with the project team. The participants were in agreement that during the PACC project, they were adequately consulted throughout the process. This was in terms of being kept aware of project plans, and having initial meetings early on during the planning phase.

The community participants were also encouraged to share their TEK with the project team in an effort to strengthen the sea wall being planned for coastal protection. An important component of TEK utilised in the plans was identifying the tree species that were best able to grow and withstand sea conditions. The tree species identified by the Tafitoala residents as resilient against coastal conditions and deep rooted were incorporated into the coastal protection plan, and grown behind the sea wall as a buffer.

Another reason to emphasise the role of communities as outlined by participants for adaptation, was the authority that villagers held within their village. Village members being authority holders within their communities would allow for ease of project implementation if the villagers are willing participants in the project. It also increased the likelihood of the adaptation initiative being maintained by the villagers themselves once the project ends.

3.2.11 Uses of a community-centric approach

When it came to the perceived enablers of community engagement, an inclusive approach was identified as crucial by both government and NGO participants alike. This approach was given different terms by the participants, such as a village-level

approach, or community-based approach. Essentially, the approach advocated for and supported by many participants is a community-centric one, as opposed to a top-down approach.

> *"But ultimately, the government is very clear on… it has to be working at the village level because there's so much...that's where the people are. And if there's going to be climate change adaptation that's successful, and disaster risk management, then we need to be working very closely with the village level and the matai and all that village level structure"* – Participant E (NGO representative)

> *"MNRE [Ministry of Natural Resources and Environment] has been doing these community consultations for a very long time, so MNRE has adapted its mind-set that you just can't step into a village and tell them what they're supposed to do…we'll get thrown out. But it's more like trying to be inclusive aye, making sure that we're facilitating but they're taking the lead. There's a sense of ownership by the end of the program that you're trying to do"* – Participant B (Government representative)

Participant B discusses the importance of community inclusion in adaptation plans, emphasising that villages need to lead projects implemented within their communities. The Ministry of Natural Resource and Environment has always been the main government agency charged with taking care of environmental issues, including climate change adaptation. Lessons in community engagement learnt by this agency therefore provided valuable insight into the methods of communication commonly employed by project implementing agencies.

The need to promote a sense of ownership was further emphasised by other participants, who not only advocated for strong community engagement but also

stressed that the engagement process must occur *early* on in the planning process of an adaptation project.

> *"I think for any Ministry, you'll find that without the support of communities, it's really difficult to even implement, so it's always best to involve them right from the beginning, so that they take ownership. One, you share your ideas with them, but at the end of the day, it becomes their ideas"* – Participant C (Government representative)

An example of an inclusive approach was illustrated by a participant, through the process of developing the 'Coastal Infrastructure Management Plan' (CIM Plans). CIM plans were developed using a community based management approach with the need to manage infrastructure in a coordinated and strategic manner to improve cyclone and hazard resilience (Lyon *et al*, 2003). This community based approach is also discussed by Participant C:

> *"So we make sure here [in the CIM Plan] to include what all their other concerns are with regards to the environment, with regards to plantations, accessibility to water, accessibility to roads. Basically, we need to hear from them what they feel needs to be improved within their own locations…to help them build their own resilience…"* – Participant C (Government representative)

NGO programmes were also discussed by the participants which further illustrated methods in which a more inclusive approach was achieved. One such program focussed on raising awareness on climate change and coping mechanisms. Driven by a local youth group, the Youth Climate Action Network of Samoa (YCAN) run programs initiated at the community level and are aimed at empowering communities to continue to persevere through climate change impacts. The way in which the group approached and communicated with communities was described as a more down to earth and simple approach. From that approach, the messages

they relayed to the communities they approached were more readily received and absorbed.

> *"I always um…see the surprise felt by the elderly community members [in response to YCAN approach], and that's the difference between hosting a you know a formal…through the formal system and having the assigned village representatives and the village mayor to come and voice their own opinions versus a setting whereby you are more decentralised, and you're running it with the actual village normal people…YCAN put it out very simply"* – Participant F (NGO representative)

As well as employing a down to earth approach, different modes of communication with communities are employed by those charged with implementing projects, in an attempt to make adaptation planning a more inclusive process. These modes of communication are discussed by government and NGO participants. They include the use of better illustrations such as maps and diagrams when in discussions with communities, breaking into smaller groups to allow for more voices to be heard, and to hold meetings and consultations in places easily accessed by all community members.

