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Trends and challenges for sustainable marine resource management for rural Solomon Islanders

A thesis

submitted in fulfilment

of the requirements for the degree

of

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at

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by

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ABSTRACT

Much has been claimed about the positive benefits of the customary marine tenure (CMT) system in the South Pacific and its implications for resource management. In Solomon Islands the premise of effective community-based resource management (CBRM) as a contemporary management tool, rests to a great degree on CMT, but does CMT still provide a sufficiently strong foundation to support this premise?

This research examines the social and environmental characteristics of two rural Solomon Islands coastal communities that have a long history in customary marine tenure; one with a strong chiefly system and the other one with a weaker chiefly system. The research gains insight into and an understanding of the experiences and lives of the villagers, given current debates on the need to address and move forward with the concept of CBRM with regards to the sustainability issues that they are currently confronting.

Using primarily qualitative methodologies the study focused on how marine resources are perceived and valued by different members of the community. The findings suggest that in communities where a common agreement on CMT no longer exists there is a significant challenge to stakeholders in attaining the goal of sustainably managed coastal marine resources through community based approaches. This challenge needs to be accounted for on a case by case basis as part of CBRM facilitation processes.

While this research may true for much of Solomon Islands, the case studies have revealed that although the villages are made up of families who are closely related they are not unified as a whole. Study findings suggest that the people retain a lingering vision of a small, integrated community but have failed to grasp how their differences as a community have affected their resource management outcomes.

The present day communities are affected by many outside factors that did not exist when traditional management systems were evolving. These factors bring management challenges for which traditional arrangements were not designed to cope and thus many have severely destabilising effects on the performance of traditional systems.

DEDICATION

*This thesis is dedicated to the people
who have influenced my life and provided me with the most wonderful childhood
and raised me with a great sense of self- belief;*

My late grandfather and late grandmother

Alec Tozaka

and

Dalcy Tozaka

my father

Dick Bennett

and

my mother

Wryne Tozaka Bennett

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CONTENTS

ABSTRACT	iii
DEDICATION	v
ACKNOWLEDGEMENTS	vii
CONTENTS	ix
LIST OF FIGURES	xvi
LIST OF TABLES	xviii
ACRONYMS	xx
GLOSSARY (Non-English words used in this thesis)	xxii
FOREIGN EXCHANGE RATES	xxiv
CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Purpose and research questions	2
1.3 Researcher's interest	4
1.4 Thesis summary	6
1.5 Outline of the thesis	9
CHAPTER 2: LITERATURE REVIEW	11
2.1 Introduction	11
2.2 Debates surrounding sustainable development	11
2.2.1 Global fisheries	13
2.2.2 Challenges in marine conservation	15
2.2.3 Small Island Developing States (SIDS) and their big Issues	17
2.3 Coastal marine development issues for SIDS	21
2.3.1 Seafood consumption and population growth	21
2.3.2 Development plans and resource use	23
2.3.3 Markets and open access resources	24
2.3.4 Cost of transport and communications	26
2.4 Development challenges of the small island states of the South Pacific...	27
2.5 Ever-changing paradigms in resource management	30
2.6 Traditional marine resource management in the South Pacific	32
2.6.1 Customary marine tenure system	33
2.6.2 Traditional ecological knowledge	34
2.6.3 A revival of traditional marine management	35
2.7 Traditional authority practices in the South Pacific/ Melanesia	36
2.7.1 Closer look at CBRM and the communities	38

2.7.2	The impacts of modernity on CMT	39
2.7.3	Community cohesion	39
2.7.4	Conservation ethic	40
2.8	Community participation and development	41
2.8.1	Conservation easement	43
2.8.2	Natural resource management and common property	44
2.8.3	Roles in co-management with the Government	46
2.8.4	Fishers to lead	47
2.8.5	Women and fishing	50
2.8.6	The socio cultural environments and their shifts	51
2.9	Summary	52
CHAPTER 3: STUDY SETTING		55
3.1	Introduction	55
3.2	The Solomon Islands	55
3.3	Economy	57
3.4	Wantok and kastom	59
3.5	Land tenure	60
3.6	Western Province	61
3.6.1	Location and topography	61
3.6.2	Culture and language	62
3.6.3	Environment	64
3.6.4	Government and institutions	66
3.6.5	Climate and natural disasters	67
3.6.6	Population	69
3.6.7	Education and health services	70
3.6.8	Fisheries	71
3.6.9	Revenue generation	72
3.6.10	Service delivery	73
3.7	The case study village settings	73
3.8	Toumoa village	74
3.8.1	Topographic, geography and natural resource endowments	74
3.8.2	Social and subsistence culture	77
3.8.3	Village authority and management	78
3.8.4	Resource management	80
3.9	Liangai village	81
3.9.1	Topographic, geography and natural resource endowments	81
3.9.2	Social and subsistence culture	83

3.9.3	Village authority and management	84
3.9.4	Resource management	85
3.10	Summary	86
CHAPTER 4: THE MARINE RESOURCES AND MANAGEMENT IN SOLOMON ISLANDS		89
4.1	Introduction.....	89
4.2	The mystery of the unknown realm	89
4.3	Background	90
4.4	Inshore resources.....	91
4.4.1	Inshore commercial marine species.....	92
4.5	Offshore resources	95
4.6	Type of fisheries in Solomon Islands	96
4.6.1	Subsistence fisheries.....	97
4.6.2	Small-scale (artisanal) commercial fisheries	98
4.7	Importance of marine resources	99
4.8	Commercial development of communal resources in the Western Province.....	100
4.9	Customary marine management systems.....	102
4.10	Ministry of Fisheries and Marine Resources.....	104
4.11	International obligations and responsibilities	107
4.12	Levels of governance in marine resource management	108
4.13	Adaptive management	111
4.14	Solomon Islands Locally Managed Marine Areas Network (SILMMA)	112
4.15	Threats to marine resources	114
4.16	New emphasis of rural development by the Government	115
4.17	Summary	116
CHAPTER 5: METHODS AND METHODOLOGY.....		119
5.1	Introduction.....	119
5.2	Research questions.....	119
5.3	Desktop research	120
5.4	Field-based research.....	121
5.5	Site description and selection	122
5.6	Research ethics and ethical considerations	122
5.7	Positionality and reflexivity.....	125
5.8	Qualitative research.....	127
5.9	Constructivist interpretive paradigm.....	128

5.10	Community based participatory research	129
5.10.1	Community and the use of its knowledge.....	131
5.11	Sampling strategies.....	131
5.12	Triangulation strategy.....	133
5.13	Methods of data collection and interpretation	134
5.13.1	Census Survey	134
5.13.2	Focus group discussions	135
5.13.3	Semi-structured Interview	136
5.13.4	Participant observation	137
5.13.5	Informal narrative interactive story telling – “Stori nomoa”	138
5.13.6	Informal dialogue with Government and NGO representatives ...	138
5.13.7	Follow-up trip.....	139
5.14	Data analysis	139
5.15	Types of data in social science research	141
5.16	Research constraints.....	142
5.17	Summary.....	144
CHAPTER 6: FINDINGS FOR TOUMOYA VILLAGE		145
6.1	Introduction.....	145
6.2	Background	145
6.3	Values and attitudes of villagers towards management practices	149
6.3.1	Traditional values attached to resources.....	149
6.3.2	Attitudes towards resource management.....	151
6.4	Constraints to existing marine resource management practices	153
6.4.1	Population increase	154
6.4.2	New fishing techniques.....	155
6.4.3	The demand for fish (protein) and cash	158
6.4.4	Nonexistence of support from Ministry of Fisheries and Marine Resources.....	160
6.5	Current trends and challenges that have impacted the management practices	162
6.5.1	Unsustainable harvesting of resources	162
6.5.2	The market in Bougainville.....	163
6.5.3	Disregard for, and questions about, leadership.....	166
6.5.4	Competitive participation in harvesting of marine resources	168
6.5.5	Climate change and natural disasters.....	169
6.6	Factors that will facilitate effective marine resource management.....	172

6.6.1	Social conditions that will influence better management of resources.....	172
6.6.2	Environmental conditions that influence better management of resources.....	173
6.6.3	Cooperation.....	175
6.7	Summary.....	177
CHAPTER 7: FINDINGS FOR LIANGAI VILLAGE.....		179
7.1	Introduction.....	179
7.2	Background.....	179
7.3	Values and attitudes of villagers towards management practices	181
7.3.1	Traditional values attached to resources	181
7.3.2	Attitudes towards resources management	183
7.4	Constraints to existing marine resource management practice	185
7.4.1	Cash economy.....	185
7.4.2	New fishing techniques.....	186
7.4.3	Notions of traditional governance and management practices....	187
7.4.4	Lack of enforcement of Fisheries Act.....	189
7.5	Current trends and challenges that have impacted management practices	192
7.5.1	New settlements – (people build new homes on different locations)	192
7.5.2	Right to use fishing grounds	193
7.5.3	Traditional boundaries and ownership of resources	194
7.5.4	Inclusive participation in the harvesting of marine resources	196
7.5.5	Influences caused by human activities.....	198
7.5.6	Natural disasters.....	200
7.6	Factors that will facilitate effective marine resource management	201
7.6.1	Social conditions that will influence better management of resources.....	201
7.6.2	Environmental conditions that influence better management of resources.....	203
7.6.3	Empowerment	204
7.7	Summary.....	206
CHAPTER 8: DISCUSSION		209
8.1	Introduction.....	209
8.2	Breakdown of tradition and the authority of villager leaders	209
8.2.1	Decline in traditional roles and values.....	209

8.2.2	Modern and traditional attributes.....	212
8.2.3	Big men, larikens and wantoks	214
8.2.4	Reputation and status.....	216
8.2.5	Modern democratic institutions	218
8.3	Marine tenure, perceptions of threats, access and the management of reefs	220
8.4	Market linkages and inshore marine livelihoods.....	225
8.5	National challenges and Government support for village-based management.....	226
8.6	Population growth and its implications	231
8.7	Resources and development	234
8.8	Modern and improvised fishing gear and techniques	238
8.9	Community cohesion - social and environmental surroundings.....	241
8.10	Summary.....	245
CHAPTER 9: CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS		247
9.1	Introduction.....	247
9.2	Overview of the study	247
9.3	A summary of key findings.....	248
9.3.1	Values and attitudes of villagers in their resources	249
9.3.2	Constraints on management decisions and responsibilities: village level	250
9.3.3	Current trends and challenges in community based management	252
9.3.4	Social and environmental circumstances	254
9.4	Recommendations.....	257
9.5	Suggestions for future research	259
9.6	Summary	260
REFERENCES		263
APPENDICES.....		297
Appendix A – Ethics Approval		297
Appendix B – Information sheet		298
Appendix C – Introductory letter to the village chief.....		300
Appendix D – Census Survey Schedule.....		301
Appendix E – Focus Group Discussion		303
Appendix F – Semi-Structured-Interview		305
Appendix G – Participant Observation		308

LIST OF FIGURES

Figure 1. Map of the Solomon Islands showing the nine Provinces.....	56
Figure 2. Map of Western Province.....	62
Figure 3. Map showing the two provincial wards of Shortland Islands.....	75
Figure 4. Map showing Fauro Island and the location of Toumoa Village.....	76
Figure 5. The traditional community structure in Toumoa.....	79
Figure 6. Map of Liangai village and the Dovele district.....	82
Figure 7. The distribution of fish and other marine species along a profile of a tropical island.....	92
Figure 8. Export of beche-de-mer in the last 10 years.....	94
Figure 9. Export of trochus in the last 10 years.....	94
Figure 10. Catch trend and annual catch by species for the 3 main tuna species (skipjack, yellowfin and bigeye tuna) in Solomon Islands EEZ for 2000 – 2009 .	96
Figure 11. Ministry of Fisheries and Marine Resources.....	105
Figure 12. Relations of the levels of governance in marine resource management in Solomon Islands.....	109
Figure 13. The adaptive management cycle.....	112
Figure 14. Toumoa fishing ground.....	149
Figure 15. Tabu reef, Rosae.....	153
Figure 16. Outrigger and Outboard motor engine canoes used by villagers for fishing.....	157
Figure 17. Fishers display their catches using the different fishing techniques A: Outboard motor trolling fishing, B: Spear gun fishing, C: Hook, lure and line fishing and D: Reef gleaning and spear-gun fishing.....	159
Figure 18. The wharf at Kagu, in Bougainville, Toumoa fishers board the vehicle on their way to the market in Buin Town.....	164
Figure 19. Evidence of sea level change and erosion.....	170
Figure 20. Evidence of sea-level rise as the stumps of Coconut palms were seen under the sea.....	171
Figure 21. Wooden dugout canoes are used for a lot of purposes in the village; particularly for fishing; children’s means of transport to school and villagers going to the garden or visiting family members.....	181
Figure 22. Prohibited mesh nets sizes.....	239
Figure 23. Copra is one of the other sources of income, apart from selling commercial marine invertebrates.....	240

Figure 24. Villagers collect trochus from *tabu* reef specifically for targeted community celebrations or fundraising..... 243

LIST OF TABLES

Table 1. SIDS constraints on achieving Sustainable developments	20
Table 2. Languages by district in Western Province.....	63
Table 3. Tourist attractions in Western Province	65
Table 4. The nine national constituencies of Western Province	66
Table 5. Number of wards in each Island.....	67
Table 6. Summary of disaster events in Western Province	68
Table 7. Population of Western Province 2009	69
Table 8. Western Province population by ward	70
Table 9. Market product by households	72
Table 10. Recurrent grants by type	73
Table 11. Distance of each village from urban centres and from each other	74
Table 12. The nine tribes of Liangai	85
Table 13. The reefs (refer to Figure 6) and the owners	86
Table 14. Solomon Islands fisheries overview	91
Table 15. Brief detail of the field work	121
Table 16. Interviewee characteristics	136
Table 17. Age distribution by gender of Toumoa household members from 38 households	146
Table 18. Education status of household members, by gender, Toumoa community.....	146
Table 19. Age distribution by gender of Liangai household members from 33 households	179
Table 20. Education status of household members, by gender, Liangai community	180
Table 21. A brief description of issues captured from the study that contribute to the constraints on marine resource management	224
Table 22. Trends and challenges with regards to resources and community in the villages	232
Table 23. Internal community disagreements, disputes and conflicts	251

ACRONYMS

ADB	Asian Development Bank
CBAM	Community Based Adaptive Management
CBMP	Community-Based Management Plan
CBPR	Community Based Participatory Research
CBRM	Community Based Resource Management
CI	Conservation International
CT	Coral Triangle
CTI	Coral triangle Initiative
CMT	Customary Marine Tenure
DWFN	Distant Water Fishing Nations
EEZ	Exclusive Economic Zones
FAO	Food Agriculture Organisation
FFA	Foreign Fisheries Agency
IK	Indigenous Local Knowledge
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MFMR	Ministry of Fisheries and Marine Resources
MPA	Marine Protected Area
NDS	National Development Strategy
NFD	National Fisheries Development
NGO	Non Government Organisation
NSDSs	National Sustainable Development Strategies
PIFS	Pacific Islands Forum Secretariat
PNG	Papua New Guinea
SDA	Seventh Day Adventist
SIDS	Small Island Developing States
SIDT	Solomon Islands Development Trust
SILMMA	Solomon Islands Locally Managed Marine Area Network
SPC	South Pacific Commission
SPREP	The Secretariat of the Pacific Regional Environmental Programme
STL	Soltai Fishing and Processing Ltd
TEK	Traditional Ecological knowledge
TNC	The Nature Conservancy
UNCED	United Nations Convention on the Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
USP	University of South Pacific
WWF	The World Wide Fund for Nature

GLOSSARY (Non-English words used in this thesis)

Pidgin	The lingua franca used by Solomon Islanders to communicate with people who speak different languages
Kastom	Used to refer to traditional culture, art and magic
Tabu	Sacred, forbidden
Stori nomoa	Informal unstructured conversation
Wantok	A person who “One Talk” same language and used often to refer to clan and family member.

Shortland words

Lala’aha	Chief
Lala’aha tegesena	Paramount Chief
Tionsolo and Batahasolo	Elders

Vella la Vella words

Lekasa	Chief
Toutou	Tribe

FOREIGN EXCHANGE RATES

The Table below represents the currency exchange rate for the Solomon Islands dollar. To convert Solomon Islands dollar into a foreign currency, one must multiply the Solomon Islands currency by the buy rate. To convert foreign currency into Solomon islander dollars, one must divide the value of the foreign currency by the sell rate.

Foreign exchange rates 2010

Currency	Buy	Sell
GBP	0.0846	0.0828
PNK	0.278	0.2875
NZD	0.165	0.1632
AUD	0.1309	0.1291
EUR	0.1056	0.1038
JPY	10.716	10.536
USD	0.1368	0.135

Source: Foreign Exchange rate, The Central Bank of Solomon Islands

CHAPTER 1: INTRODUCTION

1.1 *Introduction*

The desire to conserve the natural environment is increasingly coming to the forefront in current public, political and scientific discourses. While it is generally recognised that the conservation agenda is of the utmost importance and urgency, the mechanisms of how best to manage environments and the resources in a sustainable manner are still the topic of much debate.

For many rural villagers, the increasing demand for reef resources for livelihood options have put them into a difficult situation as they try to address the need to manage their inshore marine resources appropriately with the growing demands made on them. In the Solomon Islands, the customary marine tenure system have survived better than in some other neighbouring small Pacific island countries as such it's not subjected to open access fisheries (Aswani 2005). Nevertheless, in surveys of areas affected by the 2007 tsunami in the Western Province (Schwarz *et al.* 2007), the following concerns were expressed; (i) stocks of commercially important invertebrates are low; (ii) traditional tabu (fishery control) systems have declined or disappeared in some places, and (iii) there is a poor understanding of fisheries/resource management issues or of national regulations.

In recent years there has been a shift in the conservation pattern, away from an exclusionary protectionist model towards a more people-centred ideal that focuses on the importance of considering the local people when formulating management strategies for the environment. Therefore while it was once deemed best to lock dwindling natural areas away from all human exploitation, it is now progressively acknowledged that equitable consideration must be given to local people who rely upon the natural resources, and that these people can play a valuable role in the sustainable management of their natural resources. However, sustainable reef management needs to be encouraged by all stakeholders including the national and provincial governments with a view not only towards preserving the environment but equally importantly with an approach to reef activities as being economically sustainable to help local people to raise their living standards.

The social stability of Solomon Islands is dependent on the security and wellbeing of the rural sector, which comprises more than 85 per cent of the population and is heavily dependent on subsistence agriculture and fishing for sustenance. Subsistence fisheries are dominated by small-scale fisheries (SSF) in coastal waters. In many small developing nations small scale fisheries or sometimes known as artisanal fisheries has contributed a lot in terms of providing job opportunities, food security and alternative livelihoods. However, regardless of its importance to the poor peoples' lives the questions surrounding its sustainability is still remain unclear. SSF in Solomon Islands are under threat as human populations grow and an increasing need or desire for cash drives the commercial harvest of marine commodities. Fishing of near shore resources is regarded by some as one of the most promising sectors for development (Veitayaki 1995), yet coral reef fish resources have proved vulnerable to overfishing, leading to depletion of stocks once harvested commercially (Bell *et al.* 2006; FAO 2010; Gillett 2005; Sadovy 2005). The strong reliance on inshore fish resources to meet subsistence needs, combined with a paucity of cash income-generating opportunities, means their loss would have severe consequences. The transition from subsistence to the cash economy exposes people to global market forces. For example, strong increases in global food prices in the near future forecast by the International Food Policy Research Institute (Von Braun 2007) are becoming a reality (Asian Development Bank 2008; FAO 2008; Godfray *et al.* 2010), and the impacts of this will be most severe on the poor, particularly those unable to revert to a subsistence lifestyle. In addition, the likely effects of changes in climatic conditions (sea level rise, intensity of cyclones) are also a threat, although the exact nature of these events is not clear (IPCC 2007).

1.2 Purpose and research questions

Solomon Islands, like many of the South Pacific island nations, has a long history of customary marine tenure systems in which local people have rights of use and responsibilities of care over reef areas adjacent to their land. While the last two decades have seen much erosion of these traditional systems, through the pervasive influences of colonisation, western based development and modernisation, Solomon Islands is now keen to build more capacity into the coastal communities' abilities to sustainably manage their marine resources and coastal surroundings. As the success of community-based management ultimately rests upon the willingness and ability of local people to perform their

role, and on what mechanisms the government has in place to help them in achieving their goals, it is imperative to have a detailed understanding of local communities in order to formulate sound management guiding principles in relation to people's daily livelihoods. By conducting a detailed case study of two communities in the Western Province in Solomon Islands this research aims to enable in-depth analysis of the challenges, threats and vulnerabilities facing sustainable management of marine resources.

A clear understanding of the social and environmental mechanisms that influence a community's willingness to participate in conservation and ability to engage in marine resource management is crucial to the effective implementation of community-based management. By providing an account of the views, aspirations, opportunities and capabilities of the local communities in relation to community based marine resource management this research seeks to uncover some of the realities of community involvement in day to day activities in the near-shore reef system. A thorough analysis of social and environmental influences on communities' interactions with the environment will allow discussion of not only the opportunities and potential of such systems but also the limitations and difficulties involved in marine resource management.

The following research questions guided this study:

1. What are the values and attitudes of rural Solomon Islanders in managing their marine resource?
2. What are the constraints rural Solomon Islanders communities face in establishing sustainable marine resource management?
3. What are the trends and challenges the communities in Solomon Islands are facing in managing their marine resources?
4. What are the social and environmental conditions that will facilitate effective sustainable marine resource management in rural Solomon Island communities?

The study sought to gain insight into, and an understanding of, the experiences and lives of the villagers who owned the reefs in rural villages in the Solomon Islands, Melanesian context, given current debates on the need to address and move forward with the concept of community based resource management (CBRM).

1.3 Researcher's interest

My interest in this study is associated with the number of years I worked as a marine biologist in the Solomon Islands and other small countries in the South Pacific, in particular Fiji, Tonga, Kiribati, Vanuatu and Papua New Guinea, carrying out biological monitoring within inshore fisheries resources and listening to fishers complaining about the declining fish stocks in their respective communities. During those years I relished working on community based projects that aimed to empower resource owning communities to manage their marine resources. I came to comprehend that most of the efforts to manage marine resources have focussed largely on the marine resources themselves. The Fisheries Officers and the environmental NGOs field staff that I've encountered working in the Melanesian Island countries in the South Pacific often considered the main obstacle to effective action to be the ignorance of resource managers, and so they paid little attention to the issues affecting the people concerned. This study therefore, intends to cover some of the realities of villagers' insights in their struggle to come to terms with the dynamics of managing their reef resources.

Based on my experiences and involvement in the above areas, I became aware that human populations and societies are at least as dynamic as the other living biological inhabitants and their habitats. Sociocultural changes take place constantly and at different scales, affected by social, economic, cultural and political circumstances; employment; changes in weather; supply of, and demand for, fisheries products and other factors. These changes need to be carefully considered and valued because they can affect the sustainability and effectiveness of any management strategies related to marine resources. However, as with any biological and technological factors, it can be difficult to identify and rationalise the key sociocultural factors influencing marine resources management, generating additional doubts for those who like to assist and work in collaboration with the fishing communities. For that reason, I was motivated to move my attention to include the social, cultural, economic and political aspects of marine resource management by using two village communities in Solomon Islands as case studies.

I was also made aware that in marine resource management, human societies and behaviour are not easily transformed and fishing families and their larger

communities may not be willing to move into other new jobs, or away from their comfort zones when there is over capacity in a fishery, even though their quality of life may be suffering as a result of depleted fish resources. For the majority of the fishers, the problem is more complex and intricate when they have no other options toward which they can turn for alternative livelihoods and earning money. In such conditions, the decision to ban fishing as a management measure, is not a smart option, as the temporary costs of not including poor fishers from the fishery will be much more confronting and potentially controversial, and therefore less acceptable, than a “hands-off” approach which allows the marine resource and fishery to drop in size and quality under sustained excess fishing mortality (see FAO 2002a).

Additionally, having been brought up as a child in one of the most rural communities in the Western Province, Solomon islands, I was constantly reminded by my grandfather that fish and fisheries were an integral part of our societies and have significantly contributed to the livelihoods, social health and well-being of my people and extended family. Despite this enormous importance and value, or more correctly, because of these attributes, the marine resources are suffering the combined effects of heavy exploitation and, in some cases, environmental degradation. This study, therefore, will contribute to a better understanding of the traditionally-based marine resource management in terms of its effectiveness nowadays at the rural community level. Given the fact that more than 85 per cent of the Solomon Islands population lives in rural coastal areas and largely depend on marine resources for their livelihoods, this study should contribute to clarifying issues related to the sustainable management of the coastal fishery, particularly subsistence and small-scale fisheries. In this research I aim to develop an understanding of the social and environmental aspects of resource management in rural Solomon Islands communities. Such understanding is important in developing appropriate management strategies that will contribute to, and help others, in managing their targeted resources and reefs properly.

This study will ensure that social and cultural considerations are properly considered when involving interested parties in understanding their weakness in marine resource management, keeping them well-informed on the management aspects of their fishery and providing them with the opportunity to express their needs and concerns. I wish to help the villagers and other relevant domestic

parties with a legitimate interest in the use and management of fisheries resources and establish arrangements for consulting them to gain their collaboration in achieving responsible fisheries.

As a final point, this study will share the experiences obtained from the two rural communities in relationship to the economic, environmental and social consequences of their current situation but far more serious to plan ahead in the longer term. I believe that the information I gathered from this study will provide empirical substance to the Solomon Islands Ministry of Fisheries and Marine Resource (MFMR) for future policy decisions on community based resource management.

1.4 Thesis summary

Community based resource management (CBRM) is now widely supported around the world by governments, conservationists, academics, local communities and NGOs. It has been lauded as a viable alternative to narrow, top-down decision making (Rawat *et al.* 2010). Yet, despite the many potential benefits of CBRM, a common theme found in contemporary discourses on the subject is that many of the assertions made about communities and their abilities to perform management roles are not underpinned with detailed documentation of the interactions of communities with the natural environment. My literature search confirmed that there is a gap in research in documenting and understanding village dwellers' contemporary apprehensions and pleas for assistance, over the management status of their marine resources and reefs from a Pacific Island-- Melanesian perspective. In Solomon Islands for example, there has been research conducted on different aspects of customary marine tenure systems (see Aswani 1999; 2005; Foale 1998; Hviding 1998; Hviding and Baine 1996; Lam 1998) in defined geographical areas, and how these relate to traditional management including consideration of controlled access, self-monitoring, and the enforcement of rules and regulations imposed by local people and their traditional leaders. In contrast there has been very little research carried out that investigates the experiences of community members as they come to terms with the contemporary reality of managing their resources in the reefs.

In response to recent acclamation of the potential of community based resource management, particularly in the coastal regions of some Pacific island nations, as

well as recent critiques of wholesale assumptions about the benefits to local communities and their abilities to effectively manage resources, this thesis seeks to provide an in-depth analysis of the structure and functions of two villages with different leadership or chiefly systems. This follows Hviding's (1998) call for more detailed documentation of the day to day working of specific local management systems that show people in interaction, negotiation and conflict.

This thesis seeks to address this gap in the literature by providing a detailed account of two villages situated in two different islands in the Western Province, Solomon Islands. By focusing on a specific region of the country, it is believed that a greater depth of understanding will be gained about the complexities of the internal and external social and environmental influences that affect communities' interactions with the marine environment. The importance of such a study is highlighted by Aswani's (1999) belief that Pacific island sea tenure systems regimes can contribute to contemporary fisheries management but only if policy is not based on untested assumptions about communities, but rather is underpinned by proper consideration of biological, ecological and socio-economic evidence, and Botes and Rensburg's (2000) assertion that traditional management systems must be understood within the context of contemporary social, political and economic realities. This thesis therefore attempts to fill the knowledge gap alluded to by Ruddle (1998b) when he stated that for most localities the tenure relationships of rural fishermen have not been well described and that there are few comprehensive accounts of the structure and functioning of the community based fisheries management systems and their institutional arrangements. This thesis also seeks to provide a more detailed assessment of impediments to community based management, with such an objective being supported by Bradshaw's (2003) statements that the identification of barriers to effective community based resource management allows a more refined model of this approach to be fostered and Brosius *et al.*'s (1998) wish for a more comprehensive and detailed discussion of the challenges and constraints of community based resource management.

Therefore, I justify my study on the basis that there is a need to listen, observe and evaluate the stories and experiences of rural villagers in order to understand their efforts and struggles as they try to find a practical way to manage and look after their renewable marine resources. Information generated through proper research is vital to inform the villagers and others who have similar interests or

concerns to facilitate fisheries policies and practices that can be suitable for other areas in the Solomon Islands or other Melanesian countries in the Pacific context.

The research design, methods and processes I employed were based on the constructivist interpretive paradigm. Attention is focussed on a case study in two rural marine resource owning groups in the Solomon Islands. I chose to use this approach because it suited the nature and purpose of my study. It involved processes of talking to people, getting their stories, interpreting the stories and constructing an understanding of the situation. It focused on the individuals and is concerned with how they construct and make sense of their world (Burr 2003).

The choice of this paradigm reflects the fact that the basic aim of my research is to have a detailed understanding of local communities, in order to contribute to improved formulation of sound management guiding principles for marine management in relation to people's day to day activities. Conducting a long-term study of two communities in the Western Province in Solomon Islands enabled a thorough analysis of the challenges, threats and vulnerabilities facing sustainable management of marine resources. This research involved both qualitative and quantitative methodologies. A quantitative element (census survey) was used to inform and contextualise the research which was predominately qualitative. As the focus of this research is on how the marine resources are perceived and valued, qualitative methods were most appropriate. Accordingly the qualitative data collection included semi-structured interviews, focus group discussions (FGD), participant observations (PO) and informal narrative interactive story telling which I named "stori nomoa"¹. This was used to examine the way in which the Solomon Islands rural communities perceive, participate, interact with and manage their coastal and marine resources. The collection of data involved making use of the qualitative methods of semi-structured focus group discussions (Tonkiss 2004) with follow-up in depth interviews (Legard *et al.* 2003). This method is based upon an inductive view of the relationship between theory and research, and an interpretivist epistemological position, stressing an understanding of the social world through an examination of the interpretation of that world by its participants (Bryman 2004).

¹ This term is from Solomon Islands Pidgin and can be translated as informal unstructured conversation. I used the term "Stori nomoa" for this study because in Solomon island *Pidgin* we don't have a proper word to describe information and unstructured conversation. However "*Stori nomoa*" is basically a Solomon Island specific form of "Talanoa" (Vaioloti 2006:21) and "Storian" (Crowley, 1995:235).

1.5 Outline of the thesis

In addition to this introductory chapter, the eight remaining chapters are organised as follows:

Chapter Two, provides a review of literature written on the topic of community based conservation, is intended to provide an appropriate background to the study. It creates the theoretical basis for the project and justifies the importance of the present approach. Furthermore it introduces some of the precepts and theories that are discussed in the following chapters of the thesis.

Chapter Three introduces the nation of Solomon Islands, giving a brief description of the country but more specifically it highlights the relevant aspects of the Western Province; its history, economy, environment, cultural heritage, demography and climate. Furthermore the chapter describes the two case study villages in detail and also documents current government attitudes towards, and initiatives for, community involvement in the marine management regimes.

Chapter Four deliberates on the background of the status of coastal marine resources, their utilization and management issues in Solomon Islands. The chapter takes an in-depth look at the contributions of subsistence fisheries and small scale (artisanal) fisheries to the livelihoods of many rural communities and the importance of marine resources. Furthermore it discusses the modern applications advocated by the Ministry of Fisheries and Marine Resources and the contemporary levels of governance in marine resource management.

The methodological approach and considerations employed while undertaking this research are outlined in Chapter Five which describes the processes undertaken in situating the study; discusses how the qualitative data collection techniques of interview, focus group discussion, informal storytelling and participant observation were combined to gain a comprehensive understanding of the issues surrounding community based management in two villages in Western Province; discusses possible research and other biases built into the study, some challenges faced in the research process and the limitations of the study.

Chapters Six and Seven present the findings from my two case study villages, Toumoa and Liangai, respectively. The chapters examine the communities' diverse understandings of their existing management practises and issues they are currently facing related to livelihood options, fishing activities and harvesting,

traditional management and governance and outside influences under customary marine tenure.

Chapter Eight is the discussion chapter; it predominantly focuses on the analysis of the social norms, hierarchies of authority, gender roles and local decision making structures presented in Chapters Six and Seven against relevant literature. Following this the two villages' marine resources are described, including the physical attributes of the reefs and discussion of the customary marine tenure including reef ownership and rights to use resources in the area.

Chapter Nine draws together the conclusions from the research findings in the thesis. Specifically, the conclusion highlights the answers to the research questions. The chapter also provides recommendations and suggestions for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 *Introduction*

With increasing awareness of the political aspects of fisheries, the ‘fisheries problem’ is being framed as one of institutional arrangements rather than biological know-how. Ever since the mid-eighteenth century, there has been increasing international and national activity with respect to ocean law and policy in acknowledgement of the necessity to protect and conserve the environment and its value to humanity. The major developments now focus on the areas of ocean space adjacent to the coastlines of the coastal nations.

This chapter will re-assess the literature on CBRM and in particular look at issues surrounding sustainability that are currently faced by small island developing states (SIDS). It will mainly focus on the current conventional “top down approach” and the co-management of small scale fisheries (mostly community-based) in relationship to the current trends of exploitation of the resources.

Furthermore, it introduces the concept of community based resource management and demonstrates the relevance of the present study in terms of its contribution to current research on the opportunities and limitations inherent in this form of management. It will discuss global changes in environmental management and conservation paradigms, and situate the topic in the South Pacific Region, particularly the small island states, explaining the unique opportunities afforded by CBRM in this region. Finally, it will highlight current critiques of, and debates about, the theories of CBRM, and cite academic support for more in-depth studies of the varieties of issues that surround traditional communities and their involvement in CBRM.

2.2 *Debates surrounding sustainable development*

The debates and concerns about the effects of economic development on health and the environment in the 1980’s (see World Commission on Environment and Development 1987) have significant implications for the status of fish populations, ocean habitats and marine biological diversity. This anxiety is heightened in light of the importance of the oceans for the world community. The living resources of the oceans are seen as the most important source of food for many poorer people. They provide for the livelihoods of millions of people in coastal communities and even of whole nations, and they are of critical importance to the

world's biological diversity (Bell *et al.* 2006; FAO 2002b; Gillett 2005; Roberts *et al.* 2002). Previously, marine resources were not seen as threatened by extinction. However, the United Nations Food and Agriculture Organisation (FAO) has recommended that vital action is required at all levels (fishing communities, government ministries, regional fisheries organizations and international agencies) to address the status of fish stock populations, marine biological diversity and degradation of habitats, to rehabilitate them and to promote conditions for sustainable fisheries for future generations.

As made popular by the Brundtland report, the phrase 'sustainable development' refers to the means by which 'development' meets the needs of the present without compromising the ability of future generations to meet their needs (World Commission on Environment and Development 1987 43). Seeing as the needs of the future generations are indefinable and the future potential for wealth generation of species and ecosystems is equally not known, the term in fact implies that total biological assets are not reduced, in the long run, through over exploitation (Colchester 1994).

Subsequent to the Brundtland definition, Michael Redclift (1993) argued that "needs" do change, therefore it is improbable, that those of future generations will be similar of those to the present. Additionally, development contributes to satisfying 'needs' but it will be defined and viewed differently by different societies (Redclift 2006). For example, some societies may see clean air and space as necessary before development can be sustainable. On the other hand, however, it will not be the same for others who seek to exploit natural resources, at the cost of increased pollution (Redclift 2006). This kind of trade-off is evident in many developing countries today.

It is impossible to identify which actions are more or less sustainable than others because there are so many contradictions to sustainable development, as different people and cultures identify the objects of sustainability differently (Boutilier 2008). The global conference at Rio de Janeiro, Brazil in 1992 was initiated by the United Nations General Assembly to assess the progress that each country had made towards sustainable development after the Brundtland report was produced. However for many developing countries, they are still unable to honour it (Becker *et al.* 1999; Mishra 2012; Redclift 2006). The huge imbalance between development and demand for natural resources seriously

threatens the well-being and survival of the increasing global population (Mishra 2012; Redclift 1993).

2.2.1 Global fisheries

The sustainable development and management of both inshore and off-shore fisheries systems can only happen if the actions are properly coordinated and integrated into natural and social capitals, environments and the fishing culture contexts of the overall situation of which they are a part (FAO 1997). Within the past three decades, there has been a huge population movement, from inland areas to the world's coasts, resulting in about two thirds of the Earth's people living within 100km of the coast (Vitousek *et al.* 1997). Substantial growth of development in coastal cities has raised issues of the future survival of coastal and estuarine ecosystems and habitats. The livelihoods of many people who live in traditional coastal areas will be affected as they depend very much upon the aquatic living resources (FAO 2010).

In today's global food economy, fisheries provide employment for millions of people (Clausen and York 2008) and fish is the primary source of protein for people worldwide and represents an important part of the diet of many more (FAO 2010). According to Delgado *et al.* (2003) globally the average per capita intake of fish has escalated rapidly, and it provides humans with approximately 20 per cent of animal protein, and various sources of mineral and vital fatty acids (FAO 2010). Taylor *et al.* (2007 279) explained that:

Fish is the primary source of omega-3 fatty acids in the human diet and are critical nutrients for normal brain and eye development of infants, and have preventative roles in a number of human illnesses, such as cardiovascular disease, lupus, and other illnesses.

