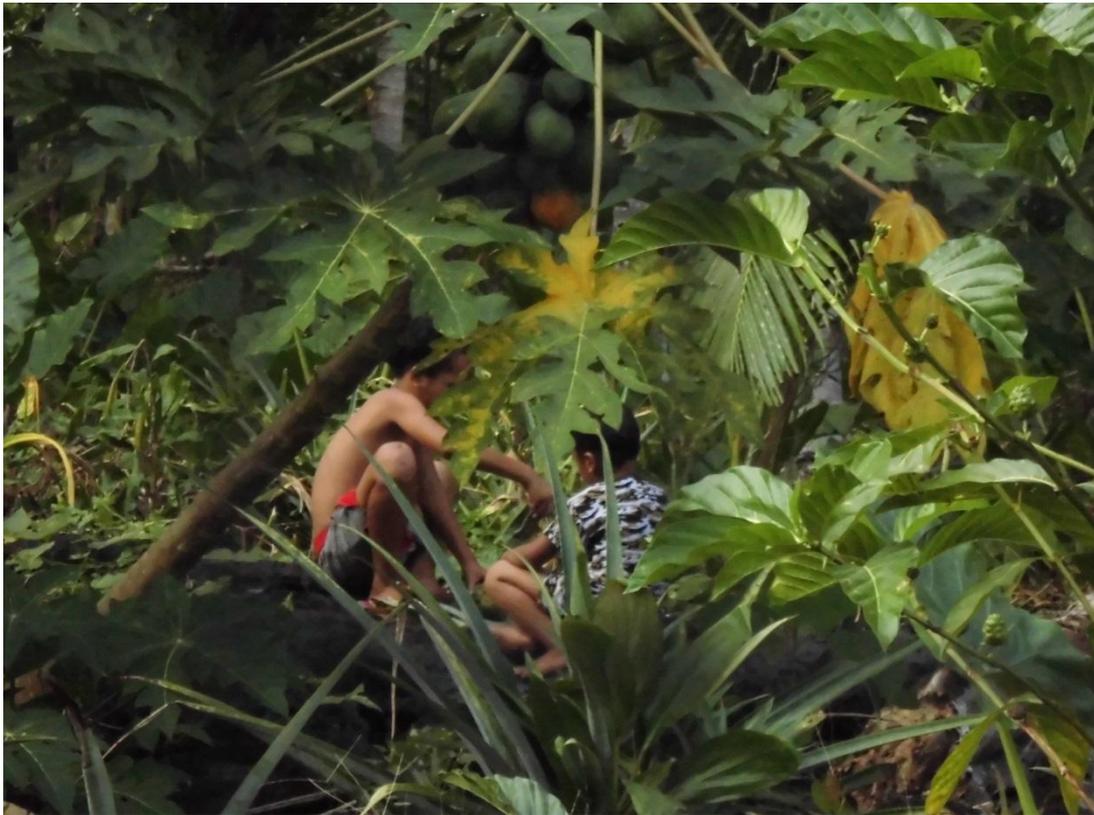


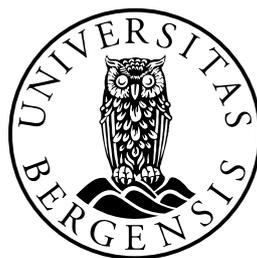
Ways of Knowing, Ways of Life

Environment, Education and Climate Change in a Rural Samoan Village



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August 2015



Front page picture: Sister cutting papaya for herself and little brother behind their family *fales*.

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Acknowledgements

With a great deal of gratitude and love, I thank my Samoan family in Falealupo. I thank my sturdy, kind host father and my beautiful, strong host mother for opening your home and lives to me, taking care of me with patience and showing me what family means to you. I thank my lovely, hardworking host sisters and your children for the laughs, the love and the lessons. Fa'afetai tele mo le talia lelei oa'u i le tou aiga. Thank you Kevin, for the engaging conversations and quality family time.

Thank you to my host family's church and every family and person in Falealupo who made this *palagi* feel welcome and loved, who walked with me, talked with me, laughed with me, and taught me what Samoan hospitality looks like.

Thank you to the students, teachers and librarian at Falealupo Primary school, for welcoming my presence in your classrooms for four months with such patience and kindness. You all work very hard every day, yet received me as a welcome guest, student and friend and not the burden I was worried of being.

Thank you, Edvard Hviding, for the enlightening conversations and for being a great teacher and encouraging academic advisor. Your work and your drive inspires me. Thank you for introducing me to the range of wonderful, inspiring and helpful people who have guided me through these past two years of work and learning. Thank you also to the Bergen Pacific Studies research group for the discussions and feedback, and for cultivating a positive academic and social environment. Thank you Jonatan for your support throughout this process and Regine for the much needed coffee breaks on the 6th floor.

Many thanks to all those of you at the PACE-sd center at USP in Suva who helped me with paperwork, information and advice when I first arrived in Fiji. A special thank you to Beth Holland for your generosity, your wise words and inspiring spirit. Also a very special thank you to Viliamu Iese for helping me with bureaucratic necessities and for giving me guidance and company during my first week in Samoa. Thank you for your continued friendship, academic support and advice throughout this whole process.

Tapu Tuaillemafua and Rate, my Apia mum and dad; Thank you for what seems a thousand little and big kindnesses. Thank you Tapu for your help with my project, for pointing me to Falealupo and finding me a home there, and thank you for giving me a second home in Apia. Thank you Rate for your warmth, for being both a friend and a mother and for making me feel welcome in your house whenever I was in Apia.

Thank you very much to my *Pisi Koa* friends for the laughs and talks, precious downtime and invaluable advice and support.



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Map of Samoa: Savai'i to the West

¹ <http://www.lonelyplanet.com/maps/pacific/samoa/>



2

Savai'i: Falealupo to the far West

² <http://www.suggestkeyword.com/c2F2YWlp/>

1

Introduction

...I have humble reason to believe that in Samoa, it is the bond between families and friends that hold fast the chains of our living systems. Even the trees and seas beckon the love of families to help them survive these foreign things that we face in our hard times. Do you ever wonder at the beauty of a banyan tree? I believe God's tears are stored high up there in the leaves... We know too well the meaning of suffering from environmental hazards. The ingredient that makes a Samoan person special, more special than any other in the world is her willingness to forgive the sea, the hard life, the difference she is owed, to move on, to live life elegantly and fully and to live it for the benefit of those she loves and with these I include the land, the forests and the creatures of the seas too.³

Lumepa Apelu, 2014

The present signs and future projections of climate change are matters of global concern. Rising sea levels, ocean acidification, accumulation of extreme weather phenomena and changes in temperatures are among the challenges that the global community has begun to prepare for in facing a future of environmental uncertainties. Though these changes are globally significant, there are those who hold higher stakes than others. The peoples of the Pacific Islands are among them (Lefale 2010). Spread across a vast range of ocean, the island nations of the Pacific are highly vulnerable to environmental change (UNESCO 2012). Especially so are the rural communities on these islands who rely on their natural surroundings for subsistence. However, the local inhabitants of such areas are far from passive victims of the environment; they are advanced in the ways of adapting to its forces (ECOPAS 2013). Environmental changes of scale have been part of small island life in the Pacific for generations, and have been met with considerable resilience through traditional

³ Written by a mother who lost a child to the tsunami that hit the coast of Upolu, Samoa in 2009. Published in the Samoa Observer Opinion pages in the spring of 2014.

knowledge and evolving solutions for adaptation. Coming from a long history of vast ocean migrations and resettlements -continually living by way of subsistence agriculture and fishing- they are the foremost experts on their natural surroundings and the demands of their climate (UNESCO 2012, Hviding 1996, Clarke 1994). UNESCO among other international organizations and scholars has repeatedly stressed that this local and regional tendency for resilience and adaptability is of global significance, as it can -alongside science- make significant contributions to worldwide education on sustainable living and adaptation to environmental and climate change (UNESCO 2012, Wall-Kimmerer 2014, Nakashima and Bridgewater 2000, Hviding 2012).

This thesis is based on a Master's project conducted as part of the work program of the European Consortium for Pacific Studies (ECOPAS), a collaborative project taking on the challenge of "restoring the human to climate change" (ECOPAS 2013). In essence, ECOPAS creates a space where dialogue can be opened and solutions discussed between the European Union and Pacific Island Nations; facilitated by contributions from natural and social scientists, EU policy makers and artists with particular interest in the sustainable future of Oceania, all with a prioritized focus on the perspectives and needs of Pacific islanders (ECOPAS 2013). My own approach to this ambition has been taken through anthropological research on children's environmental education in rural Western Samoa. This thesis does not focus on climate change per se, but on the relationship between local environmental knowledge and science and an understanding of the ways of knowing cultivated inside and outside of the local primary school in a rural Samoan village. I started out with the basic premise that in order to understand people's adaptability to and perception of climate change (no matter where in the world they live), one must first understand their perception of the environment and what knowledge they consider important, valuable and meaningful. My second, most basic premise was that what we choose to teach our children reflects what we consider important for them to know. A very common question among my own primary and secondary school classmates and for myself was, 'why do we have to learn this'? In recent years, as I have become increasingly interested in children's upbringing and education, this question has taken on a renewed authentic significance for me. Significant in terms of how decisions in curricula and teaching methods are received by students⁴ and in turn of their implications for what it means to be a teacher and furthermore a person with subjective

⁴ By 'received', I mean how students connect with the relevance, meaning and importance of what they are learning, factors which I find important to consider when asking oneself why a student does well or poorly in a subject.

notions about what is important or not to teach the younger generations. I was also interested in the environments through which teaching and learning are facilitated and knowledge is given meaning.

My plan for this project was to examine the local reception of scientific knowledge in light of local environmental perceptions, giving the latter special attention. While there is a tendency to dichotomize scientific knowledge and what is popularly called “traditional environmental knowledge”⁵, I intended to approach the relationship between the two as I would anthropologically approach any two cultures; as different but relatable, not opposite or irreconcilable by nature. As science and local environmental knowledge are two ways of essentially knowing about the same thing my questions was; if they are not connecting, what is it about the one way of knowing that distances it from the other? What is the relationship between people’s environmental perception and the way they see themselves and live their lives? I was interested further in the question of whether educational measures can be taken to approach the environment and address escalating environmental changes with proportionately cultural and scientific comprehensions, or if one form of knowledge necessarily must be compromised - to some degree or other - for the sake of the other? What was the case for Falealupo and in what ways might an understanding about local environmental knowledge in rural Samoa contribute to answering such a question on the national, regional or global level?

Background Literature

As I began to plan this research project, I searched my way through a variation of literature that resonated with as well as informed my focus. I would like to present some of the key literature from the planning stage of my project that remains relevant now. To begin with, I was dependent on finding literature that might give me an idea of primary science education in Samoa and came upon the work of Doris Varghese (2010). Based on statistics showing low achievement rates in Science as revealed by the national examinations results for Year 8 primary school students in 2006, Varghese expresses a need for research into the day to day learning and teaching practices in primary school classrooms. She argues that attention to teachers’ ideas of and methods in teaching are essential to understanding the issue at hand. She further asserts that

⁵ Mazzocchi (2006) In this thesis I have chosen to use the term *local* rather than *traditional* or *indigenous environmental knowledge*.

Learning is a highly contextualised and situated activity. In understanding learning in science, we need to consider not just the meaning made by an individual, but the context in which it is taking place (Bell & Cowie, 2001)⁶. Teachers should encourage learners to be self-reliant and develop independent modes of learning. The main factors affecting the implementation of any educational innovation include the changes in the traditional practices... (2010: 19).

Varghese here argues for an attention to context in which learning takes on meaning, and subscribes self-reliance and independence as modes in which students might improve their scientific learning while also referring to traditional practices that influence educational innovation. In my own research I came across and focused on the issues that she outlines here, albeit with special attention to what might be called traditional, cultural or local practice and perspectives.

When first looking into matters of education in the Pacific, my attention was soon caught by Pacific scholar Konai Helu Thaman. Thaman is a Tongan poet and professor at the University of the South Pacific, Suva, who calls for the decolonization of Pacific curricula and reinstatement of the indigenous knowledge and traditions that make up Pacific cultures in educational planning and practice (Thaman 2003). She argues that education is a cultural venture, as the knowledge included in education is that which is grounded in the values and priorities of the culture that shapes it (Thaman 1997). The clearest signifier of those values and priorities is the curriculum taught within a given school. Thaman draws on Denis Lawton's definition of the curriculum as "a selection of the best elements of a culture for transmission to its young, elements which are regarded as so important that their transmission cannot be left to chance" (Lawton 1975: 9 in Thaman 1997: 121⁷). What we choose to teach our children, argues Thaman, should reflect what we consider worthwhile knowledge (Thaman 1974). This is where she finds a discrepancy in the curricula of Pacific school systems, as throughout much of the Pacific the skills, traits and knowledge of cultural importance regionally and locally are missing. Instead, a Western, global culture and way of knowing and transmitting knowledge have transcended educational frameworks and curricula in the region. She describes the Western way of thinking as "fragmented, mechanical, empirically based, and individualized", in contrast with indigenous Pacific thought which is

⁶ Bell, B., & Cowie, B. (2001). Teacher development and formative assessment, *Waikato Journal of Education*, 7:37-50, in Varghese, 2010.

⁷ Dennis Lawton 1975, *Class, Culture and the Curriculum*. London, Routledge & Kegan Paul.

culturally rooted, characteristically holistic and focused on the collective (Thaman, 2003: 12). The words Thaman uses for describing the Western way of thinking predominant in Pacific education in relation to Pacific thought are the same words often used to describe science in relation to indigenous knowledge in a range of literature (Dods 2004, Lyotard 1987, Mazzocchi 2006). As environmental education in formal schooling in Samoa –and in most countries around the world- is covered by Western science, this point becomes particularly interesting (Jegade and Aikenhead 1999, Iaccarino 2003). In this thesis, I will look at how teachers think of the values and priorities of formal science education in relation to Western (foreign, global) and local culture and how the intrinsic nature and culture of science affects its applicability in Falealupo.

Anthropologists J. McCarter and M. Gavin (2001) argue that mending the gap between scientific and local environmental knowledge in Pacific Islands school systems is not a simple feat, as there are many variables to account for. They conducted 49 interviews with different persons on Malekula Island in Vanuatu who were the time involved in or affected by these kinds of projects. After assessing their results, they concluded that despite –for example- the positive potential for raising the status of vernacular languages and traditional environmental knowledge (TEK) in the eyes of students by incorporating them into schools, there are some potentially negative implications as well. One being, that ‘Traditional Environmental Knowledge’ is manifested and transmitted orally and socially and thus might be compromised by being submitted to the literate and structured mode of transmission inherent in formal academics.

Biologist and philosopher Fulvio Mazzocchi writes about how Western and what is referred to as traditional knowledge have developed very different ways of conceptualizing and transmitting environmental knowledge, as is demonstrated by how the two are dichotomized in a vast range of literature (Mazzocchi 2006). One example is how science -in contrast to the holistic approach of traditional knowledge- tends to study objects in isolation from their natural contexts. Scientists remove themselves from nature, whereas traditional knowledge is very much based on all things –including humans- in context with nature (Mazzocchi 2006: 464). While granting that these are valid points, Mazzocchi stresses that such literature often fails to account for the fact that one form of knowledge should not be described by the criteria of another, nor can it be understood through empirical accounts alone. Any form of knowledge must be seen in the context of its rooted worldview.

Anthropologist and Pacific researcher Edvard Hviding holds that what is necessary for an interdisciplinary insight between different kinds of knowledge is a holistic approach that refrains from simply accumulating a mass of loose bits of knowledge, and rather reaches into the inter-relational spaces between knowledges (Hviding 2003). Konai H. Thaman draws on Hviding's point when she argues that a necessary precondition for intercultural understanding is that one must learn about one's own culture before learning about the cultures of others (Thaman 2008: 469). What is emphasized here is that knowing, learning and teaching all exist within cultural dimensions that are of great significance for any prospects of inter-disciplinarity. Through my ethnography I will further elaborate on what exactly this entails in rural Samoa.

For considering local environmental perception in itself, Tim Ingold resonated with and inspired my standpoint to some degree, both before and after my fieldwork. Ingold (2000:168) writes about environment as "reality constituted in *relation* to the beings whose environment it is". Because of this, he argues, environmental perceptions are constituted through dwelling in an environment over time and can only be understood through an approach to what this entails. This is how I approached my own field and topic, and the understanding of which I used to examine scientific understanding.

Accessing and adapting to Falealupo

When I first began to plan my project in the fall of 2013, I had spoken with my academic advisor, prof. Edvard Hviding about three particular interests. First, there was kinship, the time-old anthropological branch which had awakened my interest in the Pacific islands region as a BA student in the first place. Second, there was the relationship between nature and culture and how people relate to the environment. Third, there was education and the upbringing of children, an interest that had developed out of my work in a pre-school the preceding year where a particular focus was put on awareness in pedagogy. It was my academic advisor, professor Edvard Hviding who suggested that I combine these interests to contribute to the ECOPAS project. To begin with and as alluded to above, I knew that I did not want to use the term Traditional Environmental Knowledge (TEK), because I find the word 'traditional' quite static, and wanted to focus on aspects of both continuity and change in my respective field. Second, I wished to conduct my research in a rural community far

away from the capital, as this would more likely place me in a village where people rely on their environment.

Previous to my fieldwork, I had never been to the Pacific and therefore had no contacts in the region. Doors to Samoa and the Pacific were therefore opened to me first by professor Hviding and associates in the Bergen Pacific Studies research group, who advised me of and put me in contact with their own friends and acquaintances in Hawaii, Fiji and Samoa who might be interested in helping me with my project. This put me at a great advantage as a first-time researcher, as it spared me the time and effort that comes with moving into a social or academic field previously unknown to me. With the purchase of flight tickets and my trip to the Pacific nearing, I already had meetings set up with contacts in Hawaii –where I would have a layover for a few days-, Fiji and Samoa.

I started my journey in the Pacific with a month in Suva, Fiji, in January 2014. During this month, I had the time to meet with academics within my research topic, get ideas and inspiration for my on-the-go preparation for fieldwork. One evening not long after my classmate from Bergen –who was to do his fieldwork in Suva- and I had arrived, we were invited to have dinner with Beth Holland, the director of the PaCE-SD⁸ center at the University of the South Pacific (USP), in her home. Well into our meals that evening, the three of us were engaged in a very interesting conversation about climate change discourse in the Pacific. Our host relayed a variety of statements she had taken note of during various official gatherings that spoke for or against the idea that indigenous knowledge must be prioritized over science to find better solutions for Pacific islanders. She then commented on these statements with her own opinion that it is not about an ultimate choice between indigenous knowledge *or* Western science in the tackling of present and future issues. Rather, she said, “we must weave together the sail for the double- hulled canoe”. Here talking in metaphor about interworking the two ways of knowing to find a solid solution to a global challenge in local –or regional- terms, she further motivated my wish to in some way contribute to that challenge by learning to understand local experiences of what it means to live in a rural village in the Pacific and being asked to relate those local meanings to science and global climatic issues.

As it turned out, for the next few months, I would live in a rural village in Samoa where terms like climate change and environment were on no one’s lips. For the duration of my stay in

⁸ The Pacific Centre for Environment and Sustainable Development

Falealupo village, I stayed with one family and went to the village primary school every day. Outside of school, I looked at how children learn about the environment through an array of daily activities; through watching and helping their parents cook, decorate clothes, houses and church, build, grow and uproot, make medicine, and through general play and movement in their environment. Inside of school, I looked at how children learn about the environment in science, and how that learning is reinforced within the larger scope of the school structure and learning environment. I looked at the roles of being a student and a teacher, an elder/ older and a youth or child. I listened to stories of ‘the old days’ and in what ways the village had changed and what people wished for their children’s futures. I moved from the standpoint that what children learn inside and outside of school reflect expressions of value systems, telling us what those deciding on knowledge to be continued believe is important knowledge. I of course am neither first nor alone in asserting such a view. Based on her years of fieldwork on the island Gau in Fiji, Christina Toren argues for the wealth of insight that can be gained through anthropological attention to the ways in which children constitute their knowledge of the world, asserting that this is “bound to reveal what adult informants can neither tell nor show us because, as adults, we cannot ourselves recover the processes through which we came to know what we know” (Toren 1999: 27). She stresses that for adults, it is difficult to explain how they came to know what they know and how it gained meaning. This is why looking at the upbringing of children is a good source of insight into people’s value systems. She continues; “In coming to grips with the environing world, children cannot help but come to grips with the ideas of those others by whom they are surrounded”.

Ou te nofo i Falealupo: I live in Falealupo

Situated at the westernmost point of Savai’i, the biggest of Samoa’s nine islands, is Falealupo village. 118 kilometers west of the main capital and 32 kilometers east of the International Date Line until it was changed in 2011, the usually lonely white beach of Falealupo is where crowds of people, local and foreign, gathered on the eve of the new millennium to witness the world’s last sunset of the 20th century. Perhaps for this reason as well as for its remoteness from the capital, people in Apia often called it “the end of the world” when I told them that Falealupo was where I was living, while also recognizing it as a place of immense beauty. People in Falealupo pride themselves on the latter, and during my stay would express their wish that I had seen it in its aesthetic “heyday”, referring to times prior to the 1990s. Back

then it was said to have been the “cleanest and most beautiful village in Samoa”. This was before the cyclones Ofa and Val left the village in ruins in 1991 and 1992, respectively. I will come back to the local memories and implications of these in the next chapter.

Falealupo consists of two parts, Falealupo Uta and Falealupo Tai, the former situated in the elevated interior and the latter on the coast by the seafront. I lived with my host family in Falealupo Uta, where the majority of families in the village live. It is in this part of the village, where the forested land is arable that all family plantations lay. In Falealupo, as in most of Savai’i and Samoa as a whole, land is communally owned and inherited by family. Approximately eighty per cent of Samoa’s land was under customary ownership in 2003 (Crawley, 2003), and most people live to a large degree off subsistence farming and fishing. My own host family lived side by side with their plantation, a little off from the main village road. Throughout Falealupo Uta, this road forms a kind of center along which most families are settled in little clearings among the trees. This pattern in settlement persists until the last stretch of the nine kilometer road down by the beach, where the forest recedes and the landscape opens up in a white clearing.

I did not choose Falealupo as my main fieldwork site myself. In fact, I was unaware of where in Samoa I would end up until early January, right before embarking on my trip to the Pacific. Never having been to Samoa or the region before, I relied on contacts of my academic advisor to find the right village to conduct my research in. It was Tapu Tuailmafua, my main contact in Samoa who, based on my wish to be in a rural village would ultimately choose Falealupo as my home and research site in Samoa. He was also the one who put me in contact with representatives at the Ministry of Education, with whom I met to present and discuss my intended project and obtain their approval to conduct research within a state primary school. Once having approved my plans, they further contacted the primary school principal in Falealupo to discuss with her and inform her of my project and interest in Falealupo. By mid-February I finally reached Falealupo, and a week later I was settled in with the family that I was to live with until the end of June.