Examples and experiences described above demonstrate adaptation in progress at the ground level. Lessons learnt from these experiences show how those implementing adaptation projects are becoming more community-centric and adjusting their approaches accordingly.

CHAPTER FOUR

Discussion

This chapter will discuss the research findings in light of the existing body of literature on community engagement and TEK use in adaptation planning. The discussion will seek to address the research question:

What are the barriers/enablers to community engagement and traditional ecological knowledge use in the climate change adaptation planning process within a Samoa coastal community?

To address the research question, this chapter has been separated into two sections. The first section discusses research findings on community engagement in adaptation planning. The subsequent section explores research findings on TEK use in adaptation planning.

4.1 Community engagement

Prominent themes that emerged from research findings include the impact of community behaviours, feelings and worldviews on community responses to adaptation projects, and community governance and its implications.

The main barriers to community engagement discovered in the findings included traditional governance threatening representation, fragmentation of climate change projects, and the values that the community holds on to whether it be cultural or spiritual. Key enablers of community engagement included traditional governance promoting participation and self-organisation strategies, and the drive by communities to seek government assistance. These key barriers and enablers of community engagement are discussed below.

4.1.1 Understanding community worldviews and ideologies

Given the magnitude of the challenges the community now faces to adapt to climate change, I had expected telling signs of distress, anguish, frustration or fear from community members interviewed. On the contrary, findings illustrated community participants to be emotionally detached when discussing the impacts of climate change on their community, in particular sea level rise. Community faith-based ideologies, as well as the many years of observing climate change impacts first hand, were raised as possible explanations for community reactions to climate change. In cases where the community is more inclined to accept the changes they have observed as the 'will of God' and unable to be changed, then attitudes might not be as receptive or supportive of adaptation projects. A study in Kiribati also encountered faith-based ideologies when studying community perception of vulnerability, and similar to the research findings, found that some respondents remained unconcerned about climate change, mainly due to their faith in God (Kuruppu and Liverman, 2011).

A major barrier to community engagement illustrated in the findings is the growing community dis-interest in climate change programmes. This has come about as a result of the growing number of agencies, from both government and NGO, going out with overlapping schedules to communities to implement climate change programmes. Information over-load can then lull villages into a false sense of security where they mistake information for action. This may also explain why instead of displaying emotional distress, villages become matter-of-fact towards climate change discussions as they have probably heard the issue being discussed many times before. But hearing about it is different from acting on it. So in a way, this fragmented approach could be even more damaging than recognised here, i.e. not only is it not effective in engaging communities, in can also create a dangerous mind-set in which villagers will think that they now know and have done enough, and will not wish to participate in any further adaptation measures.

Findings also indicate that the lack of emotional expression by community participants may also be a coping mechanism. This research has illustrated that

many community programmes have been rolled out into communities over the past years. Thus, it may also be possible that the community's continuous engagement and the recurring nature of adaptation discussions with the scientific community means that any emotional responses – like distress or anger – have been exhausted or displayed in previous discussions with project consultants. Subsequently, climate change and its impact is no longer a novel or strange concept that endangers emotion. This could explain the lack of emotion, because climate change and its impact no longer has an emotional hold on those within affected communities, as they are already taking steps to mitigate that harm. Even moving inland is a positive action that gives them control over the effects of climate change.

Another interesting finding is the preference of communities for hard adaptation solutions over soft solutions. This finding is corroborated by literature in that although soft measures ensure a range of practices are employed to combat climate change rather than building rigid and costly structures (Hale *et al*., 2009), communities facing climate change impacts prefer the implementation of hard measures (Sovacool, 2012). This finding may also be linked to community feelings as discussed above, whereby the extent of climate change experienced by the Tafitoala community in relation to sea level rise, was promoting a sense of helplessness that is alleviated when hard measures are implemented.