In 2008 the fish production was valued at 90 million tonnes globally, which consist of 80 million tonnes of marine species and 10 million tonnes from the inland waters (Allison 2011). Its projected sale value is US \$93.9 billion (FAO 2010). The recent global fisheries production has been fairly consistent, except with the variations of a pelagic fish species named, Achromatus, which was caused by the unpredictable weather in the Southeast Pacific (FAO 2010). Fluctuations in other species and regions tend to reward each other to a large degree. In terms of global productivity in fisheries, China is the global leader with an output of nearly 15 million tonnes of fisheries production recorded in 2008 followed by Peru

and Indonesia respectively. In comparison to the global leaders and for the purpose of this research, the Pacific Island regions coastal fisheries produce around 100,000 plus tonnes of fish and seafood products per year of which 84,000 t, or about 84 per cent comprises subsistence fishing (Preston 2005). The catch includes invertebrates, crustaceans and a wide range of finfish. The sustainability of these fisheries is still unclear in terms of habitat degradation and overfishing, even though it is one of the main sources of employment and food security for Pacific Islanders (Preston 2005).

Although these issues are becoming more widely known throughout the globe, the emphasis for many developing countries is more on fisheries development in terms of new resources and technology. It is well documented that stocks are overfished (See Caddy and Cochrane 2001; Camhi 1995; Dulvy *et al.* 2003; FAO 2010; Roberts *et al.* 2002; Weber 1994); however objectives are focussed more on improving and expanding fisheries rather than on limiting fishing efforts. This is true for many countries because the fundamental concern is the significant role fisheries play in providing food, income and jobs especially towards their vulnerable people. The precise intentions will be towards building infrastructure; fishery enhancement and reducing social conflicts between fisheries and other sectors (Bryceson and Massinga 2002; USAID SPARE Fisheries and Aquaculture Panel 2007).

For many small Island countries with smaller land masses the marine capture fisheries are essential for food security, but ecological destruction and the unsustainable rates of extraction are compromising their future potentials. The progressive knowledge of societies towards the aquatic environment in recent years cannot disguise the fact that humans' understanding of the marine ecology is still fragmented (Caddy and Griffiths 1995). The status of fisheries is evolving and therefore development and management must be carefully associated to research programs on environmental conservation and awareness (Allison 2011).

So far, the plea for inquiry has been aimed only to identify stock reduction and ecological degradation instead of being protective (Caddy and Griffiths 1995). In contrast to the long-standing emphasis on technical investments in fisheries, little attention has been given to the fishers (USAID SPARE Fisheries and Aquaculture Panel 2007). This is despite the fact that the socio-economic setbacks challenging fishers are the key issues leading to the over-exploitation of marine resources and, eventually, to the success or failure of fisheries

management and development (Caddy and Griffiths 1995). A further problem is that fishery officers are known to be some of the least paid civil servants, with lack of resources and training, have inadequate facilities, and limited access to outside technical and social forms of research knowledge (Oreihaka and Ramohia 2000; Ruddle 1998b). Gillett (2005) argued that for Pacific Islands, there is a high probability in the near future for a constant demand of fish protein to meet basic human needs, therefore strategic planning is required to protect and manage the marine environment.

By taking account of the shifts happening within the fisheries sector and merging forward-looking policies with convenient technologies, policy makers can help ensure that the fisheries sector remains ecologically sustainable as well as beneficial for the world's poor people.

2.2.2 Challenges in marine conservation

Globally, the notion of protected areas has been widely acknowledged as key component of fishery management. In developing countries, pressures on natural resources are growing in line with increasing human populations (Bell *et al.* 2009; Sadovy 2005; Von Braun 2007; World Bank 2000b). Creation of protected areas is increasingly being adopted as the most feasible strategy in mitigating the undesirable effects generated by these pressures. The last two decades have seen a significant growth of protected areas (Naughton-Treves *et al.* 2005). The World Data Base on Protected Areas indicates that some 20 million km² or 12.7 per cent of the earth's surface is occupied by 104,791 protected areas (Chape *et al.* 2005). This is a dramatic increase compared to 1980 when the Protected Areas network covered only three per cent of the earth's surface (Brockington 2004). Most of these protected areas are situated in developing countries, where the driving force for further expansion is their high levels of biodiversity (Chape *et al.* 2005; Naughton-Treves *et al.* 2005).

One medium for marine conservation that has received much interest in recent times is marine reserves. The pressure from societies on the marine environment has been enormous, which demand more drive for tougher marine conservation efforts (Allison *et al.* 1998). Some of the frequently used terms to described them

are Marine Protected Areas (and its acronym MPA), parks, reserves, *tabu*² areas, harvest refugia and sanctuaries. These are marine areas that are, to some extent, protected by spatial restrictions (Ballantine 1991).

The designation of such protected areas has expanded over the years (Allison *et al.* 1998). Marine reserves are now strongly advocated by stakeholders and conservationists because reserves may offer types of protection not provided by other management strategies: particularly, the specific protection of critical areas (Ballantine 1991).

Recently, marine reserves have grown into a widespread phenomenon, and the number has increased progressively (Allison *et al.* 1998). Marine reserves provide different platforms of protection for the marine environment, including its habitat and all living things from the intrusion of human activities (Halpern 2003). All different types of MPAs contribute to the safeguard and management of biodiversity. The highest level of protection generally is provided in 'no-take' MPAs, where the objective is to fully safeguard species and their habitats from the removal of fauna, flora or the substrate (Ward and Hegerl 2003).

Marine protected areas are recognized as management instruments to protect marine biodiversity (Rowley 1992), to maintain/restore ecosystem health (Norse 1993), and to provide coastal communities with a sustainable source for economic growth (Durán *et al.* 1987; Keough *et al.* 1993). MPAs are reputable for achieving many long standing objectives in fisheries management but they are mostly renowned for preserving fish population and their accompanied environments (Planes *et al.* 2009; Ward and Hegerl 2003). Nevertheless, MPAs that are implemented specifically for fisheries objectives offer improved permanence for fisheries, and prevent further exploitation of fishing grounds, and continue to support the welfare of the local communities (Ward and Hegerl 2003). Globally, MPAs are hypothetically known for their provision in fisheries to become environmentally and economically viable (Agardy *et al.* 2003; Ward and Hegerl

² A common term mostly used in the South Pacific Islands to embrace strong prohibitions relating to any area of human activity or custom that is sacred or forbidden based on moral judgment and religious beliefs.

2003). A number of detailed marine conservation goals are achieved through various practices of MPAs (Guidetti 2002; Kenchington 1990).

Establishing marine protected areas to achieve both economic and conservation goals needs a full collaboration among the parties involved (Ward and Hegerl 2003). Researchers highlighted that comprehensive dialogues with the community about the plan and management are possible and essential for successfully achieving benefits for fisheries, conservation and social goals (Christie and White 2006; Jameson *et al.* 2002; Jentoft 2005). MPAs are not often documented or acknowledged, even though they played a significant role in fisheries accomplishments, and contribute towards the preservation of the marine ecosystem and its biodiversity (see Roberts *et al.* 2002; Ward and Hegerl 2003).

2.2.3 Small Island Developing States (SIDS) and their big Issues

The Small Island Developing States (SIDS)³ hold a very small percentage of the earth's human population and often goes unnoticed when international bodies try to confront the key problems of the world (Adams 1998a; Ghina 2003; Griffith and Ashe 1993). For many SIDS, the majority of their problems and requirements in engaging in sustainable development are extensively acknowledged (Ghina 2003). The literature contains many references to the limitations placed on small islands and their economies (Ghina 2003; Griffith and Ashe 1993). This issue of SIDS has been on international agendas since the early 1980s beginning with the United Nations Convention on the law of the Sea (UNCLOS) adopted in December 1982, which provides the international legal basis for pursuing the protection and sustainable development of sea and coastal surroundings and their resources (Anderson 2000). UNCLOS bestows rights and responsibilities onto coastal states to exploit and manage both living and non-living resources within their exclusive economic zones (EEZs) (Carpenter 2011).

³ The United Nations list of SIDS includes American Samoa, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belize, British Virgin Islands, Cape Verde, Commonwealth of Northern Marianas, Comoros, Cook Islands, Cuba, Dominica, Dominican Republic, Federated States of Micronesia, Fiji, French Polynesia, Grenada, Guam, Guinea-Bissau, Guyana, Haiti, Jamaica, Kiribati, Maldives, Marshall Islands, Mauritius, Montserrat, Nauru, Netherlands Antilles, New Caledonia, Niue, Palau, Papua New Guinea, Puerto Rico, Samoa, São Tomé and Príncipe, Seychelles, Singapore, Solomon Islands, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Timor-Lesté, Tonga, Trinidad and Tobago, Tuvalu, U.S. Virgin Islands, Vanuatu (source: <http://www.un.org/special-rep/ohrlls/sid/list.htm>).

Chapter 17 of Agenda 21 which stressed the sustainability of coastal and marine resources and it was approved at the United Nations Conference on Environment and Development (UNCED) in 1992 (Preston 2005). In addition, Chapter 17 also deals with the protection, use and development of the sea and its living resources, and specifically promotes the fact that the sea and inshore areas are fundamental components of global environmental problems. Preston (2005 10) stated that,

a key difference between UNCLOS and UNCED is that the former focuses on the resources of EEZs, usually between 20km and 320 km from the coast, while the latter gives more attention to coastal and inshore waters. UNCLOS and Agenda 21 complement each other.

Furthermore according to Preston (2005) and Carpenter (2011), chapter 17 offers a different plan for SIDS because of their special circumstances and profound reliance on their marine environment and its resources. Their exceptional situations were also acknowledged in the UNCED in Rio Summit in 1992, and in other two Rio outcomes: the Framework Convention on Climate Change (UNFCCC) and Convention on Biological Diversity. In particular, these conventions could be possibly viewed as vital supplements to UNLCOS.

The Rio Summit recognised and acknowledged the special problems of the SIDS (Chandra 1995) and a follow up UN Global conference in Barbados in 1994 surveyed the disposition and extent of the explicit fragile state of SIDS (United Nations Environmental Programme 2004). Its outcome is known as the Barbados Programme of Action for the Sustainable Development of Small Island Developing States. This was the initial global summit on the sustainable development and the application of Agenda 21 for SIDS. Agenda 21, the action plan of UNCED, articulated the importance of developing National Sustainable Development Strategies (NSDSs) as a tool to assist SIDS move and work towards achieving sustainable development. The consultation resulted in a framework that provides a recommended outline of actions and policies to be implemented in 14 priority areas taking into consideration the special characteristics and constraints faced by islands countries (United Nations 1994). These are: coastal and marine resources; land resources; biodiversity resources; freshwater resources; energy resources; climate change and sea level rise; natural and environmental disasters; management of wastes; tourism resources;

national institutions and administrative capacity; regional institutions and technical co-operation; transport and communication (United Nations 1994).

Furthermore, the global conference on sustainable development of SIDS in Mauritius in 2005 approved the Barbados Plan of Action (Byrne *et al.* 2005). The Mauritius Declaration reiterates the sustained rationality of the Barbados Programme of Action; providing the necessary outline for the sustainable development of SIDS and reiterates that SIDS remain to be a “special case” for sustainable development. It recognises the seriousness of the tsunami natural disaster that had catastrophically impacted the Indian Ocean in 2004, and the hurricanes and cyclones in the Caribbean and the Pacific respectively that highlighted the need to advance and reinforce effective disaster risk reduction, early warning systems, emergency relief and rehabilitation and reconstruction capacities (Byrne *et al.* 2005). Preston (2005) argued that the protection of environment and adaptation to climate change are vital steps toward adopting biodiversity approaches for marine resource management.

The introduction of exclusive economic zones (EEZs) and adoption in 1982, after long deliberations, of UNCLOS brought an important framework for the conservation of marine resources (Preston 2005). The SIDS are characterised as large ocean states due to the establishment of the 320 km EEZ's and subsequently given legal rights to become owners of much of the world's ocean areas, resulting in the small islands being custodians of much of the world's ocean space. With inadequate capacity, many island states are unable to tap the rich resources within their EEZ (Preston 2005; Walker 2006). SIDS repeatedly lack the finances and knowhow necessary for capitalising and developing ocean resources.

The SIDS are by no means similar to each other but they all share homogenous characteristics which constrain them in their path to implement sustainable development (see Table 1). Adams (1998a) highlighted that often small island government strategic plans are often influenced and determined by large nations' interests, and this may cause them to set inappropriate priority areas in resource management policy. For instance, marine resource issues given priority by small islands governments in international forums are often weakened by the policies of larger more powerful nations (see Adams 1998a; McGillivray *et al.* 2008).

Table 1. SIDS constraints on achieving Sustainable developments

<p><i>Ecological/environmental characteristics</i></p> <ul style="list-style-type: none">• small physical size• limited natural resources• limited and fragile resource base that allows less room for error in its utilization and management• susceptibility to natural environmental events (hurricanes, cyclones, typhoons, etc.)• little natural organic biological diversity• distance from continents and external competition fosters species endemism• generally little overall climate variability, but potential for climate upsets• tendency towards ecological instability when isolation is breached• high dependence on marine resources <p><i>Geographical Characteristics</i></p> <ul style="list-style-type: none">• relative isolation• a completely circumferential sea frontier and EEZ, giving a high ratio of ocean space to land• extensive land-sea interface which increases the fragility of coastal ecosystems and the demand for coastal zone management• no interior hinterland or central terrestrial core area that is essentially distant from the sea such that coastal resource planning and management are essentially synonymous with national resource planning and management• dominance of the sea and its use for shipping makes these countries particularly vulnerable to hazards associated with international shipping and waste disposal• small land mass to ocean space makes island especially vulnerable to global environmental phenomena such as sea level rise <p><i>Socio-economic characteristics</i></p> <ul style="list-style-type: none">• extreme openness of their economies (external relations of trade, aid technology flows and investment)• more dependent on foreign trade than larger countries and having less influence on the terms in which that trade is carried on• extreme dependence on the external sector (other states, and agencies and large transnational corporations)• low economic resilience in recovering from shocks• Intimate association/relation between economic development and environmental asserts• a narrow range of skills and specific difficulty in matching local skills with job
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Source: (Nishioka 2000 4)

The coastal resources are gradually coming under pressure as human populations continue to grow (Curran *et al.* 2002). The trend in increasing population is not a general rule as several small island nations have decreasing or slowly growing populations due to emigration, especially those which have a close alliance with a developed country. However, the majority of the small island nations are burdened with high population growth rates (McGillivray *et al.* 2008).

For most small island nations, a big proportion of their natural resources come from the ocean and hence the marine resources are important for their people and also for the national economy development. Adams (1998a 2) argued that,

the few high unit-value resources that are economically viable to export from small islands (which are generally characterised by poor trade linkages and high freight costs) are typically fragile when subject to commercial exploitation,

particularly when it is carried out at a pace that overwhelms the capacity of developing fisheries management infrastructures.

For most rural communities in small island nations, marine resources enable them to obtain cash to sustain their lifestyles influenced by modernisation. However the trend of exploitation is increasing rapidly in some area and therefore urgently need regulatory measures (Adams 1998a).

A number of small island governments are now acknowledging this and prepared to search for different ways of utilising the sea (Adams 1998a), such as aquaculture (e.g. coral gardening, clam mariculture and sea weed farming) and marine-based tourism (eco-tourism) (Gillett *et al.* 2008), and these developments have stepped up in the past decade. Though it is not an easy path for several small-islands nations to follow, because of physical isolation and increased air-fares, the achievement of some islands on the main trade paths has motivated other SIDS to attempt it (Adams 1998a). Most small Island countries have pristine coral reefs and are noteworthy to tourists (Labrosse *et al.* 2006). The coral reefs hold few economic advantages over large populace countries, because of its carefree way of life, which stands as an attraction for humans (Adams 1998a).

2.3 Coastal marine development issues for SIDS

Since the inclusion of small Island developing states in the United Nations Convention on the Law of the Sea for small Island developing states, the management of sea resources has been incorporated into wider ocean management strategies. The SIDS are distinguished by their social, traditional and economic connection to the sea. They continue to be heavily dependent on their marine resources, particularly for the sustainable livelihoods of their communities, but with numerous kin-based and other social obligations they are confronted daily by marine and coastal issues.

In this section I will discuss and identify some of the common wider issues that these group of nations encounter that account for much of the overexploitation and degradation of their coastal marine resources.

2.3.1 Seafood consumption and population growth

Fish and other edible seafood products are the major source of protein for most of the small island nations' populations. The inhabitants of some of the atoll

islands of the Pacific, for example, often consume roughly around 190 kg per year per capita on average (Adams 1998a). The consumption of marine resources in most rural areas is growing but does not seem to go beyond potential production. Most of the captured fisheries are from wide variety of reef species (Adams 1998a). However, as Adams (1998a) stated, it does make the inhabitants of small island nations very susceptible to forthcoming disastrous changes in coastal environments, either through pollution or through natural disasters. These scenarios can alter and cause small island economies or societies to become more vulnerable than large Island states (Adams 1998a; Boutilier 2008) and it's crucial to be vocal about encouraging smaller island countries to actively participate in any international forums or meetings to be aware of the socioeconomic issues related to the coastal resources.

Furthermore, urban drift has contributed to environmental degradation of both the marine and coastal environments in and near urban areas in most small developing countries (see Heath and Binswanger 1996; Patterson *et al.* 2004; Thomas 2001; Van der Velde *et al.* 2007). These processes are obvious in highly populated areas with increased waste disposal, eutrophication and destructive fishing methods such as trawling, dynamite fishing and the usage of cyanide near dome urban centres (Adams 1998a). Numerous assessments from these developing countries attest to the extent of fisheries decline in the SIDS regions (see Ghina 2003; Green *et al.* 2006; Mak *et al.* 2005; Shahidul Islam and Tanaka 2004).

Adams (1998a) noted that some damages to coastal reefs in small island nations were caused by people during reef gleaning for fish, crustaceans and invertebrates. For example in the small Pacific Islands countries, this was mostly done by women and their children (Adams 1998a; Kronen and Vunisea 2007), which involves up-turning of boulders and the infringement of coral boulders with robust tools to remove edible shells, invertebrates and live rocks were usually sighted in areas that were densely inhabited (Adams 1998a). Often people assumed that reef fish are more abundant away from population centres and agreed that commercially valuable species are over-fished in rural areas but there is little data to support the claims (Labrosse *et al.* 2006).

2.3.2 Development plans and resource use

The majority of the populations of the small Island countries are heavily reliant on coastal resources for subsistence nutrients, however this is hardly reflected in the development plans, or even enumerated in the national financial reports (Adams 1998a). In the small Island nations of the South Pacific, communities obtain most of their protein from sea (Labrosse *et al.* 2006). For example, Dalzell *et al.*(1996) and Labrosse *et al.*(2006) argue that the small island countries of the South Pacific have the highest consumption rate of seafood than elsewhere in the world. This is particularly true for the atoll island nations which do not have enough fertile land area to grow large quantities of agricultural foods. High seas industrial fishing has more high commercial value than reef and lagoon fishing. Inshore fisheries involve an extensive range of fishing and harvesting techniques, which are more suitable for subsistence fishing (Labrosse *et al.* 2006).

In the Pacific Island countries, it is believed that the subsistence fishing catch is much greater than commercial fishing, in which it is valued at 85 per cent of the total captured fish of the inshore coastal fisheries and has more significance for the people particularly those in the rural communities (Dalzell *et al.* 1996; Labrosse *et al.* 2006).

In South Pacific Islands, there is a direct connection between population growth and increased fishing pressure, as these have made a huge impact and demand for people to exploit reef resources on the reefs (Jennings and Kaiser 1998; Labrosse *et al.* 2006). Apart from human impact on the marine resources, the utilisation of sophisticated fishing equipment and petrol-powered boats, and the access to new market places has changed the subsistence economy to become more sophisticated and monetary orientated (Labrosse *et al.* 2006).

Regardless of its significance, traditional fishing is inadequately assessed and not properly documented. Its impact in the marine resources is often undervalued and intricate to evaluate, particularly through monitoring fishing undertakings and socio-economic surveys (Labrosse *et al.* 2006). As a result, it has contributed to the deficiency in fisheries data, which compels the ineffective accomplishment of fisheries management strategy. Accessing data and records will enable such activity to progress and provide future directions to inform fisheries management; however this has remained to be a challenging and complex situation for responsible pacific governmental leaders and prominent decision-makers (Gillett

2002; Labrosse *et al.* 2006). The consumption of fish by the local Island population is identified to be a medium to implicitly evaluate traditional fishing (Labrosse *et al.* 2006). This has been argued to be a significant strategy to be used in assessing traditional fishing in rural villages, and also be regarded as a good indicator of subsistence fishing. Certainly, trading marine products among small islands is not feasible as it has associated high cost attached to it (Labrosse *et al.* 2006).

Hence Labrosse *et al.*(2006) insisted that evaluating fish consumption is important for checking the impact of traditional fishing in inshore fisheries. The facts gathered will help to develop the inshore fisheries management plans, which is vital for small Pacific Islands as they move from traditional economy to more cash orientated one.

2.3.3 Markets and open access resources

Markets are influential institutions with the potential to produce great improvements in the lives of fishers in all corners of the globe. Sadly, market forces can also do great harm, especially to natural ecosystems. Lucrative overseas markets, in particular in mainland China and Hong Kong, for particular sea foods have ignited the high export demand for speciality marine products leading to overfishing of certain species of fish and groups of organisms such as sea-cucumbers in small island states (Dulvy *et al.* 2003; Fabinyi 2012). These markets are typically financed by roaming Asian based companies which target specialised marine products based on relatively high value species such as non-perishable products like Giant Clams (*Tridacna spp.*), beche-de-mer (class Holothuroidea), trochus (*Trochus niloticus*) and green snail (*Turbo marmoratus*) (Fabinyi 2012). Improved methods of transportation have seen increased shipments of live reef fish, in particular groupers and giant wrasses (Sadovy 2005). This problem is not only seen in small Island nations but also in other Southeast Asia countries like the Philippines, Indonesia, Thailand and Vietnam. However, the trade has more detrimental effects on small island countries than the larger nations.

The pattern of the trade entails that the increased export of even small amounts of seafood product can place enormous pressure on the level of ecological production of small island nations. This can be further aggravated by the limited options provided to harvest the exportable resources, which can further lead to

the rapid degradation of marine species (Adams 1998a; Barber and Pratt 1997). Conversely, the fishery has extensive negative side-effects (Adams 1998a; Cesar *et al.* 1997). For an instance, the production of beche-de-mer involves huge amount of mangrove fire wood to heat it prior to exporting. The heavy reliance on mangrove wood has resulted in the depletion of nursery grounds for juvenile fish (Adams *et al.* 1992; Kinch *et al.* 2005).

Furthermore, in the Galapagos (Camhi 1995) and in Indonesia (Choo 2008) respectively, the harvesting of sea cucumbers has detrimental effects on productive reef areas, which caused imbalance within the coral reef habitat. With regards to the trading of live reef fish species, cyanide is a quicker method to catch more fish in a given time than the regular mesh net methods. Fishers have been using cyanide to collect tropical marine fish for aquarium and food trades since the 1970s in the Philippines and Indonesia respectively (Choo 2008; Wabnitz *et al.* 2003). Cyanide fishing is a reckless method to stun and collect fish from the wild (Mak *et al.* 2005; Rubec and Pratt 1984). This practice is detrimental to coral reefs permanently. Up to this day, very limited scientific information has been documented on the negative impact of cyanide on the coral reef (Bruckner and Roberts 2008). Luckily similar destructive fishing activities have not been found to be widespread in the small islands states (Adams 1998a). The policy makers of small island states are fully aware of the detrimental effects of destructive fishing practices and they are taking precautionary measures to discourage them.

In addition, these commercial fisheries are site specific and seasonal, and therefore for local fishermen it is good money for only a short period of time. However, the intensifying fishing pressure exerted on these species can be detrimental for its sustainability (Adams 1998a). Adams (1998a 4) argued that:

most communities and leaders recognise that these fisheries would be of far more long-term cash benefit if exploited on a smaller scale, but the mechanisms with which to regulate this are usually inadequate. The re-empowerment of community management is considered by many to be the only realistic way of controlling over-exploitation, but it requires a very strong community, together with an effective restraint of individual to withstand the temptations.

Sutinen (2010) explained that marine resources present a distinctive commons because fishers leave little incentive for other users to conserve the resources. Moreover, the presence of numerous non market, but ecologically beneficial,

goods and services from marine ecosystems means that markets alone cannot be expected to internalize the ecological costs of coastal cost-effective activities.

Hence, market-driven undertakings are among the endless causes of overexploited or degraded fishery resources, pollution, and habitat destruction, the three principal threats that are degrading the overall health of marine environments (Sutinen 2010). In turn, degraded marine ecosystems threaten the long-term well-being of the human communities supported by those economic activities. On the other hand “the tragedy of the commons” is playing out on a large-scale in coastal and marine ecosystems. Within this thesis, living marine resources are termed common property in the sense of being open-access resources (Berkes 1987). Markets are at the centre of the tragedy, as the economic activities that contribute most to a country’s gross domestic product are often coastal activities. As with markets and governments, the associations and arrangements of certain individuals are not always supportive towards sustainable development since behavioural expectations of society are not always up to date with protecting marine resources, protecting habitats, and maintaining the quality of the marine ecosystem (Sutinen 2007). Sutinen (2010 99) offers a thoughtful analysis highlighting that:

most markets do not reflect the ecological costs of the economic activities that use and encroach upon marine resources. Market prices for fish and other ocean products and services fail to reflect the full costs of exploiting marine ecosystem resources. The artificially low (consumer) prices and (producer) costs drive consumers to demand more and suppliers to produce more marine-ecosystem-based products. As a consequence, excessive levels of economic activities are threatening the sustainability of marine ecosystems.

2.3.4 Cost of transport and communications

Communications and transportation costs are fairly high in small island states (McGillivray *et al.* 2008; Winters 2005) and they prohibit sustainable income generation in particular from fisheries and aquaculture activities when targeting potential export activities (see for example Gustavson 2002; NZAID 2008; South Pacific Commission (SPC) 2003). It should be noted, however, this is not applicable to all small island states, as some of them have established trading links with other developed and developing countries and have exported commodities (Adams 1998a).

Furthermore, in SIDS the high value cost of transport and communications often discourage people from taking part in establishing economic businesses that can generate sustainable income in the long term (Gustavson 2002). They create comparative disadvantages in trade, tourism development and further prevent the mobilization of information to reach every inhabitant (Edwards 2009). Preston (2005) further argued that even the sharing of scientific data and know-how is a valuable tool in fisheries development and management but it is impossible because of the difficulties related to high cost of transportation and communication.

Sufficient aid has been forwarded to initiate artisanal fisheries in most rural areas in small island countries (Adams 1998a; Gillett 2002), but it is steadily becoming acknowledged that commercial initiatives will be progressed and supported by the government, with open access to suitable economic markets that will be enhance with improvements in basic regulatory infrastructure and information systems (Asian Development Bank 2008; Connell 2007). According to Adams (1998a 6), “this approach also guards against over-investment and the need to recoup loans from a dwindling resource: a chronic fisheries problem”. Thus smaller island states have missed out on a number of diverse economic opportunities that could have enabled them to effectively participate in worldwide markets.

2.4 Development challenges of the small island states of the South Pacific

The Pacific region is scattered over a vast stretch of Ocean that forms a part of Melanesia (i.e. Papua New Guinea, Fiji, New Caledonia, Solomon Islands and Vanuatu), Polynesia (i.e., Cook Islands, American Samoa, Niue, Tonga, Samoa, Tuvalu, Tokelau, Wallis and Futuna and French Polynesia), Micronesia (i.e. Kiribati, Nauru, Federated States of Micronesia, Palau, Guam, Mariana Islands and Marshall islands). The islands range from very small atolls to higher islands with larger inland areas. They share common characteristics in terms of tropical vegetation, colonisation and political structures, some ethnic/cultural similarities and they display a wide diversity of physical and economic characteristics (Gounder 2009).

Government is the main source of employment in the service sector (Saldanha 2004), though the widespread interest of past administration officials was to

minimise operational costs and thus further restricted employment opportunities (Browne and Douglas 1989). The widespread use of foreign experts and the low levels of education and training have also constrained opportunities for the local work force. In most of the countries, the pace at which labour can be riveted from the traditional sector to the commercial economy is limited (Saldanha 2004). However, certain features of these societies are not favourable for rapid economic growth and employment creation. Land is jointly own and, in some areas, can be redistributed among families by local chiefs and elders. Browne and Douglas (1989 4) discussed that, “communal property rights and beliefs in egalitarian income distribution discourage private sector savings and investment throughout the economies”.

The Pacific Ocean covers a third of the earth’s surface area yet many small Island nations of the South Pacific, are still unable to identify and meet the challenges to their quest to formulate a sustainable development policy and nor have they adequately incorporated environmentally-sustainable development objectives into a larger policy framework despite attempts in previous years (Barnett 2000; Pacific Islands Forum Secretariat 2007). As a result, they are not able to honour their commitment to Agenda 21. Linking the social and economic developments with their environmental consequences is a critical challenge for the region (NZAID 2008). The literature spawned on the subject in recent years has been extensive and wide-ranging. There is need to examine sustainable development from new perspectives and seek new insights in Pacific Islands countries (Overton and Storey 1999).

According to Gounder (2009), many challenges facing the island nations of the South Pacific, are similar to those of small countries around the world. The political, social, economic and environmental factors are relevant issues and the mix of them raises the urgency to meet the challenges of globalisation, economic growth, social development, trade, labour mobility, and climate change that often present overwhelming array of dilemmas.

On the other hand, many of the small island communities continue to support traditional management practises relating to the sea and its resources (Hickey 2006). At the community level, customary processes continue to be important elements of resource use and management arrangements (Ruddle 1996b). This is in relation to matters arising and sought through island circumstances. According to Bass and Dalal-Clayton (1995), there are past valuable and relevant

information on resource management practices, which are vital for subsistence and pliability and it is still useful today. For example, prior to European contact, the small island societies exploited both the terrestrial and marine resources to meet their subsistence needs. On fertile, land a "subsistence affluence" (Fisk 1962) was achieved; and food and labour surpluses were employed to support elaborate religious and political systems, and not to develop resource-exploitative and export-driven economies as has increasingly become the case (Hamnett 1986). Furthermore, Bass and Dalal-Clayton (1995 22) explained that:

In contrast to governmental control systems which are inflexible, community control systems, and resource ownership, are continually negotiable through traditional decision-making structures. They are hence far more resilient, and take a more "holistic" view, than their western equivalents. And, just as significantly, many of these control systems are based on the premise that resources are held in trust for future generations.

The strength of traditional practices can also be seen in local land management practices, such as on atolls where local people cultivate infertile soil to yield more local produce to sustain their livelihood. In addition, local communities have their own land and marine classification systems that take into account the islands' surrounding environments (Bass and Dalal-Clayton 1995; Veitayaki 2002).

The Secretariat of the Pacific Regional Environment Programme (SPREP), the Secretariat of the Pacific Community (SPC), the Forum Fisheries Agency (FFA) and the Pacific Islands Forum Secretariat (PIFS) are the regional organisations at the forefront of the pursuit of sustainable development in the region. There are also regional programmes which are relevant to the management of coastal marine resources at the University of South Pacific (USP) and the SPC Applied Geoscience and Technology Division (SOPAC).

A former Prime Minister of Solomon Islands, the honourable Manasseh Sogavare in his address at the 53rd plenary meeting of the United Nation General Assembly in 2001 reiterated the importance of the ocean and its bounty to the people: "...The success of national development planning depends significantly on the continued health of the marine environment" (United Nations 2001 3). The backbone in food security for most small Pacific island countries is fish⁴ (Bell *et*

⁴ Fish is used here to represent both fishes and invertebrates.

al. 2009; Preston 2005). In addition, fisheries sector plays an important role in the Pacific Islands' economies and has been acknowledged by its significance in the regional strategies, which was part of *The Pacific Plan* and *the Vava'u Declaration on Pacific Fisheries* (Pacific Islands Forum Secretariat 2007). The Pacific Plan views development along with effective management of fisheries and their ecosystems as a way forward for the Pacific Island countries (Bell *et al.* 2009). The prime concern of the Plan and the 'Vava'u Declaration', is to ensure that all Pacific Island countries effectively apply the conservation and management procedures for the viable practice of harvesting their fish resources, and also to be accountable to care for their marine environment (Bell *et al.* 2009; Pacific Islands Forum Secretariat 2007).

Marine degradation is a growing problem throughout the Pacific (NZAID 2008; South Pacific Commission (SPC) 2003). While land-use practices and climatic change are having major impacts on the marine environs (IPCC 2007), over-fishing is often identified as the major problem (Kile 2000; Knowlton 2001; Lovell *et al.* 2004). Numerous assessments in the South Pacific confirm the extent of fisheries decline in the region (e.g. Duke *et al.* 2007; Green *et al.* 2006; Lovell *et al.* 2004). Concerned with over harvesting in these 'biodiversity rich' coastal waters, numerous local, regional and international non-government organizations (NGOs) have attempted to establish marine protected areas (MPAs) in the South Pacific (e.g. the International Waters Program (2005), Conservation International (CI), World Wide Fund for Nature (WWF) and The Nature conservancy (TNC). Conserving marine resources is an issue that is increasingly coming to the forefront in current public, political and scientific arenas (Govan *et al.* 2009). It is now recognised with utmost importance and urgency. However, the mechanisms as to how best to manage environments in a sustainable manner are still the topic of debate (Barnett 2000). Although the inshore marine resources of the region are rather small in global terms, their past, present and future importance to Pacific Islanders are of greater importance per capita than in perhaps any other region in the World (Bell *et al.* 2009).

2.5 Ever-changing paradigms in resource management

Recognition that the long-term existence of wilderness areas will be threatened if the "needs and aspirations and attitudes of local people are not accounted for" (Mehta and Heinen 2001 166) and the realisation that empowered local communities can provide a valuable human and knowledge resource for

management strategies (Wescott 2002), have led to a significant change within ideas of conservation and natural resource management in recent years (Brown 2002). Moving away from the dictatorial 'protectionist' attitudes of old, towards more inclusive systems of 'people-centred' management (Brechin *et al.* 2002), the global community has increasingly recognised local and traditional community roles in the allocation and management of resources and is currently engaging in much study and analysis of traditional or locally based resource management (Paul 2005; Ruddle 1998b; Veitayaki 1997). A review of literature on community based conservation in the Pacific region and around the world emphasises this evolution of thought, and while in 1978 Johannes lamented the 'demise' of traditional marine conservation practises in Oceania, by 2002 he recognised that his predictions had not come to pass and that instead Oceania has experienced a revival of community based marine resource management (Johannes 2002).

Therefore a more widespread conservation paradigm, integrating the interests of resource users, known as 'people-centred' or 'community based conservation' has appeared in the last two decades. The shift towards this concept was evident in the 1992 Earth Summit's promotion of Agenda 21, which encouraged co-management and the sharing of natural resources management responsibilities among government, international and local organisation and local communities (Carlsson and Berkes 2005). Chapter 17 of the Agenda 21 specifically promotes the incorporation of traditional knowledge and local people into the management of the environment (See section 17.81(c), 17.92(c) and 17.94(b)) (Leach *et al.* 1999; Veitayaki 1997; Wescott 2002).

Community based management has been praised by many people engaging with and caring for natural resources. It was only widely recognised late in the twentieth century that communities as customary resource owners are vital to decision making and implementation processes. Approaches based on such understanding will enable local communities to work closely with their outside counterparts, and have their interest and needs prioritised in the planning and management of marine resources through participatory processes and grass-root approaches. Evidence over the years has strongly indicated that sustainable protection of marine resources is unlikely to be achievable, unless the desires of the local community are well considered (Lam 1998; Seidel 2009). With the inclusion of local resource owners in this approach, it certainly needs mutual understanding, confidence, perseverance and individual commitment in the long

term. These components have been long absent in the development of management plans which are apparently initiated (Bell 2007; Seidel 2009; Veitayaki *et al.* 2003). As Thaman *et al.*(2000) point out, biodiversity is best understood by the local resource owners and therefore conservation is better achieved when it is planned, implemented and monitored by owners and users at the community level.

Indeed centralised management has a number of limitations for which advocates believe community based management holds the answer. Lam (1998) explains how conventional fisheries management usually 'pits the manager against the managed' in an adversarial relationship that excludes fishers from the decision making process and doesn't encourage them to understand or appreciate the need for certain management measures. This results in frequent circumvention of these poorly understood measures (see also Adams 1998b). Ruddle (1998a) discusses how engaging local people in management minimises enforcement and management costs, and Begossi (1995) states that communal monitoring allows for more thorough and efficient detection of rule violation.

It is therefore, one of my intentions in this thesis to assess the relative abilities of the multiple stakeholders and the local people to sustainably manage the inshore environment and the resources of the two villages in this case study, in the Western Province, Solomon Islands, and to draw some conclusions as to whether or not community based resource management holds the answer for future inshore coastal management in this region.

2.6 Traditional marine resource management in the South Pacific

Most small island nations of the South Pacific region have a long record of common involvement in marine resource management, exhibiting management styles that rival western science based fisheries in their complexity and effectiveness. The paradigm of management is a combination of traditional ecological knowledge (TEK) and the existence of customary marine tenure (CMT) systems, by which families, tribes and communities have exclusive rights over the land and adjacent sea area (Maggi 2012). These are well-functioning systems of community based marine management that have evolved over time (Ruddle 1998b; Veitayaki 1997).