Living with a host family in the village and spending every day at the school meant being completely immersed in my field, keeping me at all times engaged in a classic case of participant observation. I came to find this arrangement increasingly fortunate as I began to realize the degree to which Samoan children’s learning in everyday socialization itself unfolds through participating in and observing the activities in their social surroundings. As Tim

Ingold puts it based off his own understanding of his research participants, "...native dwellers, along with their anthropological companions, learn through an education of attention" (2000:190). A while into my time with the family and the village, I began to realize that I was learning much like a local toddler learns. I was unknowledgeable of their ways and of their environment and had to be integrated through the basics of Samoan socialization. While it must be said that the art of paying attention was not something that the two year old was expected to master as well as I –and this was the only area where I found myself remotely on level with the older children in terms of my learning- our need to be watched and guided was much the same. Unlike the children of five and eight, the two year old and I were verbally warned of the sun, of rough terrains, of rain, inedible stuffs, dirty water, of acting inappropriately and so on, and when failing to 'know better' in a situation we were met with humor and patience by adults and older children.

On the everyday basis of my fieldwork, I went to school from about 8 AM until 2 PM. There I would spend each entire school day with one class level per day, although the great majority of my time was spent with the final class levels 7 and 8. I made this decision for two reasons; because every subject except Samoan Language is taught in English in these levels- facilitating my understanding of most of what was actually said in the classroom, and because these are the two years leading up to post- primary decisions; to continue in school, or stay in the village. After school I came home to have lunch and rest, and spent the rest of my day with my host family. A few days a week I would go for walks through the village to meet and see other people in the village and would usually return to spend time in the kitchen *fale* while dinner was cooked and tea and cocoa were made.

I found that there was both a disadvantage and an advantage to spending so much time with my host family and much less with other families. On the one hand, families vary in their everyday activities and ways of interacting and my access to such variations was limited. On the other, had I spent my fieldwork moving from one family to the next without spending a considerable amount of time with one, I would not have been able to get in-depth knowledge and understanding of their lives. I decided that the latter was more important, and that I would have to use the time I did spend around other families as comparative insights for what I learnt in my host family. Much of the time I spent with other families was indeed in company with my own. I came to church with them every Sunday, came to the church's Women's

Society meetings with my host mother, I came for the odd collective *to'ana'i*⁹ and visits to extended family. I went with my host mother and oldest sister to bingo a couple of times but realized that people came to these events to play and then leave, with little talk in between as quiet was needed to hear the person calling out the numbers. Though it was very helpful in my learning to count in Samoan, it left no opportunity to get acquainted with people other than in the sense of letting them get used to my presence. This was also the main effect of my walks through the village, something I did a few days of the week both in order to see and hear and smell what people were up to when and where.

I believe that my getting to know and bond with my host family fairly easily during my first week with them had much to do with a visitor they had during my first week with them. His name was Kevin, and I came to know him as a climber, builder and biologist, an Australian, father of a teenage daughter, and an adoptive member of my Samoan family. He first came to Falealupo in 1996, commissioned by Seacology¹⁰ to build the Canopy Walkway and treehouse still to be found in the Falealupo rainforest today. During their 6 month project in the village, Kevin and his wife stayed with my host family. They all grew so close as to consider each other extended family, and since that time he has returned to Falealupo every year to see his Samoan family and make necessary repairs on the canopy walkway.

During his week-long visit in Falealupo in 2014, I got to share in the quality time between him and the family. During down- time, tea- times and dinner meals with the family, we would talk about his time in the village over the years, and together with my host mother he would reminisce over past times shared with one another. During the day, as I had not yet begun spending full days at the school, I would visit him up in the canopy walkway while he was working and talk some more. During these conversations, he shared stories and impressions of the village that he had accumulated over the years that would serve as helpful comparisons to my own experiences and observations throughout my fieldwork. One of my host sisters would tell me that Kevin and I were alike in many ways, and that she appreciated that we both embraced and adapted to their way of life. I sensed my host mother –who I perceived to be the person whose affection I would need and want the most- warming up to me and talking to me with increasing ease when Kevin was around, and by the time Kevin left

⁹ *To'ana'i* is the after- church lunch, a weekly tradition usually had within individual families though on occasions with other communal gatherings.

¹⁰ Seacology is an organization that provides funding for island community needs in exchange for the protection of local marine and forest ecosystems. Website: www.seacology.org

Falealupo we had established a good connection that formed a solid foundation for our relationship.

One unfortunate thing about the timing of my fieldwork in Falealupo primary school was that climate change as a subject was not on the unit schedule until the month after I had to leave Samoa. It would undoubtedly have been a great advantage to be there for those lessons. Nevertheless, as my focus was mainly on teaching and learning of environmental knowledge outside of school with comparative consideration of the teaching and learning of science –and as climate change was a rare topic and a difficult one to discuss in the village- I saw this more as an unfortunate lack than a matter of detrimental consequence to my research. As for my focus on the children and students, I chose not to try to interview them or in any way push for informative conversations with them. This was both due to our lack of skills in a shared language, and because I did not want to put any kind of pressure on them for my research purposes and thereby lose their trust or cause them to feel uncomfortable or bored with me. I did conduct a couple of school projects with upper level students in collaboration with their teachers, parts of which I will present in Chapter 3 and 4. I also learnt some from the occasional small talk and light conversations with children and youths, and I believe a great deal more from observing and interacting with them on the daily basis. While I learnt some Samoan during my stay, I had to rely much on my interpretation of interactions, gestures and the like, ask adults around me who spoke sufficient English about things I was curious about, and ultimately hope that I understood enough to give a fair picture of the people and village that I write about.

A Brief History of Education in Samoa

The basic function of Education in all cultures is to promote conformity and obedience and respect, to fit children into roles society has determined for them. In practice it has always been an instrument of domesticating humankind with... The formal education systems (whether British/New Zealand/ Australia/American/or French) that were established by the colonisers in our islands all had one main feature in common: they were based on the arrogantly mistaken racist assumption that the cultures of the colonisers were superior (and preferable) to ours. Education was therefore devoted to *civilising* us, to cutting us away from the roots of our cultures...

Albert Wendt (1976: 55, 56)

The above arguments by Wendt represent the kinds of sentiments expressed by a range of Pacific scholars (Thaman, Hau'ofa) towards colonial influences on Pacific Island Nations that call for a brief history of education in Samoa as part of the background for my focus on perceptions of local and non- local knowledge in Falealupo. This brief but important background information should give the reader a basic overview of the relationship between Western and Samoan culture and education as they were discussed during my fieldwork.

On working to unravel the history of Samoan education from pre- European contact days and onwards, Felix Keesing (1934) writes the following about 'traditional' Samoan society:

Samoan life in the traditional pattern of which on coming to youth was shaped: boys and girls as pupils and servants of their elders earned the roles they were to play in adult life, while environmental conditions, fears, admonitions and the urge to emulate and excel in forms of activity evolved by the group all combined to harden the plastic material of their biological heritage along Samoan lines (Keesing, 1934: 414).

Kenneth E. Baumgarner (1982: 2) explains that education in Samoan culture before contact with Europeans was one of 'learning by doing', through observation and practical experiences, teaching the young to become useful members of society. Education was an integral part of daily socialization and integration of children into the family and village community life. The upbringing of children and youth was very much a communal effort and had the purpose of integrating them into village life (Auva'a 2003). Children often began their social education very early, with lessons such as crossing their legs while sitting with others, saying *tulou* when passing in front of an older person and saying 'please' and 'thank you' (Auva'a 2003). As children grew old enough to take care of those younger than themselves, they would learn to care for others than themselves by being given exactly that responsibility. At an age of eight or nine, boys and girls would begin to be separated and put to separate educations; girls mostly learning to care for younger children, preparing food and housekeeping until they were ready to work in the plantation and carry food to the village while boys learnt fishing, boating and building until they had the skills required to help in the plantation, serve the matai and ultimately join the *aumaga* (Baumgarner 1982). Education also centered around what was expected of them or wanted for their future, which separated the education and distinguished the interaction between brothers and sisters. By helping their fathers boys would learn fishing, climbing coconuts, plantation work and kitchen

responsibilities reserved for men (Auva'a 2003). For young men, their education and training was often focused on earning a matai title, which was achieved through service to the aiga and the family matai. For young women, earning a good reputation and learning skills that would make her an eligible choice for a good match in marriage. Her education would be focused much on contributing to and maintaining the household. For both men and women, their roles in serving the well-being and reputations of their extended families was of the utmost importance (Keesing 1934).

Education seems to have been one of communal and unstructured nature, where instruction, observation and imitation were key methods for teaching and learning (Auva'a 2003).

Education furthermore seems to have been oriented towards purpose; important knowledge was that which would form the young into useful contributors to their families and village. At the same time, Baumgarner (1982) writes, the system of socialization through which youths were educated facilitated for demonstrations of abilities and merit, allowing each generation to contribute to the development of Samoan culture and society. He discusses the various scientific (biological, physical and chemical) knowledge recorded from 'traditional' Samoan society, and suggests that "the emphasis was on obtaining what was needed day to day... enabling them to produce for the immediate needs of family but not for larger and longer term markets" (Baumgarner 1982: 10). He then refers to Margareth Mead's (1928) detailed records of how Samoan children began by learning the plants that they could use for play, then to mature to a stage where they must learn the ways in which (when and how) certain plants could be used for food, under- ground food storage, building, crafting, fishing, decoration, medicine and, to make tools and baskets (1982: 11). Through their constant contact with nature, Baumgarner proceeds, children learnt the properties of the various materials found in their environment, assisted by observation and copying of the ways of their elders and proven through participation in their respective social groups and family interactions.

Education during the Missionary and Colonial Era

While John Williams is recognized by scholars and Samoans alike to have begun the missionary movement in Samoa after his arrival in 1830, records show that missionary influence initially came from other Polynesian islands where Samoan chiefs for example visited and brought back what they learnt (Baumgarner 1982). This acknowledgement shows

still today in the Samoan words for the Methodist and London Missionary Society churches, in the vernacular called *le Lotu Toga* (Tonga) and *le Lotu Tahiti* respectively. With the onset of the missionary movement in the country, education began to be connected with church and Christianity. This connection followed the necessity that converts must be able to read the bible in order to join the church (Baumgarner 1982: 13). The word for teacher in Samoan remains *faia'oga*, a word that originally meant teacher mainly of the Christian faith, although the term also stood for one with educational duties.

When Germany and the United States of America took over rule of Samoa in 1900 and divided Samoa into the two separate countries they remain as today¹¹, little shifted in the educational responsibility held by the missions. With the exception of recorded occasional demands made from the settler government such as that the missionaries teach more English, and stick to practical rather than academic education, the Germans showed little interest in interrupting or investing much in the education of Samoans. This arrangement was to change when New Zealand took over the administration of Western Samoa as a mandate territory after the World War 1.

During New Zealand's rule, Samoan education came into focus, and was restructured through the direct transfer of their British school system and pedagogical ideas (Baumgarner 1982). For several decades, the Samoan school system was based off the New Zealand subject planning and literature, with teaching done both in English and the vernacular (Halvorsen, 2014). Hite, Randall and Tavana (1997: 11) explain how in the earlier stages of the colonial era, "comparisons of local culture against the western model of civilization became the rule. Early European settlers taught, and subsequently many Samoans began to accept, that European life was "better" than the traditional island lifestyle". While the new administration set up guidelines for education that stressed the aim that formal education should be closely related to the local traditions, environment, and the present and near-future interests of Samoans, their encroaching influence on social status in the villages through control over the glorified New Zealand administered schools was received negatively by many (Keesing 1934). By 1926, the so-called Mau¹² movement for self- government had begun campaigning against the New Zealand administration. One of the modes of non- cooperation encouraged by the Mau movement was for people to keep their children home from school, although this action was soon cancelled as the Mau leaders believed this would harm rather than help

¹¹ Western Samoa and American Samoa

¹² *Mau* is the Samoan word for 'rebellion'.

Samoans. While there was agitation between the NZ administration and the Mau movement, little educational development was recorded until after World War 2 when in a turn of event - prompted by a reorganized Samoan government- leadership in terms of education governance was re-organized to be shared with the high Samoan chiefs, marking the beginning of a form of state- community joined responsibility system which is still in place today (Keesing and Keesing, 1956). While the villages provided school land and buildings, the government provided teachers and resources. The new arrangement of shared governance settled the aforementioned agitation to a good degree, argues Fanaafi Ma'ia'i (1957), leaving Samoans happily accepting schooling as a path towards payed jobs and prestige while the spread of schools throughout the country accelerated through the 1950s.

As for science, Baumgarner (1982) explains that very little development was to be recorded in the subject in the years between 1900 and 1962, the year of Samoa's independence. Students were continually given basic nature lessons with a focus on immediate environment, everyday use and local meanings. Little or no written material was available to teachers until a few were created for them in the late 1950s. As written in the forewords of one such resource book, a focus on science should be prioritized especially for its necessity to develop agriculture. Baumgarner stresses that a focus at this time was on the complimentary compilation of the everyday experience- based knowledge of the students with nature studies to "add new dimensions to that knowledge" (Baumgarner 1982: 29). At the same time, however, secondary schools were increasingly adopting New Zealand curricula because the main focus for students in secondary schools was the admittance to New Zealand science programs, which required sitting the New Zealand matriculation examinations.

Independence

In the years preceding Samoan independence in 1962, New Zealand began to invest in the training of primary school teachers and in the establishment of local village- owned primary schools (Schoeffel 2013) During the years following independence, communities with some funding help from or through the government began to move their primary schooling into "more modern buildings" with updated teaching facilities. While the government supplied trained teachers to a gradually greater degree, village communities were responsible for the maintenance of school buildings. After independence, a special focus on the development of a

science curriculum initiated reports and UN involvement in Samoa, based on the ... that Samoa needed science to accomplish greater agricultural needs (Clark, 1967). To begin with, science was only taught at the secondary level, while primary schooling feature nature study as before. There followed the independence a period of lacking resources and scientific advisors in the country to properly develop a complete science program that would be well adapted locally and nationally for all educational levels. “A field I would like to see emphasized more is that of the local environment at all levels of the school system”, an officer from the New Zealand Office of Island Education during a visit to Samoa in 1966 (T.F. Kennedy 1966:11). The local environment; coral reefs, coconut use, rainforest, ocean, flora and fauna of Samoa needed to be covered from the scientific angle in science curricula of Samoa, [could only teachers with enough scientific and local experience to develop such a curricula be found] (Baumgarner 1982:42). Teachers at the primary level lacked the training needed (skills, methods, concepts). The American Peace Corps became a way of supplying science teachers at the primary and secondary levels.

In 1970, the Department of Education stated the following about primary basic science: “Our aim is to teach for understanding, so that as pupils leave the school for working life, they are better able to apply their knowledge to understanding things in the village, in the plantation and all around them” (Western Samoa Education Department, 1970: 1). There was however a prevailing lack of scientific training and experience among teachers, and many teachers had the opinion among that science could only be effectively taught by a white person (Baumgarner 1982: 55). While programs were initiated where science ‘tutors’ for teachers traveled around the country to help teachers in villagers, building their knowledge and confidence in basic science, a lack of necessary teaching resources remained a problem. The first half of the 1970s consequently saw a particular focus on local science program development, and materials were created with Samoan teachers in mind. In the mid- 1970s, standard science lesson materials developed by a committee, adapted from a science program developed for Papua New Guinea. The materials were translated to Samoan and were activity based, meaning that little knowledge of scientific concepts were needed by teachers. As Baumgarner’s history of science education and his own experiences in Samoa end in the early 1980’s, he finishes with suggestions for the continued improvement of the Samoa science program such as the continuation of teacher training and materials development.

The 1980's also saw an increased focus on educational development towards compatibility between education and society in order to integrate the value of education in a meaningful way into people's lives and communities (Auva'a 2003: 78). Indigenous culture and traditions were to be promoted through schools, furthermore to strengthen Samoan. By such measures, Auva'a explains, education came to serve both the purpose of forming moral, community-minded citizens along traditional, indigenous ethics as well as forming individuals with 'modern' ambitions for employment and lifestyles. In this way, education encouraged and offered opportunity while it at the same time endorsed the 'traditional' lifeway as many students would still not have access to opportunities outside their villages and would therefore need the cooking, farming and other skills to support themselves and their families. Ideas of the relationship between modernity and tradition or indigenous life were not only under discussion among education policy makers at this time, but also in the wider society. Auva'a (2003) explains how the pending elections in 1988 featured one party campaigning for a return to 'Samoan ways' and values from earlier times, while the other campaigned for the further embrace of modernity and development in accordance with international socio-economic movements. These ideologies reflected a divide in attitudes on the aspects of Westernization in education among parents in the country. On the one side were those whose opinion was that the imposition of the English language in school teaching and new adapted pedagogies alongside the import of foreign technologies posed a threat to the Samoan way of life, and had a negative effect on their children. On the other side were those who felt that the 'backward ways' of the old Samoa was fading and that it was time to embrace modernization. In their opinion, modern technological knowledge, curriculum and pedagogy invited increased opportunities for their children's futures. Auva'a argues that such attitudes were predominant with Samoans whose aspirations for their children's futures lay in higher education abroad. As Baumgarner states, by the 1980s, the gradual adaptation of Western-style education through more than the first half of the 20th century had set roots to stay. A gate had been opened to education leading to non-traditional skills and purposes as well as jobs outside of the village. As I will elaborate on later, I identified this splitting in the road between ideas of a future based on academic schooling –especially a future in science- and a future settled in the village during my field work.

Nevertheless, education continued to feature cultural education including local skills; for example, Agricultural Science was implemented to teach vegetable gardening, piggery and poultry, and Home Economics taught cooking. While the subject social science discusses national and international social concepts, local environmental knowledge is no longer a part

in the environmental education state primary schools in Samoa, and science has undergone alterations as well. In recent years, educational reform has led to a curriculum and teaching plan that has subject unit outlines for teachers, but not the lesson-by-lesson teaching instructions they had. There are still discussions, in rural and urban Samoa, about the degree to which the curriculum is directly adapted from that of New Zealand, and while I will touch on this topic in Chapter 4, I will not dwell much on it in this thesis. What I will focus on is the question of whether science as a global discipline in itself *can* be adapted to local culture.

Synopsis of chapters

In this chapter, I have presented the background for my research questions and topics, my ethnographic focus and analysis, as well as my methods in finding and accessing my field and conducting my fieldwork.

In Chapter 2 I focus on the past. I will introduce Falealupo with a look into the mythical and religious stories, history and memories that represent the village environment for those living there today. I will present natural, social and technological aspects of continuity and change in the village makeup and how people perceive them. This chapter is an introduction of how people's environmental perception in Falealupo is related to their self- perceptions and lifeways. I have tried to convey the reflections that people have on the relationships between continuity/ traditions and change/ modernity and how they balance these often dichotomized aspects of societies such as Samoa in ways that allow for intermingled coexistence between differences in the present.

In Chapter 3, I move on to the present. I present the everyday life as I observed and partook in it during fieldwork, and will try to shed light on how people reproduce culture as they engage with and teach their children or younger siblings how to engage with the environment. The immediate experience, practical and contextual knowledge and social values and priorities that define how, what and why children learn what they do will be in focus, as I discuss what Falealupo villagers consider worthwhile knowledge.

In Chapter 4 I describe the primary school environment and discuss observations I made as well as conversations I had with teachers that highlight challenges in the teaching and learning of science as a subject. I show how local values are in discordance with those

cultivated by science and supported by the school system, and present some of the ways in which teachers and students seemed to cope with that discordance.

In Chapter 5 I discuss various theories and issues around education, environmental knowledge, culture and climate change in the Pacific and beyond in light of what I learnt during fieldwork in Samoa. I present select notions based on what I learnt from my fieldwork and discuss what it is that the global community and international scientific education might gain from an understanding and acknowledgement of the depths to environmental perceptions in Falealupo.

2

History, Myth and Memory of the landscape

We consider our islands as “O le nu’u o lo tatou tofi mai le Atua” (The land of our heritage from God) and therefore believe that our relationship with the land places upon us a sacred responsibility to kin, ancestors and Deity.

-Namulauulu G.V. Tavana (2001:20)

I learnt early in my fieldwork the common faith among Samoans that God created their islands for them to live on. Their land belongs to them in the same way that they belong to it; their identities are physically and culturally rooted deep within the earth they walk, live and work on. From one generation to the next, land is passed on through inheritance and families are thus bound to and responsible for it (Hirabe 2011). This responsibility is at the same time towards the land itself and the family. To take care of the land once cared for by ancestors is the safekeeping of a future home for the younger generations. It is common to be buried on one’s family land so as to remain with the family and stay rooted in the land. The bonds between kin, ancestors and God are in this way manifested in the land, and it therefore follows that environmental perceptions and knowledge in rural Samoa has very much to do with what it means to be Samoan. In Falealupo I found that being –and the process of becoming- a Samoan today still centers very much on family and its socio- cultural ties to family land, village, faith and history. Before I could thoroughly understand the meaningful processes inherent in seemingly mundane everyday practice in the village, I had to learn how the relationship between nature and culture in Falealupo are connected; how they influence the way people relate to each other and together make up an indivisible socio- physical environment¹³.

In this chapter I will begin my approach to environmental perception in Falealupo in light of the above, by first relaying memories and stories of the distant and more recent past and their significance in people’s lives today. I will build the foundation for my view that the nature of local environmental knowledge can only be understood by studying the lifeworlds of people

¹³ By ‘socio- physical’ environment, I refer to my view of the environment in Falealupo; one which cannot rightfully be divided into a physical and a social domain without being bereft of local meaning.

who have dwelled in their local landscape over time, and let it mould their culture as much as their culture has inscribed itself in it.

Myth in the landscape

The landscape in Falealupo Tai is home to quite a few historical sites where old myths and stories central to Samoan ancestral culture manifested themselves. While Christianity reigns strong in Samoa, and they believe that God created their islands and heaven and hell, the old myths are still considered important parts of Samoan culture and heritage. As my host mother told me, “we are very Christian people, but that doesn’t matter, we still believe in *Moso*”.

In the watery depths beneath the volcanic rocks on Falealupo’s coast you will find the *Fafā*; gateway to the underworld Pulotu, home of the spirits of the deceased¹⁴. Pulotu is guarded by Saveasi’uleo. Falealupo is also the home of Saveasi’uleo’s daughter Nafanua, a legendary warrior in her own right, and the point at which her mother and aunt Tilafaiga and Taema are storied to have arrived from Fiji, bringing with them the body art that gave birth to the traditional Samoan *tatau* (tattoo). Near the cliffs by the sea, on the plot of one of the families living there, lies the footprint of the giant Moso, from when he stepped over from Fiji to Samoa a long time ago. Moso’s presence is still speculated today, my host mother explained, for example when the church funds have inexplicably grown without any explanation in the records. Therefore, she said, the matai will pay their respects to Moso at council meetings, in addition to prayers to God.