Another feeling that could explain the drive by communities for hard solutions is their attachment to their place or land. Understanding place attachment is suggested by Wolf *et al* (2009) as an aid in determining the level in which the community members will participate in climate change programmes. Hard physical infrastructure or barriers to sea level rise would provide coastal communities protection without them having to leave their homes that they're attached to. Alternatively, a two-prong approach may be undertaken, where structural measures are initiated first to alleviate fears of sea level rise and its impacts, followed by the implementation of soft strategies. Structural measures will give villagers a greater sense of safety because it is a tangible defence, and once fears are alleviated, longer-term measures and soft strategies such as tree-replanting and mangrove rehabilitation can be prioritised.

4.1.2 Village structures and implications on community engagement

Adger *et al* (2013) when discussing culture and climate change adaptation, emphasised that the cultural values of a community shape how supportive and motivated the community will be towards adaption measures. Some key findings from this research are related to the traditional form of governance in Samoan villages. As outlined in Chapter One, Samoa has maintained a specific type of governance that is tied to its traditional culture. This governance structure can be observed within most villages in Samoa. Accounting for these forms of structures, at the case study level, allows for a better understanding of Samoa's current situation that is difficult to understand by extrapolating findings from studies done elsewhere.

One of the key findings in relation to governance, is that the traditional form of governance structure can be a barrier to representative community engagement. Village councils have the highest authority within local communities. This authority can be viewed as over-dominating and therefore has the potential to drown out any other voices that may want to be heard but which are not represented in the council. Agrawal and Gibson (1999) in analysing community resource management note that interests and actors within communities are not homogenous, and assuming so would not allow for meaningful community engagement. Governance and representation is therefore an important issue to address if interests within village communities are indeed not homogenous but are drowned out by a powerful few. From this, another question emerges of whether an issue of meaningful representation of all interests is applicable in a village setting, because each member of the village council speaks in the best interest of their families.

Another key finding indicates that traditional governance structures in many instances also enable community engagement adaptation initiatives. This is illustrated through increased organisation and participation of community members within traditional villages. Self-organisation strategies will see

communities create various committees, each with its own role in ensuring the well-being and safety of the community is maintained. Interestingly, community participants did not identify self-organisation to be an adaption strategy when asked. Perhaps because some – if not most – of these committees have always carried out similar functions, it's just with the advent of climate change concerns, their functions now also serve as a method of climate change adaptation. Hence they did not view it as a coping strategy, because these committees were formed before the need for such strategies.

Also indicated in the findings, is the way in which traditional governance served as an enabler to community engagement through its position as the decision-making and governing entity of a community. Their support for an adaptation project is therefore crucial for a project to proceed in that community. This is recognised by Measham *et al*. (2011) who acknowledged that local governance systems are the often the entities to best handle local climate change impacts.

4.2 Negotiating TEK and its potential for integration

The literature indicates that community-based approaches give local communities the opportunity to work with relevant agencies or project implementers to identify climate risks themselves, thereby addressing vulnerability issues using local knowledge (van Aalst *et al.*, 2008; Mercer *et al.*, 2009).

A key finding from this research illustrates that the process in which the community participants transfer and use their TEK, has instilled in them a certain 'worldview', as discussed by Turner and Clifton (2009). The worldview as indicated from the findings is that of subsistence living guided by culture and faith. Findings highlight that TEK by nature, is not knowledge that is typically documented. It is handed down through generations through word of mouth. This is supported by literature which identifies that TEK is more of a 'mental map', that holds observations of the climatic past and recent experience of the weather, with the potential of anticipating future climate (Adger *et al*., 2009).

A major barrier to the use of TEK highlighted in the findings is the lack of documentation. Lack of documentation has prevented a more widespread integration of TEK into adaptation planning in Samoa, despite the acknowledgement of its value. Similarly, literature notes that there is currently insufficient evidence to determine the effectiveness and limits of TEK (Nurse *et al*., 2014). Lack of documentation may then lead to inflexibility, as proposed by Huntington (2000), whereby the use of TEK is met by resistance due to its undocumented nature, leaving its reliability to be questioned (Huntington, 2000).