The region is worthy of wider study and interest because in most Pacific Islands the ocean is regarded as not separate from the land but as a part of it. As an

extension of the land, the ocean and reefs are owned by communal groups who claim fishing rights and draw their livelihood directly from them or through exchange systems with their inland neighbours for food crops (Veitayaki 2000). Marine boundaries are also shifted and rights to fish in other groups' reefs or offshore areas are negotiated as the need arises. In many parts of the Pacific, people's knowledge of the marine environment is as astute as their knowledge of gardens and forests.

2.6.1 Customary marine tenure system

Numerous works have been conducted by a number of scholars and researchers (see Asafu-Adjaye 2000; Aswani 2005; Cinner *et al.* 2005; Foster and Poggie Jr 1993; Hviding 1998; Hviding and Baine 1996; Lam 1998; Ruddle 1998b) on the different aspects of CMT.

Many of the small island countries in the South Pacific have established values and traditions of the use of marine resources; of particular interest is the marine tenure system, sometimes known as "customary rights". Under customary law kinship groups have the proprietary rights to the majority of the inshore vicinity, and can restrict 'outsiders' from fishing in the area (Amos 1995; Hviding 1989; Wright and Hill 1993). This is known as customary marine tenure (CMT) and it operates under a diversity of different rules and practises in various island societies (Lam 1998), but the great majority of CMT systems are applied to distinct geographic and environmental locales, restrict entry, are self-monitoring, and enforce local rules and regulations (Lam 1998; Ruddle 1994 1996a).

Community property rights will usually extend to the outermost edge of the reefs and typically the customary owner/user group has the right to exclude outsiders (Hviding 1998). Traditional management mechanisms have evolved over time and generally involved restrictions from harvesting certain species or at certain areas.

According to Lam (1998), the notion of fisheries management in the South Pacific Islands is prominently acknowledged and was carried out widely. The CMT system, more commonly understood as traditional rights or customary law, promotes management at the community level. Ruddle *et al.* (1992 250) explained CMT as used here,

"customary" refers to an institution that has continuous links with the past as it adapts to handling contemporary issues; "marine" refers to the institution as dealing with reef, lagoon, coast, and open sea, including islands and islets within this overall sea space; and "tenure" refers to a social process of activities in maintaining control over territory and access to resources.

Asafu-Adaye (2000) further explained that CMT are distinct because they consisted of unwritten rules that make sure of local environmental knowledge embedded in the culture to manage access to the fishing area and the stocks of the resources. In the South Pacific Islands, mainly the Melanesian countries, CMT is noteworthy because it constructed the framework that regulates the social cultural and political relationships and defines cultural identities (Kile 2000). This thesis will study the beliefs and motivations behind local marine management and explore the rules and regulations of controlled access, self-monitoring and adherence by communal moral authority that exist within the system.

2.6.2 Traditional ecological knowledge

Traditional ecological knowledge (TEK), sometimes referred to as indigenous local knowledge (IK) and Indigenous Technical Knowledge (ITK), is a broad and well established body of information that has been gathered over many years by indigenous people through demonstration, observation, experimentation and close association with their natural environment (Berkes *et al.* 2000). Traditional bodies of information, facts and experiences were verbally and systematically handed down over long periods of time from one human being to another (Radhakrishnan and Balasubramanian 2008). It includes the quality of having know-how and teachings from older folks (Thaman *et al.* 2000). TEK is frequently expressed through traditional tunes, stories, folktales, anecdotes, ceremonies, and even rules (Robert Kimtora, 2009, pers. comm.). Other forms are expressed through different means but are related to nature-human relations (Veitayaki 1998).

Indigenous local knowledge normally differentiates one community from another (World Bank 1999). Some indigenous communities depend on TEK for survival because it holds a special and divine meaning to them and for some, TEK reflect their community's interests (World Bank 1999). This is particularly true of traditional environmental knowledge, which refers to a "particular form of place-based knowledge of the diversity and interactions among plant and animal

species, landforms, watercourses, and other qualities of the biophysical environment in a given place" (Peña 2005 198). An example of a society with a wealth of TEK is the North American Indian peoples (Reo and Whyte 2012). However, there are also traditions of ecological knowledge in various indigenous societies in South America, Australia, New Zealand and parts of Africa and Asia as well as the Pacific Islands (Ferguson and Messier 1997; Hamilton 2003; Wehi *et al.* 2009).

TEK is a highly adaptable and place relevant body of information, with Adam (1998b 129) describing how many South Pacific Islands' coastal fisheries are managed in "self-centered feed-back loops" at the village level where village elders continuously receive information from their fishers which they then apply to the local regulation of fisheries. With the proven inability of the standard western biological and economic models to successfully manage tropical near shore and multispecies fisheries the value and relevance of TEK in modern resource management systems has been increasingly recognised (Lam 1998), with Veitayaki (1997 30) stating that, "costly mistakes have been made when people ignore the experiences of their ancestors or refuse to learn from them".

Veitayaki (1997), also expressed concern that contemporary communities frequently disrespect the wealth of knowledge of their elders, and that the heuristic data that has been acquired and collected over the years is swiftly thrown away or completely displaced (Lam 1998). Thaman *et al.* (2000) stress the importance of recording the TEK of the reefs and making it available to younger generations, stating that if not protected and actively fostered, such marine biological and entho-biodiversity inheritances will be lost forever. This study will document some forms of traditional ecological knowledge existing in the communities in the Solomon Islands; how this knowledge is transferred and safe guarded; and if this TEK has been subjected to loss in recent years.

2.6.3 A revival of traditional marine management

Ignored or unnoticed by colonial administrations, numerous customary tenure systems have continued to operate in some form or another, throughout lengthy periods of colonial occupation, and in post-colonial years (Veitayaki 1997), with Johannes (1998) stating that it is apparent that a number of traditional resource management practices have been employed that the national authorities are not aware of. Cumulative interest from concerned individuals and groups have placed

focus on further research on traditional fisheries management systems, to gain better understanding of the value of learning from activities that have endured throughout the vast periods of time (Adams 1998b), has resulted in many governments of the South Pacific recognising the legitimacy of traditional management systems

Johannes (1998) and Lam (1998) described that in many small island countries, conservation initiatives and programs that are brought into the communities by outsiders have failed miserably and wasted a lot of the villagers' efforts, while Ruddle (1996b 320) cites "the weakness and the helplessness of government agencies – often 'distant, understaffed and under-funded' to manage large areas of inshore fisheries in the face of a surplus of related issues and problems" (see also Lam 1998; Thaman *et al.* 2000; Veitayaki 1997). They argue instead that community-based marine resource management, based upon traditional ecological knowledge (TEK) and customary marine tenure (CMT), can afford more opportunities for sustainable management, claiming that "socially binding yet unwritten and informal rules carry more weight than official regulations" (Ruddle 1998a 7) and that local communities ultimately hold the key to successful marine resource management (Thaman *et al.* 2000).

Others have acknowledged the essential 'flexibility' of community based management systems in allowing more fine tuning management than would be possible with centralised management, and a greater ability to respond to environmental or social catastrophe (Lam 1998; Ruddle 1998a). It is therefore a further intention of this study to describe current government attitudes towards, and initiatives for, community based resource management in Solomon Islands, and to analyse whether or not social norms and informal rules at the local level have greater management potential than official regulations. Furthermore it will study whether the current system of customary marine tenure and traditional inshore management demonstrate inherent flexibility and adaptability to change in the two case study villages.

2.7 Traditional authority practices in the South Pacific/ Melanesia

Ever since their "encounter" with the people of the South Pacific, Europeans have recognised traditional distinction amid the local population residing in the diverse islands of the Pacific region (Beaglehole 1974). They are indeed homes to many different ethnic groups, and today the rural–urban mix in each country differs

considerably (Sand 2002). To this date, the colonial pasts and structure of government of these countries vary widely (see Laking 2010).

Furthermore, rituals, customary power, and relationship ties and extended family members are still significant features in the local island populace today (Laking 2010). The indigenous notion of culture and traditional systems is embodied and practised in certain ways, according to the socio-political and cultural way of life of the people, which may not necessarily be applicable in other areas, such as *kastom*⁵ (for Solomon Islanders), *faka Tonga* (for Tongans), *faa Samoa* (for Samoans) and so on (Sanga 2008). While traditional arrangements and leadership status vary across the small Pacific Island societies, it is important to mention the important roles played by traditional leaders. In particular, chiefs, elders, “big men” and women of status exercise influence and play key roles in their respective villages.

In this study I focus mainly on the style of leadership practices within the Melanesian context of the South Pacific, particularly Vanuatu, Papua New Guinea and Solomon Islands. At the community level, Laking (2010 vii) claimed that , “the traditional authority of the hereditary chief or (in much of Melanesia) the local “big man” is a significant influence on daily life”. According to Sand (2002), the culture status of big-men is seen as one in which the leaders build on long term involvement of family and clans, to achieve wealth and surplus production, letting the leader to pass through the different social rankings (e.g., Allen 1984; Harrison 1993; Lepowsky 1990). The big men may be as influential as the hereditary chiefs and they play key roles in their respective villages, islands and even up to the level of national government. *Wantoks*⁶ and their other commitments related to family and clans are as significant as their civic life (Laking 2010).

⁵ *Kastom* is a Melanesian pidgin expression used to refer to traditional culture, including religion, economics, art and magic (See Ipo 1989).

⁶ The pidgin word ‘wantok’, which is the common local term for ‘tribe’ or ‘clan’, drawn from ‘one-talk’ representing people who converse the same language (See Jourdan 2002). It is an important concept associated with networks of distinct tribal, ethnic, linguistic, and geographic groupings in Melanesia.

However, in recent years, the traditional societies of these countries have been impacted by European systems, colonial regimes and other phenomena and traditions adopted from religious denominations and governments (Laking 2010). Today, these islands are strongly linked with the various Christian denominations and the churches have significant functions in the provision of health and education services. While many of the churches do not have the competency or ambition to extend these essential services, the national government often relies on them to run health services and education institutions (Laking 2010; Robinson and White 1997). The task is for the Island countries to construct greater and more robust coalitions with a broad array of general public groups. Predominantly in Melanesian cultures, it is important to have a good rapport with local families and clans which is crucial for managing the natural and social resources that concern the community (Harrison 1993; Laking 2010). The circumstances where such practices have been successful need to be repeated and reinvigorated even though customary practices employed on the islands are dissimilar (Hickey 2006; Laking 2010). For some villages within these island countries, chiefly authority has declined along with a number of conservation practices (Bass and Dalal-Clayton 1995; Laking 2010; SPREP 1992). Vierros *et al.*(2010) stated that a lot of traditional practices have deteriorated rapidly as a result of the weakening of traditional authorities in rural villages and the reduction in respect for customary rules and traditional knowledge. Hence, I would like to explore in this study if the institutions (e.g. church and education) and outside influences have any impacts that have disturbed the leadership authority and traditional resource management in the two villages of my case study.

2.7.1 Closer look at CBRM and the communities

Despite the volume of literature describing the positive attributes of CBRM, recent debate has ensued over its overall effectiveness with some academics and policy makers asserting the need to question some of the assumptions made about the credibility and capability of traditional communities and their involvement in management strategies (see Armitage *et al.* 2007; Berkes 2004; 2005; Bradshaw 2003; Brosius *et al.* 1998; Jameson *et al.* 2002; Veitayaki 1998). This thesis proposes to test some of the theories and debates about community based resource management against the case studies in Solomon Islands.

2.7.2 The impacts of modernity on CMT

It is widely acknowledged that present day communities are affected by a lot of outside factors that did not exist when many transitional management systems were evolving. These factors bring management challenges for which traditional arrangements were not designed and thus many have severely destabilising effects on the performance of traditional systems (Lam 1998; Ruddle 1998b; Veitayaki 1997). Stemming from modernisation and colonisation such socioeconomic factors as entry into the cash economy; increasing capacity for resource exploitation through improved gear technology; changing political and demographic circumstances; and weakened chiefly power and respect for custom, through religion and western education, all serve to put pressure on or undermine traditional systems of management (Aswani 2005; Gibson and Koontz 1998; Johannes 1998; 2002; Ruddle 1996b; 1998b; Veitayaki 1997).

Thus in order to study the tendency of a community to protect resources, it is important to study both its core characteristics (what decision making processes they have in place and how cohesive they are when faced with management decisions and issues of adherence) and also external factors that will affect the community's ability to sustainably manage its resources (Agrawal and Gibson 2001; Dietz *et al.* 2003). Such analysis of understanding the dissimilarities of traditional and the modern societies should be taken note of, and strictly examine any modern factors that might inhibit the smooth reassignment of management methods (Veitayaki 1997).

2.7.3 Community cohesion

Within the contemporary community based resource management literature there are frequent cautions against the fallacy of idealising indigenous or traditional communities as homogenous entities, devoid of internal conflict, holding widely shared values and qualities, and demonstrating collective decision making (see for examples Adams *et al.* 1992; Agardy *et al.* 2003; Boso and Schwarz 2009; Gibson and Koontz 1998; Grimble and Wellard 1997; Veitayaki 1998). Gibson and Koontz (1998) describe why the somewhat homogenous nature of indigenous people is sometimes presumed to equate to shared values and opinions. They point out that because groups of people in rural areas are likely to be of the same ethnic origin and participate in comparable livelihoods, they might therefore be expected to share the same important beliefs. Rural dwellers tend to

have frequent interfaces with each other which can produce “public and interconnected reputations among community members, facilitating trust and shared understanding” (Gibson and Koontz 1998 625).

However, Agrawal and Gibson (2001 7) on the other hand argue that;

the vision of small, integrated communities using locally-evolved norms and rules to manage resources sustainably and equitably is powerful, the fact that such an ideal views a community as a ‘unified organic whole’, results in a failure to attend to differences within communities, and an ignorance of how these differences affect resource management outcomes.

Awareness of these notions is important and vital if policy changes on behalf of a community are to lead to outcomes that are sustainable and fair. Thus following the now widespread recognition that communities are likely to be heterogenous in ways that may impede their ability to conserve resources (Agrawal and Gibson 2001; Guidetti 2002), the challenge should be to determine the extent to which this heterogeneity presents an obstacle to collaborative efforts and effective resource management (Agrawal and Gibson 2001; Boso and Schwarz 2009).

2.7.4 Conservation ethic

Conservation programs need to include a wider assessment and understanding of the livelihood needs of local people and their knowledge and interests (Berkes 2007). In addition, a thoughtful definition of the classifications of conservation to the local people is important. In many countries local support for conservation remains weak because often rural people are left out in initial dialogues (Berkes *et al.* 2000). There is a need to expand and include all people to participate, manage and conserve the natural environment (Brosius and Russell 2003; Mikalsen *et al.* 2007). To do so may involve linking conservationists with indigenous groups and local associations. The daily activities of most indigenous people often do not match with the tighter demands of contemporary conservation (Redford and Stearman 1993) however, in most cases according to Berkes (2004), they have paramount attributes to associate with environmentalist views.

A further assumption about local communities that has been critiqued in much recent communities based resource management literature is that, they are in possession of heightened ethics of conservation and have high degrees of

reverence for nature which causes them to enact roles of environmental stewardship. Hamilton (2003 68) states that:

the original romantic assumption that all indigenous people had an intrinsic conservation ethic that allowed their societies to remain in balance with nature, is a naive and somewhat patronising over-simplification of indigenous ways of life.

Ruddle (1996b) cautions that, certain conventions about community based management arrangements should not be anticipated to be carried out by genuine resource conversation actors. Smith and Wishnie (2000) critique the manner in which numerous explanations of traditional environmental interactions, indirectly or clearly associate management of resources with extensive synchronicity of inhabitants with an particular environment (see also Govan *et al.* 2009; Preston 2005; Warren-Rhodes *et al.* 2011; Wescott 2002). Nevertheless many small Pacific Islands ecosystems still remain relatively intact despite millennia of exploitation.

2.8 Community participation and development

The notion of community participation has been greatly emphasised over the preceding years. In the 1970s and 1980s, it developed to be the fundamental aspect of most developments as a medium to pursue viability and equality mainly for the underprivileged populace (Gaventa and Valderrama 1999; Rifkin and Annet 1990). A United Nations report (1979 225) defined participation as;

Sharing by people in the benefits of development, active contribution by people to development and involvement of people in decision making at all levels of society.

Participation has become a crucial component of many development plans and projects encouraged by national governments, institutions, agencies and NGOs. Despite the opposing points of view of these various organisations and agencies, all agree that community participation is very important and should be encouraged. Actions by the underprivileged to influence decision making through direct and informal ways have become known as an alternative way by which they can gain access to decision making processes and to resources, and in that way improve their comfort (Denzin and Lincoln 2005b). The World Bank's reasons for community participation, according to Rifkin and Kangere (2002 40) are as follows:

- Local people have a great amount of experience and insight into what works, what does not work and why.
- Involving local people in planning projects can increase their commitment to the project.
- Involving local people can help them to develop technical and managerial skills and thereby increase their opportunities for employment.
- Involving local people help to increase the resources available for the programme.
- Involving local people is a way to bring about 'social learning' for both planners and beneficiaries. 'Social learning' means the development of partnerships between professionals and local people, in which, each group learns from the other.

The arguments for participation seem to assemble on the relationship between three key concepts in community participation, specifically taking time, influence and power (Vandana 1994). It is important to gauge and determine who participates, what participation entails and how it is to be promoted. Likewise, any participation process seems to have two components, regardless of the context, situation or objective: a decision making process and an action process to realize the objective decided on (Mohan and Stokke 2000; Rifkin and Kangere 2002). When participants are uneven in their talents, participation means the less endowed take part and influence the decision-making process in their favour. Stiefel (1981 1-2) defines participation as;

Organised efforts to increase control over resources and regulative institutions in given social situations on the part of the groups and the movements hitherto excluded from such decision making processes.

People with different viewpoints assume very different virtues in community participation. Consequently, opinions on who should participate, in what and how, vary widely between and among development agencies and people (Parfitt 2004). Literature by NGOs tends to emphasise the need for a bottom-up approach. However, community participation can also be broken down into state-initiated as well community initiated activities.

The trend in participation at the moment is to try and support the poorer people who are considered to be vulnerable and less fortunate than others in their communities (Cornwall and Brock 2005; Desai and Potter 2012). Nevertheless,

what is obvious in most developing nations nowadays is the increasing heft of rich companies and organisations keen to extract the limited natural resources. Most people in the rural communities are underprivileged and victims of poor decision making from their leaders and their standard of living is not getting any better despite the efforts made (Desai and Potter 2012).

2.8.1 Conservation easement

The evolution of assistance-grounded methods is now being commonly accepted as a mode of minimising antagonism and safeguarding indigenous support for protecting their natural resources (Kideghesho *et al.* 2007). The methods are grounded on the theory that extensive assistances from conservation projects are important stimulated components for rural communities to alter their approaches, reinforce conservation exertions, and affiliate their actions with conservation objectives (Gadd 2005; Gillett *et al.* 2008).

Increasing number of international literature showed that backing for conservation is often compromised in situations where people's interests and livelihoods are threatened. Gillingham and Lee (1999), observed that villagers around Selous game reserve in Southeast Tanzania were ready to support conservation as long as it did not threaten their interests and livelihoods. In the same area, there was a robust disagreement against the conservation programme due to increased crop damage and associated opportunity costs (Songorwa 1999). In 1986 some families who were relocated to Lake Mbura National Park, in Uganda, were forced to leave the area again after attempting to violate the park's rules and guidelines (Hulme 1997). In Wisconsin, USA, individuals reporting losses to wolves (*Canis lupus*) and other predators were more likely to favour extinction of the predator population (Naughton-Treves *et al.* 2003). In Tanzania, grievances with the park or park officials inspired people's desire to see the parks degazetted (Newmark *et al.* 1993). In Kenya's Laikipia district, peasants perceived several facets of wildlife conservation negatively due to costs inflicted by crop raiders and dangerous wild animals (Gadd 2005). In Mozambique, the Maputo Elephant Reserve was highly applauded by a lot of people except the poor growers, who fall victim to elephants for destroying their crops (De Boer and Baquete 1993).

According to Kideghesho *et al.* (2007), the anticipated properties of assistance-grounded methods have often been very brief or uncommon at all. The explanations were: insufficient assistance (related to expenses of conservation

programmes); unequal allocation; unsuccessful assurances and unrealistic prospects (Gadd 2005; Songorwa 1999); and inadequate involvement, of indigenous groups constructing effective outcomes for resource conservation (Johannes 1998; Songorwa 1999). Additional explanations consist of difficult, experimental and unfounded expectations; failure to respect societies' interest and concern; (Foale 1998; Ruddle 1998a; Songorwa 1999; Veitayaki 1997); insufficient governmental commitment; (Gillett 2005; Thaman *et al.* 2000); scarce socio-economic facts for operative planning (Foale 2006); and obscure critical linkages between development and conservation (Axford *et al.* 2008).

Jafari *et al.* (2007) suggested, besides conservation prices and assistance, socioeconomic characteristics are also important predictors of conservation attitudes. Those generally cited in the literature comprise of affluence, ethnic background, sex, education, scope of household, profession and age (see examples Aswani *et al.* 2007; De Boer and Baquete 1993; Gillingham and Lee 1999; McClanahan *et al.* 2005). In spite of everything, it's more meaningful to see the local people benefit from their own conservation initiatives.

2.8.2 Natural resource management and common property

The conventional verdict on natural resource management and conservation is often a procedural style to problem solving (Andrew *et al.* 2007; Groot and Maarleveld 2000; Lynam *et al.* 2007; Redford and Stearman 1993). Lynam *et al.* (2007 2) stress that the process is by and large straight forward with clearly defined steps which include:

- creating a goal statement,
- assessing constraints or problems and opportunities for achieving the goal,
- identifying ways to solve problems,
- selecting the "best" way, and
- finally implementing the solution.

In spite of this, often a number of experts who come within reach of resource management in this top-down style disregard the awareness, choices and values of the people affected or disturbed by the consequence (see Groot and Maarleveld 2000; Long and Long 1992 ; Lynam *et al.* 2007). Every stakeholder is needed to participate in making decisions related to natural resources (Lynam *et al.* 2007). But, many of the interventions reflect non-local biases and local

communities often have to compromise (Gass *et al.* 1997). In many instances this style of management, according to Lynam *et al.*(2007 3), “fails to recognise and balance multiple interests, interactions, and variables involved in this wider context”.

When the opinions, experiences and choices of the people managing or depending on resources are considered there is high anticipation in solving and identifying problems related to natural resource management (Ramirez 1999). In other words the more organised the people, they can achieve the anticipated appreciative or sense of trust that experts need to be effective. Stakeholder commitment has developed from a minimal interest to a dynamic impact. The importance, and the need for, including community in resource management can revive the development of a range of tactics and methodologies (Campbell and Luckert 2002; Chambers 1992).

In 1968 ecologist Garret Hardin introduced the concept of the ‘tragedy of the commons’ as a means of acknowledging why humankind has come to be at the verge of several environmental calamities. Debates to uphold and maintain coastal resources are incomplete without the consideration of Hardin’s (1968) tragedy of commons. It is often a starting point in common property discussions. Hardin’s theory works on the premise that within communally owned areas the negative impact of exploitation by an individual is shared amongst the whole group, whereas the positive gain of exploitation is beneficial only to the individual. Thus to the individual the perceived benefits of exploitation outweigh the costs, making continued exploitation the rational course of action. The tragedy lies in the fact that if every individual operates under this rationale over-exploitation occurs. De Young (1999) explains how in such circumstances people face a dangerous situation created by the evidently suitable and innocent behaviour of many individuals acting alone.

It has been suggested that local management of marine resources can act as an alternative to Hardin’s (1968) ‘tragedy of the commons’ because sea tenure, as a form of territoriality, serves the purpose of guaranteeing access to resources, and therefore often has the effect of reducing competition for limited resources and increasing individual control over resources (Berkes 2005; Lam 1998). Alcala (1998) explains that whereas open access has been blamed for the unrestricted exploitation of fisheries; community based management provides resource users with a sense of being proprietors and claimants of a resource, and therefore

leads to more rational use (Dietz *et al.* 2003). Thus this thesis will examine the effectiveness of the customary marine tenure system in avoiding open access attitudes in that area and thus preventing a tragedy scenario.

2.8.3 Roles in co-management with the Government

Co-management, as a tool for involving more than one party in managing resources, is attracting more and more interest in the recent years. A review of community based management literature points to the need for mutual responsibility links between government agencies, non-government organisations and local communities, with Hunt (1996) and Begossi (1995) stating that without government support, coastal communities do not have the capacity to manage fishing grounds and to look after their welfare against poachers. The relationship is a mutually dependant one and it has been said of the South Pacific societies, that without the support of the rural communities it is unlikely that any Government initiated marine management regime will be successful due to the sheer enormity of maritime space under fisheries jurisdiction and a lack of human and economic resources within the government fisheries ministries (Chakalall *et al.* 1998; Wescott 2002).

According to Jentoft (2005), co-management can be seen as a step towards social consensus and community empowerment but, in society as a whole, democracy may also be exploited to the benefit of any particular interest groups (Njaya 2007). Consequently, co-management and community based management are not just simple solutions to overexploitation and other (local) resource use problems. They are in most circumstances resorted to as a form of crisis management, seen as a way to impose environmental stewardship over the resource, to take in fishers' point of views, and find solutions for existing conflicts over resource use (Béné and Neiland 2006).

The involvement of stakeholders, especially governments and other institutions in management, can be at different levels and may vary greatly among communities, regions and countries (Berkes 2009; Gounder 2009; Pomeroy and Rivera-Guieb 2006). A key task in many post-colonial developing countries, for example in the development of conservation policies, remains, "how to achieve a transition from a colonial and authoritarian past to a democratic future involving more voices and organisations at all levels" (Agrawal and Gibson 2001 x). This challenge acts across a number of policy sectors, such as the development of

conservation policy. Governments often face difficulties in deliberating their priority issues with other institutions, and the trend toward associating conservation action with community participation, livelihood options, and improved living standards, creates even greater complexity, with each additional agency involved bringing its own institutional perspectives and priorities (Brosius *et al.* 1998; Kellert *et al.* 2000; Leach *et al.* 1999; Parfitt 2004) .

The contribution and participation of NGOs is increasingly encouraged within co-management. NGOs involvement compels new actions on the part of government agencies (Alcala 1998; Béné and Neiland 2006). To a certain extent, government agencies depend on NGO funded initiatives (with their flexibility, feedback and monitoring characteristics) to explore innovative approaches and build the necessary base of political support and capacity for their implementation (Alcala 1998; Andrew *et al.* 2007; Béné and Neiland 2006; Govan *et al.* 2009; Wescott 2002).

Even though different forms of community based management and co-management set-ups have thus been developed, it has so far been challenging to assess whether anticipated outcomes of greater sustainability, efficiency and equity of the resource and its users, have been achieved (Pomeroy and Berkes 1997; Sen and Raakjaer Nielsen 1996; Sutinen 2010; Thaman *et al.* 2000). Further research is needed on the local (e.g., environmental, social, economic, political) conditions, which underpin the success of community based management as the most appropriate management approach.

It is therefore important to look at the role currently being played by the Solomon Islands Government through the Ministry of Fisheries and Marine Resources (MFMR) in its support for village based inshore marine based management and to analyse how government can best help rural communities in their need to manage their resources, whether through dissemination of information, capacity building of management skills, or increased power of local enforcement.

2.8.4 Fishers to lead

Decline in coastal marine resources due to human activities such as overfishing and pollution could be overturned if governments, NGOs, universities, communities and other stakeholders embraced a more integrated and cohesive approach to manage coastal environments (Johannes 1998; Pomeroy 1995).

Tangible marine conservation and management strategies have to involve participatory approaches which understand the makeup of beneficiary communities in order to establish and carry out effective marine resource management (Armitage *et al.* 2007; Foale 2000; Pomeroy and Berkes 1997; Ruddle 1998a).

Over the years, much of fisheries management has misapplied its prominence in development (FAO 2001; Larkin 1996). It has been dominated generally by the interest of biologists and economists (Caddy and Cochrane 2001; FAO 2001) but without realising that the notion of marine management is about managing people (Hviding and Baine 1996; Natcher and Hickey 2002). Many long standing biological and economic approaches to fisheries management have largely ignored the role of fishers, considering them to be somewhat alien elements in otherwise well-ordered statistical models (Pinkerton 1994). It is important to understand the related factors of human needs and actions in order to be successful in managing the marine resources (FAO 2001; Ruddle 2000), because fisheries management is all about integrating and understanding the intricate human aspect with the natural system (Berkes and Folke 1998; FAO 2001; Pitcher and Lam 2010).

A wide range of literature relating to the dynamics of fishing communities has arisen over the past years (World Bank 2000b) but it fails to recognise the social composition or makeup of a given fishing community with relationships to different levels of influence, power and accessibility (Ruddle 2000). Many researchers have assumed communities to be homogenous groups based on the assumption that all members have similar interests whereas they can consist of subgroups with different social, cultural and economic priorities (Gibson and Koontz 1998). For example, the livelihood dependence of a given community member and his/her family on the marine environment may not be the same as other individuals and families in the community. Someone from outside can view a community as one united group assuming predominately similar views when in fact, individuals can have different values and interests (Gough *et al.* 2010). The internal differences within a group or community can provide valuable information relevant to decision making and assist in implementing ways forward to sustainably manage the resource (Gibson and Koontz 1998; Gough *et al.* 2010).

Marine resource management is a human phenomenon and it needs more emphasis in practise, theory and policy (Colding and Folke 2001; FAO 2001).

Human actions are associated with the ecosystems and renewable resources through the fisheries. Humans' involvement is the defining characteristic. As without it there would only be the ocean and the marine species (FAO 2001; Pitcher and Lam 2010). Obviously, the fisheries are something much more human than the fishing methods, fish species, coastal areas, markets and fishing gears. It has to be noted that culture, in particular the relations local communities have with their environment, is an important factor which deserves more recognition in the implementation of resource management (Natcher and Hickey 2002; Njaya 2007).

It is therefore, important to reconsider what fisheries are mostly about, understanding that the chore is not so much the management of the marine environments, but rather the management of fishers (FAO 2001). In order to be successful in managing the marine resources, it is important to consider integrating the social and cultural concerns with traditional knowledge and the science (FAO 2001). And, in the long run, the degree of its accomplishment will depend upon how well it endorses the well-being of those under-privileged people living in fishing communities. Management regulations must also deliberate the repercussions on stakeholders (FAO 2004b).

The description of a community in conservation is a history of reassessment as Agrawal and Gibson (1999 631) explains:

The basic elements of earlier policy and scholarly writings about local communities and their residents are familiar. "People" were an obstacle to efficient and "rational" organisation of resource use. A convincing logic under-girded the belief that the goals of conservation and the interests of local communities were in opposition: Conservation required protection of threatened resources: wildlife, forests, pastures and marine resources. Members of local communities, however, rely on these resources for their fodder, fuel wood, water, and food and thus exploit them without restraint.

This was made popular by Garrett Hardin and followed by a number of authors that served to (mis)guide policy, and delivered a convincing justification of how resource degradation and reduction took place (Agrawal and Gibson 1999).

An in-depth socio-cultural study into the differences in a given community is important because fishing professions are tangled though the whole structure of the community's culture. Intergenerational transfer of fishing "legacy" and access

has been vital in the past, but is weakening at the alarming rate because of new challenging political and economic conditions (FAO 2001; Pomeroy 1995).

2.8.5 Women and fishing

For decades now women have been involved in many types of fishing and have significantly contributed to resource management (Hilly *et al.* 2012), but rarely has their contribution been valued equally to men (Bennett 2005). Women have participated in all aspects of fisheries from the pre- and post-harvest processing of seafood products to the marketing of the catch (Bennett *et al.* 2004; Srinath 2002; Thompson 1985).

In most developing countries, women and men work side by side in assisting each other in fishing activities (Bennett *et al.* 2004). The men generally use larger boats to fish off-shore and in deep-sea waters while women on the other hand fish along shallow areas with smaller boats and canoes. Today, a lot more women are engaging in fishing activities than before as they struggle to put food on the table and supplement the family income. They glean the shallow reefs using simple basic fishing gear to look for shellfish, reef fish and seaweed (FAO 1996). In artisanal fisheries, women perform the time-consuming chores such as patching and mending nets; assist their male counterparts in processing the catch and marketing the fish products (Béné and Merten 2008; FAO 1996).

The absence of records on women's roles in fisheries can be attributed to a number of reasons. First and foremost, production aims remain to govern the national strategic plans, (Thompson 1985). A lot of fisheries studies tend to focus more on the male controlled (the gathering segment) activities than the females (handling and selling segment) (Bennett *et al.* 2004; FAO 1996). Second, research is repeatedly gender biased and fails to see the bigger livelihoods scenario (Bennett 2005; Hilly *et al.* 2012). For instance, due to cultural reasons, researchers are often unable to interview women so instead they persuaded the male family member to speak on behalf of their female counterparts (FAO 1996). Third, often at the national level, there is no specific gender-grouped data; therefore it is challenging to obtain vital information when you want to narrow your search specifically toward gender in the fisheries sector (Bennett *et al.* 2004).

The role of women is often ignored. Nevertheless, research has revealed that women are powerless because they are often marginalised and excluded in decision making power in their community (Bennett *et al.* 2004; Srinath 2002). Gender inequities typically prevent women from having the same opportunities as men to participate in and benefit from development processes and are still an issue. Current social, economic and political structures duplicate and even deepen women's relegation in many contexts.

In this study I try to explore some of the activities that women undertake in the village and how they contribute to decision making. The difficulties arise in the obstacles facing women to be able to participate, contribute and be vocal in all decision-making practices related to fisheries management at every level (Bennett *et al.* 2004). Bennett *et.al* (2004) acknowledged that women barely have access to the process of management even though they have the capability to make a difference in their communities.

2.8.6 The socio cultural environments and their shifts

While biodiversity is one of the main foci for many researchers on sustainable development, much less attention is paid to the maintenance of cultural diversity (Scheyvens 1999). Despite the enduring forms of cultural diversity and similarity within the South Pacific Island regions, many if not most societies and cultures are shifting from the 'traditional way of life'. On the whole, these changes have stemmed from the adoption of western influences, in culture, trade and policy making. They have changed old forms of social organisation, sometimes removing old distinctions, at other times magnifying them. Mounting from these social transformations are new forms of disparities, new injustices and new groups of marginalised peoples as well as benefits and opportunities (Scheyvens 1999).

Social capital including culture specific and traditional oral history play significant roles in the environment (Zanetell and Knuth 2004). For example, in the South Pacific; land is a fundamental source of security and confidence (Crocombe 1987; Maenu'u 1984; Ravuvu 1983). Before the advent of Europeans and beginning of colonialism, indigenous people had customary rights to the land through a classification of responsibility and duties within clan groups, and through marriages and other procedural affiliation (Mohamed and Clark 1996). The land is core component to indigenous people distinctiveness, their traditional

custom, spiritual beliefs and a natural source of wealth. The queries of customary land entitlements and its use are central to any scrutiny of marine concerns in the Pacific region (Asafu-Adjaye 2000; Mohamed and Clark 1996). It has been widely recognised as one of the most important components of life and livelihoods in the Pacific Islands (Crocombe 1987). As Veitayaki (1997) explains, fisheries management in traditional communities is well integrated because people are aware of the dynamics of their marine resources and regard them as an integral part of the ecology of the coastal zone.

From a sustainable society perspective, issues of equity, fairness and opportunities for all stakeholders to participate in development processes are vital when considering whether sustainable resource management is an achievable goal (Axford *et al.* 2008). It is when examining these issues that constraints on the achievement of sustainable development become clearer. I am referring here, in particular, to inequalities which frame the marginalisation of significant groups within some societies. Berkes (2005) articulated that resource management is a complex affair involving not only the nature of the resource concerned, but also the nature of the tenure system applied and the different motivational dynamics of the stakeholders involved (see also Cinner *et al.* 2005; Colding and Folke 2001; Duke *et al.* 2007). Thus in order to gain thorough understanding of the details, benefits and failings of such a system, a clear-headed and realistic evaluation must be made of communities' abilities and desires to conserve or otherwise use their natural resources sensibly (see Armitage *et al.* 2007; Heath and Binswanger 1996; Hviding 1998).

2.9 Summary

The literature review delineates the theoretical basis for my research and is instrumental towards informing my research questions. It briefly outlines the debates and concerns about the effects of economic development on health and the environment in the 1980s which has significant implications for the status of fish populations, ocean habitats and marine biological diversity on issues affecting Small Island Developing states.

In addition it provides a global overview of the movement from 'top-down' (government-driven) to more 'bottom-up' (local, participatory or community-based) approaches to natural resource management. It provides an insight into, and understanding of, the topic of community based conservation. The complexity of conditions for local resource management, ranging from political

and social stability to environmental monitoring capacity and community participation, poses challenges for identifying appropriate steps to understand and explain the way forward to manage marine resources (i.e. to be successful from a long-term perspective).

Furthermore, it introduces CMT as a form of “law” found in small Island nations when indigenous communities define their rights to marine resources in their marine area. It is commonly regarded as the traditional form of marine resource management.