Behind the main settlement by the beach is where the House of Rock sits, a cave in the rocks with a large gap in the inner roof. The story goes that the House of Rock is the result of a house- building competition long ago between men and women of the village that was to decide whether a marriage would take place between two particular people. The women finished first and won –meaning that the woman in question would not have to marry the prospective husband- and so the men left the last piece of the roof unfinished. On Mother’s Day, a very grand occasion in Samoa, I was told several times (by women) how their superior working ethics in comparison to men’s tendency towards laziness could be summed up in the

¹⁴ Pulotu might also very well be the –or another- reason why people in Apia called Falealupo “the end of the world”. Unfortunately, I failed to think of asking those who used this reference what they actually did mean by it.

Samoan saying “the women finish their work but the men do not”. They explained to me that the origins of the saying lies in the story of the House of Rock. From old stories to more recent ones, the Rock House also featured as a place of shelter in several narratives I heard on surviving the cyclones in the early 1990s. I will present some of these memories later in the chapter.

The name Falealupo has a meaning rooted in a story in the landscape as well, like many Samoan village names do. The name consists of two words; *fale* meaning house, and *lupo* which is a fish, and translates to “the house of *lupo*”. Now, as the fate of old folk stories sometimes go, this story is told in different versions. The story as recorded by missionary George Turner (1884) tells of a Tongan couple living on the Savai’ian shore long ago, who had a son who was lame. All he could do was to sit on the rocks and fish *lupo*. His parents built a house for him near the rock, into which he could throw his catch. Gradually, the house filled up with *lupo*, and when the god Salevao passed by with his travelling company, he called it “Falealupo”, the house of *lupo*. Since that time this area, now a village, has been called Falealupo.

Samoan history and traditional culture rest in these sites and landscapes. The myths and stories are alive in the land, and in Falealupo they not only provide incomes from tourists who pay the fees to see them, but manifest parts of Samoan identities and national pride, not to mention local pride. They also exist in people’s memories of growing up there, in the landscape that through their engagement with and in it shaped them. In this way, one might say that their personhoods, their identities and histories live in the landscape. As Tim Ingold (2008:189) puts it, “the landscape is constituted as an enduring record of –and testimony to– the lives and works of past generations who have dwelt within it, and in so doing, have left there something of themselves”. While these are stories now spoken of as myths, they are very much a part of local identities and history, and testimony to the continuation of respect towards ancestors and thereby cultural resilience. People would remind me of these places with an air of modest pride and encourage me to visit them in order to get to properly get to know Falealupo. These sites are all tourist attractions that villagers make the odd money fee off, something that I took note of early on when considering factors for their local importance. This amount was however small, and even those who never saw the money from them would tell me about them and tell me to visit them while I was there. I would not get charged, as I was a long- term guest and ‘culture student’ not a tourist, and still they felt I should see them because they were important aspects of Falealupo’s historical and present wealth. These very

real ‘mythical’ places in the landscape are not only sites upheld to attract the curiosity and wallets of tourists, but meaningful signifiers of particularities of and strengths in Samoan culture.

Falealupo Uta is home to the Falealupo Rainforest Preserve, dubbed as such in the 1990s when Seacology, an organization headed by Paul Cox, signed an agreement with the *matai* council of Falealupo to preserve the Rainforest provided that the village would receive the funds needed to build a new school. The Samoan government had demanded that the village build a better school. If they were to fail in meeting this demand, the government would remove the teachers and the children would have to go without primary education (Seacology.org). Land is customarily owned in Samoa, and seeing no other solution for raising the needed money, the villagers decided to sell logging rights to the rainforest. Fearing for the biological riches of the rainforest, Cox went to the High Chief and asked him to stop the logging if he could raise the money for the school, and so he did. The Falealupo rainforest thereby went through two shifts in its perceived value; from being part of the village environment to being a potential source for income to being a biological preserve. The new school, dubbed by Seacology the Falealupo Rainforest School, was built and accordingly the logging in the rainforest was stopped. The High Chief himself is said to have run kilometers into the rainforest with his machete to stop the bulldozers in progress. It was his efforts to protect the rainforest and Falealupo that earned Cox his *matai* title, Nafanua. Another title was bestowed onto a foreigner soon thereafter. To mark the preservation of the rainforest, the Falealupo Canopy Walkway was built in the forest behind the school. This construction consists of an aluminum tower and a tree house with a view over the rainforest reached by winding stairs atop a Banyan tree, connected by a hanging bridge. The man who built the Canopy Walkway, as the reader already knows, was Kevin and he was given the *matai* title Pulotu.

People are proud of these places in the landscape that they belong in, and as I will elaborate on below belonging in place is in turn of great significance in people’s memories of their own personal histories in Falealupo.

Moving up to Uta: Ambiguities of the environment

There was a time when the majority of the village population in Falealupo was settled by the ocean, in the part of the village called Falealupo Tai. When telling me about “those days”, many remembered the same things; how everything was white sand and yellow leaves along the unpaved village road. In those days, elders in Falealupo Uta would tell me, village life was more social, as you could see your many neighbors from your plot without trees and bush blocking the way, and people would come to each other’s house to offer each other food before dinnertime. You could cool down in the ocean on hot days, wash your clothes in the ocean pool by the rocks, and go fishing for every day’s meals.

The village makeup changed drastically in the years 1990 and 1991, when the two large cyclones *Ofa* and *Val* hit the coast of Savai’i, leaving Falealupo in complete ruin. Elders in the village who lived in Falealupo Tai remember well how the waves washed up and their *fales* were leveled with the ground, forcing people to seek refuge at the school building, in a cave nearby, beneath the ruins of their houses or at the church. Everything was covered with the washed up white sand from the beach. Many remember how families emptied their water tanks and got the elderly and some children in there for safety. Some were stuck in there with water up to their knees, for days.

During conversations with village elders, they would tell their stories of the cyclones to me in a seemingly calm woe, in remembrance of events so long ago. One woman thanked me for asking her about it because it helped her remember that time. She had lived in the middle of the village when cyclone *Ofa* hit, where she still lives today. The day my host sister and I came to her home and asked her to share her memories of the cyclones, she was sitting in the shade of a breadfruit tree with her husband, braiding together coconut tree leaves to make shades for their Samoan *fale*. Her grandchildren were roaming about them, one of them sitting by her side watching her work and handing her leaves. As she told her stories- sometimes accompanied by comments from her husband- she would gesture to neighboring plots, up and down the village and the road to facilitate her narrative, also suggesting that I go and visit this or that place to see where she was referring to. She remembered rushing with her family to the road and meeting other families, all hurrying to seek shelter in the cave up the hill. For days the cyclone lasted, and they stayed in that cave despite the wet, “dirty and rough” conditions. Those people younger and stronger would return to their *fales* when the weather calmed a

little, to look for food and clothes, and some of the young men would cook for people in the cave. Meanwhile, she reflected, her friend in Falealupo Tai and her family had sought refuge in the church by the beach. After some time the church had filled with water from the high waves and the rain, leaving her and her parents hanging on to the high pulpit until they were rescued by some of the neighbors who had found out where they were. People living by the ocean suffered much from the flooding, she said.

When the cyclone finished, everything changed, the view and everything looked bright. You could almost see through from the one end of the village to the other. All the *esi* trees were fallen and even the birds were crawling around, the bats crawling on fallen bananas looking for foods.¹⁵

I wore the same clothes in those days. They were wet and then dried again. I couldn't change clothes as all of them were wet and lost... There was help from the government, who distributed foods and tarpaulin for temporary houses among families. You could see all the families tarpaulin houses lined up. The trees were down and it was bright everywhere. People from the Ministry of Health also had regular visits to check everyone, especially the children, because people stayed in dirty places plus the water was not cleaned for cooking and drinking at the time. People started to rebuild their houses, and cleaned their places for a better environment to stay... It was hard to collect the materials to rebuild... Some people just build very small places for hide out and waited for the government to help. There were no more breadfruits and bananas, all destroyed by the cyclone. So luckily the government and the ministry of health provided foods and needs for everyone... Everyone tried to start again. Made new houses, grew new foods, new plantations, and the bananas were cut down to re-grow.

While talking, she pointed to one of their *fale*, built with a metal roof, explaining that this was the house they built after the cyclone which had recently been updated with cemented flooring. This was where people would come for their government health checkups after the cyclone.

...Right after cyclone Ofa, there was also cyclone Valelia. Most of the families built stone walls, *pama'a*, just in case when another cyclone comes. Some families used

¹⁵ Interview translated by Roy Andrews, Samoa.

the coconut oven (copra house) to hide out and surprisingly it was safer. Well our country has been affected frequently by cyclones so people are used to running around. People and families that stayed close to the sea were moved to higher grounds. People were scared of the sea waves and the current.

With this, she expressed the ambiguity that lies in the relationships people have with the ocean that is part of their home environment. One of the elders from my family's church in Falealupo Tai explained to me that while the seafront was her home, she also worried about how her home and family could be at risk if the sea should rise in storm. While her love of her home in Falealupo Tai had outweighed the rationale of moving to higher grounds, many villagers decided to make a change after the cyclones, adapt to the pressure from the ocean and move to Falealupo Uta. The ocean is both something beloved and feared; it gives life, while it can also take it away. My host mother –amidst listing all that she missed about living in Falealupo Tai after dinner one evening- explained the rationale for moving to their land in Falealupo Uta, saying that “it was safer there. If a cyclone comes, we have to worry about the wind, the rain, perhaps falling trees, but not the ocean. And now, we also have to worry about tsunamis; they are new to us here in Samoa. Up here we are safe from the waves”. Here I decided against my common tactic to ask her directly if she saw this as related to climate change. Knowing that as a school teacher she would answer affirmatively, I still waited earnestly in curiosity of how she would answer. “Yes”, she said, “but we trust in God, that he does not want us to die. We are in his safe hands, and we pray that he will keep us safe”. My interviewee ended her story about the cyclones and Falealupo in a similar manner.

Well everyone has been prepared now, mostly families are building new houses, European houses that are built with bricks and cement which are strong enough to withhold and resist any more cyclones. Some families have built stone walls, which they believed can keep people safe. Well that is my intentions, and most likely everyone's intentions, is to be prepared for anything, for disasters, cyclones and even now with earthquake and tsunami. I don't know about the tsunami if it will reach here where we live... We all have to prepare ourselves and pray to God for protection, because no one is strong and fast enough to outrun a cyclone or any other disaster.

Faith was something that people referred to often when reflecting on the past and choices they had made for their futures. As this lady explained, handling natural forces is something that Samoans are used to, though now they have the option –that is, those who can afford the

resources- to build what they call European houses; structures with solid cement walls and rooftops that are less likely to cave under winds and waves. Although the traditional Samoan *fale* is in itself also structured for the climate- open, so that the wind can travel through and ease the heat of the day- they are now often built with cement pillars and tin roofs instead of wood and thatch to withstand the winds as well as waves for those living by the sea. In Falealupo, people also had the option to move uphill to the forests, where the waves could not reach them. These are adaptations that come of environmental rationale; as she also pointed out, there is no one strong or fast enough to outrun a cyclone and any Samoan knows this. Then there is faith, which for many of my informants was a central pillar in their sense of belonging in the land that they were born on and the lives that they lead. Samoa is believed to have been given to the people by God, and though people know of their land as volcanic growth from the depths of the sea, that belief remains with many.

I found that people would speak of rationality, but not in spite of or contrary to their faith. Their perceptions of environmental extremities came across to me as a force that they cannot control or manipulate and must deal with through respect by adaptation. Adaptation would however also be weighed up in their decisions of whether or not to remain living where and as they did with their faith in God as well as their will to remain on their inherited home land. During a conversation about the aftermath of a natural disaster, a business owner in Apia put emphasis on the fact that he considered himself a realistic, knowledgeable and rational business man. He then explained that when trying to decide whether to rebuild their family business in the same low-lying place in Apia after it had been destroyed by cyclone Evan in 2012, it was their faith in God that had given him and his wife their answer. They had faith that God had been with them always, and chose to trust that God would stay with them in the future. Experiencing a cyclone by no means diminished their faith in God's love. At the same time, as I learnt in the village, a Samoan knows not to ignore the forces of nature, so when rebuilding their business they prepared themselves for potential future encounters with such forces by building higher and stronger cement walls around their business. Like those who chose to stay with their homes in Falealupo Tai, this couple did not base their decision on the 'rational' arguments about environmental and financial risks that they were well aware of, but on their ideas about how they wished to continue living their lives, with that including the centrality of their faith in God. They were actively combining guidance from the environment and their faith.

After the cyclones in the 1990s, my host family had been among those who chose to move up to Falealupo Uta, to resettle by their plantation. Meanwhile, my host mother's cousin and his family had moved into her childhood home at her father's request and his promise to reward his nephew for his service to the family by bestowing upon him his matai title. My host mother would tell me over tea once in a while how she missed living by the ocean. "When I think back on the time in Falealupo Tai, it is like a movie", she told me once. Life was simple then, she explained, with no electricity, and only fish, bananas and coconuts to live off. If they needed more they would have to walk the long way up to Falealupo Uta to get it, but she had loved living in Falealupo Tai with the open sunny sky, the sand and the ocean. She did however see living in Falealupo Uta as safer during cyclone seasons where they must still worry about winds, heavy rain and falling trees, at least they did not need to fear the ocean. An added fear to that now, she continued, was a fear of tsunamis. She and others I spoke with referred to tsunamis as a new phenomenon to them. "I suppose it is climate change. But we trust in God, he does not want us to die. We pray that in his hands we will be safe", she said. Before ending the conversation she again emphasized that moving to Uta was not something she had wanted to do. She never wanted to stay there for more than an hour at a time during trips up there in the past, wanting only to get back to the ocean and the white sand. "The shadow up here is good", she reasoned, "but I miss the time when we lived by the ocean... I had three of my children there".¹⁶ Her daughters on the other hand told me that they were glad of living in Falealupo Uta. It was more convenient in terms of shade, proximity to the plantation and the school, the main island road and the more equipped shops.

Beyond belonging and convenience, my host mother explained on another occasion that she missed the days when neighbors were more social with one another, as in Falealupo Uta most plots are separated by trees, bushes and plantations on at least three sides and that people therefore cannot see each other without walking out onto the road and walking up and down to meet or reach each other. Other older members of the village also told me that they did not think people were or could be social in the same way in Falealupo Uta, due to that very same reason. One of the women in the village told me that she had grown up in Falealupo Tai before moving to New Zealand with her family, and that whenever she returned in the years after the cyclones when a majority –including her family- lived in Falealupo Uta, she was

¹⁶ My host mother has four daughters. In this thesis I only write about three because the youngest is settled with husband and child in Apia, and only visited once, briefly, during my time with the family.

always hit by how “the road was quiet”. People stayed in their *fale*’s more; something had definitely changed.

The Samoan Way meets the foreign;

Reflections on continuity and change in Falealupo

Fa’aSamoa is likened to an immortal tree with roots that grows deep into the ancient world. Fa’aSamoa is watered by the rains, warmed by the sun, and shaped by the winds from the four corners of today’s world. Its substance is changing, its philosophy has expanded and its practices have been enriched. In spite of these changes, fa’aSamoa, is Samoan...

(Ngan-Woo 1985: 11)

To talk about socialization, ways of life, knowing, perceiving and learning, identity, continuity and change in Samoa is in essence to talk about *fa’aSamoa*. The term translates to “the Samoan Way” or “in the way of Samoa”, and is an expression for the core values in what is considered the shared Samoan culture and traditions. It refers to the Samoan language as well as morals and behavior towards the following central pillars of Samoan sociality; the family, the extended family, the church, the matai (chiefly) system, and *fa’alavelave* (ceremonial and other family obligations). Furthermore, it speaks of the values of love, service, respect, the covenant between sibilings and others, and discipline (Anae, 2014).

Fa’aSamoa is arguably a way to talk about tradition and custom, while also including change and adaptation. Reading Keesing’s (1934) historical accounts from Samoa, I recognized a multitude of similarities to present day village Samoa, and indeed, Samoa is known for having maintained a strong hold on its traditional heritage (Auva’a 2003). At the same time, Auva’a argues, *fa’aSamoa* like any kind of culture or set of traditions exists in ever ongoing processes of continuity and change. For example, while family and the matai system remain highly important and true to traditional values, the ways in which families and the matai live their lives and the realities they face have altered. Furthermore, it is important to keep in mind that

Samoa has never been a place of isolated existence without influence from the outside. The waters that surround Samoa were never barriers to the rest of the world, but an open sphere of gateways to and for Pacific Islands peoples (Hviding 1996). As referred to above, ancient Samoan stories still alive today tell of how the traditional Samoan *tatau* came with voyagers from Fiji and was adopted by Samoans. In terms of environmental understanding, I identified this perception of connections across the ocean –as opposed to notions of isolation- in my host mother’s comments about a strange bird that was sighted in Falealupo a few times in March 2014. One day, the mysterious bird that had people excited and curious due to its exotic looks landed on the grassy field by the primary school. After quietly examining the bird for a little while, my host mother turned to me on the porch of the school building and said, ‘I believe it is a Papua New Guinean bird. It must have come with the winds from Fiji after the last cyclone’. Whether her guess was correct or not, her speculation spoke to me of life and environments in Oceania as connected in a wider world where natural flows of life across each other’s paths and domains was not uncommon.

Fa’aSamoa is in no way a frozen set of traditions, customs or lifeways untouched (Auva’a 2003). It is however a word to describe that which makes Samoa explicitly *Samoan*; in other words, their culture. It is a term which all those I ever spoke to about it described or referred to in the same if not similar ways, indicating that there is a common understanding of its current form and practice. What I believe there is less agreement on, is the degree to which the borders *fa’aSamoa* are rigid; open or closed to ‘foreign’ or ‘global’ forces, as revealed by the debates referred to by Auva’a during the 1988 elections and alluded to in a range of newspaper articles on traditional food and various other aspects of traditional ways of life that I read in the Samoan Observer in 2014. The gradual arrival of foreigners and their customs, technologies, religion, political ideologies, and capitalism inevitably sparked processes of major change in Samoa that its people had to establish relations with and perceptions of. In Falealupo, I came to interpret people’s opinions towards the limitations and flexibility of the Samoan Way by their use of the word *fa’apalagi*. *Palagi* is the Samoan word for a foreigner - specifically a foreigner of European descent. Now, certain developments, such as the now predominant use of tin plates for rooftops instead of organic thatch and the use of money to buy imported food rather than a strictly home grown diet, seemed taken for granted parts of their lives; a mere development of their lifestyles. Still, when I asked, adults and elders in the village would reflect on the adoptions of these societal aspects with ambiguous feeling about their implications for their own and their children’s relationships with their Samoan heritage.

On my walks through the village, I would often visit one particular woman who I had gotten to know my first week in the village who was very nice and easy to talk to due to her advanced English skills. On one particular visit, she was preparing a coconut for me to drink from, and commented that she was always surprised that youths and children in Falealupo were so rarely selling coconuts to cars passing through the village on the main island road. She shrugged and said that people do not use the resources they have around them enough. “This is why children these days do not learn as much about the environment as in previous days, you know” she said, in reference to a conversation we had had the previous week about my research, “because their parents go to the shops and buy European rubbish instead of using the resources that are all around them”¹⁷. As she herself admittedly bought food from the shops, she was not so much judging or distancing herself as pointing out a source to what she saw as the dwindling of local environmental knowledge. She was not the only one who said this to me during my stay. People would joke about how Samoans loved their imported meats, noodles and other and should probably stick to or go back to their local foods. National news on television and in the newspaper would feature messages about Samoan foods and their cultural significance and health benefits; notably not discouraging people from buying food from shops, but encouraging them to return to a more homegrown diet. Of course, all I knew in Falealupo either ate only what their land yielded (usually because they did not have money to buy food), or ate both what they grew and food from shops; none ate only shop food.

The reason this focus on imported versus local food caught my attention was that it would come up as interesting reflections on people’s relationship with their local resources and what implications they had for what children were learning. To buy imported foods has a default impact on the knowledge children might attain from growing up with nutritional dependency on the local environment. I remember well the surprise on my host mother’s face when her granddaughter of eight and I came back from a swim in the ocean one day during a weekend we spent in Falealupo Tai, bringing with us *limu* from the seafront. *Limu* is an edible kind of seaweed, which my little ‘niece’ spotted while diving in the shallows for rocks and shells on the sandy bottom. Coming up from a dip, she shouted out my name in thrill and hurried over to show me her catch. I had no idea what the green growths on the rock were, until she said ‘*limu*’ and demonstrated what it was by putting it in her mouth. I copied her, and joined her in

¹⁷ People I met had a tendency to call foreign things that they associated with modern or Western culture European

diving for more snacks along the shallow seafront. When it was time to leave, she found another rock with *limu* growing on it to take to her grandmother, who as I said received her gift with surprise. She laughed a little and asked how we found it. I told her that her granddaughter had, and that she had taught me the name. She then said that this was something that she had not expected her granddaughter to know or to recognize, since she so rarely went into the sea and she herself had only ever brought small, bagged bunches of already separated *limu* to the kids a couple of times from a shop in Apia. My host mother worked at the local primary school, and told me on a later occasion that the issue of health and cultural implications of imported, store-bought food was the reason why the annual parent-student day hosted at the school has a rule saying that all the food brought to the event by teachers and parents must be local in its ingredients as well as traditional in preparation.

On another walk another day, I met one of the teachers from the school as I was passing by her home. She was sweeping nearby the road while her children were playing together nearby. I stopped and chatted with her for a while about school and weather, until our conversation was disrupted by her children's laughter. She gave a chuckle, and commented that they were very happy because they got out of doing their chores. See, they had found a loophole; they had found a wooden toy that she had made with them a while back that was of the traditional kind and made of pieces of wood from their land. Her son had actually started working on carving a new one as well, as she had shown him how. They had figured out that if they played with that, she would be happy and let them play on instead of making them help her. When she was little, she said, she knew where to find the right wood for that toy and how to make it, but these days the kids only want the 'European' toys from the shop. This was a pity, she felt, and had no choice but to reward their interest in their hand made toy.