In this day and age, useful knowledge is usually described as knowledge that has been documented, monitored and proven as reliable. This is illustrated in the literature, which identifies the emphasis on science abstraction and modelling of scenarios as a barrier to engaging community knowledges (Sheppard *et al*., 2011). In stressing the need for documentation and monitoring of TEK in order for it to be more accessible, more scientific methods of acquiring and testing knowledge is emphasised in the findings. For example, the Climate and Ocean Support Pacific (COSPac) project which is seeking to integrate TEK with the formal methods of forecasting, will first attempt to verify the TEK through various data collection and monitoring techniques, before TEK can be integrated within its formal processes. This is not surprising, considering the preference for established scientific practices over the use of TEK (Huntington, 2000).

Despite the barrier of TEK documentation, research findings indicate that those charged with running climate change projects have advocated for the need of both TEK and science to come up with the most effective and sustainable strategies. This is illustrated in the integration of TEK through community-driven assessments of their environment. In carrying out these assessments, the community members are encouraged to share their knowledge and assess their own situation and hazard risk.

Further to community-driven assessments, the research findings illustrated some other practical strategies currently being employed by project teams, to enable greater integration of TEK use in projects. These include holding meetings with the community at a place easily accessible by all community members, breaking up into

smaller groups during community consultations so as to encourage those less comfortable to speak in front of a large group to share their views, and translating adaptation project proposals written by community members when applying for funding, from Samoan to English.

The types of TEK identified in this research illustrated how some TEK may prove to be extremely useful for adaptation and are sought out by adaptation project planners, whilst other TEK types may now be irrelevant due the rapid rate of climate change. TEK that seems to be of use for adaptation planning are ecological observations such as changes in available plants and fish species, and social knowledge of coping mechanisms and community support implemented when communities are self-organised to cope with climate disasters. TEK identified as outdated include the seasonal calendar of fishing activities and fruiting of plants. These activities have previously been based on weather patterns which have recently changed too drastically and at a rapid rate. Consequently, irrelevant TEK has led to community members having to adjust their largely subsistence lifestyles to accommodate for this change, whilst also potentially fostering feelings of reliance on government agencies to provide assistance against rapidly changing and extreme climate conditions.

CHAPTER FIVE

Conclusion

The main aim of this research was to assess local community engagement in climate change adaptation planning within a coastal community in Samoa, in order to identify opportunities to assist in improving the effectiveness of future climate change planning. This chapter will reflect on this study aim, and summarise the key findings which sought to answer the research question:

What are the barriers/enablers to community engagement and traditional ecological knowledge use in the climate change adaptation planning process within a Samoa coastal community?

The limitations of this study will also be outlined, and some recommendations are provided for future climate change adaptation work. Lastly, the contribution to knowledge is discussed.

5.1 Climate adaptation and community engagement – the case in Samoa

Understanding the physical and social context of Samoa is important in analysing climate adaption, and more specifically, the extent of community engagement and TEK use within that adaptation process. The theoretical framework on climate adaptation developed in Chapter Two guided the exploration of this research within Samoa. This research explored community engagement of TEK in climate change planning, alongside the more commonly focussed on areas of climate science, and climate policies and funding, and discovered that for the most part, adaptation planning is an already inclusive process.

Firstly, this largely inclusive process is illustrated at the national level. Findings have illustrated how the Samoan government has been active in developing policies, sourcing funds, and implementing projects which aim to increase the adaptive

capacity of vulnerable communities, using a community-based approach. Also, agencies, both government and NGOs, charged with handling climate change projects, are largely aware of the biggest barriers to engaging with communities. The findings show that many of these agencies are attempting to address these barriers, through the employment of various strategies.

Secondly, this research has found that community interest in climate adaptation initiatives are strongly influenced by community ideologies and community understanding of climate change as a result of their way of life and previous experiences with changing weather patterns. Community feelings that were prominent in the findings were feelings of acceptance helplessness, dependence, and dis-interest. Research findings illustrated a common ideology in Samoa to be a faith-based one. The belief the communities have in God has in turn influenced the community to adopt a more accepting attitude of climate change. Helplessness was largely driven by past experiences of sea level rise, and the impacts extreme high tides and tide volatility has had on community households. This was linked to the feeling of dependence adopted by communities towards outside agencies, when observed weather changes have been too extreme for traditional coping strategies to combat. Some participants noted community disinterest in adaptation programmes. This was due to programme implementation being fragmented, which resulted in information over-load within some communities.