Different aspects of trying to address CBRM have emerged in the literature with the unpacking of the notion over the years. Many authors came to realise the complexity of the governance of resources in the fields of fisheries, forests, wildlife and land use. They have argued that the arrangements to manage these resources will require not just a single body but a multiple parties approach. They explain that sharing of power and responsibility is a way forward to effectively manage the resources as different parties can have the potential to bring to the discussion table knowledge that is acquired at different scales. However, some researchers have cautioned against seeing co-management as a solution to legitimacy and argued that it has its weakness in poverty reduction and in empowering marginalised people because it can result in causing negative impacts on equity and community welfare. They observe that sometimes sharing of power can lead to strengthening of local elite power or to reinforce the control of state.

Finally, the review argues that community based management approaches seem to be the best possible way to make coastal marine resource management functional and through consensus, based on full community or stakeholder participation, also more resilient. For complex management situations, integrated approaches that include social, cultural and biological disciplines should be valuable, in management theory, methodology and implementation at a community level.

It is the intention of this study to try and understand the social and environmental mechanisms that influence a community’s willingness to participate in conservation and their ability to engage in marine resource management. By providing an account of the views, aspirations, opportunities and capabilities of the local communities in relation to community based marine resource

management this research seeks to uncover some of the realities of community involvement in day to day activities in the near-shore reef system. A thorough analysis of social and environmental influences on communities' interactions with the environment will allow discussion of not only the opportunities and potential of such systems but also the limitations and difficulties involved in marine resource management.

In the next chapter, I will introduce the nation of Solomon Islands by providing a brief history of the country and discussing current demographic and social trends and aspects of the economy that influence environmental considerations. The emphasis of the study is on Western Province, in particular Toumoa village on the island of Fauro in the Shortland island group and Liangai village on the northern tip of the island of Vella la Vella. These are my two case study villages.

CHAPTER 3: STUDY SETTING

3.1 Introduction

This chapter provides a background overview and introduces the case studies. It begins with a summary of the Solomon Islands' environmental, demographic, economic and socio-cultural setting. This is followed by an ethnographic overview of the Western Province, which introduces the case study sites: the village of Liangai on the island of Vella la Vella and Toumoa village on the island of Fauro in the Shortland island group

3.2 The Solomon Islands

Situated east of Papua New Guinea (PNG) and Northeast of Australia, the Solomon Islands (see Figure 1) share the beauty of the South Pacific, characterised by small island masses dispersed over part of the world's largest ocean with economic and cultural dependence on the natural environment (SPREP 1992). The country has approximately 900 plus small scattered islands spread over more than 1.3 million square kilometres of sea. The coast line has a length of 5,313 km. There are six major islands; Makira, Malaita, Guadalcanal, Isabel, New Georgia and Choiseul. The country has a total land area of roughly 28,000 square kilometres and it is the second largest archipelago in the South Pacific (Kile 2000).

The United Kingdom established a protectorate over the Solomon Islands in the 1890s. Self-government was achieved in 1976 and was followed by independence in 1978. Politically the Solomon Islands has a single house parliamentary democracy with the Prime Minister as the head of the government and Queen as the head of state. The Queen's representative in the country is the Governor General. There are nine provincial governments set up in the country; Temotu, Makira and Ulawa, Malaita, Rennell and Bellona, Central, Isabel, Guadalcanal, Western and Choiseul (see Figure 1).

Solomon Islanders contrast from island to island, and village to village. Solomon Islands has a population of 515,870 people (National Statistics Office 2009) and 87 indigenous languages in addition to Melanesian Pidgin, which is used predominantly. Religion, tradition, and other ways of life are dissimilar within each group (Department of National Reform and Planning 2003). An estimated 94 per cent of the people are Melanesian and there are small Polynesian,

Micronesian, Chinese and European communities. The majority of the population lives in villages along the coasts of the islands. Sizes of villages differ quite markedly from one island to another. Household based subsistence is focused on shifting agriculture, fishing, and reef gleaning (Hviding and Baines 1994; Rural Development Division 2001; Solomon Islands Coastal Marine Resources Consultancy 2002). However, much of what can be found in most villages today is what can be termed as “mixed production”, part for subsistence consumption and part for sale for cash income.



Figure 1. Map of the Solomon Islands showing the nine Provinces.

(Source: Max Oulton, University of Waikato).

Domestic economic growth has been slow ever since independence in 1978 and despite investments in infrastructure, services in most rural areas remain inadequate. The country faces a large number of development challenges. Major exports are limited to only three industries: fishing, agriculture and forestry. The lack of economic opportunities and services in the Provinces has sparked migration into the capital Honiara, leading to overcrowding, pollution and an increase of criminal activities (Dinnen 2002).

The country has just recovered from the economic, social and political implications of a period of major civil disturbance (referred to as “ethnic tension”) that erupted in Honiara, the capital city, in 2000 and only subsided in 2003 (Lane

2006). The conflict was so severe that it posed a threat to the viability of Solomon Islands as a nation. Some even labelled the country as a 'failed state' (Hughes 2003).

3.3 Economy

Like other Pacific island countries, the Solomon Islands is heavily dependent on aid and imports (Hughes 2003). The government has relied almost entirely on natural resources, mainly fisheries and timber exports, to offset the country's trade deficit and provide economic growth. Marine resource exports (not including tuna) peaked in 1992 (Kile 2000), while logging exports peaked in 1996 (Central Bank of Solomon Islands 2006). Exports have been in decline ever since. Nonetheless, dependence on resource rents has steadily increased, with log exports accounting for 43.5 per cent of the country's GDP in 1990's, 56 per cent in 1994 (Kabutaulaka 2000) and 68 per cent in 2000 (Central Bank of Solomon Islands 2003).

Solomon Islands is ranked as a least developed nation with a per capita GDP of \$474, and more than 75 per cent of its labor force is engaged in subsistence farming and fishing (United Nations 2002). Until 1998, when world prices for tropical timber fell steeply, timber was Solomon Islands main export product, and, in recent years, Solomon Islands forests have been dangerously overexploited. Other important cash crops and exports include copra and palm oil. In 1998 Ross Mining of Australia began producing gold at Gold Ridge on Guadalcanal. Minerals exploration in other areas is continuing. However in the wake of the ethnic violence in June 2000, exports of palm oil and gold ceased while exports of timber fell. Exports are just now beginning to recover and are slowly increasing.

Solomon Islands was particularly hard hit by the Asian economic crisis even before the ethnic violence of June 2000 (Central Bank of Solomon Islands 2000). The Asian Development Bank estimates that the crash of the market for tropical timber reduced Solomon Island's GDP by between 15 per cent and 25 per cent (United Nations 2002). About one-half of all jobs in the timber industry were lost. The government has said it will reform timber harvesting policies with the aim of resuming logging on a more sustainable basis (Central Bank of Solomon Islands 2006).

Exploitation of Solomon Islands' fisheries offers the best prospect for further export and domestic economic expansion. However, a Japanese joint venture, Solomon Taiyo Ltd., which operated the only fish cannery in the country, closed in mid-2000 as a result of the ethnic disturbances (Central Bank of Solomon Islands 2000). The plant has reopened under a new management and they have continued to export tuna overseas. The Gold Ridge mine and the major oil-palm plantation have reopened and now are in full operation (Central Bank of Solomon Islands 2006).

Tourism, particularly diving, is an important activity in Solomon Islands but has been hindered by political instability in 2003 (The World Bank 2010). The influx of tourists is picking up now after the royal visit of Duke and Duchess of Cambridge in 2012 in Honiara.

The Solomon Islands Government was insolvent by 2002. The government has reorganized its budget since the arrival of RAMSI⁷ in 2003 and has taken a good look its priorities. It has strengthened and incorporated its national debt and with Australian backing, is now looking to renegotiate its overseas obligations. Much work remains to be done. Economic development remains negatively impacted by the on-going political instability (Dinnen 2002; United Nations 2002). Corruption at all levels of the public and private sphere has always been considered rampant but recent audit reports have quantified just how omnipresent and damaging such practices have been (Aqorau 2008; Dinnen and McLeod 2009). Principal aid donors are Australia, New Zealand, the European Union, Japan, and the Republic of China (Central Bank of Solomon Islands 2003). The on-going corruption and mismanagement of government revenue and foreign aid has caused exchange rate appreciation. This has a detrimental effect on potential investment in the agricultural and manufacturing sectors and has also contributed to the over-exploitation of the environment (Hughes 2003; Lane 2006). In the midst of the complexity of the economic and political dilemma within the country; the practice of conservation regimes must be integrated, however,

⁷ The Regional Assistant Mission to Solomon Islands (RAMSI) is a multilateral intervention force, led by Australia in partnership with 14 countries in the Pacific region to the Solomon Islands in 2003 to restore law and order.

this can be further constrained by two integral socio-cultural and socio-political elements; namely *wantok* and *kastom*.

3.4 *Wantok and kastom*

The terms “*kastom*” and “*wantok*” are often used in Melanesian countries which include Papua New Guinea (PNG), Vanuatu and Solomon Islands (see Harrison 1993; Sand 2002; Sanga 2008) .

According to Tynan *et al.*(2011 3), “*kastom* is a Melanesian pidgin expression used to refer to traditional culture, including religion, economics, art and magic”. The word is used by Solomon Islanders to mutually refer to their inherited traditions and culture (Sanga 2008). In Solomon Islands traditional culture many cultural values and *kastom* are preserved and disseminated from one generation to another (See Aswani 2005; Sanga 2008). There is no codification of the kinds of knowledge and practices that are identified as *kastom*. Rather, the term has come to indicate the practices and characteristics that distinguish Solomon Islanders from other people (see Ipo 1989; Sanga 2008). For most indigenous Solomon Islanders, features of *kastom* continue to be a robust and important influence in their daily lives, particularly in the villages (Hviding and Baines 1994). The great linguistic diversity of the Solomon Islands also reflects huge cultural diversity, each language representing a group of people with distinctive oral histories, cosmologies, customs and traditions (Firth 1998). The *wantok system* and *kastom* have several elements of direct significance to this thesis because they are identified as variables that have had relevant impacts on marine resource management ambitions.

The pidgin word ‘*wantok*’, is the common local term for ‘tribe’ or ‘clan’, drawn from ‘one-talk’ representing people who converse in the same language (Jourdan 2002). According to Nanu (2011), *wantoks* have strong affiliation with, and responsibility towards, each other. They are obliged to support other group members with goods and monetary assistance. The positive aspects of this arrangement are that it provides cultural and linguistic identity and a support network in times of difficulty. On the other hand, the responsibility to one’s *wantok* is extended to public life. The inclination to ‘look after one’s own’ is not easily set aside and the result is a tendency towards political patronage which many Solomon islanders would not regard as improper (Kabutauka 1998). The *wantok* system is a social process that emphasis mutual assistance and involves a string of responsibilities based on mutual trade-off, a term often referred to as

wantokism (Kabutauka 1998). *Wantok* identity is a new form of social identification and is most relevant in provincial centres and in Honiara. For instance, residents are obliged to receive their visiting *wantoks* from rural areas by feeding, accommodating and financially supporting them (Jourdan 2002). In the villages, this is not too obvious as people are related to each other and are more focused on immediate needs such as meeting their livelihoods and have their own houses, gardens and marine resource areas.

3.5 Land tenure

For most people in Solomon Islands, land has traditionally been distinguished in spiritual, political and economic terms (see Allan 1957; Naval Intelligence Division 1945). On the whole, the land tenure systems in Solomon islands have never been thoroughly coded (Maenu'u 1984). It has been estimated that approximately 12 per cent land of Solomon Islands is alienated, with about 88 per cent remaining as customary land. Of the 12 per cent alienated land, four per cent is owned by indigenous Solomon Islanders and eight per cent is government owned (Ipo 1989)

The social relationships between and within local communities are usually grounded in the landscapes in terms of historical ancestral connections. This means that the customary tenure is not only concerned with the use of physical resources but also with forms of culture and social organization which may not be apparent to western eyes (Filer and Sekhran 1998). Much of this social organization is around genealogy, which follows the history of lineage in a geographical area or location.

From a social perspective, interest in land draws from membership of kinship groups and so it has social obligations. Generally, the kinship group upholds primary interests in land that provides for individual subsistence and survival (Nanau 2011). The land is where most dealings in ones life and the lives of immediate relatives occur so life's events are identified with the land itself. According to Allan (1957) the economic significance of the land is viewed in terms of how arable it is, and its productivity, although many believe productivity is somewhat controllable by magic. In terms of political significance, land has been a source of associations between chiefs, village elders and communities, and land allocation is a means by which chiefs may augment their status and ensure reciprocity in other forms, according to their needs (Maenu'u 1984). Lastly

but not the least, the land has a spiritual importance in that, people traditionally conceive land as a physical representation of their past and their future (MacDonald 2001).

The reefs and the nearby small islands are regarded as an extension of the land and were traditionally subject to varying degrees of exclusive interest, depending on the significance of the reefs to the social organisation and culture of the communities which controlled them (Kabui 1997). This has significance for this thesis because it is identified as one of the components that have had relevant impacts on the aspirations for marine resource management. As the case study villages are in the Western Province, the next segment of this chapter will first introduce the Western Province and then follow with the two case study villages

3.6 Western Province

3.6.1 Location and topography

Western Province is by far the largest Province of Solomon Islands and is scattered over a vast ocean area as shown in Figure 2 and has a total land area of 5,500 km² (Rural Development Division 2001). It is an archipelago of islands stretching from the Shortlands, at the southern tip of the Province's "sister Island" Bougainville in Papua New Guinea, to its southernmost point, the uninhabited volcanic crater emerging from the sea as Mbulo, just north of the Russell islands of the Central Province.

The Province consists of 11 islands of moderate size and a number of smaller ones, and lies to the west of Choiseul and Santa Isabel Provinces. The islands extend in a double chain from northwest to southeast over a distance of about 350km. Those on the inner side are Vella la Vella, Kolombangara, New Georgia, Vagunu and Gatokae. Those on the outer side are the Shortlands (located on the far most north-western end), Rannonga, Simbo, Gizo, Parara, Rendova and Tetepare.



Figure 2. Map of Western Province

(Source: Max Oulton, University of Waikato).

There are two kinds of land tenure system in the Province. More than 83 per cent is held by customary land owners, while 17 per cent is alienated land. Most alienated land is held by the national government and the rest is by non-Solomon Islanders as perpetual estate (Rural Development Division 2001).

The total area that can be used for agriculture in the Province is 3381km² (Rural Development Division 2001). Subsistence agriculture takes up much of the land use in the Province while majority of the alienated land is used for forestry and commercial agriculture and forestry with capital support from outside companies. This includes reforestation at Ringi on the island of Kolombangara, coconut plantations in North New Georgia and palm oil at Vagunu.

3.6.2 Culture and language

The Province is rich in cultural heritage and is concerned with preservation of culture and customs as an important part of its identity. Western Province has several diverse languages with different dialects just like the rest of the country. This reflects the fact that there are many cultural groups, most of which came

together in peace barely one hundred years ago. There are 17 major languages spoken in the Province (Rural Development Division 2001). According to Cox and Mirazón Lahr (2006), the languages spoken are mainly Austronesian believed to have originated from Southeast Asia about eight thousand years ago (see table 2).

Table 2. Languages by district in Western Province

Name	Alternative Name	Region
Alu	Alo	Shortland lands
Baniata	Lokuru, Mbaniata	South Rendova
Bareke	Mbareke	North Vagunu Island
Bilua	Mbilua, Vella la Vella	Vella la Vella Islands
Duke	Ndughore, Nduke	Kolobangara Island
Fauro		Fauro Island
Ghanongga	Kubokota, Kumbokota	North Rannonga
Hoava		North Marovo
Kiribati		Gizo
Kushage	Kusage	North New Georgia
Lungga		South Rannonga
Marovo		South New Georgia, Vangunu Island, Marovo Lagoon
Roviana	Robiana, Rubiana, Ruviana	Roviana Lagoon, Vonavona Lagoon, North Central New Georgia
Simbo	Madeggusu, Sibbo	Simbo Island
Ughele	ugele	North Rendova Island
Vagunu		South West Vangunu

(Source: Gizo provincial office, headquarters)

The people from the Western Province can easily identify themselves as a cultural group and at the same time acknowledged their affiliation with their church community (Rural Development Division 2001). In the Province the chief is generally acknowledged to be the head of a tribe and the chiefly title is inherited by the first born son (Rural Development Division 2001). However it is also based on the exhibition of certain qualities such as being influential and

knowledgeable about customs and having good oratory skills. Where there is no first-born son, the transfer of title differs from one island to other. Traditionally, chiefs also play a very important role in communities and villages in keeping law and order. The chiefly system is vulnerable to the negative effects of the cash economy and external conflicting cultures (Rural Development Division 2001). Culturally women are the custodians of land in the Western Province, however, most decision making in relation to land use is dominated by men. In this sense women serve mainly as the vessel through which land is passed from man to man (Rural Development Division 2001).

3.6.3 Environment

The Province is the best endowed in the country with natural resources, including logs, fish, minerals, water, fertile areas for commercial crop production and tourist attractions both on land and sea (see Table 3). The prolific marine environment is supported by attractive coral reefs, white sandy beaches, mangrove forests and the world's biggest lagoon which have contributed to the Province's reputation for scenic beauty and tourist attractions (Kinch *et al.* 2005). Kavachi is an active submarine volcano that is situated northeast outside of the lagoon and frequently surfaces above the sea before wearing away.

Over the years, however, the environmental conditions on some of the islands in Western Province have deteriorated. This is evident in the islands where logging has taken place. Soil erosion is an issue as too much logging and deforestation over time has caused large areas of soil erosion across the Province, particularly in mountainous areas of New Georgia, Rendova, Vagunu, Gatokae, Kolombangara, and Vella la Vella. This leaves areas susceptible to landslides and soil infertility which makes it difficult to set up agricultural production. In some islands in the Province wild pigs destroy gardens as a result of deforestation and loss of their habitat. Other threats to the environmental integrity of some parts of the Province are as follows:

- Depletion of mangrove forest and other bush materials as a result of increasing demand for houses and firewood.
- Poor sanitation practices and improper solid waste disposal that may cause water contamination and disease,

- Land/hill clearing for shifting cultivation that may speed up runoff velocity to destructive levels, causing sedimentation and increasing water turbidity, flooding and depletion of top soil.

The Province has some rare species of animals and plants only found in Tetepari Island that need to be conserved. These species are not found in other parts of the country and they could be vulnerable to loss of habitat, if the island is not protected from logging and agricultural activities (World Wide Fund for Nature (WWF) 2000).

Table 3. Tourist attractions in Western Province

Tourist attractions	Type of Attraction	Location
Lagoons	Natural	Marovo, Vonavona, Roviana
World war II relics and wreck	Historical	Several locations, including Alu, Mono, Vella la Vella, Rendova, Roviana, Gizo
Kennedy Island	Historical(association with former President Kennedy of USA)	Near Gizo
Traditional sites	Traditional and heritage	Most parts of the Province an example being "skull island" near Gizo
Cultural Ceremonies	Cultural	Most Islands
Wave surfing	Natural	Paeloge in Gizo, Banieta in Rendova
Rainforest, Mountains and Waterfall	Natural	Most Islands
Volcano Activity	Natural	Simbo, Vella la Vella and rarely the Kavachi submarine volcano
Scuba or free diving	Natural	Most Islands

(Source: Gizo provincial office, headquarters)

There is great concern about the effect of rising sea levels on some low lying islands of the Province. People on many small islands have observed that areas which were once crop producing are no longer fertile. It is also noticeable in small islands that water used for cooking and washing is becoming unsuitable as the levels of salt are too high due to encroaching salt water into the ground water. Changes in climate including increasing sea surface temperatures and ocean acidification may also have a significant influence on the biology of the reef

ecosystems, and on their morphology, structure and abundance (Guinotte and Fabry 2008).

3.6.4 Government and institutions

Western Province is separated into nine national constituencies and 26 wards (see Table 4 and Table 5). The Provincial Assembly has 26 members (elected by the respective 26 wards). The term of the Provincial Assembly is four years. Full assembly meetings are held twice a year unless there is an urgent matter that needs attention. The speaker is not necessary an elected provincial member whereas the deputy speaker must be a member of the executive committee. The speaker's role is to convene and control full assembly meetings. The ruling/governing body is called the Provincial Executive which consists of 13 members. That committee meets twice a month unless there are any urgent matters, when the Premier will call for an extra-ordinary meeting. All leading positions such as the Premier, Deputy Premier and Provincial Ministers are filled from the executive. The senior management positions, including the Provincial Secretary, Deputy Secretary, Treasurer and Planner are all seconded to the Province by the Central Government. The provincial headquarters is located on Gizo Island the capital of Western Province.

Table 4. The nine national constituencies of Western Province

North Vella la Vella
South Vella la Vella
Gizo/ Kolobangara
Shortland Islands
Simbo/ Rannogga
Marovo
North New Georgia
West New Georgia- Vonavona
South New Georgia- Rendova

(Source: Gizo provincial office, headquarters)

In the past there was another level of institutions that represented the provincial government at the village level and they were named Area Councils. However, they were abolished in the early 1990s by the national Government as a cost

cutting measure. They played a significant role in the rural areas because they were very influential in delivering social services into the villages. They ensured that the tasks delivered into their villages were done properly and effectively. At the present time each village in Solomon Islands adjusts its own leadership structures (United Nations 2002).

Table 5. Number of wards in each Island

Name of Island	Region	Ward Number
Shortlands	Outer Shortlands	1
	Inner Shortlands	2
Simbo	Simbo	3
Rannonga	North	4
	Central	5
	South	6
Vella la Vella	Vonunu	7
	Mbilua	8
	Dovele	9
	Iriqila	10
Gizo	Gizo	11
Kolombangara	South	12
	North	26
Vonavona	Vonavona Lagoon	13
North New Georgia	Noro	25
	Kusage	14
	Munda	15
	Nusa Roviana	16
	Roviana Lagoon	17
	Kalikolo	20
Rendova	South	18
	North	19
South New Georgia	Buintusu	21
	Nono Lagoon	22
Vagunu	South Vagunu /Gatokae	23
	North Vagunu	24

(Source: Gizo provincial office, headquarters)

3.6.5 Climate and natural disasters

The Province has an ocean equatorial climate with a mean temperature of 27° C (80° F) throughout the year which is humid. The cooler period is from June to August while more rainfall with average between 2,900 and 3,500 millimeters is

expected around November through April (Rural Development Division 2001). Western Province is often affected by natural disasters (Solomon Islands Coastal Marine Resources Consultancy 2002). Cyclones are not frequent and in the last 50 years only five cyclones have been recorded in the Province. However, earthquakes are common especially in the Shortland group, which is known to be the most active seismic area in Solomon Islands. From the period 1950 to 2010 there were at least 134 potentially damaging earthquakes that occurred (see Table 6) although no data exists for the period from 1983- 1993.

Table 6. Summary of disaster events in Western Province

Disasters	Periods					
	1950- 1960	1961-1971	1972-1982	1983-1993	1994-2010	TOTAL
Cyclone	0	4	1	0	0	5
Earthquakes	3	21	43	N/A	67	134
Tsunami	3	0	1	0	2	6
Landslide	0	0	0	0	2	2
Flood	0	0	0	0	6	6
Drought	0	0	0	0	2	2
Volcanic eruption	0	0	0	0	0	0
TOTAL	6	25	45	0	79	155

(Source: Provincial office, Gizo)

On 2 April 2007, a major earthquake struck Solomon Islands followed by a large tsunami. The tsunami affected the provincial capital island Gizo, Simbo, Vella la Vella and the Shortlands Islands. The tsunami was triggered by an 8.1 magnitude earthquake, with an epicentre 345 km northwest of the Solomon Islands capital, Honiara, at a depth of 10 km (Hadden 2007). Fifty-two people were recorded dead as a result of the tsunami. The majority of those killed were from the Western Province, and the tsunami destroyed more than 1000 homes and left thousands of people homeless (McAdoo *et al.* 2009). In Rannonga the shorelines were uplifted to 25 metres exposing the coral reef on the newly formed beaches (Fisher *et al.* 2007; Schwarz *et al.* 2007). On 5 January 2010, a similar disaster resulted in a 7.2 magnitude earthquake triggered a tsunami which completely destroyed around 200 homes and displaced one-third of the population on the island of Rendova in the Western Province. No injuries were reported despite a

series of earthquakes causing a tsunami wave that was over three metres high. The Province is deemed to be highly vulnerable to earthquake and tsunami, has medium vulnerability to river flooding and is classified as low vulnerability in terms of cyclone, drought and volcanic eruptions (Rural Development Division 2001).

3.6.6 Population

Most villages in the Western Province are located right along the shore. The most densely populated villages of the Province are located on the islands of New Georgia and Vella la Vella respectively. On the other hand the most sparsely distributed settlements are scattered in the lagoon areas of Vonavona, Roviana and Marovo (see Figure 2). Most families have their own coconut plantations. The 2009 population census recorded 76,649 people in the Province, making it the second most populous of all the Provinces in the country (after Malaita). In 1999 the total estimated population of 62,739 comprised of 33,190 male and 29,549 female (see table 7). The population increased by 18 per cent between the 1999 and 2009 population censuses (National Statistics Office 2009).

Table 7. Population of Western Province 2009

Population Characteristic	1999	2009
Total population	62,739	76649
Age 0-14	12,547	30683
Age 15+	50192	45966
Male	33,190	39926
Female	29,549	36723

Source: 2009 population census & household income and expenditure survey & Gizo Hospital report.

Western Province has a high percentage of its population under 15 years (Rural Development Division 2001). An average of five babies are born every day in the Gizo hospital alone (pers. Comm. Dr Mike Buin, Acting Chief Medical Officer, Gizo Hospital 2010). This means that by 2015 Western Province would have about 22,775 children from age 0 to 7 years. It is advisable that the provincial government must increase all social services to cater for this very young population. About 90 per cent of the total population lives in rural areas. However, the total number of people moving into the urban centres such as Noro and Gizo is increasing rapidly. This is due to the 'pull' factors of the urban centres

(Rural Development Division 2001). Table 8 provides population by sex by ward in 2009.

Table 8. Western Province population by ward

Ward	Male	Female	total	Percentage
01 Outer Shortlands	648	658	1,306	1.7
02 Inner Shortlands	1,233	1,164	2,397	3.1
03 Simbo	939	843	1,782	2.3
04 North Rannonga	266	275	541	0.7
05 Central Rannonga	1,227	1,287	2,514	3.3
06 South Rannonga	1,721	1,584	3,305	4.3
07 Vonunu	1,837	1,721	3,558	4.6
08 Mbilua	2,245	2,045	4,290	5.6
09 Dovele	1,000	967	1,967	2.6
10 Iriqila	1,461	1,372	2,833	3.7
11 Gizo	3,802	3,375	7,177	9.4
12 South Kolombangara	2,215	1,808	4,023	5.2
13 Vonavona	2,883	2,632	5,515	7.2
14 Kusaghe	1,157	1,081	2,238	2.9
15 Munda	1,352	1,268	2,620	3.4
16 Nusa Roviana	1,018	977	1,995	2.6
17 Roviana Lagoon	2,441	2,234	4,675	6.1
18 South Rendova	1,280	1,197	2,477	3.2
19 North Rendova	879	845	1,724	2.2
20 Kolombanghea	929	854	1,783	2.3
21 Mbuini Tusu	1,596	1,369	2,965	3.9
22 Nono	1,899	1,711	3,610	4.7
23 Gatokae	1,553	1,497	3,050	4
24 North Vangunu	1,320	1,341	2,661	3.5
25 Noro	1,772	1,593	3,365	4.4
26 North Kolombangara	1,253	1,025	2,278	3
Total	39,926	36,723	76,649	100

Source: National Census 2009, Honiara

3.6.7 Education and health services

The Province has a total of 123 primary schools, 29 community high schools, five secondary schools, six rural training schools and 26 registered early childhood centres. There are five schools with form six classes and one school with a form seven arts class. It is evident Western Province has a high level of untrained teachers, low pass rates in senior levels of education, insufficient supplies of resources, low literacy and a high teacher student ratio which is 1:45 (Ministry of Education 2003). The 2009 census report however revealed that Western

Province has the highest literacy rate compared to the other eight Provinces in the country. This shows that despite the above constraints Western Province is well ahead in basic reading, mathematics and writing (National Statistics Office 2009).

According to a report from the Health Department (Western Province Health Division 2009), the Province has stretched out its health services and facilities to most people in the rural areas. This has been a significant achievement in the overall health improvement of the people of Western Province. Reports from Gizo hospital analysts confirm that 95 per cent of the population in the Province has access to health services. The Province has 60 health facilities consisting of two hospitals, 24 rural health clinics, 29 nurse aide posts and five area health centres.

The two hospitals are Hellena Goldie hospital in Munda under the operation of the United Church and Gizo Hospital which is under the jurisdiction of Solomon Islands Government. These hospitals have operating theatres, X-rays, pharmacies and basic laboratory facilities. Major health services provided at these facilities are outpatient clinics, family planning, immunisation and health education. The most common health problems in the Province are malaria, pneumonia and diarrhoea. The major challenges faced by the health department include, clinics being closed due to infrastructure problems, shortage of nursing staff and medicines, and housing and budgetary limitations.

3.6.8 Fisheries

Subsistence traditional and artisanal fishing is certainly a significant means of livelihood and bony fish are a major source of protein for them. The 2009 census shows that 7,397, or 54 per cent of households, produce fish for the market (see Table 9). This makes the selling of fish a very important cash income source in the Province. To support commercial fishing, six fisheries centres have been established with donor funding. The Gizo Fisheries Centre makes and sells ice for fish storage as does the Seghe fisheries Centre in Marovo Lagoon. The other four centres (Munda, Dovele, Korovou and Noro) have not been operating for more than three years at the time of writing.

The fisheries development program in the Province is greatly affected by a number of factors such as high costs of transportation and communication, inadequate qualified staff and limited support of financial and technical

assistance from the central government (Oreihaka and Ramohia 2000). Solomon Taiyo, the major commercial fishing company, operates in the Province at Noro. Its fishing and canning operation, exclusively tuna, ceased due to the social unrest in 2000 but has recovered since the arrival of RAMSI in 2003 and has started its fishing and canning operation again (Central Bank of Solomon Islands 2006). Subsequently, the provincial government has purchased the equity of the minority shareholders, a Japanese company.

Table 9. Market product by households

Activity	Number	Percentage of households
Fish	7397	54.6
Shellfish	2379	19.8
Crab/lobster	1128	11.3
Turtle	468	4.7
Beche-de-mer	700	9.6

(Source: 2009 Provincial Development Fisheries report)

Other marine products marketed from the Province include trochus, crayfish and sharks' fins. Extraction and selling of beche-de-mer was banned by the Ministry of Fisheries and Marine Resources in 2005. Trials in pearl farming, clamshells and sponge at the WorldFish Centre at Nusatupe have been successful and present a good opportunity for expansion of the fisheries sector (United Nations 2002).

3.6.9 Revenue generation

Data on local revenue generated by the Province for the last five years is not available although major sources of local revenue are property rates, licenses, and other levies. Western Province, like other Provinces, depends on the national government for finance to fund services in the Province (see Table 10 below). The value of the grant received by Western Province is 10 per cent higher than any other Province. As well as these direct grants, significant amounts of salaries and wages are paid directly by the national government, such as to teachers, health workers and police. A conservative estimate for this was SBD \$12,000,000 in 2010. This is the largest component of the provincial revenue (Mr George Lilo, the Premier of Western Province, pers.comm. 2010).

Table 10. Recurrent grants by type

	2000	2001	2002	2003	2004
Recurrent Service SBD (\$)	4,123,060	4,642,834	4,292,080	4,292,080	4,293,000
Education SBD (\$)	747,500	657,478	657,470	657,470	658,000
Health Grant SBD (\$)	2,531,862	1,993,441	2,214,044	2,568,050	2,569,000
Total SBD (\$)	7,402,422	7,293,753	7,163,594	7,517,600	7,520,000

(Source: Ministry of Provincial Government & rural Development, Honiara)

3.6.10 Service delivery

There are several Provincial substations within the Province that provide and deliver goods and services to surrounding villages. These sub-stations are located at Sehge (Marovo), Lambete (Munda), Vonunu (Vella la Vella), and Korovou (Shortlands). The isolation and size of the catchment areas have restricted the effective delivery of goods and services provided by the substations with high costs associated with communication and transportation. With increasing interaction, transportation has become a major factor and the use of outboard motors and locally made dugout canoes are common. Partly because of transport difficulties, many rural communities are often not consulted on plans and programmes that have a direct impact on them. Political leaders usually decide in a typically top-down approach (Oreihaka and Ramohia 2000).

In the late 1980s the Province established the Western Province Investment Corporation (WPIC) as its commercial arm to assist in providing business and economic services to the Province. The total assets of the WPIC were estimated at SBD\$ 15 million in 1997. The assets include a shop, copra crushing mill and 65 houses, all at Noro, a plantation at Rendova harbour and it acquired the MV "Tomoko" in 2000 as its flagship after the MV "Western Queen" was washed ashore at Ranadi during a cyclone in 1996. The annual income of the WPIC was not available but rental income from houses alone amount to SBD\$ 900,000 per annum (Rural Development Division 2001).

3.7 The case study village settings

The physical settings of the two case study villages significantly differ. Despite the fact that they are located in two different islands in the Western Province they are approximately only 87km from each other. Toumoa village is situated in Fauro islands to the east of the Shortland islands group and is about 505 km from

Honiara, the national capital of Solomon Islands. Liangai on the other hand is located on the northern tip of the island of Vella la Vella and is roughly 423km from the national capital (see Table 11). There is limited published information on both villages. Consequently, much of the descriptions come from personal observations, information from unstructured conversations and interviews.

Table 11. Distance of each village from urban centres and from each other

From	To	Distance (in Km)
Liangai Village	Toumoa Village	86.6
	Gizo (Western provincial capital)	64.5
	Honiara (National Capital)	423.5
Toumoa Village	Gizo (Western provincial capital)	150
	Honiara (National Capital)	505

3.8 Toumoa village

3.8.1 Topographic, geography and natural resource endowments

The Shortland islands are a group of islands located northwest of Gizo, the capital of Western Province at 6°55'S 155°53'E-S 155.88°E, and shared the border with the island of Bougainville in Papua New Guinea. The group's two largest islands are Shortland (or Alu), which has an area of 208 square km and rises to 185 metres; and Fauro Island which has an area of 160 square km and rises to 400 metres at two points along a central ridge. Other islands include Ovau Island, Pirumeri Island and Mono Island (see Figure 3). The Shortlands have a total area of 414 square km and are divided into two provincial ward areas: Outer Shortlands and Inner Shortlands (see Figure 3 and Table 4). The outer Shortlands include Fauro Island and Mono Island.

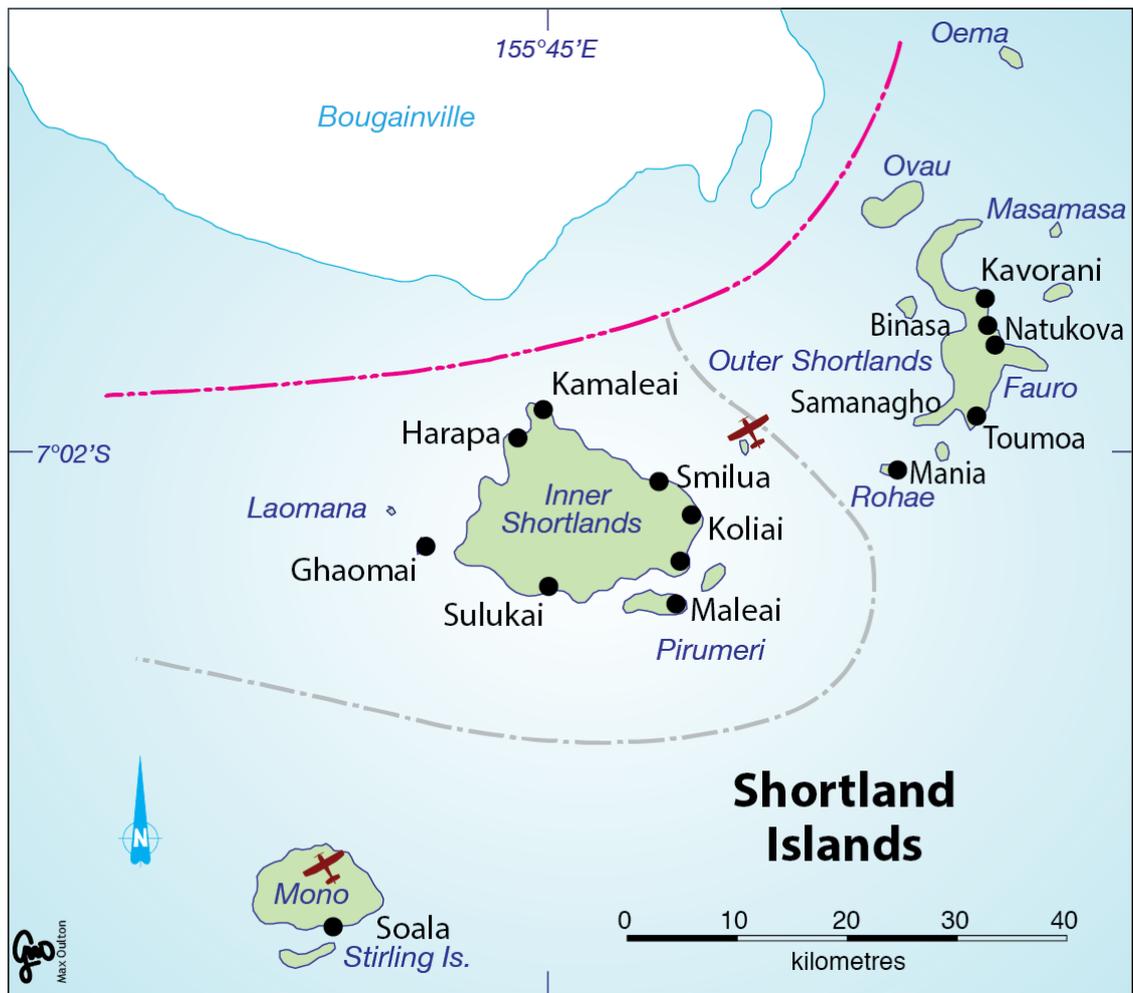


Figure 3. Map showing the two provincial wards of Shortland Islands

(Source: Max Oulton, University of Waikato).