The 1990s signify a time of major changes in Falealupo. In addition to the cyclones in 1990 and 1991 and the resulting moves of settlements, the decade was to see a range of material and technological developments. While shops would see an increase in numbers and stock, perhaps the most significant source of alteration of life in Falealupo was the arrival of electricity on Savai'i. During Kevin's visit in February, he and my host mother and I would sit up late in the evenings with our cups of hot *koko Samoa*¹⁸ and talk about their relationship, their history, and the village. My host mother would reminisce back to when her father had been alive and had opened their home to Kevin and his wife for the first time. She said that up

¹⁸ Local Samoan cocoa.

until those days, they had been a much more self-sufficient while at the same time co-dependent village. That was before electricity and new technologies such as cars, freezers and the television came to the village. She fondly remembered the time when all they used for houses, food and other things came from their surroundings. It was natural and Samoan, she said. In those days everyone would gather on Sundays and the family matai would tell everyone their duties for the upcoming week. Then all the children would fall asleep while her grandmother told them stories. They would often gather to listen to the elders, her father especially. “He was a great story teller”, she said smilingly. Storytelling is –like in much of the Pacific- a tradition that spans centuries, millennia back in Samoa, as the foremost method of passing on knowledge to the younger generations (Lichtenberg 2011). This however- my mother said- was before the television came. “People do not do it now like they did before”. Here Kevin joined in and said that he could remember how family gatherings altered when electricity reached Savai’i. In the nineties, when the road around the island was not fixed and paved well like it is now, the drives from the wharf on the other side of the island to Falealupo were long, and would often stretch well into the evening darkness. On his first stay on Savai’i, he recalled, you would drive around the island and could see kerosene lamps lit up in *fales* along the road. In circles around the lights, you would see families huddled together in circles facing the family elder or *matai* who would be speaking to them, probably telling stories and sharing news. Then, at some point, he came back to Savai’i finding that there was electricity, which over time slowly stretched around the island to the other end. The nighttime drives then began to feature a new view, of families sitting no longer in circles listening to one speaker, but in silent lines facing television sets. Electricity and television sets changed how families interacted at the end of the day, and though my family’s television set was on every night for the news and various entertainment shows which my host mother very much enjoyed, she reminisced about “those days” when story telling –besides prayer and singing of hymns which they still gathered for before evening meals- was the prime time entertainment and reason for evening family gatherings. It was also how children learnt the histories of land and family. She said that this change also did affected religion, as people do not gather every evening to pray as often as they used to. This old kind of togetherness was fading. People do not need each other’s help as much anymore, she explained, especially in Falealupo Uta where there are several shops near and people can buy all that they need and reach the buses easily at the main road. As for storing food, the freezers –like the televisions, brought by extended families in New Zealand and Australia- had for many replaced traditional methods.

While people would discuss how their adoption of imported goods had changed their ways of life and how these were not necessarily good, they did not attempt to put on any airs of direct distaste or rejection of these aspects. These aspects are increasingly common parts of Samoan life in the present, though recognized as relatively new and still reflected on in relation to tradition. There were other things that on the other hand would be kept more at a distance; things that were seen as strictly foreign, or non- Samoan; so different as to pose a threat to the *fa'a Samoa*. The terms for such things were *palagi* and *fa'apalagi*¹⁹. I found this distinction very interesting, in that this reference to collision between the Samoan versus the palagi would surface in conversations evolving aspects of village and school that did not fit well, certain aspects that stood out as too different or simply challenging to understand, accept or practice. These were phenomena that existed in Samoa, but were not integrated into the everyday life of the average Samoan. As I will elaborate on in Chapter Four, perceptions of foreign or *palagi* phenomena would come up in conversations I had with teachers in the school about educational challenges. In the village it did not come up often at all, although the following example from outside of school depicts the conversation that first brought my attention to the meaningful indications in using the word *fa'apalagi*.

Approximately one Saturday a month, I would go down to the beach in Falealupo Tai, either with my host family to visit extended family, or to meet with my American Peace Corps friend from the neighboring village. I would go swimming for half an hour to an hour, and enjoy the coolness of the water. Walking home from school one Friday, I asked my host sister if she would like to join me to the beach the next day. I asked her only half- seriously, knowing that she would not come. When she laughed and declined my invitation, I asked her why it was that she did not like to go to the beach. She smiled, and said that if she were to go to the beach to relax and have a swim, people would tease her and call her a tourist. “If I go to the beach to have fun, people will see that I am not at home helping my family with the chores and taking care of the children, and will say that I am like a *palagi*”. She then added that my going to swim was fine, namely because I *was* a palagi. Furthermore, as a longtime guest in the village I did not behave a tourist, which people could see because I swam with clothes on like a Samoan (child), showing that I respected village rules and had been taught well by my Samoan family. She, as an adult Samoan had no excuse, because relaxing and playing on the beach or in the water was the reserved leisure for children. Another contact of mine told me that after having lived abroad for a good portion of her life, she enjoyed having

¹⁹ The *g* in *palagi* is pronounced ‘ng’ like in “song”.

a swim and drink at the beach once in a while. She would, however, not do it in her own village. She and her husband would go to a resort in a village on the other side of the island so as not to be seen acting like tourists in their own village. Using the beach on for relaxation and fun as an adult is thus a sign of laziness and the shirking of responsibilities to the family, and therefore not *fa'aSamoa*. Drinking alcohol was something that I never heard of or saw women doing in Falealupo while I was there. My host sister explained to me once that while women are allowed to do it, it was not common for women to do because they were busy taking care of the children and doing chores such as washing clothes and cooking and it therefore would not be appropriate²⁰.

Concluding remarks

While Falealupo village and Samoa as a nation has experienced a wide range of environmental and societal changes over the last couple of centuries, and many of the tangible components of Samoan lifestyles such as the choices and cooking of food, building of houses and boats, earnings of labor (introduction of the monetary system), sources for light, food storage and transportation have altered, the basic values and traditions of the *fa'aSamoa* have remained intact. While certain kinds of houses and ways of life are in variation called European or *palagi*, this is not to say that they will remain so. Fairbairn- Dunlop (2000) explains that there is a measured increase in purchase of freehold land in Samoa especially amongst the younger generations today. She makes the point that as people begin leave behind the customs that lie in customary land ownership for other aspirations, this might very well influence Samoan perceptions of land. What affects that might have on societal aspects such as *fa'aSamoa* remains to be seen. As explained earlier, Auva'a remains optimistic for the capacity of Samoans and their *fa'aSamoa* to encompass continuity and change. This capacity is arguably a testament to resilience which is enacted through both the taken for granted habitus of everyday life as well as active, reflective awareness and will- as illustrated by the narratives on changes, ideas of good and bad in the old and new as well as through the

²⁰ Alcohol was first introduced to Samoa in the 19th century by European whalers and beachcombers, was prohibited to Samoans during the Second World War then to be made legal again after independence, which began a steady increase in consumption among Samoans (Samoa Law Reform Commission 2013, *Alcohol Reform Issue Paper*. <http://www.samoalawreform.gov.ws/wp-content/uploads/2014/08/Alcohol-Reform-Issues-Paper-Final.pdf>)

continued regard towards the old myths and stories despite the adoption and celebration of Christianity. In this chapter, I have focused on the latter, and how people preserved the rich meanings of their landscape in their memories and stories. In the next chapter I will move onto the former, to the immediacy of everyday life and interactions in my host family and village, and illustrate the processes through which environmental, relationships, knowledge and perceptions are cultivated.

3

Everyday socialization and environment

The faaSamoa is the matai: the matai is the family is the land. The land in the village: the village is the family, is the matai, is the faaSamoa.

Emele Moa, 1991²¹

Emele Moa's sentence sums up what it took me about two months to begin to realize; that understanding the values and ways of my Samoan family is also to understand the land in its relationship to them. I recall looking through my notes from the past two months about half way through my fieldwork and fearing that I should have chosen to study kinship rather than environmental knowledge; it was mostly about family and village socialization, little in terms of direct knowledge about nature. My focus had been steadfastly aimed towards the transmission of environmental knowledge in the village that the fact that the majority of my notes were on my host family's everyday life in general seemed to me a failure to learn about my explicit research topic.

Around this time I made a trip to Apia, where I had a meeting with a lady working at the eco-tourism office. She was telling me how puzzling it was to her that so few people in villages like Falealupo who lived and ran a business near or on the beach were coming to their climate

²¹ In Peggy Fairbairn- Dunlap 2000, *Changing Perceptions of Land: Samoa*

change awareness meetings. Were they not worried? Why were they not interested in hearing the risks of staying so close to the water? I remember thinking to myself that, surely, in Falealupo they were well aware of the risks, anyone who remembered the cyclones of the early nineties had first-hand experience with the extremity of these risks. Families were just making decisions based on their own personal beliefs, reasons and priorities, I thought. Their perceptions of their environment was guided by complex histories and present day relationships. I found myself wondering if it was her being an urban dweller and everyday working with a focus on climate change that had her seeing the choices people made in Falealupo from a different perspective, and it was after this meeting that I began to see that what my notes were representative of was the need for a shift in my own perspective and focus, from environmental knowledge to environmental *perception*. I had failed to truly see local environmental knowledge in context with the socio- physical environment that cultivates it; namely, the family and village lifeworld in which I had been immersed. Through my daily interaction with my host family, their extended family and other families in the village I had already learnt how the *aiga* is not only primary caregivers or those who have the main responsibility for raising a child; the family is also the main reason behind *why* children learn *what* they do and *how*. In this chapter I will try to illustrate aspects of how the family and the village in which it is part are the context in which a great majority of the environmental knowledge that children accumulate gains value and meaning, because rather than thinking individually or for oneself first, a Samoan child is typically raised to think first of the family, and as part of a collective (add other source).

The Samoan '*aiga*

'Aiga is the Samoan word for family, and refers not only to the nuclear family (mother, father and their children), but also to grandparents and extended family, to adopted members and those who have married into the family. The *'aiga* has a collective responsibility for one another. This does not mean that cousins and their families, or siblings and their families do not live separately or lead different lives. My own perception of family life in Samoa comes primarily of my immediate host family and the principles for right behavior and priorities the children in it learnt. I then considered my time spent with extended family and other families in the village as comparative insight. My host family lives in Falealupo Uta as a three-generation household which at the time I was there was made up of my host mother and father

and three of their grown up daughters; one of whom had three children -a two year old girl, a five year old boy and an eight year old girl- and one of whom had a five month old baby boy at the middle stage of my stay. The baby's father would come and stay with the family during weekends, and once in a while on a week night, though for the most part he lived with his family three villages away to be near his work. The father of the three older children was not present in their lives.

As is typical in Samoa, the entire family was involved in watching and raising the children. While each child had a very inclusive role in the family, the degree to which either child was paid attention to varied with their age. Of course, the baby was always watched over, cuddled and played with by his parents, grandparents, aunts and older cousins. The two year old was in a transitional stage where she was going from baby to childhood; meaning that she still enjoyed relative freedom in terms of her behavior, while also being watched rather closely and given verbal do's and don't's. The older two, on the other hand, were of an age where they were paid less focused attention to and expected to know to help their elders rather than be helped. At their age, they were expected to listen more than they spoke, and to do as they were told without protest. As they had begun to be able to take care of themselves more, they were also the ones who took over some of the responsibility of watching those younger than themselves. The two were often put in charge of watching their little sister and their baby cousin, and were of the age where Samoan children in the village in general were supposed to learn that showing respect and love for their elders was about listening to, observing and obeying them. This entailed a gradual accumulation of chores. For example, during my stay, the oldest began to be charged with washing her little sister. I remember sitting on my bed one morning, watching the two argue by the water tank as the older tried to soap in and wash her reluctant little sister who got soap in her eyes, got very upset and consequently tested her older sister's diminishing patience through fidgeting and screaming. I remember trying to refrain from laughing with adoration at the spectacle; one of their aunts shouting out reprimands at the older for failing to wash her sister without creating a ruckus and the latter protesting in dismay at her little sister's behavior. She was a headstrong 8 year old who did tend to get in trouble with her female elders for responding with some resistance the strict form her relationship to her elders had taken, but for the most part she did as told.

The two year old would often merrily tag along with her older siblings while they played in the shallow of the trees, until she grew tired or wanted milk from her mother. "*Fia susu!*", "I want milk" were in fact some of the first words I learnt from her; often her cue for me to take

her hand or lift her up and dutifully bring her to her mother's breasts. I came to know her as quite the personality in the household. One of her aunts would often joke to me and call her the boss, fully well knowing that she herself was "the boss" favorite doter. Still being so young, the little "boss" was still exempt from the expectations the adults had for her siblings in terms of attitude, behavior and duties. To grow up in Falealupo and in Samoa in general has much to do with adjusting one's behavior towards being of service to the family, specifically to elders. For the most part, I did not see children refuse or shirk their duties, although the occasional exception did occur. Though less obstinate than his older sister, I do for example recall the five year old in the family trotting around outside one day, subtly mumbling complaints while picking up rubbish²² in between the lava rocks by the kitchen *fale*. "It is not fair that my little sister doesn't have to help", he whined. This had his mother bursting with laughter in the kitchen, as we all knew very well how incapable the two year old was of carrying around a basket on the uneven rocks on her own.

My three host sisters had different roles in the household as well, not so much according to their ages but their time and ability. While the youngest was a teacher at the primary school, she would come home after work and help watch the baby, tend to the washing of her own clothes and those of the children, bathing and otherwise caring for the two year old. Between this and correcting her students' homework, she would spend her late afternoons picking up rubbish, sometimes weeding around the *fales*, and once in a while helping with the cooking. The family had an ailing, though functional car, so she would often drive her mother to various meetings and visits in the village in the evenings and make runs to the shop for dinner ingredients like meat and noodles. The middle sister had her baby, and taking care of him was her only obligation in the early months of his infancy. As time went by and the baby grew, she began to help with washing dishes out back behind the kitchen and the gathering and making of cocoa. She was not expected to do as much as her sisters for quite a while, however, due to her status as new mother. The oldest sister and mother of three was in charge of the majority of cooking for the family. Two days of the week she was also responsible for cooking breakfast and lunch to sell to the children at the primary school, a modest source of income to spend on her children and her own wants and needs. She would tell me once in a while that she wished for a proper payed job to earn more money to save for her children's futures, but she also took pride in being the best cook in the family.

²² "Rubbish" usually referred to the fallen leaves of breadfruit trees, which had to be picked up on a daily basis as the trees were plentiful on my family's land.

My host parents would also help with various tasks at home, but not very much. My host mother worked at the primary school every day, which had her quite busy. At home she did her own laundry and once in a while helped to cook, but at her age and with grown up children and growing grandchildren, it was her time to do less of the hard work at home and instead be served. Her husband is a *matai*, more specifically an orator which means a talking chief in the village council. He would often be out meeting and speaking with other *matai*, but home in the evenings to watch his newscast on television and pray, eat and spend time with his family. During daytime when he was home, he would relax in the shade, speak with guests and his family, or work in the plantation. Traditionally, *matai* do not have to work, but there were rarely any young men –such as sons or nephews- around capable to tend to the plantation for him, so strong as he was at his age he took care of that work himself. Other than when extra cash was needed, my host parents did not sell their crops. My host father would therefore tend to the crops when needed, but did not spend a great amount of time in the plantation. He would provide the taro –his favorite root crop- and ta’amu –my favorite root crop- for our meals when his son in law was not there to help. His son in law would prepare the *umu*, the stone oven, every Sunday, for our *to’ana’i* or after- church lunch. The *umu* is his job to prepare by tradition as a young man, so on some days he would go straight from the kitchen of his in-laws early in the morning to that of his own parents two villages away to tend to the *umu* there. I would watch him do this and go in and out of the plantation helping his father in law with the heavy work, help his sisters in law and wife in the kitchen, clearly without needing to be asked or told; he knew how to contribute by having been raised by doing so. In time I learnt that this was his part in showing –by practicing- respect and love for his family, and would also come to see how the children in the family were in the process of learning to do the same as they matured. In what follows, I will elaborate on the roles of family members in terms of hierarchy, and how the distribution of roles and expectations in my host family and others was oriented according to maturity and responsibilities towards both those older and younger than one self.

Responsibility, respect and love in the family hierarchy

My first contact in Falealupo was one of the village *matai*, whose family took care of me my first week in the village before I was settled in with my permanent host family. It was he who

took me to meet the primary school staff for the first time. I remember it raining slightly that day, so he and his daughter and I got a ride down to the school in a friend's car. As we got to the school early, we went into the little *fale* next to the school building where an elderly *matai* was sitting. My friend introduced me to the man and sat down to have a cigarette and talk to him. After a little while of listening to their conversation –without actually understanding a word of Samoan at this point- my attention awakened when he told his daughter something to which she responded by getting up, walking over to the bench where the other man was sitting, picking up the tea kettle beside him and serving the two men some tea in each their cup. After serving them she sat down beside me again and resumed fiddling with a little leaf she had picked up before. I remember noticing that he did not say please or thank you, and that she served them with a seemingly familiar ease, giving me the impression that I was seeing a given aspect of their relationship. What I would come to learn was that this was my first observation of respect by 'servitude' towards elders and a hint of the hierarchy that family, village, and general relations are oriented through in Samoa. Indeed, not very long after, I would find myself rejoicing on the inside- all the while trying to exude an air of nonchalant normalcy on the outside- when my host parents began to –albeit, only once in a while- tell me to do something for them rather than ask me. By the time my host father said to me “'aumai lau ili” (“give me your hand- fan”) for the first time –my host father was often missing a hand- fan-, I had begun to understand this as a sign of familiarity and even closeness.

Age and gender are two central modes of social organization in Samoa. Brother-sister relationships, for example, affect how family members orient their movements on a daily basis (Auva'a 2003). This is why, during my first week with my host family my new sister said to me, “we are very lucky that there are no men around, it makes everything much easier²³”; and furthermore the reason why this aspect rarely entered my conscious movement or field topics on the daily basis²⁴. Though gender is an important signifier for social organization, it was the adult- child/ older- younger person relations that were central for my understanding of the system that guided the social orientation that the children learn in their

²³ She was here referring to there being no brothers, barely ever a brother- in- law and only her father as an adult man around their home on the everyday basis.

²⁴ The 'gender factor' was however the reason why I did not spend time out in plantations to observe the learning processes there, as the plantation work is done by men. My host father was in the plantation alone at random hours (when needed) without anyone to teach, and I could not go into plantations of other families with the men because that might cause rumors about my time spent alone with only men, a risk that my host mother warned me of.

families and the village. It is common for Samoan children to learn early that they should behave in particular manners towards another person within and outside of their family according to whether they are older or younger than one self (Halvorsen, 2014). In addition to age, someone with a special title or status such as matai, priest or guest is placed in a special category to which they must also adjust their attention and behavior appropriately. In any family I was around in Falealupo, this hierarchy was quite visible. My host father, being an elder, husband and matai, was placed at “top rank” in his immediate family. After him came his wife and then his daughters –although their all being in their thirties and thoroughly positioned in their respective roles made their hierarchic orientation towards each other difficult for me to notice anything of- and at last the children according to their age. I found that meal times made the order of this hierarchy the most visible, as that is when all are served food according to their “rank”. My host parents and I would be served first, as they are the oldest and heads of the family, and I was a guest. Meanwhile, one or two of their grandchildren, alternatively a daughter, would sit and fan our food to keep away the flies. After the three of us had begun eating, my host sisters and the children would be served.

The children learn how to move and behave according to where they are and in whose company, because the manner in which they position their bodies around their elders reflects their respect for them (Duranti 2003: 110). There are detailed spatial ethics that they must abide by; children should not walk in front of an elder unless necessary, and if they do they should bow their heads, arch their backs and utter the expression of pardon and respect; “tulou”. When seated on the floor amongst others, they –like everyone else- must sit with their legs folded, not stand in the presence of matai or guests and so forth. They must also be ready to serve their elders tea, cocoa and food. The oldest two children in my host family usually helped their mother to serve dinner to the table every evening, and would be scolded if they were caught spilling or slacking off. The children were learning their place in the family on a daily basis throughout daily activities and it was clear that the oldest of them was given the most chores and was met with the least patience for tardiness or reluctance from her adult relatives. At the same time as this hierarchy seemed rather clear in its top to bottom orientation, I do not believe that it can be defined simply by age per se. A person’s *maturity* should be reflected in their skills and demeanor, meaning that they are expected to behave their age. It is the maturity of behavior that shows that a person is not only learning from and paying attention and respect to their elders, but also that they are fit to watch over and further teach skills and behavior to those who are younger. In that way, a person’s responsibility is

not only to her elders, but to those younger than her as well. I find a good signifier for how this upward and downward responsibility permeates the Samoan social system in the way that a *matai* earns his title and position of leadership in a family, here as my host sister described it: “he must serve his parents and family well, be respectful and loving, and take care of his family”. I believe that this required quality or ability of a *matai* to serve in order to lead, a sort of circular directionality of responsibility, can be relatable to the family and social hierarchy in general, as a child must learn to follow and obey her elders before he or she is able to lead younger siblings. Respect is thus the award for display of collective consciousness. One central sphere for concentrated effort on behalf of the collective I found in the kitchen, where my sister(s) cooked for the family.

How, what and why children learn what they do

The umu kuka

I was sitting in the *umu kuka*, the kitchen *fale*, alone with my host sister one day, practicing my Samoan sentences and watching her cook. It was late March, and the sun was beginning to shine high in the sky. Moving from one task to the next, she sat down on a stool and began grinding coconuts for our coconut cream, sweating from the heat of the fire and the workout of grinding. Amidst her work she looked up at me with a tired smile, wiped a lock of hair away from her sticky brow with her shoulder and said, “Samoan cooking is too heavy”. I returned her smile and complimented her strength. Once she had finished with the coconuts and moved on to stir the food that was simmering over the fire, I asked her how it was that she became so good at cooking. She told me she had learnt from watching her mother cook hours on end and helping her in the kitchen when she herself was young, and that this was how her own children would also learn to do the work.

I realized early during my fieldwork that the kitchen *fale* would be a central sphere of learning for me, as this was where much of the children’s learning took place. My host sister was often very busy in the kitchen and though she was a patient woman, I found that she most of the time preferred that I not delay her work by trying to help or ask too many questions. In the beginning she would feel a need to entertain me as one would a guest and because she was often too busy to do so tended to tell me that I should go to my bed and have some rest. After a while, however, I learnt that if I brought a cup of tea and one of my notebooks to the kitchen, or if I was playing or spending time with the children she was satisfied that I was

entertained and would carry along with her work. For the most part I was thus to be found on a chair in the kitchen corner, from which I observed and took part in a great deal of interactions between adults and children throughout my time with them. Once in a while however, she would also let me help her, either when she trusted me to know how already - chopping cucumbers for example- or when she had time to show me how and would not mind lightening her load.