Thirdly, this research has illustrated the effect of different local governance system types on the adaptive capacity of a community. Literature suggests that the governance system of a community contributes to the extent to which that community is able to effectively adapt (Warwick *et al*., 2016). This research demonstrated that traditional governance structures in many instances enable community engagement adaptation initiatives through increased organisation and participation of community members within traditional villages. Also demonstrated was the way in which traditional governance served as an enabler to community engagement through its position as the decision-making and governing entity of a community. Despite the enabling aspect of traditional governance structures, this research also illustrated that the traditional form of governance structure can be a

barrier to representative community engagement. Thus, organisations working to engage with communities must be cautious that all groups within the communities are adequately represented.

Lastly, the findings emphasised some aspects of TEK to be considered in future climate adaptation planning. According the research participants, TEK has continued to be passed down verbally through generations and widely used within communities. Findings indicated that government and non-government agencies in charge of adaptation planning largely value TEK for adaptation purposes, but highlight the difficulty of integrating TEK into the planning process due it its undocumented and unverified nature. The preference for a more scientific approach in integrating TEK is illustrated through the responses, in that although the value of TEK was acknowledged, it was seen was unusable for adaptation planning unless it could be adequately monitored and verified. Current efforts being made to counter this difficulty of undocumented and unverified TEK was also discovered, in the form of a major project, COSPPac. This is a positive reflection of the push for TEK utilisation in adaptation planning.

In conclusion, this research has indicated that the adaptation planning process in Samoa seems to be employing increasingly inclusive methods of planning, to increase levels of community engagement and TEK utilisation. The framework used for this research emphasised the inevitable link between: communities that are vulnerable to climate impact, their knowledge of the changing environment around them; the science of climate change; and the policies and funding which determine the adaptation activities to be initiated. Each aspect therefore is required for greater effectiveness of adaptation planning. Findings at the national level demonstrated the efforts by government to put into place appropriate and strong policies as well as to source funds for adaptation initiatives. The policies included in them aspects of community inclusivity. Local level analysis further demonstrated adaptation work being carried out within communities, with communities voicing their perceptions of the rapid threat of climate change and thus their need for government to intervene for their protection. Ultimately, this research illustrates that effective initiatives would be best facilitated by government structure and

funding, but informed by TEK from communities, and data and research collected by NGO, thus illustrating an alignment of local and national adaptation interests.

5.2 Recommendations

Generally, the findings illustrate the large-scale efforts by government agencies and NGOs in promoting appropriate community adaptation measures. Despite this, fragmentation of climate change programmes is apparent. Fragmentation needs to be addressed in order to overcome community dis-interest. The Samoan government has managed to successfully increase awareness on climate change and have worked hard to continue on that path. An example of that work in action is the mainstreaming of climate change into all sectors and ministries. To prevent project fragmentation and community dis-interest, a ministry such as Ministry of Natural Resource and Environment, or an already established climate change taskforce, could act a central unit whereby all climate change adaptation work is centralised. An example of an already established unit is the National Climate Change Country Team (NCCCT). This unit was established in 1999 and provides coordination of climate-related activities covering initiatives funded by donors as well as the national budget. Key members of the unit include Chief Executive Officers of relevant government ministries and representatives of civil society and the private sector (Adaptation Fund, 2011. p.13). Such a unit could therefore be responsible for disseminating all adaptation initiatives, looking at which agencies will work in which community at what time etc. This would decrease the likelihood of programme overlap.

Also, there has been valuable work already implemented in Samoa which has encouraged community engagement and TEK integration in adaptation planning. Although there has been work carried out, it has not been captured in journals, but rather in comprehensive project reports and end of project publications. Some project publications contain knowledge and valuable lessons on adaption planning within communities. Studies on community-based initiatives and the inclusion of

TEK and community perspectives within PICs, are a gap in the current body of literature. This gap could be addressed through publications of the knowledge and lessons learnt by those already implementing community-based adaptation measures.