Fauro Island is renowned for the attractiveness of its coastal and marine environments, high marine biodiversity and rich marine and coastal resources. The coastal and marine environments include amongst others: mangrove forests, coral reefs, sandy beaches, cliffs, sea grass beds and muddy tidal flats (Green *et al.* 2006). The intertidal zone consists of sandy flats and stony reef platforms, while narrow patches of sea grass beds and coral reefs are found in the sub-littoral zone. The island is known for its active reefs with enclosed shelter areas that support a high biodiversity of marine species particularly reef fish (Green *et al.* 2006). There is a region of habitat close to the village with a spectacular setting comprising mangrove on the western end of the village, shallow reef flat and rich coral reefs.



Figure 4. Map showing Fauro Island and the location of Toumoa Village

(Source: Max Oulton, University of Waikato).

Toumoa community is one of only three communities situated on Fauro, the second largest island within the Shortlands group after Alu (see Figure 4). The two other villages in Fauro are Kariki located on the far northern end of the island and Samannago on the south western end. Toumoa village is the biggest of the

three in terms of population and a number of households. The nearest airstrip is at Ballalai Island (located between Fauro and Inner Shortlands) and it is approximately one and half hours by 25 horse power outboard motor from the western end of Fauro Island.

The reef system in Toumoa is relatively more diverse and prolific in comparison to the reef system of Samannago and Kariki villages. Barrier reefs run along the south east shoreline, with the reef flat width ranging from 50 to 200 metres within the lagoon. The eastern reef system is more complex with the formation of a few shallow and relatively submerged reefs in between the intruding passages and lagoon. Sand and rubble islands cluster around the south eastern barrier reefs and are associated with deep channels and extensive shallow areas with a bare sandy bottom. Mangrove patches are found along the southern end of the village.

3.8.2 Social and subsistence culture

Toumoa village has a population of roughly 300 people in 38 households (data supplied by communities during focus group discussions) and they all speak the local Shortland language, Alu. The village is geographically right on the seashore and it is approximately 1 km long and 200-250 metres wide from the coast to the hinterland. The community is made up of six main clans: Baumana, Bauahu, Talili, Talapuini, Talasagi and Simea. These groups were originally from Mono (at the south western end of the Shortlands, see Figure 3) but a very long time ago a great chief from Mono conquered the land and other tribes followed thereafter to settle. All of the land surrounding the village is used and owned by the individual households of the community. Land ownership is hereditary and land is not bought or sold.

The people rely on both marine and terrestrial subsistence for income generating strategies to meet their livelihood needs. Coastal and marine areas are fundamental to their wellbeing, social and customary systems, and subsistence and cash economies. Although locally grown food still comprises the bulk of consumption, the villagers are increasingly supplementing their diets with store bought foods. Imported rice is extremely popular and items such as tinned fish and tinned meats are favoured for their convenience and for the flavour they add to the predominately vegetarian diet.

The village has a running water supply but no electricity so lighting at night is provided by kerosene lamps and battery torches and cooking is carried out over fire in a cook house separate from the sleeping areas. The village has a primary school from grade 1 to 6 and a new clinic funded by Caritas, after their old clinic was destroyed during the earthquake and tsunami in April 2007. The majority of the people in Toumoa are Roman Catholics. Church services are held twice a day (in the morning at 7am and in the evening at 6pm) except on Saturday when it is only held in the morning. Despite the fact that the church services are optional, the villagers participate in all the church activities.

The households in Toumoa generally comprise family units living in extended compounds, which link all household members to a series of family attachments. This is a common trend because of the wantok system. Affiliation to a grouping in the village is bilateral; meaning relationships in a kinship group can be acquired by either matrilineal and/or patrilineal association (however matrilineal descent carries more weight in the village). Furthermore a person in Toumoa can obtain access to resources through his or her birth right, spousal affiliation, and location of residence (see similar cases like this in Aswani 1997; Hviding 1998; Racelis and Aswani 2011). While the mutual kinship system can give individuals access to various resources and territories, it does not generally confer an individual with decision-making powers, which regulate resource use and access

3.8.3 Village authority and management

As in much of the Western Province, Toumoa village exhibits strongly patriarchal elements despite the matrilineal descent system. Leadership of the people of Toumoa follows a highly organised structure, like other parts of the Shortlands. There are different levels in the traditional hierarchy, each level with a defined responsibility in governing a community. The highest level of leadership belongs to the chief. The village operates under systems of chiefly rule, and important decisions are deferred to the chief. Traditionally, in the village, the chief plays a very important role in maintaining peace and harmony in his community. The history of Toumoa village has thus given it a reputation of being a “strong communal” community. The paramount chief (*Lala’aha tegesena*) is chosen from chiefly tribes or clans. The current *Lala’aha tegesena* is the fifth chief of the village and he inherited his title from his late father. The chiefly system in Toumoa is very intact in uniting its community in comparison to the rest of the Shortland Islands group and even throughout the Western Province. In terms of leadership

structures, the village is overseen by the *Lala'aha tegesena* with a team of advisors (*Lala'aha*) he chooses from his immediate chiefly tribe or clan members (see Figure 5). The elders are the next level of leadership in the community. Traditionally the elders, or *Tionsolo* (men) and *Batahasolo* (women) as they are called, are the heads of other tribes within the community who are just ordinary members from the village. They are the “right hand men and women” of the *Lala'aha tegesena* who partake in the important discussions, and decision making. A collective of these heads of the tribes make up a group called the *Hahanuasolo* which comprises men only.

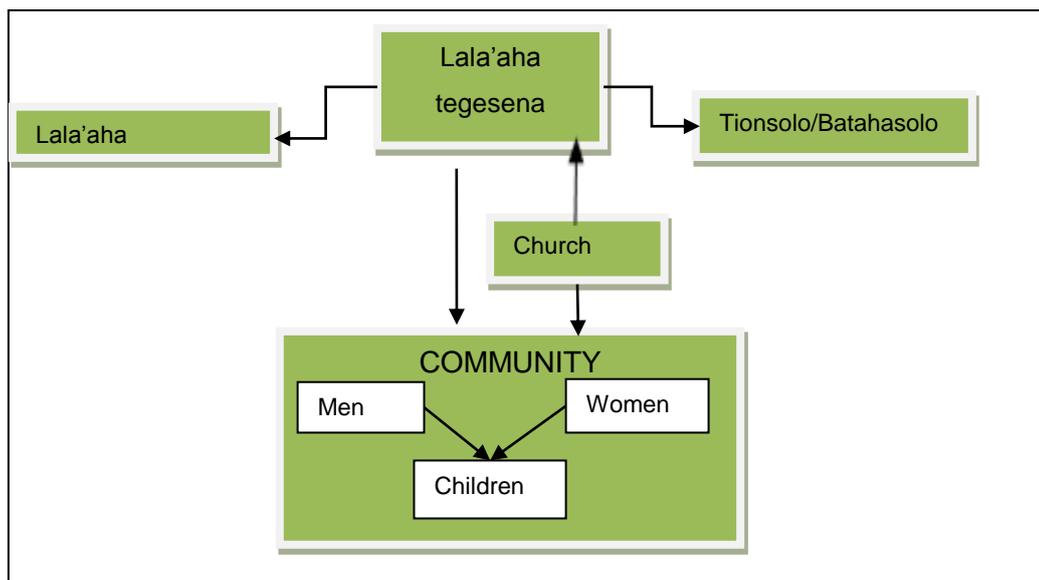


Figure 5. The traditional community structure in Toumoa

The council of the village consists of four to six members mentioned above and they meet twice a month unless any urgent matters arise and the *Lala'aha tegesena* calls an extra-ordinary meeting purposely to discuss issues arising for immediate attention.

Women’s affairs in the community are also looked after by the *Batahasolo*. They are traditionally wives of the *Hahanuasolos*. Sometimes the responsibility is passed on through inheritance but in some cases appointments of other women within the tribe are made by the tribal heads (*Tionsolo*). Usually, selection is made when the person is seen to have outstanding leadership qualities.

Community meetings are usually held every Sunday. The meetings are held separately for the men and women. In most circumstances the *Lala'aha tegesena* will chair the meetings. He will beat the bell two times to call the men for their meeting at the men’s rest house. In most cases after the deliberation of the men’s

meeting, the *Lala'aha tegesena* will then call for the women's meeting by beating the bell three times. He will gather them at his residence, inform them and also get their second opinion about the things he has discussed earlier on at the men's meeting. If the agenda of the meeting involved community participation or activities, it is the responsibility of both men and women to go back to their respective houses and inform their children and those who were absent during the meeting. In regards to community activities, the villagers tend to be very supportive. They have a lot of respect for the *Lala'aha tegesena*. Contemporary socio-cultural variation in Toumoa is generally described in relation to the Roman Catholic Denomination membership. The church together with the current chiefly system is the major focus of community organisation and provides much of the rhythm of village life

3.8.4 Resource management

Toumoa's traditional fishing boundaries cover the areas from further northeast of Pauboubou to Mokunrapa to the southwestern end of Lobofo reef (see Figure 4). Traditional marine management practice in Toumoa remains particularly strong and ideas regarding community based management of resources, as introduced by outside groups, are not new concepts. For over thirty years, a five kilometre fringing reef stretching in front of their village named *Rosae* has been managed and looked after by the *Lala'aha tegesena* of Toumoa and can only be used when a special need of the community arises. Half of the *Rosae* reef, the western end, belongs to the *Lala'aha tegesena* and the other half is for the community. This reef however remains closed every other day and is opened for harvest only for a mutual community need if and when permission is given from the *Lala'aha tegesena* and his team of advisors. This practice of management was one of the early practices of the people. It has been kept throughout the generations and the governing system was strengthened with the arrival of the church (see Chapters Six and Eight).

In Toumoa, the system of 'traditional' rights or 'customary' law over marine areas or resources emerges from the social process of interacting activities concerning control over territory and access to resources. In this particular case, the *Lala'aha tegesena* exercises control over resource use and access to tribal territories on behalf of his community. The responsibilities for management of the resources reside within the rights of customary marine tenure of the area.

3.9 Liangai village

3.9.1 Topographic, geography and natural resource endowments

The other village case study is Liangai village which is geographically located in the Dovele district east of Iriqila village on the northern tip of the Island of Vella la Vella (see Figure 6).

Vella la Vella is an island of some 647km², located much closer to Gizo than the Shortlands (refer to Figure 3). Most of the land in Vella la Vella is customarily owned, which means that it is looked after by lines of descendants that began from the first clearing of primary forest and subsequent settlement of the land. In Vella la Vella, the land tenure was determined by membership of a matrilineal tribe called *Toutou*. The leader of the *Toutou* is called the *Lekasa*, a term that is not widely used today. The Vella la Vella custom dictates that marriage is to be exogamous to the *Toutou*, which has implications for land allocations. More subordinate families sometimes made claims to land by marriage to the dominant *Toutou*. Past and present day restrictions within the tenure system apply mostly to gardening and plantation land and restrictions on hunting and the use of the reefs are not governed by the same level of control.

The district of Dovele comprises three full-size villages; Boro, Liangai and Suantali, and two smaller settlements, with a total population of approximately 1500 people. The two small settlements, Motulu and Vese, are situated towards the western end of the district and are made up of immediate members of extended families from the three main villages.

The reef boundaries of Dovele stretch from Mede on the northeast side of the village of Iriqila to the exposed intertidal reef of Katasalado, off the village of Boro (see Figure 6). The coral reefs at Dovele are mainly fringing and intermittent and there are sporadic mangrove patches along the coast. Dovele and the adjoining Jorio region of Vella la Vella on the western end of Iriqila encompass a large area of extended fringing reefs.

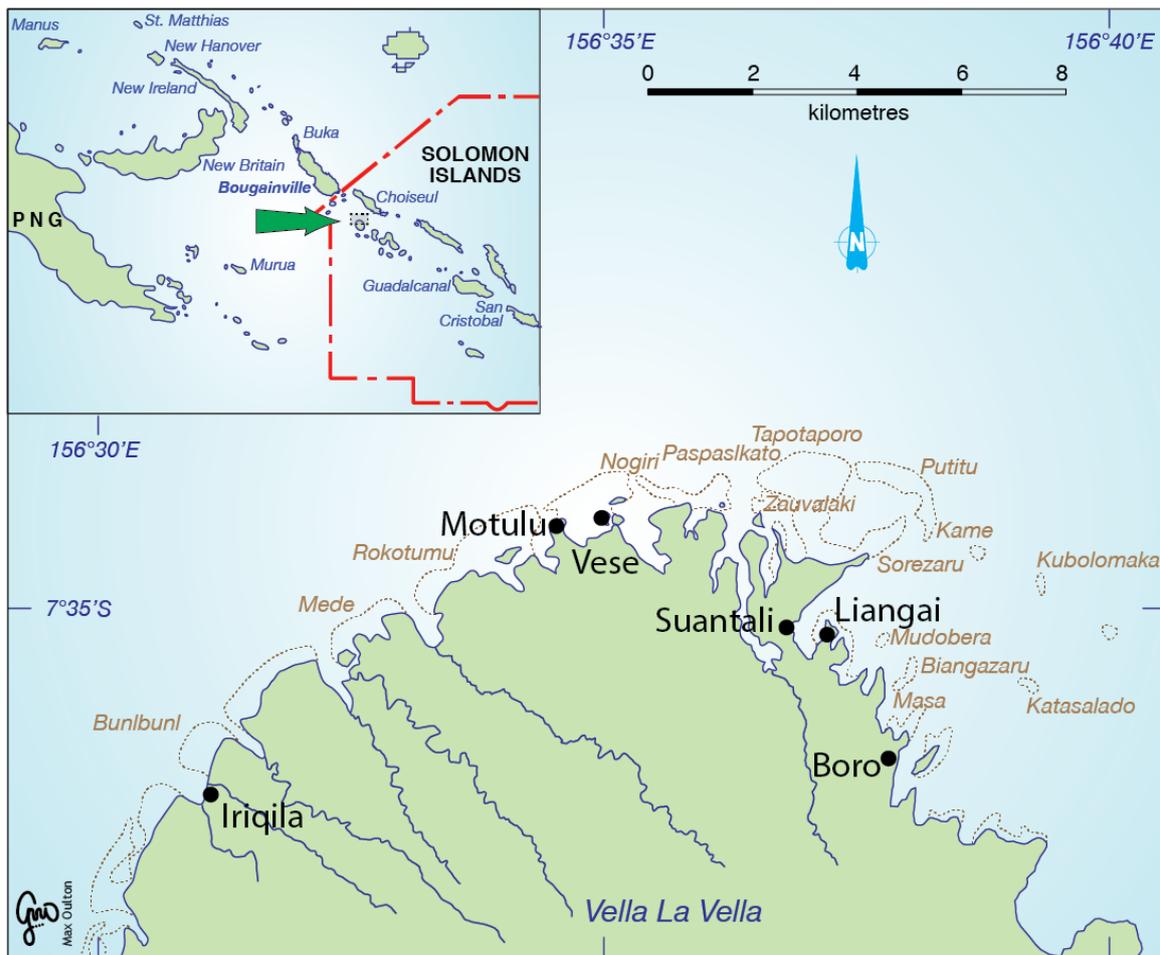


Figure 6. Map of Liangai village and the Dovele district

(Source: Max Oulton, University of Waikato).

The fringing reef systems play a central role in maintaining the coastal land against the eroding forces of storms and rising seas, and they provide essential resources in terms of construction materials and habitat for marine species in the regions. Its spectacular attractiveness with rich abundance of inshore marine species has the potential to offer an essential fascination for tourists although the potential of marine resources to contribute to sustainable economic growth in the region has yet to be fully explored.

Coastal and marine areas are central to the wellbeing, social and customary systems, and subsistence and cash economies of the Liangai community. The coastal areas are comprised of diverse ecosystems, but are vulnerable to change. Coastal areas are the recipients of most foreign and local development activities, some of which (e.g. logging) cause significant physical changes to natural systems. The Dovele region is experiencing increased degradation of habitats, soils, forests, coastal and inland waters, reefs, overexploitation of resources and growing conflicts in resource use and access.

3.9.2 Social and subsistence culture

Present-day sociocultural distinctions in Dovele are commonly described in relation to the prevailing Christian denomination. The District's population belong to the Seventh Day Adventist (SDA) church and have a standing of being a "strong" community especially when it comes to church associated activities. The St Jones college secondary school (JAC), Vare-Tutty primary school and a modern clinic at Boro village are some of the examples of how church and the community members participate in development in the district. The church is the main "centre of attention" of community organisation and provides much of the "tempo" of the village life. While SDA communities are more distinctive and considered more 'monetised' than other denominations in Solomon Islands, the household is still the primary focus of local production. Like the economies of other parts of Solomon Islands generally, the Dovele economy is of a 'hybrid' nature with people deriving their incomes from several options and a range of ever-dynamic sources. In the SDA communities most households derived a significant portion of their income from copra, followed by marine resource exploitation and the sale of garden produce.

Integration into the cash economy is escalating and people are more reliant on cash than ever before. In terms of expenses, school fees in SDA communities are the highest in the Western Province and SDA devotees are obliged to pay a tithe to the Church of one-tenth of all their cash income, garden produce and fish catch. There is increasing household reliance on tinned fish, fuel, tobacco and importantly rice, which along with sweet potato and cassava, has replaced taro as the main dietary staple. These combined expenses constitute a significant financial challenge in the absence of waged work, and put increasing pressure on natural resources as the only available sources of income.

However, I noticed when I was in the district visiting the villages and talking to different people, that young people, especially the males are increasingly moving away from the church as they chew betel nut and/or smoke tobacco which are proscribed. These people are referred to locally as "backsliders". These are often the same group who harvest beche-de-mer, which along with crustaceans and pork are considered unclean in SDA doctrine. The Dovele district defines a political boundary within the North Vella la Vella constituency (see Table 3). However for this study I will focus my attention on the village and people of Liangai alone.

3.9.3 Village authority and management

The village of Liangai has a population of roughly 200 in 32 households (data supplied by communities during focus group discussion) and they speak the Vella la Vella dialect of Bilua. The village is made up of nine named tribes (see Table 12). The Vella la Vella people followed the matrilineal system of appointing a chief. The chief inherited his chiefly title through his maternal side. Should he be incapable of leading his tribe (e.g. serious illness or death), his nephew (son of his eldest sister) should be the next chief to oversee the affairs of the tribe. In the past, a custom ceremony was held when a new chief was installed. The role and authority of the chief are clearly defined within the tribe the chief represents. For the existing chief to nominate a new chief to replace him there are certain qualities that the nominee must have. They must demonstrate and uphold open-handedness, trustworthiness and be capable of solving problems between conflicting parties. More so, they must be exceptionally talented in organising community and cultural activities and have a comprehensive understanding of the tribe's genealogy. The person nominated must be approved and mutually endorsed by the people in the tribe. If the newly appointed chief is incapable of looking after the affairs of a tribe, then cultural practices allow that his nephew may replace him. This is the expectation but not necessarily the practice today.

The village chief of Liangai is from the *Ijo* tribe. He is elected to look after the village by the leaders of the nine different *Toutou* in the village. Each *Toutou*'s affairs in the village are managed by a senior male leader or their *Lekasa* (see Table 12). The village chief is assisted in his duties by these senior leaders. However, at the present time, most of the *Lekasa* of the nine tribes have moved and reside in other areas and therefore only a few leaders tend to be present in the village to assist the chief in the day to day village affairs.

There is significant gender differentiation in work patterns and type, with men predominantly fishing and women mainly gardening and being responsible for domestic tasks. Nevertheless there is also much flexibility between these areas. This variability is particularly relevant today in relation to fishing, with numerous people commenting that women and children fish in a manner and frequency not permitted in the past.

Table 12. The nine tribes of Liangai

Toutou	Lekasa
Ijo	Mr. Ruben Koebule, chief of the village
Laena	Mr. Elaisa Biaga
Sambe	Mr. Allan Paul (in his absence Kenneth Manavaki)
Sauro	Mr. Donially Gomese (Based in Vese)
Zabana	Mr. Kelvin Ligo (Based in Suantali)
Temesoka	Mr. Barnabas Babu based in Boro (In Liangai Mr. Masden Viga)
Kegolo	Mr. Jamuru Noeitu(Based in Motulu)
Barekasi	Mr. Raymond Poka (Chief of Barekasi toutou)
Povana	Mr. Lepese Paul

The people of Liangai village live a generally subsistence lifestyle which is increasingly modernising and becoming increasingly supplemented by a cash economy. While many families still reside in simple houses made of traditional bush materials and built in traditional design, there is now an equal or greater number of families whose houses, while still basic, are a hybrid of traditional and modern design, constructed with both traditional (woven palm and timber) and modern (concrete, milled timber and corrugated iron) materials. In many ways the decisions to build a modern house and the wherewithal to do so, reflect the changing economic structure of Liangai and the Dovele district as a whole, with the once largely subsistence communities developing a stronger dependence on the cash economy and the outside world.

3.9.4 Resource management

In Dovele district, the reefs are under the supervision and care of the entire village, through the chief and also some particular *Toutou* (see Table 13), but they are open for anyone in the village to use. Before, people from neighbouring villages in Vella la Vella were obliged to seek permission to fish and dive on the reefs, and were often given restricted access with strings attached. Nowadays there is a common understanding and cooperation in the usage of the reefs. In the past the reefs were subject to varying degrees of exclusive interests, depending on the significance of the reefs to the social organisation and culture

of the communities which controlled them. Now, however, values encouraged by the church, which include sharing all with everyone, have lifted past restrictions and use is assured as long as permission is asked of the residing chief. As usual, exceptions do apply: People from other islands who have requested access to the reefs for commercial diving, have been refused. In cases like this, local people become very territorial and demand payment for use of the reef or close them off from use by outsiders entirely.

Table 13. The reefs (refer to Figure 6) and the owners

Reefs Name	Caretakers
Kubolomaka	Community
Bazazaru	Barnabas Babu
Katasalado	Barnabas Babu
Biangazaru	Community
Masa	Enock / Poka
Mubobera	Community
RuvuRuvuzu (Sasa)	Ijo Tribe
RuvuRuvuzu(Matu)	Ijo Tribe
RuvuRuvuzu(Tabu)	Ijo Tribe
Kame to Nyogo	Mr Ruben Koebule (chief of Liangai)
From Nyogo – Tapotaporo	Mr. Paul Lepese
From Paspasikato to Tabutobele	Mr. Paul Lepese
TabTobele to Kage	Mr. Donelly Zarukana
From Motulu Reef to LopaBanga	Mrs. Maeva Noitu
Rokotumu reef	Mr Barnabas Babu (Chief of Boro)
Makuti reef	Mr.Denty Biah (sorezaku)
Mede reef	Bolopoe Tribe

3.10 Summary

The Western Province is by far the largest Province in Solomon Islands with a total land area of 5,500 km² and in terms of population it is the second highest after Malaita Province. The Province is one of the more fortunate Provinces being well endowed with a wide range of natural resources, including, logs, fish, minerals, water, fertile areas for commercial crop production and tourist attractions both on land and sea. However, much of the provincial revenue comes from national government grants. Development projects are financed mainly by aid donors through the national government. The majority of people in

the Province live in rural areas in small, widely dispersal coastal communities. The customs and traditional ways of Solomon islanders are still very much intact but changing. Land is a pivotal component of the society and its well beings.

The two case study villages significantly differ from each other because they are located in two different islands in the Western Province. Toumoa village is situated in Fauro islands in the east of the Shortland islands group and Liangai village, on the other hand, is located in Dovele district on the northern tip of the islands of Vella la Vella. Both communities rely on both subsistence and cash income generating strategies to meet their livelihood needs.

The marine resources are an important source of food (protein), cash income and even employment for the two rural case study communities. Fishing, for instance, has always played a very important role in these communities' culture and tradition. Traditionally marine areas and resources were managed by the custodians of the adjacent land and the traditional leaders in the two communities.

The background on the status of marine resources and their utilisation in Solomon Islands, and policy context for marine resource management are presented in the next chapter.

CHAPTER 4: THE MARINE RESOURCES AND MANAGEMENT IN SOLOMON ISLANDS

4.1 Introduction

This chapter takes an in-depth look at the marine resources, in particular the inshore coastal fisheries, and the management situation near the shorelines and reefs, in Solomon Islands. It will briefly describe the off shore commercial fisheries but this is only to contextualise the types of fisheries that take place in Solomon Islands

The chapter further evaluates the input of subsistence and small-scale (artisanal) fisheries to the livelihoods of many rural communities and the significant importance of the marine resources to the people. Furthermore, it discusses the modern approaches advocated by the Ministry of Fisheries and Marine Resources and the contemporary levels of governance in marine resource management.

Moreover, it explores the impacts of the contemporary subsistence and small-scale commercial fisheries on customary marine resource management. Particular attention is focused on Western Province where the study has been carried out and how the two case study communities approached a Non Government Organisation (NGO) to work with them. Additionally it looks at the current threats to the marine resources and the new corporate plan that the Government has established for rural development.

4.2 The mystery of the unknown realm

The ocean is an unknown realm for most people who live on the land. Around 80 per cent of the planet earth is covered with water, with the ocean occupying the largest part. Nayak and Vijayan (2006 9) affirmed that, “millions of people not only live on the coast but gain almost their entire livelihood from the ocean’s resources”. The coast is a dynamic region between the land and the sea. While coasts can be of different natures, they form a living ecosystem with complex dynamics sustaining vegetation and both animal and human populations. While people depend on the ocean for their livelihood, it is often challenging to understand the dynamics of the sea because of its unpredictable actions. In this account I look at the sea as a source of resources on which rural Solomon

Islanders, particularly communities in Toumoa village and Liangai village, depend and their rights in safeguarding their access to these marine resources.

4.3 Background

The marine resources of Solomon Islands (i.e. coastal fringing reefs, offshore reefs and reefs around offshore islands) are 88 per cent customarily owned by families and clans (Foale 2000; Solomon Islands Coastal Marine Resources Consultancy 2002). It is on the whole an extension of the customary land tenure system. Solomon Islands coastal resources are vast and have great productive potential. There is a distinctive diversity of fauna in Solomon Islands coastal marine waters.

A team of international scientists and researchers conducted a large scale marine resources assessment in 2004 and concluded that Solomon Islands has one of the highest levels of biodiversity of marine life in the world (Green *et al.* 2006) and has placed the country alongside Philippines, Indonesia, Papua New Guinea and Australia, in terms of species richness.

They found 485 coral species from 76 genera, across 66 sites, which placed Solomon Islands in the Coral Triangle⁸, recognized as a global coral diversity hotspot, and centre of coral endemism. This amazingly distinctive diversity of coral reef species is second only to Raja Ampat in Indonesia as compared to the rest of the world (Green *et al.* 2006). According to Green *et al.* (2006), it is home to an estimated 1019 coral reef fish species, several species of marine reptiles (including turtles, marine snakes and a single species of crocodile), as well as a diverse collection of marine mammals including nine species of dolphins, eight species of whales and a single dugong species. A number of macroinvertebrate species inhabit coastal waters including 19 species of sea cucumber, four main species of crayfish, six giant clam species, three species of pearl oyster, *trochus*, and green snails.

Solomon Islands 320 km exclusive economic zone (EEZ) encloses 1,340,000 km² (see Table 14) of marine waters and the total annual fisheries production

⁸ The Coral Triangle is a geographical term referring to the tropical marine waters of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste that contain at least 500 species of reef-building corals in each eco-region.

from this area is estimated at 8,000 tonnes. About 60 per cent of the total or 4,800 tonnes are reportedly taken from waters within 15 km of the shore which comprises roughly five per cent (about 64,050 km²) of the nation's marine waters.

Coastal waters are more productive than open waters and nearly one-third of the inshore waters contain three of the most productive habitats – coral reefs, mangroves and sea grass beds.

Table 14. Solomon Islands fisheries overview

Land area	27,556 km ²
Ocean area:	1,340,000 km
Length of coastline:	5,313 km
Population (2009)	515,870
Gross Domestic Product (2009)	US\$ 48.6 million
Fishing contribution to GDP (2009):	US\$ 2.3 million
GDP <i>per caput</i> (2009):	US\$ 1057

General economic data (Source: Central Bank of Solomon Islands, 2009)

4.4 Inshore resources

The inshore marine resources are those that are concentrated on coastal and near (in) shore reefs and lagoons (see Figure 7) and are regarded as renewable resources. That is, they can be fished and used as a food forever as long as the numbers caught are replaced by adequate young ones.

The inshore resources in Solomon Islands, like any other small island state, are viewed as small and therefore highly vulnerable (Adams 1998b; Bell *et al.* 2009). The renewability of the marine resources, however, depends on the users' ability to see that not too many fish are caught, and that the surroundings in which they live do not decline significantly. This implies that the stock has to be managed. In particular, the amount of fishing has to be controlled, and the marine environment is to be protected for the future generations. The switch from subsistence fishing to profit fishing has often resulted in overexploitation (Gillett 2005), a situation where the populations of the marine resources have decreased to an extent that the adults population are incapable to spawn enough young fish to maintain the stock. As the population increases the introduction of fast boats and use of improvised fishing gear which is readily available and enable the targeting of more inaccessible fish (Brewer *et al.* 2012; Duke *et al.* 2007).

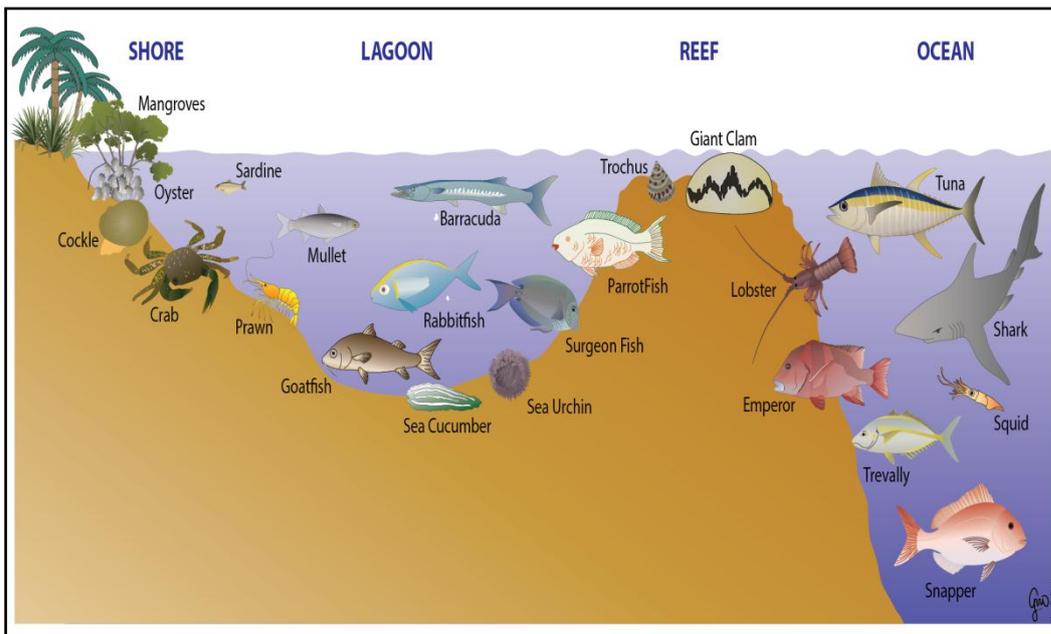


Figure 7. The distribution of fish and other marine species along a profile of a tropical island (Source: (King and King, 1995), drawn by Max Oulton, University of Waikato).

The importance of coral reefs is obvious (Bell *et al.* 2006). They serve as natural buffers against storm surges, flooding, and high waves and help stop shore erosion, thus protecting coastlines and the lives and property of their inhabitants (Roberts *et al.* 2002). The skeletons of corals break down to rubble and eventually to sand, which helps build up shorelines and the many beaches in the islands. Coral reefs and sandy beaches provide a significant lure for the tourist industry with their natural and scenic beauty and wide range of marine species. They are also a critical ecosystem for fisheries. Coral reef ecosystems support a variety of human needs. They are important for survival, fisheries and are essential in the development of new medicines (Bell *et al.* 2006).

4.4.1 Inshore commercial marine species

Beche-de-mer (various aspidochirotid *holothurian* genera, otherwise known as sea-cucumber, sea-slug, or *trepang*) and trochus shell (*Trochus niloticus*) are important to the rural economies of many Solomon islanders. Along with, to a lesser extent, pearl oyster (*Pinctada margaritifera*, *P. maxima*), green snail (*Turbo marmoratus*), and a number of other invertebrates, these organisms provide a natural resource that can regenerate, and relatively non-perishable, easy to gather and are valuable. Kinch (2004 5) emphasised that, “non-perishability is an important consideration in rural areas and outer-islands where preservation facilities and transport services are limited”. Add to this the fact that these

resources form commodities that are almost entirely exported, they presently play a very large part in the national development plans (Ministry of Fisheries and Marine Resources 2004).

Beche-de-mer is a major source of livelihood for many rural Solomon Islanders but it is being overfished as a result of continuous fishing and lack of effective management by authorities. The overfished populations of the fishery will take decades to recover if harvesting continues (see FAO 2004a). In 2005 concerns for the fishery led to a national ban on the collection and export of sea cucumber being imposed by the Solomon Islands government. Subsequently following the earthquake and tsunami in April 2007 that devastated Western Province, the ban on sea cucumber was temporarily lifted to enable the most vulnerable people to obtain cash in order support their family needs. On 1st April 2008 the ban was reinstated. That situation remains as of the time of writing although periodically confusion around the legal status of the ban has meant that there have been periods when fishing and trading has occurred in some places (e.g. 2009, Figure 8). With few sources of cash income in the rural villages, villagers have endured financial hardship as a result of the moratorium (e.g. Ramofafia *et al.* 2008).

Solomon Islands beche-de-mer exports and trochus shell exports were worth over SBD\$10 million (nearly US\$1.9 million) and almost SBD\$4 million (nearly US\$½ million) respectively in 2007 (see Figures 8 and 9). Since 1999 export volumes and value of the two commodities have fluctuated. Beche-de-mer volumes declined dramatically in 2004 (Honiwala 2010), contributing to the decision to impose a national ban. In 2007 there was a peak in exports when the Government lifted the moratorium. A similar explanation cannot be used to directly explain the peak in trochus exports in 2007 as this commodity was not subject to an export ban. It is possible however, that while the beche-de-mer ban was lifted there was an increased number of local buyers stationed in coastal villages encouraging men, women and children to harvest more trochus at the same time as beche-de-mer was being targeted.

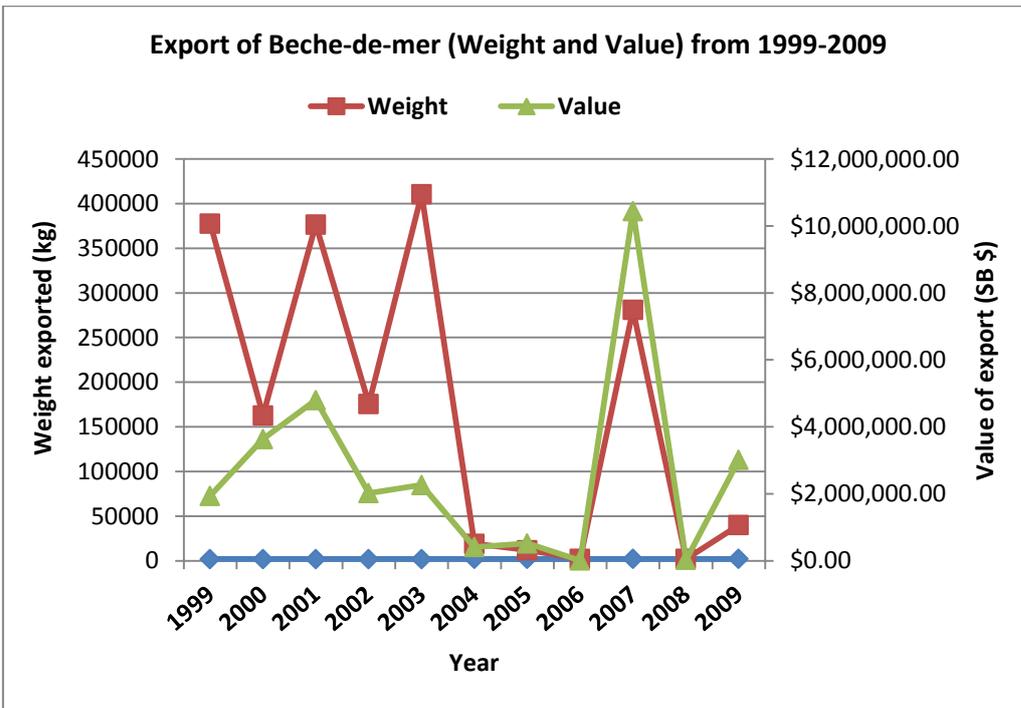


Figure 8. Export of beche-de-mer in the last 10 years

(Source: Honiwala 2010).