Most learning and teaching in the kitchen featured children observing, mimicking and practicing until they had the skill down. I never saw any children in the village sat down to be taught how to cook, or be taught any task step by step in concentrated sessions. They were told to help according to their ability when they were needed. They moved in and out of the spheres of their elders, and when needed, they were told. Once they had mastered one skill, they would be expected to use it efficiently and learn a new one through helping with more tasks. My sister's oldest daughter began learning how to work the cooking fire during my stay with them. The first time I saw her practicing, I was sitting in the kitchen with the five year old on my lap and my Samoan notebook in my hands, practicing some new Samoan phrases and telling him their English translations. He had fun mouthing out English words for a while, until his attention was caught by his sister, who had quietly come into the kitchen, gone and found the lid of a small container and begun fanning the diminishing fire. Her brother went and found a burning stick that had fallen out of the fire to play with, but his sister was not playing with him tonight. She was very focused on the task at hand. Her mother was busy chopping up a chicken and was giving her no direct attention or advice. She had spent countless hours throughout her childhood around her mother, grandmother and aunts in the kitchen and was now moving on to apply her observations to practice. She caught me watching her from my stool on the side and looked a little embarrassed, so I lowered my eyes back to the open pages of my notebook. Once in a while I would look up as she was trying different methods; fanning, blowing at the ember, adjusting the firewood. Then, after a little while, I noticed that she had stopped, was looking into the air –apparently thinking out a better method, because next she went to the pots, looked around and found a larger lid. I had my nose in my notebook again when she suddenly gave out a small *woot*, and on looking up saw that she was effectively fanning life back into the fire, flames beginning to rise. She did a small victory dance that only I watched, and looked at me for a smile in recognition. Her mother still paid her no heed. This was not for any lack of affection for her child, but for the sake of teaching the children to, as explained, behave their maturity and help their elders as

though it were a given. The oldest of the children received the least recognition because, as her aunt had explained to me, she was at the age where she must help and take on duties without complaint. As I spent time with my host family and others over time, I came to understand that this also entailed getting less praise for accomplishments.

One evening, I came down to the kitchen *fale*, where a fire was going and two of my host sisters were working. The oldest was cooking our dinner, while her younger sister had started a second fire in the pit where she was roasting beans for our evening cocoa. I came and sat by her, watching for a little while before I asked if I could peel the beans that were done. I had done this a couple of times before, and was pretty sure that I had understood how it worked: First you pick up a small handful of the beans, feel them and look at them individually, and if they have the right consistency they are finished and can be put in one of the coconut cups; if they need some more roasting they go in the other cup. I began checking and separating the beans, though after a while, upon seeing my sister separate a few I realized that I was not separating them the way she was. I showed her one of the beans I believed to be done and asked if I was right. “No”, she said, and showed me a few examples of finished ones, without any verbal explanation. “Aha, okay”, I answered, quite confused but not wanting to interrupt her focus on the beans roasting atop the metal plate over the fire. I could kind of gather what the difference was, but not for sure. I had been separating them wrong for some time now, I realized that much, and began to do it the other way. Still, most of the beans had such ambiguous looks, and 90% of the time I was not at all sure if I was doing it right. My sister did not check on me, however, nor did she worry about my having gotten it wrong. She just let me continue on, now perhaps with an improved eye and understanding. I was a little stressed, feeling pressure to contribute well in making a tasty cocoa, but she did not seem to mind my mistake.

The next time I helped with peeling cocoa beans, my oldest sister was doing the roasting, and her two year old daughter was sitting with us. The little one wanted to join me in the helping. Most of the time she was contributing by way of taste- sampling the cocoa beans, at times alternating by sorting some into one of the coconut cups. Her work relieved some of the pressure I had felt before, as she was simply putting every bean she spared in one and the same cup. At the same time, it made me wonder that her mother did not stop her from helping. After all, she was doing it wrong! ...Then something dawned on me. For one, I had to make the conclusion that some unfinished beans would not ruin the entire batch of cocoa, or else my host sisters would have been stricter with me and my little companion. Second, I

took a mental step back and looked at our scenario, and found that I was actually experiencing firsthand how the children in the family began to learn new skills, especially the youngest. My little “host- niece” and I were both somewhere in the initiation stage of learning a skill. We were paying attention to a certain practical activity, and participating in it. We were not given any verbal instructions, but mimicking what the elders were doing. We were not expected to get it right, right away, but to try again and participate until we understood it –did it- better. The difference between my little co- apprentice and me, and the older two children was that we were shown more patience due to the inherent ignorance and lack of skill as toddler and foreigner.

The gathering and preparation of food would be a central theme in my research, as it is a central facet of everyday use of nature and cooperative family activities. Also in terms of choices between using local resources and/or buying food at the shop. Certain families in the village had no income, and therefore only cooked and ate what grew in their plantation or the soil around their *fales*. In my family, as there were two incomes and the addition of my own financial contributions during my stay, we often ate pork and chicken from the shop, as well as noodles. Every meal did however contain one or several of the options growing in the plantation and the plot; taro, ta’amu and bananas being an everyday part of our meals, and other greens and fruits such as edible hibiscus and pineapple when they were ripe. My host family’s land grew a great variety of plants that were actively used for everyday use, and the children of five and eight gradually demonstrated to me that they knew the names of them all. While it made sense, pretty much as a given that they would know the names of what they use, it dawned on me at some point that this was an aspect of local environmental perception worth giving attention; contextual knowledge.

The relevance of useful plants

While Kevin was in the village during my first week with the family, he and one of the young men from the village were repairing parts of the Canopy Walkway. In a conversation with the two of them one day while they were taking a break, the young man mentioned that during the week that he had been the guide for tourists visiting the Canopy, several of the groups had kept asking him to tell them about the rainforest environment that he had not been able to do so. Not because he did not know local trees or plants; he had grown up in the village and

knew a great deal about local plants. To talk about the rainforest environment in general was what he had trouble with. After some time in the village, I thought back on this conversation and began to understand what his trouble was. In Falealupo, the rainforest environment was not something that was discussed in itself. Few people ever ventured much into the rainforest, and the plants, areas and objects that people had knowledge of was very much in context with what they used. A point came when I realized that I had not been taught the name of one plant that was not of *use* in one way or another. Accordingly, not once had I asked about a plant that was used for a structure, cooking or other use and not been given the name. Of course, it depended on who I asked, and to what degree they used it themselves. An example, and I believe the scenario in which I first realized the context between relevance and use was the day that my host sister, her niece and nephew and I were down by the road waiting for a van to pick up her niece for an Easter choir gathering in a church in another village. My sister and I were sitting in the shadow under a tree while the children were playing with leaves. They had started a tug-of-war- like game, where they picked the leaves off a certain bush to pull at each end and see who pulled off the longer piece and won. Their aunt and I joined in as I got curious, and she explained to me that this was a game that she used to play when she was little too. After playing with them for a while I asked my sister the name of the leaf, but she could not recall. Instead she asked her eight year old niece, and the young girl named it instantly. I asked her in the teasing way that I had adopted from her and her sisters, “oh, now! Your little niece knows the name but you don’t?” to which she laughingly answered in defense, “well, I haven’t played with it since I was little”.

It took a few moments before it hit me that I had received what she had just told me as such a natural comment on knowledge and relevancy that I had almost missed how central it was to my fieldwork. The bush that grew the leaf had not been of use to her since she was a child, and it did not grow on or around her family’s land. Because the plant no longer was useful to her, she had no need for its name. This had me reflecting a bit on the plant names I had learnt thus far from the members of my host family and acquaintances around the village. Most of them had been introduced to me when being used, and in cases where I had asked for the name of a plant, its usage had often been served along with it, or was when I asked. I was never taught the names of plants that were not seen around the road or *fales* or those without a use of some sort. They were all useful for medicine, decoration, cooking, or building, or play as demonstrated above. I had not learnt the name of one irrelevant plant. Now, this might seem like a given thing, that it does not occur to people to teach something to someone else

unless it is relevant in the context of a situation, and indeed this I had taken for granted until I realized what a contrast it was to the way of learning in school. In the classroom, and in science class for that matter, the lesson plan continues its course day in and day out independently of what goes on in local life. Its curriculum is steered by scientific priorities rather than local ones. It was this realization that had me truly recognize the centrality of the *context* of experience and ground my feet in it for the first time. Nothing about the everyday scenario was about learning for the sake of learning or knowing for the sake of knowing, it was about learning and knowing for the sake of a very local purpose –that purpose most often being the good of the family or the village. Over time, I realized first hand just how contextual knowledge and upbringing was. Determining what knowledge about nature was important and what was taught was very much entwined with what was actually engaged in everyday life and special occasions.

And learning did not happen in planned sessions for learning in itself. Learning would happen in social contexts. Learning took place when my oldest host sister and I brought flowers from our place down to our church one evening to make alter decorations for the next day's service. My sister and one of the other ladies from our church sat on the steps surrounded by flowers and leaves while children were playing about. Another young woman from our church came over, and suggested some white in the decorations. At this, my host sister stood up and walked over to a green leaved plant, tugged at its root which gave into her strength and came out thick, brown and long. She got a machete knife and began chopping off layers of the root's skin, revealing the bright white mass inside. Out of this she made long, fine leaves to swirl around themselves and decorate the bouquets. The bouquets were stuck into very convenient ... in plastic boxes which were hidden beneath the leaves. All the while, the children were intermittently playing and watching on, "ooh"-ing and "aw"-ing at the white in the root and the beauty of the bouquets. Learning took place when coconuts were opened with the backs of machete knives, when children played in the trees around their *fales*, when meals and medicines and cocoa were made, when walking around in the sun and rain, when people did not show up in time because of heavy sun or rain, when the church ladies gathered at our home to make traditional costumes from plants for a joint Easter celebration with other neighboring villages... Learning took place when sociality and work took place- contextually and through attention to social and physical surroundings and practice. While this might be called an unstructured and unconcentrated form of teaching and learning it is at all times

intended for learning enmeshed in the meaning, purpose and relevance of collective knowledge and insight.

In terms of relevant knowledge, I learnt that identity comes into play when considering what knowledge applies to whom. For example, whenever my host father had a bad stomach or headache, my host mother would collect *nonu* leaves or *lau ti* from around the *fales* to make a natural medicine for him. I therefore figured that when I had stomach sickness during my first and third month in the village, she would make me the same. Instead she and my host sister brought me pharmaceutical pills and liquids for my ailments. The second time around, I asked her if I might try some of the plant medicine instead, as I am not fond of pharmaceutical remedies. I explained that back in Norway, I would usually use water, fresh air and various foods to fix my stomach and head aches and only take pills as a solution if the former did not work. She replied that she had not thought that I would want the *nonu* or *lau ti* because she figured that I as a European was used to the pharmaceutical medicines. While this told me something about her perception of European lifestyles and relationships with nature, she further added that she herself preferred a combination of plant leaves and Panadol pills. I was to realize that combinations of Samoan traditional and Western modern medicine were relatively common. When the two year old's throat became seriously enflamed with chickenpox, her mother first followed the advice of a traditional healer from church to dab her throat with chili oil on *nonu* leaves. After a few days of doing this without improvement, she, the two year old and I were driven by her brother in law to the hospital a few villages away to see doctors. They examined her daughter's throat and issued her pills to treat it. We got home, and for the next few days she used both the chili oil and the pills to treat the chicken pox. When they faded, she said that she believed the pills were the right remedy but had used both just in case. The treatment of ailments in Falealupo were often first sought from local traditional healers, I was told, and then from hospitals if the former did not work. The failure of traditional healing was not seen to disprove the practice in itself, it simply meant that ailments are of different natures and need the treatment meant for it. Cluny and La'avasa found a similar explanation in their study of medical beliefs and practice in Samoa, saying that there are two kinds of illnesses; *ma'i Samoa* and *ma'i palagi* and they require the corresponding treatments (1990). My host mother told me one night about when she became deadly ill some years ago, and how she had resorted to hospital care without any improvement. She had come home and been seen by a different healer- with whose care along

with prayers to God she had gotten well and strong again. It was the healer and God who saved her, because the doctors did not have the right treatment for her illness.

Relativity: where in the village one lives informs learning

The relevance of knowledge comes also of where in the world, and even in a village one lives. Because local environmental knowledge and perceptions are so locally grounded, even the variation of where they live in the village will affect what children learn early and how they see their village. As I have described, Falealupo stretches across a length of approximately nine kilometers, and the road connects one end to the other- from main island road to the beach. In Falealupo Uta, there are plantations and forest on both sides of the road, while in Falealupo Tai, there is an open, sandy clearing and ocean, little arable land, though coconut trees and some breadfruit trees do grow around *fales*. As the students put it in their answers to questions I presented to them in a homework project during my last month with them,

Children who live in Falealupo Tai play on sandy fields and are close to the ocean for swimming, while children in Falealupo Uta play on fields covered with grass, but have no ocean for swimming.

Falealupo Uta and Falealupo Tai are different in chores that have to be carried out in their families. The chores that they both do depend on the environment where they live.²⁵

Swimming is not a skill that children in Falealupo Uta need the way that children in Falealupo Tai do. Falealupo Tai has little shade from the sun, and cooling down in the ocean is therefore a great option on hot days. Furthermore, fish is a much more common everyday meal in Falealupo Tai than in Falealupo Uta due to the proximity to the ocean. While staying with my host mother's cousin and his family for a week in June, I went swimming with the children in the family every day, and went out spear fishing with two of my young male 'host cousins' one day. The children all knew how to swim. My host sister's children and other children from Falealupo Uta I had been to the beach with on the other hand did not. I asked my host sister one day if she and her siblings knew how to swim, and she replied that they had known once, when they were little and lived in Falealupo Tai but that since they moved there had not

²⁵ Translated to English for me by their teacher; they were given the questions in both Samoan and English and had the option to answer in either language. Three students out of the eleven that submitted before I left replied in English.

been opportunity or need and since they had grown up there had been no reason at all to go in the ocean; so she did not know if she could swim any longer. As I have explained, grownups do not have an excuse to go into the ocean unless it is for a productive purpose, such as fishing from a canoe or with a spear. Falealupo Tai also has an ‘ocean pool’; an enclosed rock pool where ocean water enters, then to be heated by the sun which eliminates much of the salt and thereby creates water good for washing clothes and children. In Falealupo Uta, on the other hand, many children are in and around their family plantations on a daily basis, have many trees to play and find shelter in –and to clean up leaves from- and often help with weeding.

Children’s perception of their village’s socio- physical environment also inevitably varies according to which part of the village they live in. When I asked students in one of the classes at Falealupo Primary school to describe and draw their part of the village for me on paper during my last month in the village, I found that there was trace of these differences in their drawings. While those who lived in Falealupo Uta drew their own family plots with their various *fales*, some plants and trees and the path to the road, students from Falealupo Tai drew pictures that showed houses of various families and churches scattered around, the open plane with trees and plants, the road, the beach and the ocean. Not one of the students in Falealupo Uta drew the forest, and though this might be analysis verging on speculation as I never got to ask any of them why, I wonder if this had to do with their rarely or never venturing into it. The road was included in most of Falealupo Uta drawings on the other hand, likely because that is where much of the daily socialization outside of family plots or *fale*’s happens as well as the connection between most family plots. Respectively, while students from Falealupo Tai would include the road in their drawings, they did not draw their homes with the road alone, as the open landscape freely allows for socialization around and across the road. Below are drawings by students of Falealupo Tai to the left and of Falealupo Uta to the right.



As I described in Chapter 2, the openness of Falalupo Tai and the relative isolation of plots in Falalupo Uta featured as a distinctive difference in people’s perceptions of social life in either part of the village and thereby one of the factors of change in their community life when they moved uphill after the cyclones. This was why it was a special treat when my host mother, her two oldest grandchildren and I spent two nights sleeping in an old *fale* beside our church’s priest’s house in Falalupo Tai that the women of our church were going to fix up a little, and she got to relive some of that socio-physical openness. Our first evening there, the neighbors on the other side of the priest’s house –who we could see clearly in their open *fale* from where we were staying- sent over some of their dinner food to us, a gesture that we returned the next evening. They were not from our church and my host mother did not know them personally, it was merely a wave of sorts to greet us as temporary neighbors; a particular gesture I never saw in Falalupo Uta due to the separation between neighbors by hills, trees and other vegetation.

²⁶ Drawing of Falalupo Tai by student living in Falalupo Tai

²⁷ Drawing of Falalupo Uta by student living in Falalupo Uta

Learning from the environment

That local environmental knowledge and perceptions are influenced by the local environment that people live in was something that I took for granted in the earlier stages of my fieldwork in Falealupo, and it therefore took some time for me to see the significance in it. What helped to alter this, was my comparison of the local with the scientific knowledge taught in school. Taking seriously the teachers' wonderment over the fact that they were teaching their local children knowledge that to them seemed little worthwhile in their local setting had me realizing that the local character of environmental knowledge and perception was exactly what I was there to understand and take seriously. Learning further that people did not feel a need to know everything about every plant in their entire village and that this corresponded with the fact that most people there do not seek to exploit, or use more than they need most of the time was another. I was to learn many lessons about the variables that I at first took for granted and did not see clearly for their interpretive significances. One very basic lesson was one that I learnt from the natural environment itself.

During my first week with my host family, I would go into a comatose state during the sun's peak every day, unable to stay awake in the heat. As I knew that most days for the next couple of months would be much like this, I decided to fight my body's instinct to rest and force myself to stay awake and observe what goes on while people were resting; after all, my fieldwork was at stake here and an hour or two of every day was one or two too many to miss.

As one might imagine, however, little actually went on while people were resting. The oldest two children would often stay awake during these hours, playing quietly in the trees, which gave me a great opportunity to play with them or observe their activities. There was, however, little if no interaction between adults and the children at this time. For some variation, I began going for walks during these hours- which I was only allowed by my host mother to do if I brought an umbrella to protect me from the sun. These walks were eerily quiet, as I very rarely met anyone on or near the road during that time of day. Some children and sometimes adults and elders still awake in the shades of their *fales* might call out '*malo, Miriama*', greeting me as I wandered past. For the most part, however, I walked in silence and solitude, determined to appreciate the ethnographic value of recognizing the village in its less social suit. I enjoyed the feeling of being accompanied by nature alone and getting to know the hills and curves of the long peaceful road through the village, but I soon realized that the physical exhaustion of walking in such heat in itself had taught me why people were staying inside

resting rather than moving about at this hour of the day. I therefore soon decided that the best way of proving to have learnt something -to myself and to others- was by giving up my afternoon walks and replacing them with walks in the early evenings. I still stayed awake through this time -on most days, lying on my bed taking notes, watching the five month old baby while his mother rested or watching the children play outside, but I remained with my family. My walks from then on were more eventful, as the sun would be setting behind the trees and the village was coming back to productive life. I would encounter men returning home from plantations, some going to fish in Falealupo Tai, youths playing volleyball or helping to weed, gather crops and prepare for dinner, watching their little siblings, or doing chores while most of the elders stayed in the shadows of their houses making cocoa and food.

It was through going for walks that I learnt to adapt to the weather as locals must. It might seem like a no-brainer that physical activities in hot weather leads to exhaustion, but as a fresh and eager researcher, I started out very occupied with learning as much as I possibly could at all times. This inevitably put distance between my own and the environmental perceptions of others and it took the climate to put me in my place, which was at home with my host family. The heat of the sun forced me out of my own way and gave me a local understanding of what it meant to live in Falealupo, forcing me to adapt my social and practical movement to the environment.

My everyday participant observation did not only entail learning from people directly; it enabled me to learn from my surroundings- the physical environment, the climate- and thereby attain a certain embodied understanding of why people live the way they do. With no air conditioning, few fans and few cars, people are forced to know and respect their climate and live in accordance to it. Of course, my host mother and sisters would *tell* me that it was 'too hot' or that I should rest instead of walking, but it was through experiencing exertion from trying to defy the climate myself that I truly learnt why in Falealupo, you adapt to your environment or you simply do not do very well. A common signifier of this relationship between the physical and social environment was the flexibility of timing. Arriving earlier or later than expected for a visit in Falealupo was not something that was frowned upon. Because rain and sun cannot be controlled or avoided, people must often patiently wait for the weather to allow for effective and comfortable movement. Simply, people move with the natural forces, not against, and paying attention to them is therefore an integral part of everyday life and education. I came to interpret this as a reason behind the general relaxed relationship people had with time in general.

As I began realizing the degree to which my lack of know-how and insight meant that I had something like the local socio- physical maturity of a toddler in Falealupo and that my host parents, other adults and elders, youths and children in many ways looked after me as such, I saw that the above lesson was another example for this. My host mother and sister told me in words that the heat was too much, and had it not been for the fact that I was in fact an adult and guest and expressed a strong desire to go out and walk, I would not have been allowed out. Still, in my host family, it was only my little two- year old ‘host niece’ who were verbally warned of heat, rain, sharp rocks and knives. Her two older siblings were not warned, and when the rain was poring down outside the *fales* and the two older children were running excuberantly up and down the grass clearing, soaking wet and thrilled, collecting water to play with it, I asked their aunt –quite possibly with a hidden inner sense of “why do they get to do it and I don’t?!”- how come they were not warned or brought inside. My sister shrugged and told me that they knew the risks, that they could get sick, but that they did it anyway. And that was it. Just like the teacher told me about the students swinging from the torn and low hanging coconut tree branch outside the school; they knew the risks and chose to do it anyway. This was something that I came to see as a pattern through my time in the village, that the smallest children- those of three or two years and younger- were warned verbally of the dangers of the environment as they were the most vulnerable and were not expected to know, while children of older ages are to begin taking care of themselves and at some point younger children and therefore must learn their own lessons. As was made quite clear, I as a fresh-off-the-plane *palagi* and guest with little experience or know- how in the local socio- physical environment was basically a two year old and in need of extra surveillance and instruction, and was due to my lack of knowledge (as well as being a guest, this came into play as well) laughed at rather than scolded when I behaved in ways not entirely proper.

Concluding remarks

Children in Falealupo do not learn *about* the environment outside of school so much as they learn *in* it. I spent countless evenings with my Samoan family watching or helping to prepare mealtimes. I would join or watch as the children played, as they roamed about their elders while banana bunches were cut down, food was prepared, fires were started and tended to,

and as they helped their family members with certain tasks now and then when told. Once I had shifted my focus to the makeup of environmental perceptions, I found that I was unable to distinguish whether their participation was a process in which they were learning to be helpful members of the family, learning facets of socio- cultural behavior, or if they were learning about the environment. As time went by, I learnt to stop trying to distinguish and isolate potential intentions and lessons, and see these daily activities as intricate compilations of each aspect. Through learning to be a helpful, loving and respectful member of the family in everyday socialization, children take in piecemeal knowledge of the environment and thereby turn out perceiving it in context with their family and village life. While I started off taking as detailed notes as I could manage on a daily basis, I gradually began to alternate this with simply being present and going with the flow, detaching myself from details in order to take in a day –rather than a moment- at a time. Coming home to analyze my notes and writing, I had no choice but to take my detailed notes on *how, what and why* children in Falealupo learn about the environment and continually try to continue considering them from a holistic viewpoint. In this chapter I have attempted to present the complicated simplicity of everyday life, in order to convey how the family and the village of which it is part make up a learning environment through which environmental knowledge is produced and reproduced and perceptions are formed. In the next chapter I will present and discuss particular facets of the local primary school learning environment and science education in light of the ethnography and analysis of this chapter.