5.3 Limitations and further research

There were several limitations to this research. The language was a bigger limitation than I had initially anticipated. This was discovered when carrying out interviews with community participants. Although I have sufficient knowledge of the local language and have spoken it often, I had difficulties explaining the research questions in-depth and attempting to give examples when the participants needed further clarification or remained unresponsive. This occurred despite the research information and questions having already been translated to Samoan and given to the participants before the interview took place, to give the participants more time to consider the research. The difficulty in explaining the research and clarifying the research questions may have been due to some terms being more technical and therefore unfamiliar to the participants. Assistance was then provided by my partner who accompanied me to the field.

Cultural protocols provided some limitations in that the protocols had to be adhered to while planning for and carrying out field work. These protocols affected the interview planning process with community participants and limited the control of the selection of community participants. According to village protocols, initial contact with the community was made with the *pulenu'u* or village mayor. The Ministry of Women, Community and Social Development (MWCSD) assisted me to make that initial contact. MWCSD made contact with the *pulenu'u* from which a meeting was set up to discuss my research and the potential for some village members to participate. Fortunately my research was accepted by the *pulenu'u*, and although I was able to offer my views about preferred participants in which I requested a diverse (in age, gender and community role) range, ultimately the selection of community participants were chosen and finalised by the *pulenu'u*.

In addition, finalising and gathering the participants for interviews took a number of weeks due to the limited availability of community members from their everyday community and family roles. A number of interview meetings had to be postponed due to some unforeseen village gatherings and events, and eventually two potential participants withdrew from participating altogether due to other ongoing responsibilities. Also unforeseen and very tragically, was the recent and sudden passing of the previous *pulenu'u* who had been the village's focal contact during the implementation of the PACC project. Although the new *pulenu'u* was happy to assist setting up the interview meetings and was able to provide some insight regarding the village setting, he acknowledged that he had not been living in the village during the period in which the PACC project had been implemented. To get a greater representation of community perspectives, it would have been more beneficial for the research to have had higher participation to include a representative from as many village groups as possible.

Finally, what this research has provided is an assessment of adaptation planning in Samoa. The conclusions reached from this research therefore are specific to the context of Samoa, and to the coastal village of Tafitoala. Generalizing the findings may not be appropriate, as the context of Samoa has many unique factors, such as its culture and the way of life of its communities. In saying that, the discussion of community coping strategies, incorporation of TEK into projects to enhance community adaptive capacities, and the work being implemented around effective policies and raising understanding of climate change and disaster preparedness in communities, may provide lessons to aid adaptation work in other small island countries in the Pacific with similar areas of vulnerability.

5.4 Contribution to intellectual knowledge

The existing literature on community engagement and the incorporation of TEK into climate change adaption planning has illustrated that it is a complex process. Many factors are considered when planning for climate change, and the perspectives and

knowledges of the local community may at times be less of a priority as compared to other factors such as the urgency of potential climate change impacts, the available scientific evidence, or the amount of the funds available. This research contributes to this discussion by illustrating issues of climate change planning within Samoa. This work highlights specific barriers and enablers to community engagement, such as community ideologies and perceptions, community governance structures, and undocumented TEK. As illustrated, increasing efforts are being made by government and NGO organisations to involve communities in the adaptation planning process, but it is the past experiences and social context of that community which will ultimately determine their willingness to participate in the process. This research thus contributes insight into the perspectives of a coastal community facing climate change on an everyday basis, and how their experiences with climate change as well as with adaptation project teams affect their responses to adaptation.

Additionally, the literature illustrated that the common discussions around community engagement and TEK barriers have not included many aspects of the various cultures and contextual factors present within the Pacific. Having a case study in a village of Samoa contributes to this literary gap. This research has discussed issues such as different village structures and its effect on a community's ability to self-organise and therefore adapt. Such issues are specific to this Samoan village and illustrate the importance of researching into specific cases in depth to better understand the context of that community and thus identify its issues.

Lastly, this work has focussed on both community engagement and TEK utilisation in adaptation planning whilst previous research has tended to focus on one or the other.

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