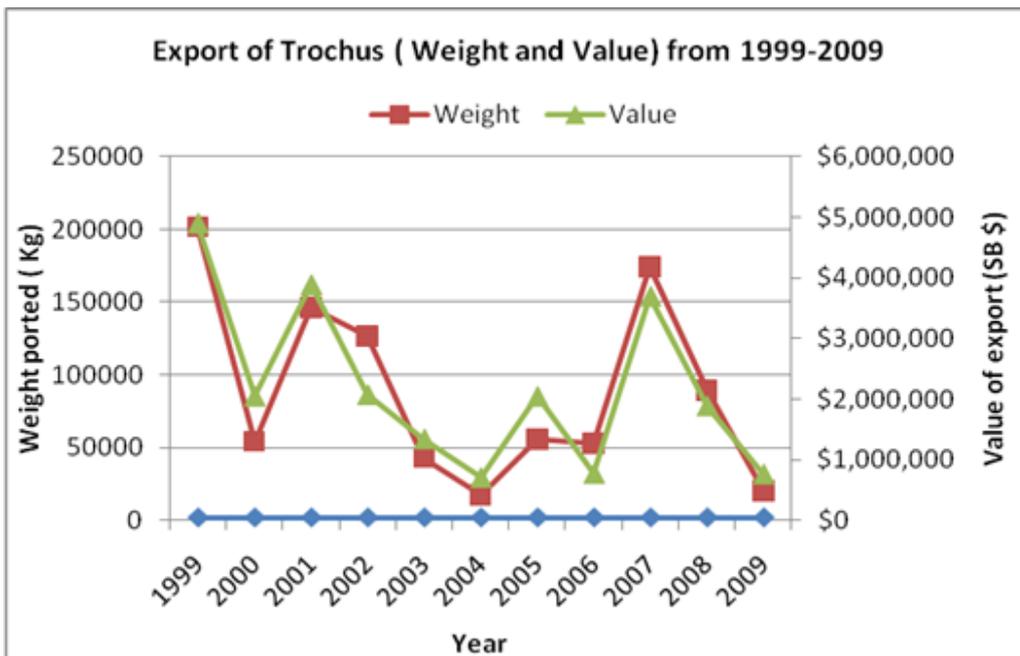


Figure 9. Export of trochus in the last 10 years

(Source: Honiwala 2010).

Unfortunately, many of the characteristics that make these resources economically important also make them vulnerable to overharvesting. Whilst neither trochus nor beche-de-mer are likely to be in danger of local biological extinction (unlike giant clams and turtles), experience in the past, and in several

countries, has shown that these resources may become rare enough through excessive fishing that a large-scale export fishery is no longer economically viable (FAO 2002b; 2008).

4.5 Offshore resources

Just as inshore fisheries resources are under increasing pressure from local fishermen, the offshore resources (particularly tuna) are the focus of increasing demand from foreign fishers. Solomon Islands coastal and offshore waters are rich tuna grounds; it is one of the richest tuna fishing grounds in the world (Aqorau 2004). The offshore resources have traditionally been exploited by distant-water fishing fleets. Japanese long liners have fished in the zone since at least 1962 and annual catches have been as high as 9,500 mt (1978), but have been around 3,000 - 4,000 mt in the late 1990s (Ministry of Fisheries and Marine Resources 1988; 2004).

The major tuna species components of Solomon Islands tuna industry include skipjack (SKJ), yellowfin tuna (YFT) and bigeye (BET). Figure 10 shows annual trends for major tuna species in Solomon Islands EEZ by both foreign and local fleets. This is in respect of the purse seine, long line and pole and line fleets. Catches are dominated by skipjack (*Katsuwonus pelamis*) with yellowfin tuna (*Thunnus albacares*) and bigeye (*Thunnus obesus*) making up the balance.

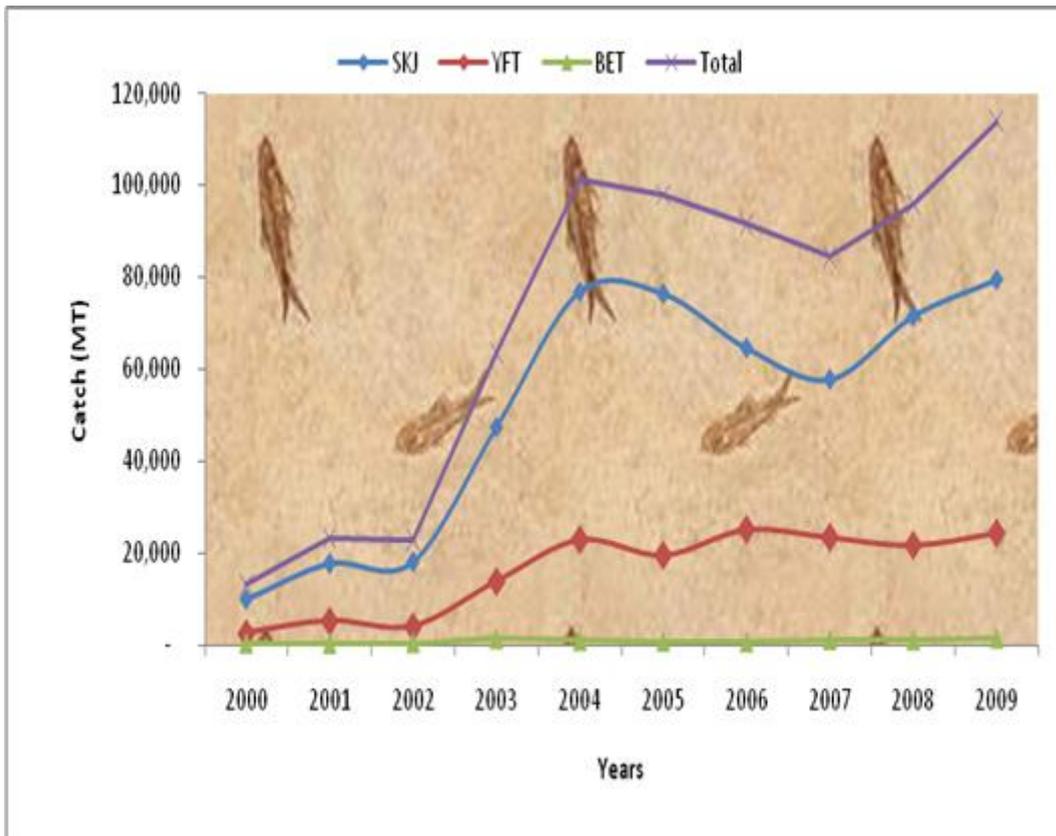


Figure 10. Catch trend and annual catch by species for the 3 main tuna species (skipjack, yellowfin and bigeye tuna) in Solomon Islands EEZ for 2000 – 2009

(Source: Honiwala 2010)

Figure 10 clearly indicates the catch was at its lowest in 2000 – 2002, reflecting the impact of the ethnic tensions on the industry and problems with MFMR data collection and management systems. The first high catch experience after the tension period was in 2004 with a total of more than 101,374 mt (SKJ 76,702mt, YFT 22,932mt, BET 963mt and others 778mt). The plot shows a decline in total catch estimates to 84,455 mt in 2007. The total catch increases again to more than 94,000mt in 2008 and 105,000 in 2009 respectively.

4.6 Type of fisheries in Solomon Islands

Fisheries embrace a complex set of interactions among the marine environments, species fished and the people involved in fishing and handling the resources that are caught. According to King (1991 3), “the marine environment consists of the living and non-living surroundings of a fish stock”. A fish stock is regarded as the fish population or other marine resources which are being exploited. Fisheries are often divided into non-commercial and commercial sectors even though the distinctions between them are often unclear. For this thesis it is important to

define the difference with regards to the Solomon Islands setting. The fisheries situation in Solomon Islands is characterised by:

- The large importance of subsistence fisheries and
- The small scale fisheries or occasionally mentioned as artisanal fisheries usually use reasonably small capital and energy to supply the local market or consumption (FAO 2006). Artisanal fisheries can be subsistence or commercial fisheries.

4.6.1 Subsistence fisheries

The subsistence fishery in Solomon Islands involves the catching of both pelagic and reef fish to eat rather than to sell, although it may include the sale of surplus catches. In Solomon Islands subsistence and artisanal fishing activities are very common and extensively used as more than three quarters of the population live in the rural area. These fisheries are concentrated in coastal waters and near shore reefs and lagoons (see Figure 7). Subsistence fishing takes advantage of a wide range of vertebrate and invertebrate fisheries in the inshore waters, including inter-tidal mangrove and fresh waters. According to the Ministry of Fisheries and Marine Resource report in 2004, Solomon Islands domestic production of fish for subsistence purposes is one of the highest in the South Pacific region.

The target resources are reef associated finfish, trochus, giant clams, lobsters, and associated sea urchins. In shallow waters in rural Solomon Islands villages, an estimated number of 180 species of reef fish, from 30 families were recorded in subsistence fisheries (Oreihaka and Ramohia 2000; Richards *et al.* 1994). The predominant catch is composed, mostly, of snapper (Lutjanidae), grouper and rock cod (Serranidae), emperor (Lethrinidae), mackerel (Scombridae) and trevally (Carangidae).

In the late 1970s, subsistence fishing was not seen as a major concern for management in Solomon Islands (Ministry of Fisheries and Marine Resources 1988). This is because during those days there were not many people and people only fished to put food on the table and the activities were generally sound. However, over recent decades concerns over coastal fisheries have grown. In the remote islands the total catch from subsistence fishing is believed to be several times larger than that from commercial fishing (Oreihaka and

Ramohia 2000). King (1991: 17) acknowledged that, "In terms of participation, production and local use, subsistence fishing represents the most important sector of island fisheries". However, the Ministry of Fisheries and Marine Resources generally does not have adequate funds and staff to survey the large number of participants and catch species involved.

4.6.2 Small-scale (artisanal) commercial fisheries

The small-scale commercial fisheries are mainly located near the main urban area of Honiara, and to a much lesser extent, around the provincial towns of Auki on Malaita Island, Munda in New Georgia Island and Gizo, the Western Provincial capital.

Small-scale fisheries play an important role in rural livelihoods and economies in rural Solomon Islands villages in terms of protein and income (Schwarz *et al.* 2011). Many rural fishers earn income from these fishing activities. It also contributes greatly to the employment (both part and full-time) in the rural communities (Schwarz *et al.* 2007). The seasonal nature of fishing means part-time fishers often engage in other non-fishing activities during off periods. In contrast, full-time fishers may fish throughout the year, but often modify their fishing methods and gear to follow sequences of different periods of marine species abundance. These fisheries are in favour of providing fresh fish to the wage-earning residents (Weeratunge *et al.* 2011).

The other common form of small-scale commercial fishing is that of producing non-perishable fishery products for export. The most important of these items are trochus shells, beche-de-mer, and shark fins (Preston 2005). These commodities are an important source of cash for Solomon Islanders, especially in the isolated villages since the downfall of the copra industry. With an average production of about 40 tonnes per year of trochus, Solomon Islands is one of the largest producers in the Pacific Islands region (Bell *et al.* 2009).

In the mid 1990s, numerous programmes were carried out by the National Government to promote, improve and commercialize the rural fisheries, largely with the assistance of external donors. A number of fishery centres in rural areas were equipped under this assistance with ice-making and/or storage plants (Gillett 2010). The rural fishermen used to go and sell their fish, buy new fishing

gear, learn new fishing techniques and improved their catch handling at the fishery centres.

About 25 of these centres were established throughout the nine Provinces of Solomon Islands, but, by mid-2001 less than a dozen were still functioning (Ministry of Fisheries and Marine Resources 2004). Part of the problem is the adverse economics of profitable fisheries in rural areas and the civil unrest which greatly affected the landing of fish. In Solomon Islands many other aspects of fisheries were also greatly disturbed by the social unrest (FAO 2002b).

Small-scale fishing is widespread and increasing in Solomon Islands and it continues to contribute to nutrition, food security, sustainable livelihoods and poverty reduction for rural Solomon islanders (Oreihaka and Ramohia 2000). Regardless of its contribution, the concerns surrounding the sustainable development of small-scale fisheries are still unclear (FAO 2004b; Kile 2000). An FAO (2002b 12) report stated that,

In larger nation states, the context for small scale fisheries varies widely, from traditional and relatively undefined and unregulated coastal fisheries in less developed economies towards highly regulated fishing, increasingly based on quota management and allocation of transferable rights, effectively privatizing access. Throughout the region issues of transport and distribution are critical in connecting catches with high value markets. The region is also characterized by its ecological importance, with a number of highly sensitive and globally valued ecosystems and habitats, for which there is increasing international support for protection and conservation.

For many Pacific Islanders the significance of small-scale fisheries cannot be overstated as it linked with a lot of levels of dependence on important issues related to diet, livelihood, food security and health (Gillett 2002; Preston 2005).

4.7 Importance of marine resources

The marine resources are undoubtedly one of the greatest assets of small island states in the Pacific Oceans, including Solomon Islands (Bell *et al.* 2009; Green *et al.* 2006). According to Gillet (2002 15), “much of the region’s nutrition, welfare, culture, employment, and recreation are based on the living resources in the zone between the shoreline and the outer reefs”. This applies to Solomon Islands, where the present way of life, the prospects for future development and food security are all highly dependent on these primary resources.

Solomon Islands' coastal marine inshore resources embrace a diversity of marine habitats, including estuaries, mangrove communities, sea grass beds, macro algal assemblages, sand and mudflats. In a study of coastal resources management in the Pacific Islands (World Bank 2000b), trochus shell (*Trochus niloticus*), beche-de-mer and shark fins are regarded as important to the rural economies of many communities in Solomon Islands. However, trochus and beche-de-mer are in danger of overexploitation because of their high commercial value, low mobility rate and lack of importance in local diets (Kinch 2004).

The Pacific Islands regional economic review (World Bank 2000a) studied the value of subsistence fisheries for food security in five Pacific Island countries including Solomon Islands. It concluded that the value of annual subsistence production of finfish and shellfish protein for Solomon Island is equivalent to US \$13.9 million. It also demonstrated that, "Solomon Islanders have one of the highest per capita seafood consumption rates in the world" (Richards *et al.* 1994 3). Over 85 per cent of Solomon Islands population derived their protein from marine resources. The annual production from subsistence and artisanal fisheries has previously been estimated at SBD 60 million (roughly equivalent to USD 8.8 million) (Kile 2000) and the sale of marine resources provides the nation's second highest foreign exchange earnings.

Regardless of this, the national government does not put much focus on the subsistence fisheries sector (Gillett 2002). Unlike the tuna fishery where data collection and monitoring is well established, the inshore fishery lacks such initiatives. This is primarily due to the highly subsistence-oriented nature of the fishery (Oreihaka and Ramohia 2000). According to Oreihaka and Ramohia (2000), the only data available on inshore fisheries are those having commercial elements, which are normally obtained by the Ministry of Fisheries and Marine Resources (MFMR) through Export Permits and Marine Purchase Returns forms. In the country most information made readily available about subsistence fisheries come from NGOs, academics, and international organizations (Gillett 2002).

4.8 Commercial development of communal resources in the Western Province

Community-based, participatory systems are the traditional practices for the integrated management of land and sea that have been effectively carried out

over the years for most villages. Mangroves, coral reefs and lagoon areas are administered and managed in a similar way. In most villages in Western Province, rights of control and ownership have been passed down from one generation to another. For the locals, the rights are based on social relationships among people, and are expressed as rights to exploit resources (Hviding and Baines 1994). In real meaning, an area and its resources are owned by a "community", or the tribe, which are "primary rights holders" who collectively have the authority to allocate use rights (through the elder or chief, the spokesman for the tribe). Ordinary members are those who hold "secondary" rights. According to Hviding and Baines (1994), such rights may be inherited, or they may be gained through marriage to a "primary" rights holder, through approved residence in a village located on the "community" land, or for other reasons.

The trend is that over the years of promoting community commercial development of fisheries stocks no attention has been given to what a community needs to keep reserved for its subsistence needs. A common impact of localised commercial development is depletion of resources needed for local consumption, with the already disadvantaged becoming more so (Boso and Schwarz 2009). The trend nowadays is that only certain fishers who can afford powered outboard motor engines have the opportunity to gain more income from harvesting communal resources. This is because they can move from one reef to another in a given time compared to their other colleagues who still use dugout canoes (United Nations 2002).

Overfishing is already a primary concern for most of the islands in the Western Province (Kinch *et al.* 2005). Where there has been access to receptive markets, overexploitation has inevitably followed. According to a report by the United Nations (2002 23), "harvests for export typically expand until the resource is depleted, or a drop in the market price provides a disincentive". Solomon Islands fisheries for beche-de-mer, giant clams, and other sedentary species typically undergo a decline in stock (United Nations 2002).

In the late 1980s, in most rural Solomon Islands villages, trochus shell and copra were the main sources of cash income. Copra prices, however, have declined and, where the alternative of fishing for trochus was available, a typical villager response was to concentrate on that. The result of over harvesting was a subsequent rapid decline in trochus stocks after 1990 (Adams *et al.* 1992). However, a renewed interest in beche-de-mer emerged in the mid-1990s. Not

only was this a convenient alternative source of income, but there had been a surge in prices for this product (Ramofafia 2004). As noted earlier it was as a result of this that, in late 2005, the Ministry of Fisheries and Marine Resources imposed a moratorium in harvesting of beche-de-mer nationwide.

Land for food production has long been a problem for almost all the communities in Western Province as the lower (and often more fertile) land has been logged and been used to plant long-term coconuts plantations. As a result of these, women and children now must walk long distances to and from their villages to fetch food and firewood in their gardens. This is a case that clearly demonstrates the contribution that women and children can make to planning and resource management. Nor have women's roles been fully recognised in most remote communities in Western Province. More attention is needed to plan resource management to ensure a sustainable basic supply of food for all. Women's roles in fishing are worth mentioning in comparison to their male counterparts as they struggle each day to provide nutritious food for their family – particularly during periods of rough weather when fishing is not possible. As noted earlier, women have the leading role in food crop production (Hilly *et al.* 2012).

4.9 Customary marine management systems

Traditionally, in the past in rural Solomon Islands communities, customary marine management systems were based on imposed spatial and temporal restrictions on harvesting. Individual communities or villages set up their *tabu* areas, which functioned similar to marine protected areas (MPAs) and could be in place from a few months to years. By tradition such areas were established after a chief's death or that of an important community member and often lasted for three to four months. This kind of decentralised decision-making is the best form of natural resource governance, to ensure the social and ecological effectiveness of decisions (Pomeroy 1995). Customary Marine Tenure (CMT) has been described as complex and dynamic and is recognized under the Solomon Islands Constitution (Fisheries Act 1998).

The notion of respect ensured plenty of easily harvestable marine resources for the community and their visiting relatives at the end of the mourning period (Johannes 1998). Furthermore, other customary management measures like effort, gear, and species restrictions have been practised over the years in Solomon Islands. Today, the Government and some environmental institutions in

small Pacific countries are trying to help revive traditional resource management as part of their modern conservation strategies. They believe that it will enable rural communities to manage their resources sustainably and ensure that they achieve their community goals (Cinner *et al.* 2005). This is because of the continuous socio-economic alterations that have affected the traditional management systems in rural villages (Grimble and Wellard 1997).

The management of inshore resource use in Solomon Islands has posed a great challenge to centralised management systems. This is because of the geographical isolation of most islands which impede the enforcement and compliance of fisheries activities to be carried out in rural villages (Ministry of Fisheries and Marine Resources 2004).

In recent years, however, depending on the commitment, ability, and personal authority of the chiefs and village leaders in Solomon Islands, traditional approaches have been implemented and enforced in a gradually *ad hoc* manner but as MFMR are trying to attempt and revive these systems, they identify the lack of legal enforceability as a key barrier to implementation (McDonald 2006). McDonald (2006 2) further explained that;

In some cases, areas are suffering the effects of over-exploitation either due to population pressures or the shift to a more market based economy, but the local communities have not yet embraced the need to manage their resources on a more sustainable footing. Despite the breakdown in traditional approaches, attempts by government to impose constraints on land and resources risks resistance from landowners who are suspicious of government motives. Many people in Solomon Islands argue that customary landowners have complete rights over their land and resource, and that the state has no authority to control resource uses.

Modern efforts of community based management in the Pacific have had better success (Lam 1998). While there are numerous approaches to integrated management; adaptive management, a structured process of 'learning by doing' (Walters 1997), is widely recognized as a powerful approach to accommodate the on-going uncertainty that characterizes most coastal fisheries (Carpenter and Folke 2006; Folke *et al.* 2002). Community Based Adaptive Management (CBAM) (Govan *et al.* 2009) recognises that threats and solutions to the problems of managing coastal fisheries come from outside the domain of the fishery as well as from inside the fishery (Andrew *et al.* (2007). CBAM therefore uses a model where the main part is done by the local resource users, supported by other

relevant local stakeholders and institutions. Adaptive management is based on the notion of an approved, accepted and applied management plan which is carefully observed and modified at regular intervals if necessary (Boso *et al.* 2010; Tawake 2007). The intention is to incorporate contemporary technical knowledge with old-style management and governance systems to highlight local issues and to develop management plans to support sustainable marine resource practices.

Seidel (2009), however, debated that in community based management, science-based management is fairly given a lower priority because contemporary science has had no traditional role in local management and management decisions can be expected to be made within existing cultural and socio-economic frameworks. Therefore, the local participation of resource owners has been argued to have more significant priority than conventional based management (Seidel 2009). But in recent times, according to Munro and Fakahau (1992), many areas that are closer to urban centres in small Pacific nations have been heavily fished and traditional ownership around these areas are no longer existed.

Murawski (2002), in contrast, argued that scientific information is vital for CBAM not only in the rural communities but also at the provincial and national levels. At the moment in rural Solomon Islands villages, the natural science role and its degree of application is not clearly defined in community based management and is applied differently by different actors. However, assessment is required of its actual and potential role at different governance levels for sustainable management of coastal resources in Solomon Islands.

The case studies used for this research were a group of communities living in remote rural areas in Solomon Islands. These remotely located and economically less developed communities face the 'classic' challenge of sustaining rapidly growing populations in the context of limited agricultural land and natural resources, as well as facing more recently emerging 'modern' problems related to their increasing exposure to the global economy.

4.10 Ministry of Fisheries and Marine Resources

The Ministry of Fisheries and Marine Resources (MFMR) is responsible for ensuring the sustainable development and management of Solomon Island's living marine resources and it is one of the most important ministries of natural resources of Solomon Islands government. The aspirations of the Solomon

Islands government are increasingly dependent on the fisheries sector. This places considerable pressure on the MFMR to perform to a consistently high standard. Currently, within the structure of the MFMR⁹, there are about 45 officers, including the Minister and the Permanent Secretary based in Honiara and 25 external provincial officers spread across the nine provinces. The Ministry, being technical in nature, has been structured into seven main divisions as of 2009 with an administration team that services the needs of the Ministry (see figure 11).

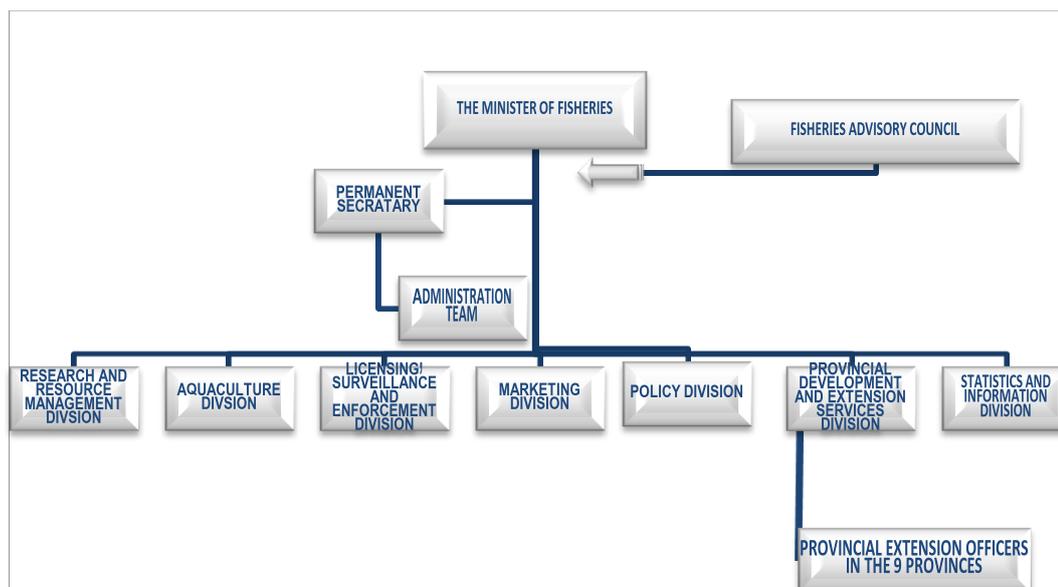


Figure 11. Ministry of Fisheries and Marine Resources

(Source: MFMR Solomon Islands).

In 2009 the seven divisions within the MFMR were;

- The research and resources management division
- The aquaculture division
- The licensing, surveillance and enforcement division
- The marketing division
- The policy division
- The provincial development and extension services division

⁹ Noted that since 2009 MRMR has been undergoing restructuring under an institutional strengthening program (MSSIF) and some re-arrangement of these Divisional remains in progress. Nevertheless the main functions can be examined using the 2009 structure

- The statistics and Information division

The research and resource management division is responsible for the provision of technical and scientific advice to the national government on all subsistence, domestic and foreign commercial fishing activities in the country. The division ensures that the harvesting practices of all marine resources are properly coordinated and monitored to make sure that the resources are not depleted unnecessarily. In dealing with renewable resources, research and management cannot be separated from development. The division continues to research into new potential areas as well as furthering the research into already exploitable resources so as to maximize the use and benefits derivable from these resources whilst ensuring sustainability.

The licensing, surveillance and enforcement division is responsible for the licensing of fishing vessels and fish processing establishments. It is responsible to ensure that the exploitation and sustainability of resources is properly monitored and protected by legislation and enforcement. It is also the revenue-collecting arm of the Ministry. The provincial development and extension services division manages the development and management of rural fisheries, mostly through the maintenance of fisheries centres in the nine provinces. It helps to provide local fisherman with facilities to store and market their marine products. The aquaculture division carries out research in aquaculture and promotes aquaculture-related development for food security and livelihoods. The statistics and information division compiles information to support management and other functions of the Minister. Information recorded by this section is used to make decisions when processing licenses and also with decision making concerning tuna stocks. The marketing division facilitates effective marketing and marketing developments for fisheries. It also provides support services to provincial fisheries centres. The policy division is the newest addition to the Ministry. It amends and creates policies suitable for the operation of the Ministry. This division moreover negotiates on internal and external fisheries issues that affect marine resources with other stakeholders and organisations. It provides policy advice on fisheries for government.

The MFMR's headquarters is located in Honiara and there are nine provincial centres situated in each of the nine provinces of Solomon Islands. Each province has its own fisheries departments or officers, who are variously engaged in fishery extension, development, and research and monitoring, and work in

conjunction with the national MFMR. MFMR is the central administration agency in charge of managing fisheries resources within the Exclusive Economic Zone (EEZ), while provincial governments have the primary responsibility for the management of their coastal areas out to three nautical miles off-shore.

4.11 *International obligations and responsibilities*

Solomon Islands government through the Ministry of Fisheries and Marine Resources maintains contact, on technical issues, with regional and international organizations dealing in fisheries and resource management. These organisations are the Secretariat of the Pacific Regional Environment Programme (SPREP), the Secretariat of the Pacific Community (SPC), the South Pacific Forum Fisheries Agency (FFA), The SPC Applied Geoscience and Technology Division (SOPAC) and various United Nations agencies (e.g. FAO, UNDP and ESCAP).

Solomon Islands is a signatory to the United Nations Convention on the Law of the Sea (UNCLOS), the agreement for the implementation of the provisions of the United Nations Convention of the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks. The convention embraces a wide-ranging legal framework to regulate all ocean space, its uses and resources. It declares the sea and their resources to be "the common heritage of mankind".

UNCLOS ensures that the marine ecosystem is conserved and protected for the use of research, development and dissemination of information on marine knowledge. It has, among other things, stipulations relating to the territorial sea, the contiguous zone, the continental shelf, the exclusive economic zone and the high seas. One of the most important parts of the convention for a small country like Solomon Islands with vast area of sea; the convention specified that the exploration for, and exploitation of, the resources on sea bed and floor to be protected and limited to each national jurisdictions..

The expansion of modern techniques for the exploitation of the living resources of the sea has increased people's ability to meet the needs of the world's expanding population for food and has exposed some of these resources to the danger of being over-exploited. Accordingly Solomon Islands has legal obligations and responsibilities to fulfil under a number of conventions and treaties which, directly or indirectly, relate to fisheries. Policy and other international matters are

managed in the first instance through designated contact points, quite often through the Ministry of Foreign Affairs and External Trade.

The main fisheries law in Solomon Islands is the Fisheries Act of 1998, and the various fishery regulations promulgated under the Act, which establish rules for both domestic and foreign fishing of all kinds. Other relevant legislation includes the Fishery Limits Act (1997) and the Delimitation of Marine Waters Act (1988) under which Solomon Islands lays claim to the 320km EEZ and defines the various fishery zones included therein.

The Fisheries Act of 1998 “revised the laws relating to fisheries and made provisions for the proper management and development of fisheries in Solomon Islands” (Solomon Islands Government 1998 1). The act highlights several principles that the Minister of MFMR has to take into consideration when exercising his powers and functions as provided under the Act, one of which is that the Minister of MFMR shall have regard to the principle that Solomon islands marine resources shall be managed, developed and conserved so as to ensure that the resources are not endangered through over-exploitation but are utilised at a level that ensures their optimum sustainable yield.

It also supports the notion of sustainable development and ensures that the cautionary approach to the protection, management and utilization of fisheries resources are effective in order to safeguard the marine resources and maintain the marine ecosystem. In this setting, the utilisation of fisheries resources in Solomon Islands can be accomplished through well-developed management plans

According to McDonald (2006), the government is responsible to coordinate, plan and develop policies to ensure that local provincial government, NGO and the community activities are aligned with the national priorities. This is especially so in relation to management of inshore resources that are subject to international trade, such as beche-de-mer and trochus. It is necessary that a national strategy be adopted, even if it is implemented at the provincial level, to ensure that the overall goals of sustainable management of the coastal fishery are achieved.

4.12 Levels of governance in marine resource management

Government (at various levels) is the appropriate party to deliver vital services that required establishing and looking after conserved marine areas over an

extended period. It makes sense for the MFMR to be a lead organization because it has the largest presence (both at national and provincial levels) and the most capacity to address the principal motivations of the majority of marine managed areas where in the communities identify fisheries management as their major priority. For this study, the relevant divisions in the Ministry of Fisheries and Marine Resources corresponding to this research are the research and resource management division and the provincial development and extension services division.

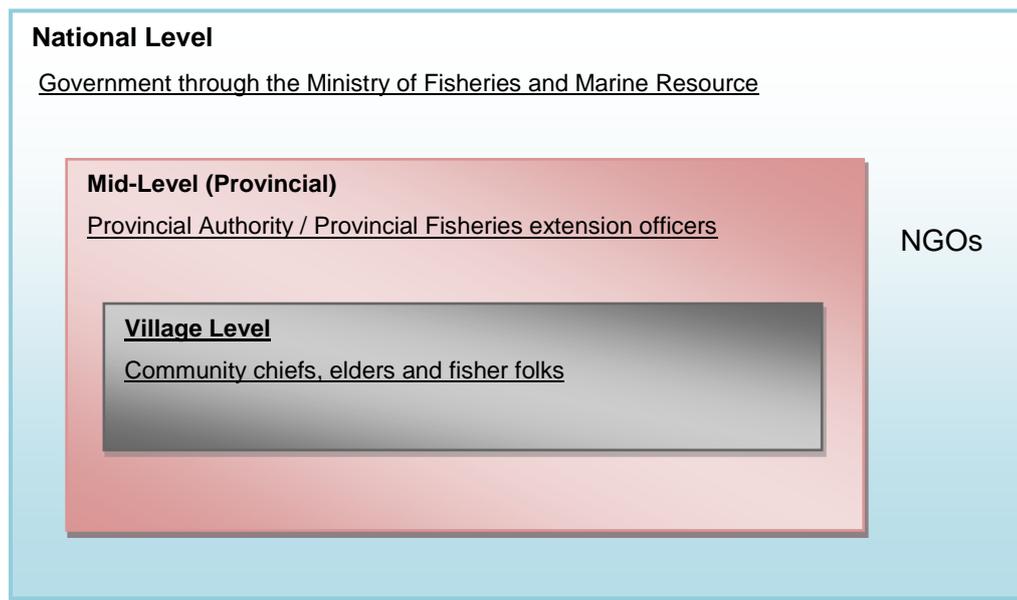


Figure 12. Relations of the levels of governance in marine resource management in Solomon Islands

(Source: Solomon Islands Government, 2009)

At the provincial level and in the case of Western Province where the study was carried out, the provincial based extension fishery officers work closely with the Western Provincial government (see Figure 12) on matters regarding the provincial fisheries and marine resource development and management. As specified in the Fisheries Act 1998, the provincial government under its provincial fisheries ordinance can make laws to govern the exploitation of marine resources within its provincial waters. According to McDonald (2006), provincial fisheries ordinances are very important because they enable development interventions. In the Western Province, the provincial government has had three established ordinances. These are the Western Province Resource Management Ordinance 1994 (WPRMO), Western Province Simbo Megapode Management Area Ordinance 1990 and the Western Province Coastal and Lagoon Shipping

Ordinance 1991. The one that is relevant to this study is the Western Province Resource Management Ordinance 1994¹⁰.

The relationship between the village authority, the provincial government and the MFMR is not often all-inclusive but when the need is there and funds are available, the provincial based fishery officers reach the village communities in all matters channelled from the Ministry and the provincial government.

In terms of resource management awareness, the principal fishery extension officer often accompanies Non Government Organisation (NGO) representatives to the villages which provide an opportunity for passing national and provincial government information. Most of the villages closely affiliated to the NGOs are more likely to be located in areas closer to the Western Provincial capital, Gizo. The information disseminated is often relayed verbally by talking to the villagers in village meetings or through letters to village chiefs or church elders. Likewise, the officer disseminates information about marine resource bans (e.g. beche-de-mer) by the Ministry and the Province to the villagers. The MFMR and the provincial government often ask the chiefs or elders to enforce and monitor bans but in most cases the request is overlooked as it is not the top priority for the village leaders. According to McDonald (2006 3):

Under the Fisheries Act the government is entitled to impose strict controls on the harvesting of species located within customary waters, regardless of whether it limits landowners' use of their resources. Provided a law is valid, it will prevail over any customary laws applying to the use of an area or resource.

However, the resources and ecosystems are dispersed over a vast area with poor transportation and communication infrastructure. The financial, technical, and human resources required to centrally manage them far exceed those that could ever be made available to the relevant agencies.

A good number of NGOs and established institutions have assisted the government through the MFMR in providing their expertise in helping rural

¹⁰ In 2012 the Western Province government was in the process of finalising a Western Province Fisheries Ordinance (Mr Kolo Hivu, Provincial fisheries officer based in Gizo, Western Province, pers.comm.2012)

Solomon Islanders' to manage the marine resources in the Western Province over the past years. Some of the active NGOs working with the locals in Western Province are the WorldFish Center, Live & Learn Environmental Education, Solomon Islands Development Trust (SIDT), and the World Wide Fund for Nature (WWF). They often team up with the Ministry's research section in undertaking research and assisting rural communities with advice in managing their marine resources.

In terms of cost effectiveness and financial sustainability, Solomon Islands, like other Melanesian countries, faces serious development issues and financial resources are stretched very thin. Government environment and fisheries departments have extremely low budgets relative to the magnitude of the area and challenges they face. The main problems that confront the MFMR are in enforcing the regulations and in convincing fisher folks, usually through local communities, to reduce overfishing. Controls to achieve this can be applied at any convenient point in the post-harvest chain (pers. comm. Dr Chris Ramofafia, the Permanent Secretary of MFMR 2009).

4.13 Adaptive management

The communities of Toumoa in Shortlands Islands and Liangai village in North Vella la Vella where this study was conducted have worked in collaboration with WorldFish for the past four years. WorldFish projects (past, current and future) in Solomon Islands together form an integrated approach to improving, in various ways, the status of coastal marine resources and the communities that rely on them. Each of the two communities put a request forward asking WorldFish to help play a role in facilitating the revitalization of community based resource management in their communities. This was after the earthquake and tsunami in April 2nd 2007 which caused substantial devastation in the two villages and their coastal habitats. According to Schwarz *et al.*(2007) most communities that were visited by the WorldFish team after the disaster highlighted poor understanding of resource management issues and the national fisheries regulations and therefore they wanted to work closely with non-government organisations and government agencies to sustainably manage their inshore fish resources.

The process that WorldFish uses to enter these two villages is through a "learning by doing" (adaptive management) framework based on Andrew *et al.* (2007) and similar to other processes described for the Pacific (see Figure 13). In

2008, introductory visits were made to the two communities to ascertain community level interest in working with WorldFish on an initiative to design and implement an approach to community based management of marine resources. This was the entry point for the diagnosis phase of the framework. The goal of the initial visits was to establish relationships between the communities and the team (comprised of Solomon Island based WorldFish staff members experienced in working with communities) to listen to the concerns of the community leaders and members and to explain the planned approach and what they could expect. This adaptive management framework assists communities in identifying a series of actions and processes to be followed to achieve the goals of resilient communities and resilient near shore resources, leading to the development of effective community-based management plans (CBMPs).