4

Science Education and Primary School Learning

Thaman (1993) argues that education and curriculum are culturally defined, and thus the Western aspects in Pacific curricula must be considered in context with Pacific indigenous knowledge. Building on this argument, I begin with the notion that formal schooling in Falealupo should be considered in context with the local socio-physical environment of the village, and this chapter is dedicated to doing just so. Every day for four months I spent time with the eight classes at Falealupo Primary School, though I spent most days with the classes of the final years 7 and 8, where a majority of teaching was done in English. I have compiled my notes from these four months, and in what follows I will present these to give an illustrative background for this chapter.

A Typical Day at Falealupo Primary School

It is 08.30, and the school day begins by the front steps at the center of the porch, where the students and faculty gather for fifteen minutes of united prayer, led by one of the teachers. She, like all the other teachers, is clad in a colorful *pule tasi*, a traditional Samoan long skirt and top, the teacher uniform for women²⁸. The students are wearing their uniforms made up of white short-sleeved shirts and blue skirts- the girls' ones with blue fabric suspenders. The sun is up but has not entirely risen, so there is still a slight chill in the air and some shadow covering the students where they stand. At the teacher's cue, one of the students begins banging a beat on a drum and a hundred voices rise in choir, their loud harmonies certain to be heard by anyone within a two hundred meter radius.

My host sister stands ready at the far end of the school building with her large pot of breakfast for sale. On today's menu is *koko alaisa*²⁹. As the students enter their classrooms, some with

²⁸ Two of the eight teachers at Falealupo primary school were male, but for the sake of anonymity I will refer to all teachers as female in this chapter. As the men and women seemed to share the same pedagogies and views on school and village matters I find that I can do this without compromising any gender-oriented variation that I might have come across during my time with them.

²⁹ *Koko Samoa* is a dish made of Samoan cocoa and boiled rice.

breakfast, others without, they are put to work on their homework. The classroom has two blackboards stretched across either long end walls of the classroom, with large paper sheets with lesson writings on them, along with words in chalk written from yesterday's classes. The walls are covered with drawings by students, as well as maps and alphabet letters illustrated with animals, fruits and objects according to each letter. On the floor, between the groups of wooden desks and benches, there are four large woven *laufala* (Pandanus leave) mats to sit on.

The students can choose between homework or pedagogical board games, in groups or individually as they choose. Most students choose to sit in groups; some by the chalkboards, while the rest huddle together on chairs and desks. One student lies on the mats on the floor copying yesterday's lesson off one of the chalkboards. In each of the groups repeating lessons aloud, a girl has taken on the role of teacher, while the rest partake as students. The group leaders are as usual reenacting their teacher's methods and demeanor. The leader by the chalkboard uses a wooden rod or ruler against the chalkboard to aid her teaching, as the group repeats words and sentences written on the board from yesterday's lessons in unison. In the math-oriented group sitting on and around desks, the "teacher" in a steady rhythm gives math puzzles which that group also answers loudly in unison. Meanwhile, the group of students working on their homework assignments in their notebooks sit quietly at their desks, at times walking over to one another to see how another has done their work and ask each other questions. Copying off each other's work is a frequent practice.

As class convenes, English being the first subject of the day, the teacher begins by telling the students "nofo i lalo", sit down. The students know by experience that she means for them to sit down on the floor for the beginning of their lesson, and do so in a square formation of four lines on the mats, in whatever spot they choose to sit. When all have sat down and become quiet, a morning ritual of rehearsed dialogue pursues. The teacher wishes the students a good morning and the students answer together in English, "good morning teacher, good morning Miriama", acknowledging my presence. This is a higher age group class, so all subjects excepting Samoan are taught primarily in English, with Samoan to assist explanations. The teacher continues by asking the questions, "how are you this morning; what did you eat for breakfast this morning; what day is it today". The students answer each question with the same answers as any other day, excepting the variation on the correct day of the week. This seems to be a lesson in English spoken curtesy more than an actual conversation, though it stands out from the elder- youth learning environment outside of school, where curtesy is

mostly directed only towards the elder and not the other way in return. Following this routine, the teacher instructs them in a quick beat; “hands up, hands down, hands on your head, shake, hands down”. She and other teachers have explained to me that this is an exercise they practice to get the students to release pent up energy and settle in to focus during lectures. After this, she begins her lesson. As she goes along, she asks them questions now and then, and some raise their hands to answer. The students do not ask the teacher questions.

As I alluded to when describing the students’ reenactments of their teacher, there is a certain rhythm that carries each classroom lesson. The teacher uses a hard tool of some sort, a rod, a stick or a ruler, to create a steady beat against floors, desks and chalkboards by which the students can structure pronunciations when repeating sentences and words written on the chalkboard. It tends to get quite loud, so standing outside the school building or in the vicinity one will often hear a range of choiring young voices rehearsing various lessons. Most subjects throughout the day feature this method, to help them remember and maintain order. During her lectures, the teacher switches back and forth between speaking English and Samoan, to make sure that the students have understood the aims and concepts of the lessons. After about ten or fifteen minutes of lecturing, the teacher sends the students to their desks with an assignment to finish individually or in their groups. The students are seated together according to their levels of advancement as proven by their developing English skills and exam scores. Their teacher tells me that this is so that she can more easily keep tabs on who is in need of more help than others. Two of the nearby students bring me one of their benches to sit on, and return to their desks and huddle together in their then limited space. In the beginning of my time at the school, I would insist that I go and look for a low chair to sit on so that they could sit more comfortably. This would not fly with them, however. They would only look hesitatingly at each other and their teacher, and without her having to tell them anything they decide that the most respectful thing to do is to offer a better seat for a guest and elder, and insist in turn that I take their bench.

While the students work on their assignments, the teacher walks around to check their work and offer help to those who need it. After a round, she comes back to her desk where I am sitting in a chair opposite to her to finish preparing teaching resources for the next subject. A short while later, a student from another class level enters the classroom with a teapot and a cup. The teapot is filled with *koko Samoa* (Samoan cocoa), which the student pours into the cup while the teacher tells her to go and get another cup for me. She then asks me to walk around and help the students as well. Of course I gladly accept and begin my round, all the

while knowing that my chances of actually helping the students are slight at best. Even the students with the strongest English skills in the class have a difficult time understanding my explanations and my Samoan is far too weak for me to convey or understand anything of substance. I look at the paper in front of the first student I approach; their assignment is to fill in the right adjective to describe a subject in a sentence. I see that none in this group- which is the group with the strongest English skills- have filled in the majority of the answers, this after about fifteen minutes of work. I ask them about the subject and they shrug their shoulders. I ask them about the adjectives that they have filled in –they have all filled in the same answers, as they usually do by way of copying each other- and they shrug again. The girl nearest me gives me a very sweet smile and asks me to “just tell us” the right answers. Though I do sympathize- having been a primary student in foreign language classes, myself- I smile knowingly back, regretfully tell her that I cannot and move on to the next group. Despite our difficulties in communication, walking around like this does allow the students and me to get more and more familiar and comfortable around one another, as well as it gives me insight into which areas students feel more and less confident about in their studies. While the students work on their assignments on their own for a while, the teacher begins preparing a poster for the next lesson, now and then exchanging some words with me. When there is time, she might answer a question I have, or share a reflection on the students and the lesson.

A few minutes from recess, a teacher comes in from another class to ask my teacher companion a question. She listens to the other for a bit, discusses something with her and then takes out her cellphone, typing a few words in and after a minute or two reading some information out loud. When the other teacher has left, I am told that she needed an English definition of a certain scientific phenomenon and as she herself did not have a touch phone with internet, she had come to this classroom to borrow one. This kind of collaboration happens once in a while when a teacher lacks or cannot find the supportive literature she needs for a lesson. The teachers also turn to each other when planning lessons according to who is known to be stronger in a particular subject.

After the third subject, it is time for recess. My oldest host sister has set up her two large pots of *sapa sui*, Samoan Chop Suey, and cooked bananas at the end of the porch, and comes to the door of the classroom to signal that I should help her. I usually assist her on her two days a week as “lunch lady”; she takes money from the students and pours the *sapa sui* into a cup, hands it to me to put a banana in it and pass it to the child. There is no line to speak of here;

the children are eagerly crowding all around us, shoving determinedly to the front to get their lunch as quickly as possible. Some of the older students will buy a few portions at a time for their younger siblings or cousins, while some have been sent to buy and bring lunch for a teacher. Once all the students around us have been served, I join my teacher companion for the day and go to the break room, where a where some of the teachers are sitting together eating food brought from my sister by a few of the oldest students. One of the students is still around, walking about refilling our cups with *koko Samoa* before joining her friends outside. After talking to one of the teachers for a little while, I take my cup and walk to the porch outside, where the principal and a couple of teachers are sitting on low chairs with their cups, talking. They invite me to sit with them and open a coconut for me to drink, from a basket full of coconuts that a parent of one of the students had brought for the teachers. When their conversation after a few minutes carries on in Samoan, I bring my attention to the children. A large group of students, mostly boys, are playing rugby on the grass with a coconut. I suppose nobody could get their hands on a ball today. The sun is shining fiercely in the sky and the children are sweating, but they do not seem to mind. Once in a while, one of them will come to sit in the shadow and take a break. Across the street beyond the grass field, a group of girls sit in the shadow of banana trees that skirt the neighboring plantation and talk. At the outskirts of the grass field on the far end, a group of boys are taking turns at swinging from a low-hanging branch of a coconut tree. I ask the teacher next to me if the boys are not afraid of falling coconuts. She shakes her head and says that they know the danger but they do not seem to worry about it. Near the boys, a group of both girls and boys are standing in a ring clapping and mouthing out a beat to which a couple of students at a time enter the center and dance to cheers and rooting. I watch their friendly game in admiration until my attention is disrupted by quick scolding from the women next to me who are reacting to a student having run past them. In the excitement of her play, the student had forgotten the right etiquette of slowing down to a walk, a slight bow and a polite *tulou* (“pardon”) as she passed in front of elders.

The librarian comes out of the library with her smallest child dozing on her hip, her older child off with the many daily nannies among the students. In the midst of play, talk, song and laughter, a teacher at the front steps rings the metal bell to signify that fourth period is about to begin, and a stream of students and teachers on their way to classrooms begins to fill up the porch.

Back in the classroom, the next subjects go on in the same fashion as English, with the exception of Samoan class which is conducted in the Samoan language exclusively, and entails subjects relevant for Samoa specifically.

In each subject, both local and foreign examples are used, depending on what resources the teachers has. The majority of the subject resources that can be found in the school library – which is not very extensive- have been donated from Australia and New Zealand and are therefore invariably foreign in their contents in terms of references and examples. The teacher does however also use or create resources that are locally –as in Samoan, or village- rooted.

After the final period, the end-of-day bell rings, and the students gather their things in bags – some backpacks, some regular fabric or plastic bags- and sit down on the floor in front of the teacher’s desk. Together, they say the regular prayer, say their goodbyes and get up to exit. Outside on the grass, the students form three long lines headed by a teacher. These are walking lines that allow the students to walk home together. Those students who live at the lower end of the village by the ocean, are usually picked up by a pickup truck or van to ride them down, but today there was no available ride and they will walk together with a teacher much of the way home, which might take close to an hour for some. The other two lines live in the upper, nearer part of the village and therefore take the opposite direction in company with the teachers walking the same way. And this concludes the school day.

Factors in Effective Teaching and Learning;

Relevance, Language and Pedagogy

Doris Varghese (2010) points to test scores from Year 8 primary school students to demonstrate that Samoa has seen particularly low achievement percentages in primary school Science in recent years. This was also a concern that teachers brought up in conversation with me and a basic question for this chapter is therefore, what the main challenges for teaching and learning Science were at Falealupo primary school. I will approach this question based on observations, participation and conversations I had with teachers and students, and consider these in light of village contexts.

Several teachers at Falealupo Primary school, regardless of whether or not they favored science as a subject commented now and then on how the curriculum translated to their

village. Their demeanor and efforts during science class lessons did not exude any ambivalence towards the subject, but I learnt through small- talk and conversations I had with several of them during our downtime that while they taught what they had been trained to, they did indeed question the relevance of the subject to some degree.

Samoa depends to some degree on foreign aid for curriculum and teaching resource materials, particularly from New Zealand and Australia, something which caught my attention during my first few days at the school. Among students' drawings and former projects, the walls were decorated with illustrated alphabets and other materials that featured animals, fruits, vegetables and objects not local to Samoa. My first time sitting in during science class with one of the higher level classes gave me a good idea of the kind of challenge foreign research materials can present for the students and teachers. The teacher began the session by pointing to the learning objectives for the day's science lesson written out in English on the chalk board and asked the students to repeat them. The theme for the day was the world of life and the diversity of living things, and the key words; behavior, learned behavior, inherited behavior and environment. The students repeated the learning objectives a few times before the teacher asked the students to name living things. They listed dogs, trees, cows and fish. "Very good", she told them and asked them to pick up their copies of a four- page booklet she had handed them and read out loud from the top of the second page. Together they read about how animals teach their young certain kinds of behaviors to help them stay alive; flying, hunting, building nests and so on. The teacher then picked up the original booklet with a picture of a squirrel crouching in leaves with a half- visible nut lifted to its mouth on it. "This is a bear", she said. I gave the picture another good look and got confused. "We don't have bears in our environment", she continued, and asked the students to describe what the "bear" was doing on the picture. Students answered that it was building a nest and finding food. The students had all been handed each their copy of the same picture and text inside the booklet, and were asked to read information aloud about why this animal collects food for the winter and how this is part of its behavior that helps it survive throughout the winter. "We don't have winter in Samoa either, but where this animal lives they do", she added. After saying this, she hesitated for a moment, looked closely at the picture and then turned to me. "Miriam, this *is* a bear, right?" she asked me. I answered that it is actually a squirrel. She laughed and repeated that to the students, adding that she thought she had seen bears in a movie before and remembered them looking different. "So, a squirrel is a small kind of bear?" she then asked me. I tell her no, that squirrels are quite different in for example how they live and what they

eat and that as far as I knew they are not at all closely related. I saw another copy of the booklet on her desk and picked it up, read a few lines out of the information inside and finally understood her confusion. While the picture on the front of the booklet showed a squirrel, all the information inside it was about bears, with not as much as one picture of a bear. A mistake must have been made in the production of the booklet. “Well”, the teacher carried on, “we will be learning about bears today, so go to your desks, read the information and answer the questions on the question sheet you’ve been handed”. “Malamalama?” she asks. “Malamalama, fa’afetai”. The students went to their desks, and their teacher back to her own. We discussed the confusion and I shared what I knew about the common and seasonal behavior and habitats of bears. She then told me that she was going to make a round to check if the students needed help, and would I mind circling after her to explain how bears look and behave to fill in the blanks left by the faulty picture? I told her yes, and below are the notes I made after my rounds.

I begin at the nearest group of students; the ones the teacher has explained have the strongest English. As I approach them, they have already got many questions since their teacher left. For one of their tasks, they are supposed to find the right words to describe the bear, and so they point to specific words. The first one they do not understand is “dangerous”. I try out a few related words first, like *danger*, *angry*, and *aggressive*, which are met with blank expressions. I then instinctively throw my arms in the air, form my hands into claws and bare my teeth at them as a bear would, quite convincingly I think, but no good. Of course they find it all very amusing and try to control their giggling -probably so as not to find themselves making fun of their adult guest- but as they have not seen a bear it fails to explain the word dangerous. I laugh at myself, think for a bit, and then tell them “you know, like a *maile* (dog)³⁰; the bear *bites*. You must be *careful*, it is *dangerous*”. The words ‘dog’ and ‘bites’ hit a mark, I believe. They nod and give each other “aha” sorts of expressions and discuss something about dogs and write answers. I walk onwards to the next group predicting that this would not be easy; even the best English students in the class did not understand me, and as it turns out, none in the class have ever heard of bears before and can therefore not have the first idea in advance of how a bear looks or behaves. I

³⁰ Dogs (“*maile*”) in Samoa are often very aggressive. As they often guard open *fale* homes with valuables as well as crops and other, they are raised to be more dangerous than loving so as to keep potential thieves and intruders out. This leads to dogs biting innocent passers by now and again, which the children also fall victim to.

stumble my way through a series of confusing conversations and crowd-pleasing though further confusing dramatic displays until I find myself back at the teacher's desk. I turn to watch the teacher finishing her notes for the next subject in between answering student's questions at her desk and checking their work. *I need to work on my Samoan, fast.*

I was confused. How were the students to understand the concepts at hand with guiding examples that were alien to them and their teacher? Why would they see this science lesson as relevant to their local surroundings and circumstances when the very examples used to describe it all were completely foreign to them? They were asked to imagine an alien animal and its alien behavior before they could comprehend what the point of the example was. I would soon see that situations like this came up now and then. The teachers made clear to me that they were aware of this cognitive disruption, but that they often simply had to move on to the next lesson even if students had not understood in order to keep up with the curriculum and unit plan. Whenever teachers spoke of the trouble with foreign teaching materials, they would shrug their shoulders and say that they were foreign because they were donations, which they sorely needed so there was not much to do about it.

Beyond the examples of the materials, what teachers would comment on in terms of relevance was the approach that science took to the environment. One day during recess after a science class session that the students seemed to have breezed through, I asked my teacher-companion of the day the question I would often ask; how had the lesson gone, and did she think the students had understood? She answered by recapping that her students were learning about the different parts of seeds. She smiled and chuckled a little over the fact, as though to express how silly it was. I asked her if she thought it was important for the students to know. "No", she said, "only if they are going to be teachers or scientists. They do not need to know the insides of a seed; they need to know how to sow one and to make it grow". She continued saying that what is important for a farmer is not to know what is inside a seed but what to do with it. "And a plant's lifecycle", she added with raised brows, gesturing to a poster on the other side of the classroom illustrating the details of just that. "Do they not need to learn that"? I asked. "They have *seen* it" she answered and gestured to the world outside the windows. "All of this other stuff" –she concluded while pointing to the written work on the chalkboard- "they should learn it in university. Some of them will go to university". For this teacher, it was relevance in terms of approach to nature and the right time to teach a certain kind of knowledge to a student that was in question. While she did not question whether

science was an important subject –in fact she was one of the teachers who favored science as a subject to teach- she did question whether science was relevant in Falealupo, as exemplified by its approach to seeds and lifecycles.

As the teacher pointed to above, the students and teachers do indeed have the natural environment surrounding their school to their disposal when teaching various unit topics. However, while this should mend any trouble with relevance for them, the issue of timing and lacking contexts would occur. For example, when learning about living creatures one day, one of the classes went outside behind the school to find ‘samples’ of living creatures, in order to have a practical lesson. We spent about twenty minutes outdoors before going back to the classroom, where the students presented a sum total of one worm and a half- dead bee (whether they found it as such or whether they swatted it in order to collect it remained unclear to me). More than that was difficult to collect on demand within a limited timeframe and span of land. Back inside, the students created drawings of their specimen, and discussed and wrote down their characteristics. By the time they had finished with those tasks it was time for the next subject. While the students were closing their science notebooks, handing them to her and finding spots to sit on the floor, the teacher commented to me that the search had not been very fruitful, but at least they got to move out of the classroom. As she proceeded to gather her teaching materials and walked over to the chalkboard, it struck me how out of context the sample collection had been when I compared it with the engagement with nature that is part of education outside of school. Children were never told to go find something without there being knowledge of whether a natural specimen was available and was needed or could be used for something. Practical education always happened to the rhythm with and in context of what was actually going on and what was necessary to use and do in the social and physical environment at that time, not independently of it.

Language and relevance were the most commonly commented upon issues for teachers, and the two issues that I observed students struggle with. Particularly language, which the students had only some exposure to before beginning the 7th grade. They had been taught English in the subject English throughout primary school, and the teachers teaching the lower level classes had rehearsed techniques with their students for incorporating it to a degree in their lessons as well in order to prepare the students for learning in the foreign language. Still, probably much to do with the very limited exposure to English outside of school in Falealupo, there were few who were able to speak with me in English. Teachers found this an unfortunate hinder for effective learning, especially in Science which has a language, or

terminology of its own. After science class one day, while explaining the method she used to help the students categorize and remember information, one of the teachers told me that she believed science could and should be taught in Samoan with local terms so that the students would understand it better. As an example she said that “they learn about ‘solar systems’, but we do have a Samoan term for that; ‘malosiaga mai le la’”. The connections between Samoan language, environment and culture become relevant here. Speaking for Pacific Islanders, Thaman (1997: 125) states the following;

Our ancestors’ thoughts and feelings were linked to processes and events within an environment which was not seen as separate from them. Our languages were used to describe these processes and served to unfold a sense of spirituality in which people, land, biosphere and universe were subsumed into a single conceptual framework (linguistically represented by culturally evocative words such as *whenua*, *fonua*, *vanua*, *ples*³¹), places to which people were inherently attached. This holistic conceptualization has been simply translated in English as ‘land’ because there is no equivalent concept in the English language.

That which connects Samoan people to the biological in meaningful, deep ways then risks being lost in translation. It is this kind of threat to the preservation of culture that Thaman wishes to see gone from Pacific education.

As I explained in the previous chapter, collective thought as well as respect and obedience towards those older than oneself, especially adults are among the most emphasized inter-relational aspects in children’s upbringing. Inside of school on the other hand, I learnt that pedagogy as it was done much of the time was not pedagogy as the teachers were supposed to practice it. The Ministry of Education and the science curriculum encourage them to engage the students in student- centered learning, not teacher- centered, meaning that the teachers should not rely mainly on lecturing to the children, but facilitate learning by letting the students find things out on their own. Furthermore, the students should be encouraged to think individually and critically. This, one teacher explained, was something that she struggled to achieve as it was a challenge to teach them the opposite in school of what was considered respectable at home. Not only was she and the other teachers accustomed to engaging with children and youths in a teacher- centered manner, but the students were being raised at home to orient themselves in the same fashion. Even when she tried to encourage them to ask

³¹ *Fanua*, in Samoan

questions and take initiatives in the classroom, she said, they were not inclined to challenge their teacher, nor were they eager to speak up in class. As another teacher explained to me, here lay divides between what they consider *fa'aSamoa* and *fa'apalagi* pedagogy in the village. When children were asked to behave and show respect in certain ways at home and then asked something else at school, they would not listen to their teachers, she said.