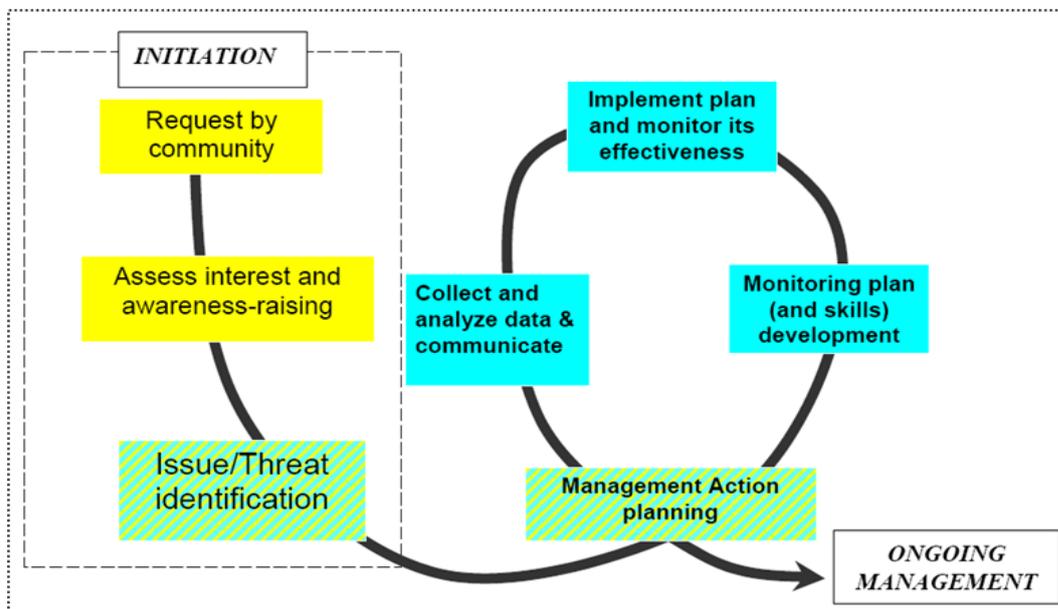


Figure 13. The adaptive management cycle

(Source: Tawake 2007)

4.14 Solomon Islands Locally Managed Marine Areas Network (SILMMA)

Rural Solomon Islanders depend on good governance of marine resources at local, provincial and national levels, for their livelihoods and for development to be sustainable. However, there is a pressing responsibility to empower and build networks that are conducive to enable a systematic approach, into present and planned marine resource governance.

In Solomon Islands a number of management initiatives have been (or are being) undertaken at various levels of authority in an attempt to sustainably manage inshore marine resources. These responses range from bottom-up to top-down

and include traditional management systems, collaborative management arrangements, and enforcement of policies and laws through regulatory mechanisms. Even though efforts have been made to try and conserve the marine resources, continuous problems (e.g. pollution, loss of biodiversity and habitat destruction) have occurred, which clearly reveal deficiencies in the existing management frameworks.

Marine Protected Areas (MPAs) have become increasingly important for marine resource management (Duke *et al.* 2007; South Pacific Commission (SPC) 2003). MPAs are feasible strategies used to protect and manage marine environments and their resources around the world. In most national parks and wildlife refuges, MPAs are also used to prevent harmful extraction activities (Agardy *et al.* 2003; Begossi 1995). In addition, MPAs have social and biological objectives which include coral rehabilitation, biodiversity protection and economic benefits (Bell *et al.* 2006; Roberts *et al.* 2002; Ruddle 1998a; Thaman *et al.* 2000). However on the other hand, MPAs also confronted with funding problems, clashing views and inactive participation.

In Solomon Islands, resource management institutions have not kept pace with the technological ability to exploit resources although locally managed marine conservation areas still play a critical role in protecting biological diversity and marine reserves. Some resource managers believe that the key to protecting the biological diversity of Solomon Islands is to establish a network of marine conservation areas and their practitioners. Realising the need to work together and help manage the marine resources of Solomon Islands, a “network” of conservation and fisheries management practitioners was formed in 2003.

The Solomon Islands Locally Managed Marine Areas Network (SILMMA)¹¹ consists of a group of people who have teamed up to identify strategic ways to advance the efforts to improve their conservation and fisheries management. SILMMA is affiliated to the regional and international umbrella of Locally

¹¹ SILMMA's mission is to help communities manage/conservate marine resources to maximize benefits and ensure food security by sourcing funds, facilitating, coordinating and providing information, building capacity and empowering partners through traditional and scientific approaches. Its vision is to be a well resourced network for information sharing to ensure well-informed decision making by members on sustainable resource management and conservation of biological diversity.

Managed Marine Areas (LMMA)¹². At the present SILMMA is co-ordinated by a secretariat of staff from MFMR (co-ordinator and administrator) and advised by a volunteer SILMMA Advisory Council. SILMMA is housed in the MFMR and aligned with the research and resources management division. SILMMA works toward developing guiding principles for LMMA establishment nationally in Solomon Islands that are consistent with the goals of the rural people of Solomon Islands and the strategies of the MFMR and the Ministry of Environment, Climate Change, Disaster Management and Meteorology.

4.15 Threats to marine resources

Despite the presence of customary marine tenure at the level of many villages in Solomon Islands, the marine systems are showing increasing signs of overexploitation. Knowlton (2001 5419), for example, explained that, “modern human civilization and coral reefs make poor companions”. As the world’s population increases it is clear that marine resources too will undergo considerable environmental and physical change similar to that resulting from large-scale terrestrial deforestation. The increasing pressure on this resource has resulted from the need for cash income as well as rapidly increasing populations. A report produced by WWF South Pacific in (2000) stated that the threats to the marine resources in Solomon Islands are due to both human activities and naturally occurring processes.

About fifty per cent of the country’s revenue comes from taxes levied on timber exports and the sale of logging licenses, but the impacts the industry has on the marine environment are enormous. Marovo lagoon in Western Province, regarded by experts as perhaps the most beautiful lagoon in the world, is in serious danger of huge discharge plumes of sediments into its waters (Albert *et al.* 2008; Duke *et al.* 2007; Kinch *et al.* 2005). Likewise, in Isabel Province, subsistence fishers have complained that the effects of logging and subsequent

¹² The Locally-Managed Marine Area Network is a group of practitioners involved in various community-based marine conservation projects around the globe, primarily in the Indo-Pacific, who have joined together to learn how to improve our management efforts. We are interested in learning under what conditions using an LMMA strategy works, doesn’t work, and why. The Network’s membership consists largely of conservation and resource management projects that are using (or planning on using) an LMMA approach, and includes: community members, land-owning groups, Traditional leaders, elected decision-makers, conservation staff, university scientists and researchers and donors.

siltation from run-off made it difficult for them to spot marine invertebrates and fin-fishes when they go out fishing, because of increased turbidity (Kinch 2004).

Apart from logging, the marine resources are increasingly dwindling from human pressures (over-fishing, pollution, sedimentation, eutrophication, coastal development), as well as natural events (cyclones, tsunamis, earthquakes and human pressure) (Kile 2000). The April 2007 earthquake and tsunami in the Western Province caused extensive damage and disruption to coastal communities. The extensive damage done to the marine habitats varies from village to village: some shallow reefs were uplifted and exposed whereas in other areas there is no sign of broken corals or damaged shoreline (Schwarz *et al.* 2007).

4.16 New emphasis of rural development by the Government

An institutional strengthening project funded by NZAID through the Ministry of Fisheries and Marine resources since 2008 has completed a new corporate plan that reflects the new Government emphasis on rural development, with a focus on the inshore fisheries sector. The plan allows for the replication of some of the best practices and lessons learnt from the past work in Solomon Islands. One of the major components of the corporate plan is to address the prospect of 'community based fisheries management'.

The MFMR Inshore Fisheries Strategy (Ministry of Fisheries and Marine Resources 2010 2) states that, "in the absence of clear and targeted national direction the inshore fisheries sector has suffered from ineffective management with limited benefits flowing to the people of Solomon Islands". Most rural communities have tackled their coastal and inshore fisheries management challenges alone, with limited assistance or support from local, regional and international organizations. These organizations have provided valuable assistance but their effectiveness is constrained because they are not mandated by the Government to discharge the powers and functions of the Minister of Fisheries under the Fisheries Act 1998. While authority is clearly the responsibility of MFMR there is a clear agreement on the need for MFMR to achieve its sector goals through coordinated and supportive partnerships with coastal communities and other key stakeholders (FAO 2009).

Community-based management, which can draw on the strengths of *kastom* systems, is becoming more important and desirable offering significant cost

efficiencies to national government and providing more effective outcomes. In most rural areas and other locations, this is true because the centralised controls are ineffective. The MFMR Inshore Fisheries Strategy identifies 10 pillars with a focus on securing the sustainable flow of benefits from inshore resources and the wider ecosystems on which they rely through management approaches that encompass resilience to variability, adaptation to climate change, biodiversity conservation, and take an ecosystem approach including watersheds and the coastal zone.

The Government through the MFMR is working slowly to empower and support communities in this process of securing benefits. It is believed that the new amended Fisheries Act will give a legal basis for communities to manage their sea resources.

4.17 Summary

This chapter provided an overview of the marine resources, types of fisheries and their management in Solomon Islands. It describes the Ministry of Fisheries and Marine Resources (MFMR), the Government Ministry that is responsible for ensuring the sustainable development and management of Solomon Island's living marine resources.

The *Fisheries Act 1998* is the main legislative mechanism in Solomon Islands for the management of the fisheries. The *Act* was formulated to guarantee that the development of fishery resources in Solomon Islands is expanded with suitable conservation and management measures, so that those resources are used at their optimum sustainable yield, so as to achieve economic growth, human development, and employment creation, whilst also providing a sound ecological balance. Customary rights are also respected under this Act. Understanding traditional marine resource-use rights is central to understanding marine resource management in Solomon Islands.

Small kinship-based groups living in villages have long managed their own resources. It is no surprise that attempts to impose contemporary "top-down" approaches to resource management and conservation have been unsuccessful. It is clear that inshore fisheries resources are of vital importance for the subsistence element of the village life that is destined to continue for some time. It is also clear that this "subsistence resource" can be quickly depleted. Therefore maybe the best approach is for Solomon Islands government through MFMR to

provide the legal and administrative framework to empower traditional management systems. The *Fisheries Act*, 1998 (and this is strengthened in the draft fisheries Bill currently being considered by parliament) has provision for supporting community based management strategies.

The next chapter, Chapter Five, outlines the research methodology and the practical methods of data collection and analysis engaged during field work.

CHAPTER 5: METHODS AND METHODOLOGY

5.1 Introduction

This chapter outlines the research methodology and presents the research approach, strategy and methods of data collection used in the study. The empirical component of the study was undertaken over a period of six months and comprised five months of site fieldwork supported by a desktop study of relevant literature. Here, I describe the process undergone to obtain the findings discussed in the thesis, and will detail key aspects of the fieldwork. The chapter explains how the qualitative methodological approaches of interview, focus group discussion and participation observation were applied to gain a clear understanding of the two rural communities, comments upon reasons for choosing the methodology and reviews previous methodologies used for similar research. Possible researcher bias is discussed and research constraints that were encountered throughout the research process are identified.

5.2 Research questions

The methods of data generation and analysis in this study draw on a variety of theoretical perspectives. As Glaser and Strauss (1999) note, the research topic and research questions determine the research design and indicate the approach to data collection. This study is designed to investigate the social and environmental conditions that facilitate effective sustainable marine resource management in rural Solomon Islands communities. Attention is focussed on case studies in two rural marine resource owning groups in Solomon Islands. To recap, the research questions were:

1. What are the values and attitudes of rural Solomon Islanders in managing their marine resource?
2. What are the constraints rural Solomon Islands communities face in establishing sustainable marine resource management?
3. What are the trends and challenges the communities in Solomon Islands are facing in managing their marine resources?
4. What are the social and environmental conditions that will facilitate effective sustainable marine resource management in rural Solomon Island communities?

The research questions guided the appropriate methods of gathering the data that would provide the answers to the questions.

5.3 Desktop research

A thorough examination of literature on the subject of community based resource management (CBRM) was taken prior to departing for field-based research. This review enabled a basic understanding of concepts and current approaches to CBRM, allowing preparation for the types of issues to be covered and the formulation of key questions to be answered (see appendices D, E and F).

This research involved both qualitative and quantitative methodologies. Quantitative approaches were used, but only to inform and contextualise the research which is predominately qualitative. Both methodologies are often associated respectively with interpretive and positivist/structural philosophies (Jureidini and Poole 2000). Patton (1997 267) argued that social science research “has come to recognise that, where possible, using multiple methods – both quantitative and qualitative - can be valuable, since each has its strengths and one approach can often overcome the weakness of the other”. As the focus of this research is on how the marine resources are perceived and valued, qualitative methods are most appropriate.

Further, this qualitative research adopted a case study approach. According to Bell (1997 8) a case study approach is appropriate for “individual researchers because it provides a chance for one aspect of a problem to be studied in depth within a limited time scale”. This study investigates the challenges stakeholders face in attaining the goal of sustainably managed coastal marine resources in their respective communities. The methodology has been selected in order to incorporate the villagers’ beliefs, experiences, actions, feelings and behaviours as a major emphasis for investigation and interpretation. The case study approach is preferred for this study because case studies are geared towards intervention, setting policies and improving decision making (Toma 2006).

Sourcing the relevant literature primarily involved database searches of key journals as well as web-based and library catalogue searches. Aside from increasing the researcher’s understanding of the topic, the material obtained from these searches also contained valuable advice on the best methods of establishing cross-cultural interviewer-interviewee relationships and highlighted some of the social norms to be expected in Solomon Islands.

5.4 Field-based research

The field-based component of this research took place over a five months period spent in Solomon Islands between October 28th 2009 and April 8th 2010 and a second trip in the month of October 2011. The fieldwork started with the knowledge that there would only be six months available for the field based research, a condition of the New Zealand Development Scholarships that kindly funded my studies. Exceeding the six months field based policy would require securing other sources of funds which was not likely at that time. Accordingly, the research was planned with a fixed time frame and resources available to the researcher (see Table 15).

Table 15. Brief detail of the field work

Date	Duration	Place	Activities
29 th Oct	1 week	Honiara, Guadalcanal	<i>Stori nomoa</i> with Government bodies/ searching for secondary data
6 th Nov	1 Week	Gizo , Western Provincial Capital	Preparation for field trip / <i>Stori nomoa</i> with provincial government officials
13 th Nov	5 days	Liangai, Vella la Vella	Seek permission for research and carry out household census study
17 th Nov	5 days	Toumoa, Shortlands	Seek permission for research and carry out household census study
26 th Nov	8 week	Toumoa, Shortlands	Field trip (FGD, Observation, Interviews and <i>stori nomoa</i>)
25 th Jan	8 week	Liangai, Dovele, Vella la Vella	Field trip (FGD, Observation, Interviews and <i>stori nomoa</i>)
2 nd April	1 week	Honiara, Guadalcanal	<i>Stori nomoa</i> with NGO's/getting secondary data
Oct 2011	4 weeks	Honiara, Gizo, Toumoa and Liangai	<i>Stori nomoa</i> , observation and meetings

The fieldwork consisted of a week spent in Solomon Island's capital of Honiara, on the island of Guadalcanal while waiting for first available transport to travel to Gizo, during which time I visited representatives from various government bodies and had informal unstructured conversations - "stori nomoa" (see section 5.13.5) about their views of CBRM. A total of nineteen weeks were spent in the Western Province (see Table 15). Sixteen of these were spent in the two case study communities, eight weeks each respectively, observing community/environment interactions and interviewing local people about their use of, and attitudes towards, their marine resources. In between the trips, one week of follow-up work

was conducted in Gizo. During this time the provincial government administrators, the Lands Departments and a few NGOs were visited to gain some additional information and also seek population and topographic data.

5.5 Site description and selection

The study was focused at a community level in two villages with contrasting degrees of customary marine tenure based on traditional ecological knowledge. The case studies were planned to generate information on similarities and differences between the two villages in their existing management practises, marine resource uses, fishing activities, and group understandings and perceptions. The villages were purposively selected, a non-random sampling procedure that is based on the use of pre-determined criteria to select the cases to be studied (Sarantakos 1993).

The community of Toumoa has a strong chiefly system and still retains its traditional marine resource management regime. It has a *tabu* reef that has been traditionally looked after by the community through its chief for nearly three generations and the community has practised special arrangements to fish in this *tabu* reef.

Liangai village, on the other hand, is an example of one of the many communities in Solomon Islands that have experienced collapse in their traditional marine resource management systems. Liangai's chiefly system is less dominant and inactive and its traditional *tabu* (fishery control) systems have disappeared. Elderly people in the village have complained that changes associated with modernisation are eroding the traditional marine management in the village and are marginalising their lore and customary practises.

Nevertheless in Solomon Islands, traditional management systems are still being acknowledged as an important tool, as customary marine tenure is still widely held and all reefs are "owned" by particular groups and tribes who have fishing rights. Chiefs, churches and village leaders, or even the villagers themselves, regularly place *tabu* on particular reefs, usually for a restricted period of time for special purposes.

5.6 Research ethics and ethical considerations

A key aspect of social research is to ethically and responsibly carry out fieldwork; thus a brief discussion on research ethics is necessary. Before going to the field,

the researcher must be guided by ethical principles and successfully meet the requirements of the Faculty of Arts and Social Sciences Human Research Ethics Committee (see appendix A for ethics approval). The University of Waikato Human Research Ethics Committee emphasizes the significance of ethical guidelines when researchers go abroad when investigating research problems. The purpose of their regulations is “to facilitate ethical conduct which respects the rights of people, communities, companies, trusts, and other organisations” (University of Waikato 2009 1). Whenever people are involved in research, the researcher must apply ethical principles such as the notion of respect between the researcher and participant. This can be achieved by obtaining informed consent, respecting privacy and maintaining confidentiality of the participants (appendix B). In protecting the participants, informed consent is seen as encompassing some of the most significant issues in ethical research. Consequently, the researcher must ensure that the participants are capable, fully informed and comprehend the nature of the research and that their involvement is voluntary.

Despite the research paradigm or the methods being used, a researcher has to make a number of difficult decisions in the field and if one cannot adhere to ethical principles, he or she should not be out there. The data may be of little use and as researchers we potentially can bring immeasurable damage to people's lives (Weis 1992). As a result, the quality of the research would be compromised and would be of little significance to the research communities. Therefore, a number of ethical considerations were taken into account before going into the research field. They included; informed consent and confidentiality, recruiting procedures and access to the participants and research venues.

Social science research has outlined the importance of informed consent during any research project; informed consent has been regarded as one of the most crucial aspects of ethical research. Informed consent sets the pace for an understood relationship between the researcher and the participants (Davidson and Layder 1994), and as such it ensures the rights of both are respected.

To carry out research in Solomon Islands, it is important to mention here that non-Solomon Islander researchers would apply for a research permit through the Ministry of Education and inform the Ministry of Home Affairs including the

provincial authorities where the fieldwork will be carried out before doing fieldwork in the country. As a national, I was not required to satisfy that obligation.

An important part of my responsibility as a researcher was to make my field-based research plan known to the two villages earmarked as study sites. Official letters were sent to the two respective chiefs of the two communities (see appendix C) through my contacts in my former workplace, the WorldFish Center. Local village protocols for entry were followed. On arrival at a particular village, village chiefs were my first points of contact. Briefings and formal instructions were given during the first meetings to enable them to inform their people about my research plan in their own way. As such it is not a matter of respecting the chief over others but a culturally appropriate approach and also a strategic way of getting accepted in the village.

A positive experience was linked with my entry into Toumoa Village in Fauro Island, Shortland Islands where I was well received. As soon as I arrived in the village, the chief took me to meet his village leaders including church leaders, both male and female, and other village elders. They were fully aware that I was coming. This proved effective as it reduced the expectation of the villagers who maybe had confused me, a research student, with a NGO representative from the WorldFish Center or a consultant for example. A lot of Solomon Island villages are used to seeing government officers, both provincial and national, aid workers, NGO reps and consultants visiting their villages, often spending a lot of money in accommodation and other amenities. Therefore early clarification often reduced the expectations of people and also freed them up when giving their opinions.

My experience with Liangai village in Dovele district, Vella la Vella on the other hand was not as seamless. The chief had received my official letter and he verbally agreed for me to stay and carry out my research project in his village. However, he didn't inform or mention my request to his community that I would be a visitor to their village. I later found out that there is a communication breakdown between the chief and the villagers. As far as I know, he only mentioned my visit to his immediate families rather than informing all of his villagers in their weekly village meeting. As a result I invited the village chief again and three tribal leaders to meet with them. It was through this meeting that I had the opportunity to outline to the leaders who I am and the work I was there

to do. This sorted out the confusion and I was accepted as a visitor into their village.

It has to be noted here too that Solomon islanders are very open and accommodating people, and the two villages were generally keen to learn how they can best manage their resources under their own responsibility. Therefore with a good understanding of my research project it was not difficult to receive the agreement and willingness to cooperate and help from the village authorities.

5.7 Positionality and reflexivity

Social learning is a tradition of “iterative reflection that occurs when we share our experiences, ideas and environments with others” (Keen *et al.* 2005 9). The importance of learning enables a researcher to reflect on the current circumstances, which then generates new knowledge - it is an on-going process in the case studies that follow (Jureidini and Poole 2000). Reflexivity in social science research involves reflection on one’s position in the research, the research process, how people and places are represented, critically examining power relations and politics in the research process, and researcher accountability in data collection and interpretation (Jones *et al.* 1997; Sarantakos 1993).

Ethnographic research allows social scientists to be open to opportunities and envisage new ways of rationalising about what might appear too familiar to be worthy of in-depth deliberation (Hoey and Fricke 2007). The position of a researcher in ethnographic qualitative study is often questionable through etics (outsider) and emics (insider) perspectives as Lett (1990 130) explained;

etic constructs are accounts, descriptions, and analyses expressed in terms of the conceptual schemes and categories regarded as meaningful and appropriate by the community of scientific observers and emic constructs are accounts, descriptions, and analyses expressed in terms of the conceptual schemes and categories regarded as meaningful and appropriate by the native members of the culture whose beliefs and behaviours are being studied.

Naaeke *et al.* (2012) maintain that etic and emic viewpoints are important because they can impact the research process, through the findings, and the arguments made by the researcher on the outcomes of the study. In my case, I valued the complexity and extensiveness of my study because it placed me in a spotlight as a Solomon islander to think through myself within the cultural, social,

and physical contexts of the two rural communities. Dwyer and Buckle (2009) explain that often researchers studying a community to which they are not a member can nevertheless view their temporary membership as an outsider or an insider. It is therefore important for qualitative researcher to fairly interact with participants and “honour the consequences of acting with genuineness” (Glesne 1999 105).

Returning to Solomon Islands to carry out my fieldwork posed several dilemmas for me. What constitutes the ‘field’ versus ‘home’ is a tricky distinction, as returning to Solomon Islands to do fieldwork was by no means returning ‘home’. The two field sites were both rural, quite different from where I was brought up; the socio-economic context was also quite different. Yet strong family ties to rural areas (where many relatives still live) also made me feel very familiar with such settings. Therefore for that reason I view myself as an insider because I’m their *wantok* from Solomon Islands.

Furthermore between 2007 and 2008 I was employed by the WorldFish Center and this Non Government Organization has played a crucial role in facilitating the revitalization of community-based resource management in Solomon Islands communities including the two study villages. The WorldFish projects (past, current and future) in Solomon Islands together form an integrated approach to improving, in various ways, the status of coastal marine resources and the communities that rely on them. The WorldFish Center has been working with these local communities and Solomon Islands government to develop livelihood options that are socially and economically as well as environmentally appropriate, through externally funded projects. My previous personal experience may have influenced the ways in which I interpreted and viewed the data collected.

Some of the people from the two villages knew me and I see this as an advantage for me as an insider because it offered me opportunities to start up a conversation more freely using Pidgin. However, being a Solomon Islander and a former WorldFish staff, I was also cautious too of my position because the villagers assumed that I had a lot of money to meet their social obligations while in the village. For that reason, within the first couple of days when I was in the village I explained to those who knew me about my position. This gave me the opportunity to outline who I am and the work I was there to do. The approach was proven effective as initial explanations reduced the expectations of villagers who may have been confusing the research student with a NGO staff or a consultant.

After the initial conversations I felt more relaxed and easily made more friends in the village and at the same time I started joining their activities. Quite often, I would be in my house in the village and the people would just come spontaneously and talk to me or invite me to join them in their gardens or go fishing with them. Having to speak pidgin makes it easier for us to communicate with each other.

As the days passed, the villagers became more accommodating and they started asking me all sorts of questions including being a Solomon Islander studying in a foreign country such as New Zealand. During these informal conversations and interactions little did I realise that even though I viewed myself as an insider because of my Solomon Islands connection, I also considered myself as an outsider too because I was flabbergasted about the overwhelming facts and details I gathered from the two villages. One thing I realised from my experiences in these two villages was that even though I assumed Solomon Islands was a very small country with a lot of villages along the coast and very close to each other, a lot of the things are not site specific and cannot be compared to another village, even nearby, and that truly surprised me as a Solomon Islander. I came to realise also that the values and attitudes of the villagers with regards to their native language contributed to the social-culture differences.

The important thing for me as a university student was to be as faithful to the relations in that space and time, and to the stories that were shared and the knowledge that was produced through the research, however partial. Nagar (2002) notes, being a local I can be embedded within broader processes with better explanations acquired of how issues of marine resource management, social integrity, equity and village politics are implicated in village life. Accordingly to Sultana (2007 376), “being reflexive is important in situating the research and knowledge production so that ethical commitments can be maintained”.

5.8 Qualitative research

A lot of human geographers over the last three decades have used qualitative methods as they “operate on a basis that the ‘natural’ order of reality is seen, conceived of, and understood in different ways by different people” (Robinson 1998 408). The purpose of qualitative research is to try and understand how human are interacting and visualising their worlds and the events happenings around them; looking at the social processes and comprehend their engagements (Eyles 1988; Tolich and Davidson 1999; Winchester 2000).

This research is, by and large, qualitative (interactive) research. However, some quantitative data were collected as supporting evidence. Qualitative research involves outlining, understanding and enlightening multifaceted experiences. It is ideal to gain in-depth information on issues that are difficult to achieve in quantitative research as in the case of the marine resources issues in the two villages. According to Winchester (2000), it is based on personal contacts, environmental sensitivity, naturalistic inquiry, holistic perspectives, design flexibility and inductive analysis.

I used qualitative research using two case studies for this research because the research was designed to investigate the details of marine resource management circumstances and problems of the two villages. A well-used distinction between qualitative and quantitative research is that qualitative researchers focus on issues of *quality* rather than quantifiable data (Cresswell 1994; Denzin and Lincoln 2005a; Strauss and Corbin 1990; Tolich and Davidson 1999).

Denzin and Lincoln (2005b 3) argue that qualitative research

is a situated motion that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the globe. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings they bring to them.

As reported by Lamnek (1988), the main principles of qualitative research are based on the centre of a number of fundamental concepts, such as communication, understanding, subjectivity, and everyday life. This diversity reflects the philosophical background of qualitative methodology.

5.9 Constructivist interpretive paradigm

Using the constructivist interpretive paradigm helped me to find answers to the question: how can rural Solomon island communities achieve sustainable resource management? The paradigm searches to comprehend participants' definitions of a situation. It focuses on the individual and is concerned with how individuals construct and make sense of their world (Burr 2003). Thus it is imperative to have a detailed understanding of local communities in order to

formulate sound management guiding principles in relation to people's day to day activities. By providing an account of the views, aspirations, opportunities and capabilities of the local communities in community based marine resource management this research seeks to uncover some of the realities of community involvement in their day to day activities in the near-shore reef system.

Interpretivism repeatedly addresses vital features of shared meaning and understanding whereas constructivism on the other hand broadens this concern with knowledge as produced and interpreted to an anti-essentialist level (Schwandt 1994). Constructionists claim that information and facts are the consequence of perspective and therefore all truths are relative to some meaning, context or perspective (Schwandt 1994).

A clear understanding of the social and environmental mechanisms that influence a community's willingness to participate in conservation and ability to engage in marine resource management is crucial to the effective implementation of community-based management. A thorough analysis of social and environmental influences on the communities' interactions will allow discussion of not only the opportunities and potential of such systems but also the limitations and difficulties involved in marine resource management.

There are a number of interpretivist and constructionist genres (see Turner 1991) but crucial to all of these has been a concern with subjective meanings; how individuals or members of communities capture, understand and make sense of social aspects, events and surroundings (the idea of interpretation) and how this sense making produces features of the very settings to which sense making is responsive (the concern for reflexivity).

5.10 Community based participatory research

Community participation is not a new concept for research (see Botes and Rensburg 2000; Pomeroy 1995; Simmons 1994; Zanetell and Knuth 2004). However, the theory of "participatory" research has emerged over recent years, raising challenges to the positivist view of science, and the construction and use of knowledge; the role of the researcher in engaging society and the participation of the community, the importance of the power relations that permeate the research process, and our capacity to become just and more even-handed (Wallerstein and Duran 2003).

In the field of marine resource management and other social work related fields, community based participatory research (CBPR) is increasingly acknowledged as the term that may best capture this paradigm. Like participatory action research, CBPR takes the perspective that “participatory” research involves three interconnected goals; research, engagement and empowerment. As part of the collaborative processes, shared principles include a negotiation of information and capabilities in both directions; researchers transferring tools for community members to analyse conditions and make informed decisions on actions to improve their lives, and community members transferring their expertise and experiences to the researchers in the pursuit of mutual knowledge and application of the knowledge to their communities (Hatch *et al.* 1993). The foundation for an effective participatory research process is to understand the community, its people with their socio-cultural values and behaviours. CBPR has gained attention and respectability in the field of fisheries management.

With CBPR emerging as a concept in its own right, a debt remains to the global inter-change of participatory research activities (see Wallerstein and Duran 2003). As development studies theorist Robert Chambers has noted, it has become difficult to “separate out the innovations, influences and diffusions as if they follow straight lines because these sources and traditions have, like flows in a braided stream, intermingled more and more”(Chambers 1992 2).

Despite the decades of value-based rhetoric of participation in development studies, fisheries management, and participatory research, only relatively recently have researchers begun to question if the reality of participation reflects the ideal. Some have queried the legitimacy of the participatory process (Natcher and Hickey 2002; Thomas and David 2000) or perceived participation in a more restricted routine, especially in the use of rapid rural appraisal to involve community members as key informants (Cornwall and Jewkes 1995).

Community based participatory research commences with a study topic that is significant to the community, with the objective of merging knowledge and experiences for social changes to improve community needs and aspirations. Mutamba (2004 112) noted that if we are to transform society to be aware of the environmental problems and promote social fairness, “a more democratic and ecological approach to scientific study is necessary”, one in which “education between researchers and concerned stakeholders must take place in both

directions". CBPR in resource management relies and dwells on the issues of trust, authority, dialogue, community capacity building, and collaborative inquiry towards the goal of achieving sustainable resource management to improve community needs and well-being.

Although, CBPR is time consuming and filled with challenges as researchers and local villages steer through challenging moral and practical situations, addressing concerns of authority and dependence and often contradictory agendas (Backer 2003), it holds immense potential for addressing challenges to marine resource management and social problems, while helping building and bringing conditions in which communities can recognize and build on their strengths and become aware of creating knowledge to mobilise changes.

5.10.1 Community and the use of its knowledge

The conception and use of information are inherently the motivating force behind all research, yet like participation, CBPR raises the questions of knowledge defined by whom, about whom, and for what purpose (Cornwall and Jewkes 1995). The concept of community is fundamental to community based participatory research because of its aspect of collective and individual identity (Israel *et al.* 1998). Although positivist research models have justified researcher understanding of knowledge creation as a neutral and value free activity, CBPR researchers have often derived from critical theory, interpretive, and postmodern ways to contextualise their research (Cornwall and Jewkes 1995).

CBPR distinguishes community as a component of identity. Community is portrayed by a sense of recognition and emotional attachment to other individuals, common symbol systems, shared beliefs and customs, communal (although not necessarily equal) controls, common interests, and commitment to meeting shared needs (Israel *et al.* 1998; Natcher and Hickey 2002). Components of identity – for example, attachment in a family, relationship network, or surrounding neighbourhood – are all socially assembled dimensions of identity, created and re-created through social interactions (Hatch *et al.* 1993).

5.11 Sampling strategies

The returns of a qualitative approach to environmental issues are becoming increasingly recognized by both academics and researchers, but misunderstandings about the philosophical basis and the methodological

approach remain (Ritchie and Lewis 2003). Sometimes qualitative research is viewed differently from quantitative research, basically because of the way that data is collected (Marshall 1996).

Qualitative sampling is biased by the nature of the underlying qualitative framework, which is perceived as an investigative process, not greatly different from detective work, where one makes gradual sense of a social phenomenon, and does it in large part by contrasting, comparing, replicating, cataloguing and classifying the objects of one's study (Denzin and Lincoln 2005b). Irrespective of the type of sampling chosen, several sampling parameters have to be chosen before the study can begin. Once I had identified the research villages, I used a snowball technique to select the village research participants.

Qualitative studies typically utilize a form of non-probability sampling, such as purposive sampling and snowball sampling (Bryman 2004; Sarantakos 1993). Most of the participants in the focus group discussion and semi-structured interviewees were over 18 years of age and largely those who had spent most of their lives in the village. These included fisher folks, village elders and church leaders, those who had married into the village and those who are seen as "outcasts"¹³.

It is important to note that the sampling procedures used by qualitative researchers demonstrate a number of characteristics; many writers (including Bryman 2004; Cresswell 1994; Miles and Huberman 1984) note that qualitative sampling is directed:

- Not towards large numbers of informants or respondents but rather towards typical cases;
- Not towards statistical or random sampling but towards suitable cases, snowball and purposive samplings;
- Not towards representativeness but rather towards appropriateness;
- Not towards statistical sampling but towards theoretical sampling;

¹³ A pidgin term applied to those few villagers, who are viewed by the majority as unproductive and not cooperative, and sometimes end up being seen as mischievous in the community.

- Not towards fixed samples but towards ones that will change in size and subjects.

My personal familiarity with the case study villages has helped me to ensure that the selected participants were representative and with the backing from the key informants in the village, they provided me with valuable in-depth information which I took into consideration before I proceeded with the research. In fact I did not have total control over the research environment and I adopted a flexible approach to accommodate changes in the course of the data collection. Sampling comes after factors and conditions become clear and directive, and making decisions about sampling before the study has begun is neither proper nor useful (Miles and Huberman 1984).

5.12 Triangulation strategy

In order to increase the understanding of the research topic, researchers use a number of methods or different styles of interviewing to try and answer the research questions. The data in this study were drawn together through: household censuses, semi-structured interviews, focus group discussions (FGD), participant observations (PO) and informal narrative interactive story telling (“stori nomoa”). These methods of data gathering were useful in triangulating the data. Triangulation in social science is often used to ‘calibrate’ the multiple methods used in a study with a view to double (or triple) checking results. Cohen and Manion (1994 223) define triangulation as an "attempt to map out, or explain more fully, the richness and complexity of human behavior by studying it from more than one standpoint”.

Triangulation is used a lot in qualitative research to increase the credibility and validity of the results. It is an approach to research that uses a combination of more than one research strategy in a single investigation and confirms the findings necessary in qualitative research investigations. The logic of triangulation according to Patton (1999 1192) is based on the argument that

no single method ever adequately solves the problem of rival explanations....each method reveals different aspects of empirical reality, multiple methods of data collection and analysis provide more grist for the research mill.

Resource management is a complex affair involving not only the nature of the resource concerned, but also the nature of the tenure system applied and the

different motivational dynamics of the people involved. Therefore in order to gain a thorough understanding of the details, benefits and failings of such systems a clear-headed and realistic assessment of the combination of interview, observation, and “*stori nomoa*” must be made to fit with communities’ abilities and desires to conserve or otherwise use their natural resources.

The importance of combining these methods in terms of triangulated information generation and the complementarity of each other was assessed. The selection and uses of qualitative methods disclosed different information, thus complementing each other to give a deeper understanding of the situation and also the research questions.

5.13 *Methods of data collection and interpretation*

As noted, this research involved both qualitative and quantitative methodologies. A quantitative aspect (census survey) was used, but only to inform and contextualise the research which was predominately qualitative. As the focus of this research is on how the marine resources are perceived and valued, qualitative methods were most appropriate.

The collection of data involved making use of the qualitative methods of semi-structured focus group discussions (Tonkiss 2004) with follow-up in depth interviews (Legard *et al.* 2003). This method is based upon an inductive view of the relationship between theory and research, and an interpretivist epistemological position, stressing an understanding of the social world through an examination of the interpretation of that world by its participants (Bryman 2004).

All photographs depicted in this thesis were taken by the author. Quotes from villagers included in the text have been translated from *pidgin* into English by the author and to the best of the author’s knowledge and abilities this has been done with fidelity to the sentiment of the speaker.

5.13.1 *Census Survey*

A census survey targeting each household in each community was used to enumerate household demography and fishing activities. Before the household survey was conducted, two key informants (from Toumoa and Liangai villages) provided a list of all the households and the names of the household heads in each community. Interviews targeted the male

household head¹⁴ and his wife, although in some cases only the household head was interviewed as the wife was busy with community and household commitments. Alternatively when the male household head was away his wife was interviewed on behalf of the household. A check list of interview questions was prepared before the field work commenced (see appendix D).