Jegade and Aikenhead (1999) suggest that this potential divide between school and village arguably creates a cultural boundary that teachers and students must cross when entering the classroom. Several teachers expressed that whenever they tried to make or let the students take charge by asking questions and making suggestions, they would remain quiet, because it was different from how they related to their elders outside of school. In response to such issues, Jegede and Aikenhead (1999: 2, 3) argue that

Whenever pupils enter the world of science, it soon becomes evident that science too, is another culture with which s/he has to interact, bringing with him/ her the other baggage of cultures s/he already carries... From the viewpoint of cultural anthropology, to learn science is to acquire the culture of science. To acquire the culture of science, pupils must travel from their everyday life-world to the world of science found in their classrooms.

The forms of language, relevance and pedagogy used in science and the formal school system as presented above represent certain values that disagree with those taught and reproduced at home, and this arguably poses challenges for effective learning and teaching at school. As I continue, I will demonstrate with outtakes from the science curriculum that the Ministry of Education, Sports and Culture (MESC) acknowledges and addresses some of these issues. With an elaborate introduction of principles, values, aims and priorities for science education, it explains how science should be taught and how it can benefit students, communities and Samoan society. The intentions and guidelines for use of language and applied relevance are addressed explicitly, while those for pedagogy is more indirectly included.

In the Samoa Science Curriculum (MESC 2013: 7, 8), Science is introduced in the following words,

Science is fundamental to an understanding of our physical and biological world as it affects every aspect of our daily lives... Science education helps students to understand themselves and the environment and provides opportunities for them to

develop independent, rational thought and responsible action. Understanding of the nature of Science and the procedures of scientific enquiry is crucial so that they can appreciate why scientific ideas are valued and how Science can inform many issues in society.

On relevance, the curriculum states the following;

Relevance in education implies a system that is meaningful, recognised, applicable and useful to one's life... The Science curriculum at the primary education level allows students to make connections between what they learn in the classroom and their everyday lives.

On language;

Science has a language of its own. This is understandable given the abstract nature of Science concepts and the specialised jargon it uses. Since English is the international language of Science and, given the potential use of the Sāmoan language as a learning tool to enhance students' understanding in Science, it is imperative that the English Science terms be retained at all times (or bracketed alongside their Sāmoan equivalents) for clarity, universality and the maintenance of content integrity within the Science curriculum.

On pedagogy, the curriculum states that students should be encouraged to “develop independent, rational thought and responsible action” (MESC 2013: 8)...

Students are encouraged to ask questions, explore and investigate the world around them and use their observations and findings to construct reasonable explanations for the questions they pose, communicating their explanations to others... Therefore, learning Science becomes a process of inquiry and exploration, as students are engaged in the active construction of ideas, explanations and activities that develop their abilities in doing Science (MESC 2013: 11)

On applying Science to local, everyday needs and realities (11, 14, 15);

Adoption of a ‘Science for all’ approach to Science education ensures that all students benefit from participation in school Science and are equipped to use their knowledge of Science concepts in their daily lives, rather than only those who intend to pursue a career in Science. Through this approach, students appreciate Science is not a ‘list of

facts' but a way of finding out about the world around them... The Sāmoan Curriculum recognises that *fa'asamoa* must be upheld and that the community plays a large role in the education of students ... The Sāmoan Curriculum emphasises the need to develop environmentally and socially sustainable practices. This applies not only to the physical environment but also in the way society structures itself socially, culturally and economically (p.15)... Sustainability requires the wise use of human, financial and material resources to ensure balanced and continual development in the system. Transparency and accountability are necessary at all levels. The collective values of trust, integrity and a sense of responsibility for the common good in community and national development will be promoted.

The curriculum addresses an apparent tendency that science is seen as a discipline useful only to those planning to pursue a career in science. I identified this view in youths and students through a few conversations and written assignments that I did with them during my last month in the village and also learnt that teachers and parents held the same perceptions. As explained above this had much to do with the values, language and priorities of science. The curriculum makes it clear that the *fa'aSamoa* should not be excluded from or discarded by science education. The curriculum further emphasizes that environment and social, cultural and economic structures are connected and must be approached in relation to one another to develop sustainable environmental practices. It points to values such as trust, integrity and collective responsibility, values that are cultivated in the everyday life of families and communities in Falealupo. The curriculum clearly aims towards inclusion of *fa'aSamoa*, yet the teachers seemed to feel that the science they taught in itself was not relatable or especially relevant to village life.

While this dissonance between knowledge systems existed inside school, and teachers would express dismay over them in conversation and comments now and then, the school environment did not appear to be a conflicted space in any way; in fact the day- to- day school environment seemed at such equilibrium. Because my attention had fastened itself to the differences between school and village learning, I would at times find myself wondering how this could be so. I therefore began trying to identify ways in which teachers and students coped with the challenges of language, pedagogy and relevance, and found that there were two rather common coping mechanisms that had stood out to me early on. For the students, it was the steady reply and unwavering unison of the words *malamalama, fa'afetai* ("understood, thank you"). Earlier in the chapter I explained how the students always gave

this answer to their teachers' question of whether or not they had understood. Jegede and Aikenhead (1999) refer to this kind of phenomenon as falling under *Fatima's Rules*. *Fatima's Rules* apply to scenarios when students faced with the challenge of incomprehension in the classroom as result of language or crossing over a cultural border between home and the science classroom choose to feign understanding rather than confront the problem. In such a case, they may carry on and might memorize facts but will not obtain deep understanding. I believe the students found it easier to use this technique to deal with a continuous problem such as lack of necessary language skills or conceptual understanding. This hinders effective learning but at the end of the school year it is the national examination that determines their fate and not their level of deep understanding throughout the course of the school year. The teachers on their end, who would tell me now and then that they did not believe that the students had understood but had to carry on anyway, explaining their decision to continue onwards with their lack of time and need to stick to the unit plan so as not to fall behind. They considered it unavoidable to accept the children's feigned understanding some of the time because time was what they did not have. While learning outside of school happens on a contextual schedule, the challenge with planning a school unit plan for and teaching a whole class of students is that scheduled timing and the quantity of students -who learn at different paces and prosper in different areas- makes it a challenge to ensure effective learning for all within that same time frame. In addition to that, teachers did not seem eager to go out of their way to implement the values and priorities listed in the science curriculum that were considered so different that they might undermine local values and priorities. Contrary to being any form of defiance, I found that this was how they upheld a balance between the potentially different cultural aspects of the social environments inside and outside of school.

Village seeps into the school

The school is not simply an extension of the state detached from the village, it is also very much part of the village environment. As several teachers explained to me to help me understand their decisions at school, how parents interact with their children outside of school was not something that could be ignored or detached from how teachers interact with their children at school. One teacher used this rationale to explain her theory on the continued use of corporal punishment in schools around Samoa despite it having been made illegal, and why most parents do not report it when it happens. If parents and teachers were to condemn such

practice at school, they must also condemn the practice at home. Opening a dialogue with students rather than punishing them for bad behavior physically she referred to as the *palagi* way, which she did not think many people on Savai'i used. In a two-way dialogue between an adult and a child, a setting is established for equal right to be heard which does not correspond well with the nature of social hierarchy in many Samoan homes. To act in divergent manners during and after school might thus result in disequilibrium between school and village, and challenge village relations and identities. Through discussions with teachers in Falealupo and teaching Peace Corps volunteers from other villages, I began to see that the continuation of teacher-centered practice in Samoan schools said much about how children and adults maintained a balanced relationship between school and village.

Balance between school and village was manifested partially in tangible ways, such as the students sitting on woven mats during lectures; mats woven by women in the village. At the same time, the students sat in straight, backward rows on the mats, rather than in circles as they would in a structured gathering outside of school. The less tangible, yet visible social inclusion of village culture I identified in social movement and orientation and in behavior. Examples of these were presented in the above sketch of the typical school day; students serving teachers tea and food, fetching objects for them, addressing them with 'tulou' when passing in front of them, while at the same time going about classroom activities and learning concentrated, framed subjects structured by a rigid timeline. These respective aspects of village and school ways seemed to intertwine like a braid of sorts- in a variation of more and less equal strands. Then there was one aspect of the social balancing between village and school that it took me a while to realize. I was sitting in with one of the classes I had spent less time with one day. I was a little late that morning because my host sister had wanted to give me a proper breakfast after having served students and teachers at the school early that morning, and arrived in the classroom about half an hour into their Social Studies lesson. I walked quietly over to the teacher's desk and sat down, then turned my attention to the chalkboard where the teacher had drawn a table and was listing titles on either side of the line while discussing it with the students. I looked at the words on one side, and recognized them as school role titles (principal, vice-principal, teachers, librarian, students), and then the words and titles for members of the village on the other side, such as *matai*, *matai's* wife, untitled men, women and children. When they had finished their table and the students were sent to their desks to write in their notebooks, the teacher came to her desk and wished me good morning. She explained to me that they had been talking about social systems and

hierarchies, and that they had made a comparison of the village and the school. The principal was compared with the village high chief, the vice principal with a lower ranked chief and so on down to students and children. “It is very much alike” she explained, elaborating that those lower down have to respect those higher up, and those higher up are responsible for those who are lower down. As the teacher went on to prepare for the next lecture and help her students with their work, I sat in my chair and chewed on what she had just explained to me; the village and school hierarchies are very much alike. With that, I understood the connecting balance between village and the school; they were socially interwoven through the central aspect of social orientation that is the village hierarchy. This connection kept the *fa’aSamoa* present within the school and allowed for teachers to uphold their roles and relationships with the children as they were in the village. The village was thus not delegitimized or cast a veil over inside school but further made an active part of it and likewise the school was actively integrated in the village. The general structure of the school positions which can be seen in a parallel comparison to the hierarchy in the village can thereby be understood to smooth out the differences between inside and outside of school teaching and learning environments. This allows for teachers and students alike to relate to their varying roles without a disruptive barrier that would force them to reject or delegitimize one or the other. Consequentially, were relationships and roles to change in the village environment it might arguably change within the school environment.

Drawing again on Thaman’s argument that education is a cultural venture, the science classroom can then be seen as an active sphere of cultural negotiation and translation; a trans-local space where various threads of non- local concepts, language and ideas are continually conveyed by teachers in ways that should make them meaningful and relevant locally. It was therefore of great significance for me when teachers described science as in many ways foreign and global in its contents, language and approach, making their job to relate it to their students challenging. The curriculum explains that the relevance and importance of science in Samoa is a matter of both national and global priorities for environmental understanding and sustainability, as well as significant for Samoa’s continued participation in the addressing of global concerns such as climate change.

“Science contributes to and influences decision-making in all aspects of today’s world. Many crucial issues and opportunities faced by society need to be approached from an informed scientific perspective as well as a social and ethical perspective” (MESC 2013: 11).

Auva'a (2003) argues that this global orientation for education will necessarily influence educational policies and aims such as those stated in the science curriculum. Based on a review of education policies and alterations, Auva'a states that "these policies are shown to reflect concern with both the maintenance of traditional Samoa culture –the *fa'aSamoa*- and the need to change to adapt to the demands of a modern global economy" (2003: V).

Concluding remarks

In this chapter I have presented some of the factors that weigh into the relationship between local environmental and scientific knowledge and perceptions. I have attempted to explain how the two ways of knowing are divided by factors that are arguably of differing cultural natures and how this affects the effective teaching and learning of science in Falealupo primary school. As explained, both MESC and the teachers are well aware of these factors and approach them according to their respective work. The teachers were on a daily basis facing the challenge of translating and negotiating between socio- physical and cultural knowledge systems in order to make what they were teaching not only understandable but relevant and meaningful for their students. As Auva'a explains, global expectations and priorities have implications for local education and in the next chapter I would like to examine this global- local relationship. I will present a variety of ideas and arguments from different scholars and activists that discuss how a global shift in perspective of what effective environmental education and sustainable knowledge systems are made up of might benefit local environments such as Falealupo village, and the effective learning of science in school.

5

Learning From Falealupo

I am the fanua (I am the land)

I am the fanua
The placenta buried in my ancestral land after childbirth
I am the pute
The umbilical cord buried and my link to my fanua

I am the fanua
The land which holds my history, my life, my death
I am the fanua
The land of my people, my ancestors, my descendants

I am the fanua
That which bonds me to the air, the earth, the sea
I am the fanua
That which binds me to the plants, the animals, the fish

I am the fanua
My mother's pain and joy in giving life
I am the fanua
Mother earth's pain and joy in giving life

I am the fanua
God's beautiful and unparalleled creation
I am the fanua
God's undying and steadfast love

I am the fanua
Wailing in despair at my self-destruction
I am the fanua
Dying of a slow suicide

I am the fanua
Expecting God's revelation
I am the fanua
Believing in God's promise

I am the fanua
You are the fanua
We are the fanua.

Faautu Talapusi, 2009

In her essay *Towards a Pacific Concept of Education* (1997: 128), Konai Helu Thaman asserts that “scholars must analyse educational ideas and practices and set them within the context of indigenous worldviews”. This has in essence been the aim for this two- year project. The focus of this thesis has been what local environmental knowledge in Falealupo entails, and how the environment out of which it grows is both a product and producer of perceptions. In light of that background I have further considered science education in the local primary school and how it relates to those who teach and learn it. In this chapter I will take what I learnt in Falealupo and consider how it might contribute to some discourses on education, sustainable development and climate change both in and outside of Samoa. As has been suggested by various scholars and activists (Ingold 2013, Wall- Kimmerer 2014, Saddington 2014), Western science has dominated the narrative on climate change, and this might be the reason why the narrative is not thoroughly connecting with people locally. Even in Falealupo, a village whose neighboring islands are seeing their islands slowly engulfed by the ocean, climate change as a phenomenon is not spoken much about. I will consider why this is, and whether ways of knowing local to a place like Falealupo might contribute to environmental end educational solutions both in Samoa and across the globe.

Reconsidering local and global environments

The slogan “Think Globally, Act Locally” has been a popular choice for climate change awareness movements, reminding us that the choices we make have implications for the rest of the world (Gough, 2002). If one takes a moment to think about these words, however, it might occur to ask oneself, is it really possible to *think globally*? Tim Ingold argues that the very terminology of “global environmental change” has a paradoxical nature (Ingold 2000: 209). An environment, he explains, is something that surrounds, and since the globe cannot actually surround us, the term global environment should refer to that which surrounds the globe- which of course it does not. He further stresses that our global conceptualization of the environment is telling of our modern perception of it; one withdrawn from the perspective of dwelling in an environment. He finds this telling of a process of separation that he recognizes in Western scientific schooling, where children go from viewing the environment as a lifeworld in which they are centered to seeing it as a globe – a view which realistically can only be achieved by an astronaut floating in space (ibid.). He writes, “We are taught that this is what the earth looks like, although none of us, with a handful of significant exceptions, has

ever seen it. By and large, life is lived in such a close proximity to the earth's surface that a global perspective is unobtainable".

Furthermore, should thinking globally be made a standard when so many of the meanings and priorities we have are derived of our local surroundings/ lifeworlds? The problem with the current science and the policies that rely on it, Ingold says, is that the relationship between knowing and being has become confused (Ingold, youtube presentation 2013). This, he suggests, is why techno- science based policies continue to come up with unsustainable solutions. "The more knowledgeable we become, the less attention we pay to what is going on around us in our environment", he says, pointing out that in a time of climate change and diminishing populations of bees, a pre-dominant focus on graphs, tables and databases might very well lead more to distraction from lived reality than to beneficial solutions.

Ingold's points resonate well with what I learnt in Falealupo, where the local way of knowing the environment is also very much the local way of life. What the people I met consider worthwhile or important environmental knowledge is for the most part inextricable from their socio- cultural lifeworlds and their everyday needs and wants. Because this is so, the 'knower' is not removed from what she knows –in this case, the environment- or seeks to know in the sense that she has a direct relationship with it; her environmental knowledge is subjectively constructed. With this as a given foundation for the nature and rationale of environmental knowledge, it makes sense that the local application of science education with a goal of integration creates a challenge. As I have tried to demonstrate, local environmental knowledge is produced through, given meaning to and reinforced by central aspects of the *fa'aSamoa* such as language and pedagogy (the social system) and by the socio- physical dwelling in their environment over time (with connections that go back to ancestral times on to their lives in the present) which gives life to knowledge naturally endowed with relational and contextual relevance. As the teachers explained to me –and gave me the opportunity to observe myself- the language, pedagogy and focus of the science curriculum had a tendency to come across to them as foreign, or simply not relevant locally in terms of how they know and live in their socio- physical environment. They did not reject the legitimacy or importance of the discipline in itself; rather they reflected on it in terms of why and how it is they teach their young what they do. Roberta Dods (2004) argues that one reason why this kind of issue between science and traditional environmental knowledge is the objective and field-independent nature of science. As Western science is often the narrator of climate change (Wall- Kimmerer 2014, Saddington 2014), this might explain why climate change is difficult

to connect with as a concept, especially for those who do not experience or do not believe they are experiencing it to a great extent.

Perceiving climate change and environment

In May 2014, I participated in a USAID funded disaster management seminar by the Coastal Community Adaptation Project (C-CAP³²) in Falealupo Uta. I was informed of it and invited along by a *matai* friend while visiting him the day before. On the day, my host sister –like many of the other women in the village- had made a pot of *sapa sui* which she sent with me³³. When I got there I got to know the seminar leaders and was invited to join them for seminars in two other nearby villages the next day. In Falealupo, the villagers that attended – approximately 40 people- listed the kinds of environmental risks that they must be prepared for and discussed how to do so, and they all agreed that the worst risks applied to those living in Falealupo Tai, by the ocean. Oddly enough, only a handful of people from Falealupo Tai had actually come, despite one of the four seminar leaders driving his van down to pick up anyone who needed a ride. I suspect that this was because those living in Falealupo Tai knew the risks well and had already chosen to stay there rather than move and therefore did not see it as necessary to attend the seminar. Curious to hear an opinion on people’s attitude towards these kinds of projects, I commented later in the evening to one of the Samoan seminar leaders that I had noticed that they had not really spent time talking about climate change. She then explained to me that one of the reasons that climate change awareness projects are difficult to engage people in is their faith in God. “When we present this, it’s like we are giving them something to believe in. For them, only God can know what is going to come; that we cannot know what will come tomorrow or later”. They usually all understood the basics of climate change, she continued, that was not the issue. “They just do not want to know about it”. She would hand people in Savai’i villages surveys, which they might fill out with good explanations for climate change but end their survey by commenting “...but it is up to God”. An additional challenge in talking climate change with people in Falealupo for

³² Information available on USP website: <http://pace.usp.ac.fj/usaid/CCAP.aspx>

³³ This made me think back on two separate conversations I had with acquaintances in Apia, who told me both jokingly yet seriously that the only way to get Samoans to come to these kinds of events is by ensuring that there will be food. Indeed there were copious amounts of food served after this seminar, and the event was initiated by a proper, traditional *kava* ceremony to honor the guests.

example, she added, was that since the cyclones in 1990 and 1991, they had not had another cyclone of such scale. She stressed that cyclones are becoming larger and occurring more frequently, but have been taking other routes, and since they do not hit Falealupo, the people there are not seeing the changes happening. Three months earlier over a cup of *koko Samoa*, Kevin and I had shared a similar conversation about climate change and the challenges of relating to it and adapting one's life to that relationship. His view was that such adaptation takes a great amount of faith, above all else. "Faith in something that one might not see or experience in one's lifetime". I remember thinking that I could not have agreed more; this was the kind of view that inspired my initial ideas for this project.

I came to Falealupo to learn what local environmental knowledge means there. What I learnt was about perceptions; perceptions of self in context with an envioning lifeworld. While people did not talk about the environment per se, they allowed me to observe and take part in their interaction in and with their environment; interactions through which children develop much of their environmental knowledge and perceptions. How they work and live in the environment in their present everyday lives they showed me in the practice of knowledge activated through social interaction and responsibilities. In conversations they told me the old stories rooted in their landscape and about their parents, grandparents and ancestors who were buried in the landscape that they work and live in. I learnt that knowledge is automatically relevant by its local nature; its makeup is for the most part that which is useful and wanted from the immediate environment and thereby instantly connected and relevant to the knower. Even if a child grows up to leave the village or even the country, the knowledge that they learnt in the village will forever connect them with their homes and identities and enable them to make worthwhile contributions to their families. Since coming back to Norway, there has been no way for me to explain environmental knowledge in Falealupo without talking about the significance of family, village, faith and heritage, which is why I came to think of the village as a 'socio- physical environment'; one made up of human and biological aspects in relation with one another. This is also how I have learnt to understand where the resilience of Samoans lies; in relationships and collectivity.

The upbringing and environmental education of children in Falealupo cultivates collectivity, as it is in itself a socialization process that earns each child a belonging and identity as part of a family and village. As I elaborated on in Chapter 3, they go through a gradual environmental education –from their family members, the environment itself and through play- that is at the same time their socialization into their family and village community. The

responsibility to know how plants and weather work is a responsibility to help the family and contribute to the village. To take care of the land one lives on is to take care of future generations and pay respect to the memory of past generations. I would further argue that it is because the purpose of local environmental knowledge in Falealupo is oriented by these relationships that it is sustainable. As I explained, environmental knowledge in the village was highly characterized by a focus on what was used and needed in everyday life, and in turn, people did not use more out of their environment than they needed. They are therefore contributing significantly little to the acceleration of climate change. In terms of facing the environmental stresses of climate change, resilience becomes an important aspect of human persistence, a solution to which Lumepa Apelu placed in the continued cultivation of family and the Samoan family's ties to land.

Preserving environmental perceptions in the face of change

On behalf of Samoa, Tikai and Kama (2010) argue that indigenous knowledge can offer effective alternatives to Western know-how and therefore must be preserved and developed, not undermined;

Conservation of Samoa's natural resources depends on human beings and their interaction with the environment which is very much related to the Indigenous knowledge that has been communicated and passed down from generation to generation through family members and communities (Tikai and Kama 2010: 65)

Well over a year after first arriving in Fiji, I met Beth Holland again at a climate change symposium hosted by the University of Bergen on the 29th of May, 2015. Among the speakers, panelists and audience on this day were representatives of various European and Pacific nations; natural and social scientists, artists and EU policy makers come to Bergen to listen and contribute to a collaborative discussion on climate change issues in the Pacific and try to work towards solutions to how the Pacific Island nations can and will deal with their environmental situations in the future. During the symposium, Professor Joeli Veitayaki presented a photograph from his home village in Fiji. The picture was of a large metallic bridge crossing over a village. There once used to be a wooden bridge crossing that river, he explained, but it had recently been replaced by the new, more solid structure. Now, while the new bridge might withstand rougher weather, he wanted to point out that without the need to

build a bridge such as the old one, the knowledge of how might be lost, and along with that much more. The knowledge of how to build a bridge out of local woods harbors resilience, and people of Pacific Island Nations are resilient, he continued, but “sometimes you can’t blame the people for loss in resilience. It comes with development”.

My host mother told me something similar over dinner one night in May. Dry season was upon us and I had noticed an attention to this shift in the commercial breaks during nighttime television news. I had seen a commercial, I believe by the water authorities, that was telling people to save the water in their water tanks so as not to run out. I asked my mother if there were people who did not know to do this (she and my sisters had reminded me to use minimal water for my baths and for washing my clothes quite a while back already). “No, they know it well, it is the usual way here. Especially in Falealupo. In the old days they used wells that they dug out, up in the forest which helped them through the dry season. But those wells are gone now. Now, if the water tanks are empty we call the Water Authorities and we pay them money to fill up the tanks again. And also we drink coconut water. But we know that we should bathe with half a bucket of water and save”. Her words, as well as those of Joeli and villagers in Falealupo (as presented in Chapter 2) remind me of countless conversations I have had with friends and fellow anthropology students about the Western perception of the relationship between nature and culture, culture and development; the question of whether modernity and development inevitably means a withdrawal from nature. With capitalistic and technological advances, do we continue to lose the reliance on nature that upholds our relationships with it? Towards the end of Baumgarner’s (1982: 114) thesis on how to better the science program in Samoa, he takes a moment (a paragraph), before continuing onwards about science to ask,

What effects will the silicon chip, the satellite, the laser have on Samoan society, or will Samoan society survive the changes better than Western societies? Will Samoans need, in the future, to give Western societies assistance in survival skills and training in interpersonal relationships?

He then goes on to share the aim of the development plan for Samoa at the time, which included the need for science education that would prepare Samoans to cope with modern life in addition to the preservation of the current Samoan culture and way of life. I interpret his question above as an expression of acknowledgement for the complexity of balancing such a relationship. People in Falealupo acknowledge it too. As one young woman explained to me

one day as we were resting in the shadow and talking about their *fales*, she and her families liked their open *fales* both for their aesthetic and climatic attributes but were planning to take a loan once they could afford it to build a European house so that their extended family in New Zealand would stay with them rather than a hotel when they visit. Accustomed to New Zealand standards, they did not like to sleep in open *fales*. She then nudged me and said that what she liked about me was that I actually appreciated sleeping in a *fale* and living as my host family lived. In essence, she was telling me how technological and economic advances have socio- cultural implications, like planting feelings of inferiority in the self- perceptions of the supposed have- nots such as herself. Ironically, an increasing number of environmentalists, natural and social scientists are putting people living like her on pedestals for their ways of life. At the same time, as climate change continues to accelerate, none would blame a Samoan for wanting a concrete house to stand against wind and waves; in fact such alterations might be called climate adaptation. Nonetheless, this girl's wavering sense of dignity in her way of life had me asking myself, what is causing it? This brings me back to environmental education in schools.

Mending the gap

In Chapter 1, I included the question of whether Western science and local environmental knowledge in Samoa might be combined without causing one to be compromised for the priority of the other. I would like to consider some different variables to this question. In Samoa as in Norway, environmental education in primary school is covered by Western science. Expanding on Ingold's arguments on the relationship between global and local understandings and the points made by teachers at Falealupo primary school; while science may be globally applicable, is it locally applicable in the sense that it connects and integrates people's local environmental perceptions? Does it prompt people to care about the environment and act accordingly? In a TEDxTeens presentation, David Saddington (2014), a young, British climate change awareness activist explains that the reason he finds it difficult to motivate people to care about climate change is that the scientific language gets in the way of communication and engagement. "By making climate change an academic and scientific concept, we have made it an abstract, remote phenomenon, far removed from everyday life". The focus needs to shift to the human side of climate change, he argues. Science is in this

perspective not subjective enough to connect with people at a personal level, a point that philosopher of science, Paul Feyerabend (2010) considers in the following,

...”is it not possible that science as we know it today, or a “search for the truth” in the style of traditional philosophy, will create a monster? Is it not possible that an objective approach that frowns upon personal connections between the entities examined will harm people, turn them into miserable, unfriendly, self- righteous mechanisms without charm or humour? “Is it not possible”, asks Kierkegaard, “that my activity as an objective [or critic- rational] observer of nature will weaken my strength as a human being?” I suspect the answer to many of these questions is affirmative, and I believe that a reform of the sciences that makes them more anarchic and more subjective (in Kierkegaard’s sense) is urgently needed.

While I did not come out of my fieldwork with a notion or fear that Samoan children –or children elsewhere- might be turned into “miserable, unfriendly, self- righteous mechanisms without charm or humor” through their scientific education, I include Feyerabend’s words to make the point that the rationality behind the objective nature of science is debated over. But is it really so that Western science must be altered to allow for local knowledge systems to be included and thrive?

Rather than focusing on science, James D. Proctor (2009) challenges the term *environmentalism*. He argues that environmentalism as it exists today suffers from a disconnection inherent in people’s understandings of nature; namely, a dualism between nature and culture evident in the thought and practice of environmentalism. “Somehow our notion of environment got wrapped up in our notion of nature, and with it came a whole host of conceptual binaries that effectively drive a wedge through any lasting resolution of environmental problems” (Proctor 2009: 294). Proctor finds that the authority placed on for example science to justify environmental concerns works to perpetuate binaries such as fact being related to nature and value to culture. He does however see room for alteration of this issue, and concludes that it is up to passionate environmentalists to work towards the conceptual inclusion of human connections with nature to guide their thought and action. While environmentalists are understandably keen to find immediate, effective responses to the urgency of climate change, he asserts, this urgency also causes them to think speedily rather than deeply, and to reject the risk of taking the time to re-think what environment really means, or should mean. The suggestion here is then a shift in perceptions of environment in

order to find sustainable solutions to the problems that will arise and increase with the escalation of climate change.

Wall- Kimmerer (2014) suggests that science should not be altered –lest it lose its integrity- but that environmental education should expand to include both science *and* local, indigenous or traditional environmental knowledge and thereby open for cooperation between the two. As McCarter and Gavin (2001) argue, while it is a challenge to introduce Traditional Environmental Knowledge³⁴ (TEK) into the structure of formal schooling without compromising its oral and social form, such a move might raise the perceived status of vernacular language and knowledge in the eyes of students. Thaman (1997) on the other hand argues that this problem can be solved by rethinking the educational structure in itself, and adjusting it to be culturally appropriate in its national or local setting. She further argues that to support vernacular knowledge can at the same time strengthen the language that holds the culturally rooted ecological knowledge of Pacific islands such as the Samoan. Thaman (1997: 126) puts it as follows;

A great irony is that while the global community is increasingly concerned with conservation of global biodiversity, our island countries are unwittingly losing our own. An example of this is the loss of traditional environmental knowledge and of the languages to describe this knowledge. This is unfortunate because Pacific (Island) cultural systems (including their languages) have evolved over thousands of years in response to this diversity.

Based on these arguments, a collective global endorsement of the wealth that lies in the Samoan language –and this applies also to other indigenous languages the world over in their respective countries (Wall-Kimmerer 2014)- might allow the Samoan government to formally educate their young in their own language to the benefit –not detriment- of Samoa’s participation in and contribution to the global economy, politics, discourses and research.

³⁴ I here use the term *traditional* environmental (alternately ecological) knowledge to adhere to the term used by the narrators

The double-hulled canoe

Wall- Kimmerer (2014) advocates for the inclusion of TEK in environmental education to the benefit of not only indigenous, but all societies. She argues that rather than trying to blend the two ways of knowing, they should be working in cooperation with one another, cultivating a relationship of knowledge- sharing between humans and between humans and nature. She stresses that TEK is a rich source of adaptive management, and argues for the value of the resilience inherent in these ways of knowing. While changes in nature occur, what we can learn from TEK is how our relationships with nature can endure and strengthen resilience. She suggests that one way to ground science and place it in relation to people locally is to give space for TEK to guide the directions of science. That way, science is connected to local wisdom, values and priorities. She like Proctor argues that we must work on our perceptions of ourselves in relation with nature in order to find sustainable solutions for adapting to the environmental changes that will come. This resonates well with what I learnt in Samoa. Local environmental knowledge in Falealupo village takes on meaning and relevance through the relationships that preserve it. I have chosen to use the term ‘socio- physical environment’ to relate how local environmental perceptions in the village encompass the human and the physical to the point where nature and culture cannot be dichotomized or disconnected. Environmental perceptions are shaped through dwelling in a sphere of physical, social, spiritual, linguistic, economic, and historical variables that influence each other as well as notions of the *fa’aSamoa*. Perception of self then comes through the process where ways of knowing become ways of life; caring for the environment is caring for one self and others. As suggested by the UN, by ECOPAS, Pacific and other scholars such as Joeli Veitayaki, Beth Holland, Edvard Hviding, and Wall- Kimmerer, an expansion of environmental and climate change discourse to include the human side of both from local perspectives, can alongside science benefit not only Samoan and Pacific islanders but educational programs, climate change initiatives and policy decisions on a global scale. As for local, national and regional decisions on the matter, Fe’iloakitau Kaho Tevi asserted at the climate change symposium in Bergen in 2015, that solutions for sustainable futures in Oceania must be made by Pacific Islanders in order to work for the Pacific Islands, and recognition and support of this notion is what the Pacific Islands needs from Europe.

While the global responsibility for our planet is of increasing importance, I would argue that values such as collective responsibility, community, care for others and resilience is

something that we learn locally, and in Falealupo these values extend to the natural environment as well. While climate change is not a familiar concept to many Falealupo families, the central concepts of environmental change, adaptation and responsibility are.

While the global responsibility for our planet is of increasing importance, I would argue that values such as collective responsibility, community, resilience and care for others is something that we learn locally. In Falealupo these values extend to the natural environment, and as Lumepa Apelu expressed in the introduction to this thesis, this is a relationship particularly Samoan. Might it therefore be that both local and global environmental initiatives and science might benefit not first from global, field- independent thinking but by looking to local, traditional and indigenous environments and knowledge systems such as those local to Falealupo to learn how thinking locally can benefit and educate the world? By seeing education, knowledge and environment as culturally defined aspects of a community and society, I returned from Falealupo feeling confident that with further communication between these connected cultures, solutions can be found. Quoting Professor Vilsoni Hereniko, the writer and producer of the Pacific climate change performance *Moana: The Rising of The Sea*, “Maybe, like the double- hulled canoe, western science and indigenous knowledge can safely navigate us out of these dangerous waters”.

Bibliography

Apelu, Lumepa

2014, (n.d), *We Do Belong Here*. Opinion pages, the Samoa Observer, Apia, Samoa.

Anae, Misatauveve Melani

2014, *Samoaans - Culture and identity*, Te Ara - the Encyclopedia of New Zealand, updated 9-Dec-14. Accessed electronically on February 13th through

<http://www.TeAra.govt.nz/en/samoans/page-3>

Auva'a, Tololima Leifi

2003, *Continuity and change: Education policy and historiography of education in Western Samoa*. MA, James Cook University

Baumgarner, Kenneth E.

1982, *A Case Study of the Development of Science Education in Western Samoa with Specific Reference to the Development of the Western Samoa Science Programme, Forms 1 & 2*. MA project, Macquarie University, School of Education. Australia.

Clark, W.R.

1967, *Western Samoa: Teacher Training- Elementary Science*. Serial No. 245/BMS.RD/EDS Paris: UNESCO

Clarke, William C.

1994, *Land Use and Agriculture in the Pacific Islands*. In *Science of Pacific Island Peoples: Land Use and Agriculture*. Institute of Pacific Studies, the University of the South Pacific. Suva, Fiji.

Cluny and La'avasa Macpherson

1990, *Samoa Medical Belief & Practice*. Universty of hawai'i Press. Honolulu, Hawai'i. North America.

Crawley, Tagaloa Bismarck

2001, *Climate Change and Samoa- Sustainable Development*. In *Samoa Environment Forum*. Ministry of Natural Resources & Environment.

Crawley, Tagaloa Bismarck

2003, *Climate change and Samoa - sustainable development*. Samoa Ministry of Natural Resources and Environment. Accessed electronically on May 20th 2015.

<http://www1.mnre.gov.ws/documents/forum/2003/5.%20bismarck.pdf>

Dods, Roberta Robin

2004, *Knowing Ways/Ways of Knowing: Reconciling Science and Tradition*, in *World Archaeology*, Vol. 36, No. 4, Debates in World Archaeology, pp. 547-557. Taylor & Francis, Ltd.

Duranti, Alessandro

2003, *Indexical Speech Across Samoan Communities in The Anthropology of Space and Place: Locating Culture*. Edited by Setha M. Low and Denise Lawrence- Zuniga. Blackwell Publishing, Ltd.

ECOPAS

2013, *Restoring the Human to Climate Change in Oceania; Suva 6-9 December 2013*. Accessed electronically on July 31st 2015 through

<http://www.google.no/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CB4QFjAAahUKEwjt2LSU8ojHAhVE1ywKHbCzDwY&url=http%3A%2F%2Fwww.ecopas.info%2Fwp-content%2Fuploads%2F2013%2F09%2FSuvaConferencePoster1.pdf&ei=q0K9Va3XHcSuswGw574w&usg=AFQjCNEH0OHigSgH3uskBVcb2ZOZBqFqXA&bvm=bv.99261572,d.bGg>

Fairbairn-Dunlop, Peggy

2000, *Changing Perceptions of Land: Samoa*. Samoan Environment Forum: Proceedings of the 2000 National Environment Forum, 2001: No.2. Ministry of Natural Resources and Environment. Apia, Samoa. Accessed electronically on January 10th 2015 through: <http://www1.mnre.gov.ws/forum/2000/index.htm>

Feyerabend, Paul

2010, *Against Method*. First published by New Left Books 1975. This edition published by Verso. London, UK.

Grattan, F. J. H.

1948. *An introduction to Samoan Custom*. Apia, Western Samoa: Samoa Printing & Publishing Co. Ltd.

Gough, Noel

2002, *Thinking/ Acting Locally/ Globally: Western Science and Environmental Education in a Global Knowledge Economy*. *International Journal of Science Education* (Special Edition: Environmental Education and Science Education), 24 (11), pp. 1217-1237

Hereniko, Vilsoni

1992, *Interview with Konai Helu Thaman*. *Mana: A South Pacific Journal of Language and Literature*. 9:2.

Hite, Steven J.; Randall, E. Vance; and Tavana, Gaugau Va'afuti,

1997, *Cultural Values and Education in Western Samoa: Tensions Between Colonial Roots and influences and Contemporary Indigenous Needs*. All Faculty Publications. Paper 1142.

Hviding, Edvard

1996, *Guardians of Marovo Lagoon: Practice, Place, and Politics in Maritime Melanesia*. Pacific Islands Monograph Series 14. Center for Pacific Islands Studies, University of Hawai'i Press, Honolulu.

Hviding, Edvard

2003, *Between Knowledges: Pacific Studies and Academic Disciplines*. *The Contemporary Pacific*, Volume 15, Number 1, Spring 2003, 43– 73 © 2003 by University of Hawai'i Press.

Hviding, Edvard

2012, *Sciences in the Plural: The UNESCO Environmental Encyclopedia of Marovo Lagoon, Solomon Islands*. In *The Journal of Pacific Studies*, Volume 32.

Iaccarino, Maurizio

2003, *Science and culture*. In *Science and Society: EMBO Reports*, 2003 Mar; 4(3): 220-223. Accessed electronically on April 17th 2015 through <http://embor.embopress.org/content/4/3/220>. Accessed on 07.19.2015.

Ingold, Tim

2000, *The Perception of the Environment: Essays on livelihood, dwelling and skill*. Routledge, London.

Ingold, Tim

2013, *Thinking Through Making*. Recorded presentation at University of Aberdeen, Scotland. Youtube. Accessed electronically on February 27th 2015 through <https://www.youtube.com/watch?v=Ygne72-4zyo>

Jegade, O.J and Glen S. Aikenhead

1999, *Transcending Cultural Borders: Implications for Science Teaching*. In *Journal for Science & Technology Education*, 1999, vol. 17, no. 1, pp. 45-66. Centre for Research in Distance and Adult Learning, The Open University of Hong Kong.

Keesing, Felix M.

1934, *Modern Samoa*. New York: AMS Press, Inc.

Keesing, Felix M. and M. M. Keesing

1956, *Elite Communication in Samoa: A Study of Leadership*. New York: Octagon Books.

Kennedy, T. F.

1966, *Some Impressions from a First Inspection Tour to the Pacific*. *Pacific Islands Education* 43, 8-13.

Lefale, Penehuro Fatu

2010, *Ua'afa le Aso, Stormy Weather Today: Traditional Ecological Knowledge of Weather and Climate. The Samoan Experience*. In *Climatic Change*, Volume 100, Issue 2, 317- 335.

Lichtenberg, Samantha

2011, *Experiencing Samoa Through Stories: Myths and Legends of a People and Place*. Independent Study Project (ISP) Collection. Paper 1057.

Lyotard, J.-F.

1987, *The postmodern condition. In After Philosophy: End or Transformation?* (eds K. Baynes, J. Bohman and T. McCarthy). Cambridge, MA: MIT Press, pp. 73-94.

Ma'ia'i, Fana'afi

1957, Education in New Zealand's Pacific Dependencies. *Oversea Education* 29, 2, 54-59.

Mazzocchi, Fulvio

2006, *Western Science and Traditional Knowledge*. Volume: 7, Issue: 5, Pages: 463-466, EMBO Reports (European Molecular Biology Organization).

McCarter, Joe, Gavin, Michael C

2012, *Perceptions of the value of Traditional Ecological Knowledge to Formal School Curricula: Opportunities and Challenges from Malekula Island, Vanuatu*. Volume: 7, Issue: 1, *Journal of ethnobiology and ethnomedicine*.

Mead, Margareth

1928, *Coming of Age in Samoa*. Harmondsworth Middlesex, England: Penguin Books.

Merriam-Webster.com

Culture. <http://www.merriam-webster.com/dictionary/culture>

MESC (Ministry of Education, Sports and Culture)

2013, *Science, Years 1-8, Primary School Curriculum*. Ministry of Education, Sports and Culture, Curriculum Materials and Assessment Division. Apia, Samoa.

Nakashima, D., Prott, L. and Bridgewater, P.

2000, *Tapping Into the World's Wisdom*. UNESCO Sources, 125, July- August, p. 12

Nakashima, D.J., Galloway McLean, K., Thulstrup, H.D., Ramos Castillo, A. and Rubis, J.T.

2012. *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*. Paris, UNESCO, and Darwin, UNU, 120 pp.

Ngan-Woo, F.

1985, *Fa'aSamoa – the world of Samoans*. Auckland: Office of the Race Relations Conciliator.

Proctor, D. James

2009, *Environment After Nature: Time for a New Vision*. In *Envisioning Nature, Science, and Religion*, 293- 311. West Conshohocken, PA: Templeton Foundation Press

Saddington, David

2014, *Why I don't Care about Climate Change*. TED Talks/ TEDxTeens. Independently Organized TED event. Youtube. Accessed electronically through: <https://www.youtube.com/watch?v=7vnzKPq390Q>

Schoeffel, Penny

May 6th 2013, *Do We have too many schools in Samoa?*. Samoa Observer: Education. Accessed electronically on November 3rd 2014 through <http://www.samoobserver.ws/education/4737-education-do-we-have-too-many-schools-in-samoa>.

Seacology.org

1993, *Falealupo, Savai'i island, Samoa. Falealupo Rainforest School and Reserve*. Accessed electronically on October 7th 2014 through <http://www.seacology.org/project/238-samoa/#>

Talapusi, Faautu

2009, *I am the Fanua*. Accessed electronically on July 15th 2015 through <http://www.oikoumene.org/en/what-we-do/climate-change/time-for-creation/2009-prayers-from-the-pacific>:

Tavana, Namulauulu G.V.

2001, *Traditional knowledge is the key to sustainable development in Samoa: examples of ecological, botanical and taxonomical knowledge*. Samoa Ministry of Natural Resources and Environment.

Thaman, Konai Helu

1997, *Reclaiming a Place: Towards a Pacific Concept of Education for Cultural Development*. In *The Journal of the Polynesian Society*, Vol. 106, No. 2, pp. 119-130. Published by The Polynesian Society.

Thaman, Konai Helu

2000, *Interfacing Global and Indigenous Knowledge for Improved Learning*. In: *Interfacing Global and Indigenous Knowledge*. Accessed electronically on November

10th 2013 through

http://unesco.org/education/aceib/conference/panel/_2/thaman.doc

Thaman, Konai Helu

2003, *Decolonizing Pacific Studies: Indigenous Perspectives, Knowledge, and Wisdom in Higher Education*. The Contemporary Pacific, Volume 15, Number 1, Spring 2003, 1-17. University of Hawaii Press.

Thaman, Konai Helu

2008, *Nurturing Relationships and Honouring Responsibilities: A Pacific Perspective*. International Review of Education, Vol. 54, No. 3 /4, Living Together: Education and Intercultural Dialogue, Springer.

Thaman, Konai Helu

2013, *Short speech and poetry reading*. Youtube: Talanoa Admin. Accessed electronically on July 20th 2015 through www.youtube.com/watch?v=AcEVdeKbIXw

Tikai, P and Kama A.

2010, *A Study of Indigenous Knowledge and its Role to Sustainable Agriculture in Samoa*. In Ozean Journal of Social Sciences, Vol. 3, No.1.

Toren, Christina

1999, *Why Children Should Be Central to Anthropological Research*. Etnofoor, Vol. 12, No. 1, Kids & Culture, pp. 27- 38. Stichting Etnofoor.

Turner, George

1884, *Samoa a Hundred Years Ago and Long Before, Together with Notes on the Cults and Customs of Twenty-three Other Islands in the Pacific*. Macmillan, London, UK.

UNESCO

2015, *Education for All 2015 National Review Report: Samoa*. Accessed electronically on June 5th 2015 through

<http://www.google.no/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CB0QFjAA&url=http%3A%2F%2Funesdoc.unesco.org%2Fimages%2F0022%2F002298%2F229876E.pdf&ei=RziDVf37NOT6ygPSoJ6oDw&usg=AFQjCNHR0NRVsnz8xiky47SKLmDmTEQMRA&bvm=bv.96042044,d.bGQ>

Varghese, Doris

2010, *Science Teachers' Practices and the Use of Resource Materials in Teaching Science in Year Eight Classes in Samoa*. University of Canterbury. Educational Studies and Human Development. Master of Teaching and Learning.

Wall- Kimmerer, Robin

2014, *Climate Change & Indigenous Knowledge*. CAI Speaker Series, Centre for Aboriginal Initiatives. University of Toronto. Accessed electronically on July 11th through <http://aboriginalstudies.utoronto.ca/news/watch-robin-wall-kimmerers-talk-on-climate-change-indigenous-knowledge/>

Wendt, Albert

1976, *Towards a New Oceania*, MANA Review: A South Pacific Journal of Language and Literature. 1:1, 49- 60.

Western Samoa Department of Education,

1970, *Preliminary Information- Science for Form 1 and Form 2*. Documents distributed to schools in Western Samoa.