5.13.2 Focus group discussions

Focus groups are an efficient and interesting way of gaining insights into the way in which people construct environmental and social issues; sharing their knowledge, experiences and prejudices; and argue their different points of view (Bedford and Burgess 2001 121).

In each of the two villages' two separate focus group discussions were held; one for the males and the other for the women. This approach, especially with the women, not only provided answers about the participant's understanding, knowledge and perception of their village and fishing grounds but also allowed observation of the mechanisms of discussions amongst them leading to agreed answers. The flexibility and openness of this method encouraged two way interaction, including exchanging of information between the researcher and the informants (see appendix E).

The focus group discussions were met with varying degrees of success, with the conversations of the female forums developing more comfortably and naturally in a social situation more typical to their usual interactions than with the men (See Bedford and Burgess 2001). The group discussions suggested that the women were more open in expressing their opinions regarding potentially contentious topics than were the men.

It was noteworthy that in the villages a kind of hierarchy exists amongst the community members. The hierarchy exists due to the different traditional and social status of certain tribes and extended families, and this was reflected, where people respected this order, by leaving the first and the last word to the most respected person especially among the men. Similar patterns of respect were not shown so clearly within the women's focus groups. For this method, as

¹⁴ In Solomon Islands males typically head households.

for the other interviews, one had to be aware of the cultural differences. Whereas in western societies, people are more used to speaking up freely, in traditional settings such as Solomon Islands and other Melanesian countries, people often have a different perspective on social position and often accept their function to be quite distinct and restricted.

5.13.3 Semi-structured Interview

The most decisive source of information came from the sequences of semi-structured interviews (see appendix F) I conducted with eleven people from each of the two villages. I found this method more practical because as a researcher I obtained detailed information and understanding about participants' responses to the open ended questions. It tended to be flexible, responding to the direction in which participants took the interviews and enabled the emphases in the research to be adjusted as a result of significant issues that emerged in the course of conversation. While the questions were open-ended, prompts were used because they helped to fill in gaps when participants' responses to a question faltered. According to Bishop and Glynn (1999 109)

This type of interview offers the opportunity to develop a reciprocal, dialogic relationship based on mutual trust, openness and engagement, in which self disclosure, personal investment and equality is promoted.

Table 16. Interviewee characteristics

Toumoa Interviewee	Age	Primary Occupation	Secondary Occupation	Liangai Interviewee	Age	Primary Occupation	Secondary Occupation
M	40	Fishing	Gardening	M	42	Fishing	Gardening
M	65	Fishing	Gardening	M	28	Fishing	Gardening
M	57	Other*	Fishing	F	50	Gardening	Fishing
F	50	Gardening	Fishing	M	38	Other	Fishing
M	40	Other	Gardening	F	26	Housekeeping	Gardening
M	45	Fishing	Gardening	M	40	Other	Gardening
M	67	Fishing	Gardening	M	67	Other	Fishing
M	45	Fishing	Housekeeping	M	50	Gardening	Fishing
F	40	Gardening	Fishing	M	51	Fishing	Other
M	40	Fishing	Housekeeping	M	39	other	Gardening
M	58	Other	Gardening	M	56	Spear diver	Gardening

*Other includes builder, catechist, carver, church elder, hunters and teachers but are not included here to protect the privacy of individuals, who may be easily identified

In total I conducted twenty two audio-recorded semi-structured interviews (see Table 16). Most of the interviews were held at a time and place that was convenient to the participants. Each interview took forty five minutes to one hour to complete. The participants were purposively selected from each village. The interviews were mostly conducted in Solomon Islands pidgin language. In rare instances where a person wanted to express a point and felt uncomfortable using pidgin, they were encouraged to use their mother tongue and then others would translate it into pidgin for me. This was not common as most people speak Solomon Islands pidgin.

5.13.4 Participant observation

Biases built into interviewing were somewhat mitigated through the process of participant observation, by which the researcher lived in the community in order to gain a more richly detailed understanding of the people's experiences in the context of their everyday lives (Valentine 2001). Literature that supports such an approach include Cutter *et al* (2002) who state that the most effective way of learning about an environment is directly experiencing it so that all the sensory modalities are activated; Latham (2003) believes that ideas grow out of an immersion in the data and out of the process of living; Elwood and Martin (2000) assert that research data acquired by means of first-hand interactions with members of a local community, over a substantial period of time, allow an in-depth understanding of the inner- workings of a particular social group; and Valentine (2001) considers that by conducting participatory observation the researcher may observe things that may not be discussed in an interview, perhaps because they are so much taken for granted that participants do not think they are important or interesting, or perhaps because they are highly contentious or of a delicate nature.

The eight weeks spent amongst the people of Toumoa and Liangai respectively allowed me to gain a greater depth of understanding of the complexity of issues that surround a community's involvement in marine resource management than would have otherwise been possible. An understanding and appreciation was gained for what social structures; hierarchies of authority; economic considerations; dichotomies between religion and tradition, education and tradition; individual and community aspirations and motivations; and views and opinions on the government, the villages and the reef, exist within the region.

Participant observations through directly interacting with the villagers and joining them in some of their daily activities and discussions enabled me to gain an in depth understanding of some of the reasons for their behaviour and attitudes towards their environment.

5.13.5 Informal narrative interactive story telling – “Stori nomoa”

Most of my interactions with the villagers and informants that took place during my field work involved informal and unstructured conversations and storytelling. In many instances, I picked up bits and pieces of information which I recorded in my field notes rather than involving people in interviews. The aim of the informal narrative interactive story telling is to stimulate discussion and explore different viewpoints of different stakeholders in the village. This is important for my topic because it is concerned with people’s perceptions of marine resource issues and how they can relate this to their day to day lives. It is very common in Solomon Islands for individuals and groups of people to pay a visit with fruits or food to a visitor in their communities. Betel nut is the most common gift that is shared and chewed by people as they converse with their visitors in a similar manner to people in the western societies offering tea or coffee to their guests on arrival.

As a researcher these incidents of “stori nomoa” provided invaluable opportunities to get clarifications on points raised during focus group discussions and interviews. In my opinion “stori nomoa” is a very important tool for my fieldwork since individual villagers I interacted with in the villages are not pressed for time or constrained by seating arrangements that could hinder the free sharing of experiences.

5.13.6 Informal dialogue with Government and NGO representatives

Government and NGO representatives were visited in Honiara including the Permanent Secretary of MFMR, Dr Chris Ramofafia; Nellie Kere, Marine coordinator for World Wide Fund for Nature Solomon Islands programs; Peter Ramohia, former Deputy Director of Research and Resource Management Section, MFMR who is now coordinating an Asian Development Bank (ADB) funded project from the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), "strengthening Coastal and marine resource management in the Coral Triangle (CT) of the Pacific"; and Patrick Mesia who is the former coordinator for the Solomon Islands Locally Managed

Marine Area Network (SILMMA). These informal visits were conducted after informing them about the nature of my visit. The aim of the informal visits was to form a greater understanding of the current government attitudes towards community engagement in marine resource management in Solomon Islands and to be informed about what government's view was on the issues of study.

5.13.7 Follow-up trip

Qualitative researchers have suggested several possible criteria for determining the authenticity and quality of qualitative research. However, the perspectives proposed by Lincoln and Guba (1985) appeared to be widely accepted by numerous qualitative researchers over the past decades. Lincoln and Guba (1985) and Lichtman (2009) interpreted internal validity to mean credibility; external validity to mean transferability; reliability to mean dependability; and objectivity to mean confirmability. In this study credibility, transferability, dependability, and confirmability issues were addressed through triangulation of methods and participant feedback to ensure accuracy in the reporting of data through rich, thick descriptions, and clarifying researcher biases.

After conducting my PhD field work in 2009-2010, an additional follow-up trip was carried out in October 2011 to the two villages in Solomon Islands. The trip was to obtain participant feedback and validate my results. I discussed with participants issues relating to their responses on each interview, and provided them a copy of their interview transcripts so they could look through and make any changes to my interpretation of their responses. This helped me to confirm the participants' responses in each of their transcripts, and added to the accuracy of the data I generated in this study. The participants' feedback to my preliminary analysis of interview data indicated that they were happy with my interpretation of their responses. The opportunity to revisit my former participants also prompted them to understand and appreciate the significance of their roles as users and owners of the reefs and marine resources in their respective villages. This gave me confidence that I had satisfied the confirmability criteria in this study.

5.14 Data analysis

The information that I obtained in the villages through semi-structured interviews, focus-group discussions, *stori nomoa* and participant observation made up the bulk of the data as my primary source of information. Documents and reports from Government (both provincial and national) and NGOs on issues relevant to

the research aims were also collected during fieldwork. Written documents are a good way of cross checking and verifying information obtained from the villages and vice-versa. The secondary data were summarised in an excel spread sheet.

Data from audio-taped semi-structured interviews, focus-group discussions and *stori nomoa* were transcribed and translated into English, and then added to the notes that I took during the period I stayed in the two villages. The notes were important because they provide significant information relayed by the stakeholders in the village. All transcribed data including the census household survey were presented and stored in an excel spread sheet.

Having all the data organised and displayed in an orderly form in the excel spread sheet, I reflected on the overall data gathering process to try and certify that all the information that I gathered did not misconstrue the situation in the two communities.

The next step was coding and analysis of the data. Coding allowed me to organise the data into component concepts, which were later arranged into categories. Accordingly, the data in the spread sheets were the ones that I sorted, coded and then analysed. While coding, care was taken not to lose the richness of the data. Working with this information through the spread sheet enabled me to use the themes identified. Memos were outlined to link together the themes that emerged. In reality the themes that emerged influenced the data collection in relation to how questions were asked while retaining an open mind through the process.

Individual case study analyses were done separately for the two villages and the results were presented in two separate chapters based on respective villages. The data analysis and interpretation process involved data deduction, data analysis and interpretation techniques which included verification and conclusion (see Bryman 2004; Cohen and Manion 1994 ; Ritchie and Lewis 2003; Tolich and Davidson 1999).

A cross-case analysis was undertaken to compare and ascertain the similarities and differences between the two villages in order to gain further insight to the overall trends in this case study. This was done after the two case studies were studied individually.

Lastly, I have used codes instead of the research participants' real names to ensure confidentiality. The two villages were labelled; 'T' for Toumoa, 'L' for Liangai. In terms of the village research participants, I listed their names by the village they come from, whether they are 'old' (O) or 'young' (Y), and whether they are male (M) or female (F). For example, if Mrs B was the first old fisher I interviewed in Toumoa village, then by using codes I refer to her as 'TFO1'. 'T' means that she is from Toumoa, she is a Female (F), she is old and she was the first to be interviewed in Toumoa village. For key informants, I have referred to them as 'KI' to mean key informant. For example, TKIYM1 means that the KI informant is from Toumoa, young, he is a male and my first informant.

5.15 Types of data in social science research

Data are the basis for, and are central to all systematic research and can be a costly part of any research process, across any discipline (Denzin and Lincoln 2005b). Accordingly, to Ritchie and Lewis (2003), it's an important component of the evidence required to evaluate results, recreate the events and processes leading to them and to understand why they have occurred.

Gathering decent quality data has a significant role in supplying objective information for the issues under study so that some analytical understanding of the problems, and hence solutions, can be obtained (Bryman 2004; Ritchie and Lewis 2003). Data can be obtained through qualitative or quantitative methodologies (Creswell and Clark 2007; Neuman 2005). The obvious difference between the two is that one deals with description in the form of words and the other deals with numbers (Pope *et al.* 2000).

Face to face interviews have been predominately the primary source of data in qualitative research but recently, telephone interviewing is becoming more common due to the advance developments in computer technology (Pope *et al.* 2000). For this study, the qualitative data provide comprehensive and rich information as participants construct their own meanings of events or situations. Davis (2007 574) professes that "good qualitative research has equalled, if not exceeded, quantitative research in status, relevance, and methodological rigor."

My qualitative data is arranged through primary and secondary sourcing in the form of narrative (text) scripts, gathered from interviews, survey questions, informal storytelling, recorded observations, or existing documents, among other sources. Sarantakos (1993) explained that qualitative data is combined into

meanings, then sorted, interpreted carefully, and conclusions are reached. Stenbacka (2001) on the other hand described qualitative data as powerful in describing peoples lived experiences, events, and situations. In many traditions, qualitative data required creativity because it involves long description of words which links meaning of events and situations (Davis 2007; Miles and Huberman 1984).

The findings chapters that follow are based on all of the forms of data discussed here.

5.16 Research constraints

While I managed to complete my field work and collect all the data that I wanted for my research trip in Solomon Islands, I went through some social and physical moments of doubt and frustration. I will highlight some of the problems, risks and stresses that researchers in rural Solomon Islands may have to undergo with insights from my fieldwork experiences. Furthermore I will highlight difficulties in data collection and therefore implications for data quality and reliability.

To begin with, communicating with Solomon Islands villages in the remote islands is not very effective and can be very frustrating for research fieldwork preparation. The most common form of communicating to rural remote villages is by two way high frequency radios (commonly known as 'wireless' in Solomon Islands). Even with this technology, not all villages are accessible. Even letters to the villages are not delivered on time (if they ever are) due to a less effective postal service and absence of a reliable transport network throughout the country.

Secondly, shipping and air services to most islands in the provinces are available but are subject to disruptions and delays. Some islands in the country can only be accessed by ship rarely throughout the year so proper planning is important. Not only that, but the drop off point of say a ship or plane may be a good distance away from the village study site and added complications arise in that one may be unable to travel from one island directly to another as the Solomon Islands' transportation network revolves around Honiara's (capital city) ports and airport. Accordingly for my fieldwork I had to travel from Honiara to Gizo before catching another form of transport to my first study site which was Toumoa village. This could be time consuming, expensive and tiring for a researcher. My sea travel from Honiara to Gizo for instance took me 24 hours while the one from

Gizo to Toumoa took me around 18 hours by the same passenger boat. My choice to go first to Toumoa Village instead of Liangai village was based upon transportation availability.

The point is that transportation networks are lacking and depending on where one is travelling, the experience can be hectic with implications for the quality of data from the field. More importantly, these trips are risky because of potential high seas and other travelling risks.

Thirdly, like any other work, finance is always a huge concern. The geographically scattered islands and provinces, coupled with transportation and communication difficulties can make fieldwork very expensive. At times, a researcher will come across fundraising activities organised by a village and he or she is normally expected to contribute something towards such causes. For case studies, such participation may be vital in providing further insights into village social norms.

Fourthly is the risk of tropical diseases like malaria. As Solomon Islands is in the tropics, malaria bearing mosquitoes are present. It is important to have regular medical check-ups, especially for the malaria parasite when doing research in rural Solomon Islands. As remote villages may be very far from health facilities, it is advisable to carry anti malaria tablets and treated sleeping nets when carrying out fieldwork in very remote Islands in Solomon Islands.

Finally is a caution about the participant/villager expectations. Some people could easily misinterpret a researcher's time in the village as someone intending to directly assist the community in development activities. This particular issue was faced by the researcher in one of the villages studied. Efforts had to be made on arrival to clearly explain to people that the activity was related to a university student doing fieldwork for academic purposes, not a development project. My advice is to spend a few days sitting around and *stori nomoa* with the village members before expecting them to fully understand the research intentions. It is important to explain why one is there and how the information collected will be used to minimize unrealistic expectations from the community members.

All in all, the two villages are situated in two different islands of Western Province and were studied in the course of the fieldwork. The initial plan was to spend at least twelve weeks each in the two villages but because of transportation

difficulties and other logistical problems strategic changes had to be decided upon there and then. As a result, a maximum time of eight weeks were spent in each of the two villages for the primary data collection. The rest of the time was spent on arranging and waiting for transport availability. As the transport network for the two villages revolves around Gizo, the Western Provincial capital, this was one of the difficult things to deal with. While in Honiara, Government offices, non-government organisations and other data sources were consulted as well as follow-up on issues raised in the remote villages' discussions

5.17 Summary

This chapter has presented an overview of the methodology underpinning my research. The research questions guiding the research are outlined. A case study approach was used to generate information on similarities and differences between the two villages in Solomon Islands in the existing management practices, marine resource uses, fishing activities, and group understanding and perceptions. This research uses the constructivist interpretive paradigm since its purpose is to understand the social and environmental mechanisms that influence a community's willingness to participate in conservation and ability to engage in marine resource management. The other theoretical framework used to inform and strengthen the methodology and this thesis is community based participatory research (CBPR). This research involved both qualitative and quantitative methodologies. A quantitative aspect (household census survey) was used, but only to inform and contextualise the research which was predominately qualitative. As the focus of this research is on how the marine resources are perceived and valued, qualitative methods were most appropriate. A triangulation strategy was employed for validating the credibility of the data. The qualitative data collections included semi-structured interviews, focus group discussions (FGD), participant observations (PO) and informal narrative interactive storytelling. The research constraints were presented. The next chapter deals with the presentation of data and findings.

CHAPTER 6: FINDINGS FOR TOUMOA VILLAGE

6.1 *Introduction*

This chapter and the next present the findings derived from the field data collection. The major aim of the research was to identify influencing factors from both within and outside the villages' environments that support or challenge the stakeholders' ambitions towards attaining the goal of sustainably managing their coastal marine resources.

The data from this study are presented below and categorized according to the method of data generation. An analysis of the villagers' interviews provided a rich source of information on their personal knowledge, their attitudes, practices and their views on how they interact with the resources that they extract day in and day out.

Given the aims of this research, the villagers in Toumoa who I interacted with played a pivotal role in the provision and interpretation of the data. Data obtained from the interviews, informal *story nomoa* and focus group discussions were categorised into themes. This provided a valuable source of information and comprehensive knowledge of the fishing community's attitudes and beliefs regarding their resources

6.2 *Background*

Toumoa village has a total of 38 households and a population of 244 and all of the population lives within five hundred metres of the shoreline. More than half (59%) of the population were 18 years old and above (see Table 17). There are more females (53 %) than males in the village. Household size in the village ranges from three to nine people with an average of six per household. The households were mostly made up of nuclear families although there are a number of households comprising extended families. This is a typical Solomon Islands tradition, having all the family members around each other.

Table 17. Age distribution by gender of Toumoa household members from 38 households

Age group (years)	Male		Female		Total	
	No. of males	% of males	No. of females	% of females	No. of respondents	% of respondents
≤18	50	44	50	39	100	41
>18	65	56	79	61	144	59
Total	115	100	129	100	244	100

Data obtained from household census (2009)

Most of the villagers had been through some formal education at either the primary or secondary school level (see Table 18). Eleven of the respondents have had a tertiary level of education through the college of higher education or rural training centres. However, there are a good number of fresh high school 'drop outs' roaming around the village. When asked, 'what the future holds for them?' Most of them, without prompting, responded '*mi no save (I don't know)*'. The reality for most of them is that there are not many opportunities available within the village in terms of being productive and active, based on their high school achievements given the isolation from urban centres. Furthermore, for most of these young adults adjusting back to the village life is a rollercoaster because they had learnt, adapted and developed new ideas from their respective high schools in the different islands where they studied in Solomon Islands.

Table 18. Education status of household members, by gender, Toumoa community.

Education level	Male		Female		Total	
	No. of males	% of males	No. of females	% of females	No. of respondents	% of respondents
No education	10	9	14	11	24	10
Primary	66	57	74	59	140	58
Secondary	35	30	31	25	66	27
Tertiary	4	4	7	5	11	5
TOTAL	115	100	126	100	241	100

Data obtain from household census (2009)

The majority of the household heads responded that their primary occupations were gardening, fishing and copra. A large area of prime agricultural land along the coast at both ends of the village has been transformed into coconut plantations which are owned by individual families.

With regards to household incomes, all the respondents in individual interviews stated that there is no regular source of cash income except for the primary school teachers and nurses who were paid wages for work in the village primary

school and clinic respectively. The rest of the villagers depended entirely on copra, trochus, and fishing (local market) as their main source of cash income. A small number of women together with their family members, baked buns regularly for sale but it was only enough for them to buy kerosene, soap and sugar at the local canteens.

On the whole, after the moratorium placed by the Ministry of Fisheries and Marine Resources (MFMR), in 2005, on the harvesting of beche-de-mer, many of the villagers have suffered because it was their main source of cash income. Therefore, nowadays most of the villagers have to dig deeper and search harder for alternative incomes. As one man explained his experience and frustration:

I cannot make any more money here (he sighed)...before I can get easy money from diving beche-de-mer. But now it is banned. There are few lucky ones in the village who have coconut plantation but the rest of us, it is just impossible to pay for our kids school fees. (TMO7)

Fishing was a major activity in Toumoa besides gardening mostly for men. Though women and children fished, it was only for subsistence. It was the men who put a lot of effort and spent long hours during the week fishing as a source of cash.

The Shortland Islands group are very much out-of-the-way from basic services such as markets, hospitals and money making opportunities compared to the rest of the islands in the Western Province. On the other hand, they are very close to the island of Bougainville in Papua New Guinea (PNG). The border between Solomon Islands and Papua New Guinea sits between the Shortland Islands and the Island of Bougainville (see Figure 2). The closest tips of each other are about five nautical miles apart.

Buin town on the southern tip of Bougainville Island, is the nearest urban area and provides a market/business opportunity to the Shortland Islanders as it is more accessible than the Solomon Islands towns of Gizo or Honiara. The Buin market gets very busy on Saturday with a variety of local fresh vegetables and sea food. For the fishers in Toumoa, it is a two hour outboard motor ride across the Solomon Islands – PNG border to go to Bougainville Island to sell their smoked fish and other commercial marine resource products such as clam shells and shark fins. They have ventured into the opportunity since the early 1980s and this has been their main source of income and commercial opportunity.

The fishers go there every Saturday morning to sell their fish because the demand for their fresh smoked fish is high. In return they receive Kina (the PNG currency). After the market, they shop for goods such as rice, soap, sugar and other basic needs before they return back to their village in the afternoon.

Likewise, fishing plays an important role as a source of protein-rich food and employment for them. Subsistence and artisanal fisheries catches are mainly comprised of a few species groups, namely parrot fish (Scaridae), rabbit fish (Siganidae), sardines (Clupeidae), and mackerels (Scombridae). Access to the reefs, means that resources such as trochus, fish, giant clams and crayfish can be harvested at any time by the Toumoa community.

Any people from outside Toumoa including 'outsiders' and those from nearby villages are regarded as poachers unless they have prior permission from the chief to enter the Toumoa fishing areas (see Figure 14). Fishing for subsistence is, however, totally unregulated for the people of Toumoa although, when commercial fishing is undertaken, the permission of the chief is required.

Given a general perception in Solomon Islands of declining chiefly power (see section 2.7) what was remarkable to observe in Toumoa was even as times and external pressures change, the positions of leadership and power structures seem to have not changed very much at all. Most villagers show great respect to their chief and in return the chief has a deference and admiration towards his people. The possession of differing levels of power and influence over natural resources was not found to affect an expressed willingness to manage them sustainably.



Figure 14. Toumoa fishing ground
(Aerial photo taken by the author)

6.3 Values and attitudes of villagers towards management practices

This segment will present the villagers' perceptions of, and feelings about, what value they place on their resources and management practices.

6.3.1 Traditional values attached to resources

Toumoa village represents a traditional Solomon Islands community where marine resources are important to the livelihoods of the people. There are a number of small cash sector activities in the village but according to one of my key informants, a primary school teacher, "the local economy remains dependent mainly on family based activities, built on shifting cultivation of root crops in the gardens and inshore and off-shore fishing". The perception of the right to use land which is not ones own to make food gardens and access resources means that individuals or families who do not have access to their own customary land

(or enough of it) to meet their needs can be given the right to use other families' lands.

One thing I noticed that really stood out is that history is important to this community, which has developed a strong sense of place. The community is made up of six main clans: Baumana, Bauahu, Talili, Talapuini, Talasagi and Simea. As noted earlier, these tribes were originally from Mono (one of the three main islands of the Shortland groups see Figure 3 from Chapter three) but around five generations ago a great chief from Mono conquered the land and other tribes followed thereafter to settle. The villagers are now deeply rooted in their community comprising the descendants at least four to five generations to have settled in the area. Their sense of place is historical and the past plays a critical role in their present and future events compared to their two neighbouring villages.

Knowledge of fishing techniques is one of the main aspects of culture that gives recognition and status to Shortland islanders in the village communities. Exploitation of different inshore and offshore areas determines the type of fishing method to be used. I was reminded by one of my informants who is a fisherman that some of these methods are only appropriate to a given area and specific fish species.

Another important benefit of the traditional social system was its excellent understanding of sustainable management of the natural environment. Much of the coastal area along the village is key to the traditional livelihoods of the villagers who are dependent on marine resources through either resource extraction or traditional customs and beliefs. The older villagers have a high level of awareness of the marine environment and possess valuable traditional knowledge concerning fish stocks. During one informal conversation I had with the village chief, he reiterated the importance of traditional values that his community members have concerning their reefs and resources:

Knowledge and understanding was developed over years and handed down from generation to generation. Verdicts were based on detailed information on the local area and a keen understanding of the natural cycles of the resources. Communication of knowledge occurred through an oral tradition by direct demonstrations and experience.

All the land and sea resources were held in the trust of the reigning chief for his people. He coordinated stewardship of all extraction of the natural resources. However, the villagers had rights to the resources for subsistence and tribute. I was told and reminded by the chief that the socio-spiritual characteristics of the traditional way of life provided further protection against over harvesting.

Most of the older fishers I chatted with reminded me that the art of fishing was passed along family lines. The fishers were of a special lineage and each one was taught for years as a trainee. They were trained to observe and detect changes in the condition of the marine resources which include feeding habits and the growing conditions of different species.

The traditional life style is a complex system and challenging to measure because it is not only about access to land and sea but also includes social capital, social exchange of material things and social security. In Toumoa, the communal and traditional way of participation is seen as still being upheld very strongly and the chiefly system is currently very much valued. However experiences were found to vary slightly among villagers.

6.3.2 Attitudes towards resource management

Traditionally in Fauro Island, people were allowed to fish almost anywhere for food, indicating that marine areas were, in the past, generally managed as open access. However due to the growing desire for cash, the demand for sea resources has escalated, resulting in the depletion of certain commercial reef marine resource stocks. This has alerted the community to be more vigilant and cognizant of the urgency to manage more of their productive reefs.

When I asked the question, 'how important is it to manage the marine resources in your community?' An elderly woman commented:

It is very important...it is our life... that's where we got our food and income especially this village that's how we live so we need to manage them properly. (TFO4)

This demonstrates how much the elders treasure their resources and the implications for their village should they run out. In Toumoa, the creation of management systems to cater for long term sustainable use of scarce marine resources has occurred for over 30 years in recognition of the dangers of

overexploitation of those resources. A no-take sanctuary has been established, and is an important conservation initiative, one that has come from the community leaders themselves.

It has a high level of local acceptance and community ownership. The protected area is viewed by many in the village as a source of recruitment for other fished reefs within and around the area. Importantly, the customary owners know which species live in the sanctuary area, when they spawn, and during what lunar phases they aggregate. Such conservation measures have contributed to placing the village on a sustainable footing, particularly when now there are many more people in the village than before.

Greater respect for the property rights of local people has supplemented this practical approach to management. Village decision-making is, however, often challenged now by a few 'elites' wishing to access valuable resources, and this potentially distorts traditional norms.

The difference that adequate surveillance can make in the functioning of the traditional management regimes was made apparent by the fact that all the village houses directly front the shoreline and sit opposite the *tabu* reef, Rosae (Figure 15). This traditional practice is still functioning effectively in Toumoa. The reef area had a *tabu* against fin-fishing and shell-fish gleaning initiated by the grandfather of the current chief. The villagers assert that no-one breaks this *tabu* at any time, day or night.

From what was seen in Toumoa, the traditional resource management practices (*tabus*) are the basis through which a relatively high proportion of local people are involved in an attempt to sustainably manage their marine resources. Although tradition is associated with a specific location and time, community-based marine management systems, if appropriately modified and sanctioned, can be the bases of suitable strengthened management arrangements. When reflecting on issues he faced today in his village, the village chief told me that:

The sustainable use of marine resources was easier to achieve in the past because people were fewer in numbers, had fewer needs and had more limited capacity for consumption.



Figure 15. Tabu reef, Rosae

(Photo taken by the author).

Costly mistakes have often been made when people disregard and ignore the experiences of their ancestors or fail to learn from them (Veitayaki 1998). The chief further explained that at times he noticed his people were very destructive in their activities but their small population and limited capacity reduced their overall impacts. The villagers' understanding of the settings of the sea, reef and rainforest is dynamic and constituted an on-going process of knowledge transmission, individual learning and collective knowledge.

6.4 Constraints to existing marine resource management practices

In this segment, I look at the constraints that confront the villagers in Toumoa village in relation to the existing resource management practices they have.

6.4.1 Population increase

As the village has grown in population and expanded to cover a larger geographical area and cash economies have developed, the villagers have found themselves displaced by the very development that promised a better life. For many communities in Western Province including Toumoa, which had evolved practical and sustainable ways to utilise their resources, the western style of development posed significant challenges. Population increases and the growing cash dependence have made the harvesting of giant clam shells¹⁵ an attractive commercial opportunity for fishers in Toumoa. The people I talked to consistently reminded me that the resources were decreasing due to an increase in population. An old man recollected when he was a teenager and shared the following:

When I was a teenager, there were only three teenagers in the village (Ninamo, Kevin, and myself). There were a lot of resources in the sea. There were only seven houses here. Everything was easy. For example there were a lot of clam shells in the sea just in the front of the village but we don't eat them every day only the women glean them when they are tired of eating fish. People just fish and dive in front of the village. We hardly paddle up to those islands outside of village because during those days we thought that they were too far. The Island Arambo (the closest island) is too far. We only go there on Sunday. (TMO3)

The communal and traditional way of participation is seen as still being upheld very strongly and the chiefly system is currently very much valued. However, experiences among members in the community were found to vary greatly. Resentment of having to face the cash economy with the growing population was shared by a father:

When I was small I wasn't interested in collecting beche-de-mer, only my father and few other young blokes in the village dive beche-de-mer. However few years ago, when the beche-de-mer was open, everyone in the village including my little

¹⁵ Giant clams are a type of bivalve mollusc that lives in tropical waters throughout the world. There are eight known species of giant clam and six of these can be found in the Solomon Islands. The giant clams found in the Solomon Islands are; *Tridacna gigas*, *Tridacna derasa*, *Tridacna maxima*, *Tridacna squamosa*, *Tridacna crocea* and *Hippopus hippopus*.

daughter will paddle out to the reefs during night to look for it. Everyone is interested to look for money. I think that's one of the reasons these particular resources have depleted. (TMO11)

The demand for fishery resources has been gradually increasing with the growth in population. Various suggestions amongst the villagers for management responses to supplement with existing traditional management have been (or are being) considered in the attempt to manage the coastal and marine resources sustainably. These responses include further traditional management systems on other suggested reefs, collaborative management arrangements with groups such as the WorldFish Center, and village based enforcement of rules through regulatory mechanisms.

6.4.2 *New fishing techniques*

The fishing methods and gear used by the villagers have changed over time and will continue to evolve and expand in response to the increasing demands for fish and marine products. It must be noted, however, that locally known information about fish behaviour, seasonal variations and periodicity is an essential ingredient in the successful adoption of newer methods and as such that knowledge, while apparently previously used for management (section 6.3.1) can also contribute to over-exploitation. The different type of fishing methods often determined the different coastal areas to harvest. Fishing involves a wide range of techniques as explained below.

Reef gleaning: Women and children practically glean seashells, invertebrates and seaweeds during low tides from reefs and surrounding lagoons as they are important sources of food and livelihood in the village. Species include sea cucumbers, sea urchins, crabs, shellfish, seaweeds, and finfish. The impact of reef gleaning using modern knives, crowbars and bags has been substantial and extensive already, particularly on the reefs in front of the village and nearby. The commercial invertebrates and crustaceans are now nowhere to be seen in the nearby village reefs. In the focus group discussion the participants confirmed that fishers now have to paddle further out to the reefs on the southern end of the village and spend more time in order to find them.

Hooks, lures and lines: Fishing using hooks and lines is a common practice throughout the Western Province and ranges from simple hand-held lines to more elaborate long lines which aim to catch pelagic fish such as tuna and sharks.

Lures towed behind boats or outrigger canoes are also used to catch pelagic species such as mackerel, trevally and tuna. In line fishing, specific methods with different lures, bait and baiting techniques are employed. For example, one-to two-inch hooks with a white feather lure are especially valued for catching Spanish mackerel (*Scomberomorus commerson*). At various seasons, other reef fishes are predominant and at certain grounds only. Knowledge of the prime areas and preferred methods is kept secret by local fishermen, and when fishing for common reef fish such as coral trout (Serranidae), snapper (Lutjanidae) and others, ordinary hand lines are used.

Spears: Spears are traditional tools that have been used for many generations but have been modified in recent years with the arrival of waterproof torch lights. Fisherman nowadays use modern gear with fins, masks and spear guns at night to simply target valuable reef fish that shelter within the coral. Underwater torches have had a huge impact on the fishing activities in Toumoa, with people now having the means to go diving at night when fish are noted to be a lot more docile. One fisher related how the sleeping fish “just float there’ unaware of a diver approaching with a torch and spear-gun. On the other hand, others complain that the waterproof torches make it easier to poach at night.

One of the biggest changes to marine harvesting regimes in the area has come about through the availability of snorkelling masks, which enable people to dive for fish and shell-fish in the deeper waters, and the previously inaccessible waters of outer reefs. This gear goes along with underwater spear-guns, which can propel a spear into a fish or turtle at quite a considerable speed and force.

Nets: The villagers use a range of fishing nets in the village such as gill and barrier nets, seine nets and casting to name a few. These are mainly unselective fishing methods that can be extremely destructive. One of the worst is set or lay gillnets. According to local fishers, the use of set monofilament gillnets has reduced the populations of inshore reef fishes in the village. While some nets are used only to catch targeted certain species, the others like for example lay gillnets were left overnight over the reefs. As a result, they destroyed the bottom habitat of coral reef and depleted both targeted and non-targeted species, leaving nothing behind. The by-catch is often more than the volume of the targeted catch. Given their relatively low price, ease of use and high efficiency, the use of monofilament gill and barrier nets has proliferated in the village. They

are now widely used to target a range of fish species including mullet and milkfish.



Figure 16. Outrigger and Outboard motor engine canoes used by villagers for fishing (Photos taken by the author).

Outboard motor fishing: Offshore fishing is one of the most important economic bases for the fishers who travel to sell their smoked fish in Bougainville. Tuna, in particular, is a substantial component of both small-scale artisanal and subsistence fishing. A modified outrigger canoe with an improved sail design for greater manoeuvrability has helped to improve older outrigger canoe designs for more extended usage of the craft. Pelagic fishing is carried out from canoes with outboard motor engines powered by 15 to 25 horse-power engines to go beyond the breakers to depths greater than ten metres and as far offshore as five to fifteen kilometres depending on the capability of the boat and engine (see Figure 16).

Basically the canoe is tailored with fishing lines for casting, deep-bottom and trolling, baited hooks, a club, knife and a four litre container water to quench one's thirst. Despite the advantages conferred by fibreglass boats and outboard

engines, the tremendous expense incurred through fuel consumption has led to a realisation that only a few village fishermen can afford such equipment.

Despite the spread of modern fishing techniques, much of the inshore fishing in the Shortland Islands is still conducted by non-motorised small outrigger canoes or by wading and fishing in shallow inshore waters and lagoons. Introduction of new fishing gear has widened the experience of some of the villagers. The fisheries use both traditional and contemporary boats and fishing gear. New fishing techniques, gear types and fishing boats have helped contribute to overfishing. As an elder shared:

It is difficult now...I changed my bait regularly when I go out fishing, especially trolling. Now I have to improvise things in order to catch the tuna or trevally. The fish are even clever they don't like the old baits now. I must admit you cannot catch a fish with the older baits. You have to improvise and keep trying. (TMO2)

There is a general experiential and practical knowledge related to fishing that is currently retained and used by a few enthusiastic fishers in Toumoa. However, the knowledge no longer has the same importance, and there is evidence that some of this knowledge will disappear with the present day generation if current trends continue.

6.4.3 *The demand for fish (protein) and cash*

Fish, root crops (taro, yam and cassava), and bananas constitute the traditional diet of the community. Thus fish have long played an important role in food security by providing nutritious food which includes protein, essential amino acids, fish oils and essential micronutrients such as calcium, iodine and certain vitamins. Fish and clam shells are culturally and nutritionally an important source of food throughout the Shortland islands group and the fisheries play a central role in many aspects of food security.

Today the village faces a tremendous challenge — one that is growing. When reflecting on the traditional diet of the community a fisherman told me that:

As the population increases, so too does the demand for fish protein and also the demand for cash is growing on a per capita basis. (TM011)

Human activities – from overfishing, to pollution of inland and coastal waters, and destruction of nursery grounds – are putting increasing pressures on fish stocks, and are undermining the basis for future productivity and recovery.

The villagers acknowledged that the depletion of certain commercial marine resources has been attributed to overharvesting largely because of the growing number of fishers using more sophisticated fishing methods and also because of the demand for a balanced diet in every meal provided for their households. Given the situation whereby fish and the other edible marine resources are the main source of protein readily available in the village, they are targeted every day except Sunday. Other sources of animal protein such as cattle, pigs and poultry are 'rare' and not farmed in a consistent way for food and were expensive to get hold of or purchase.

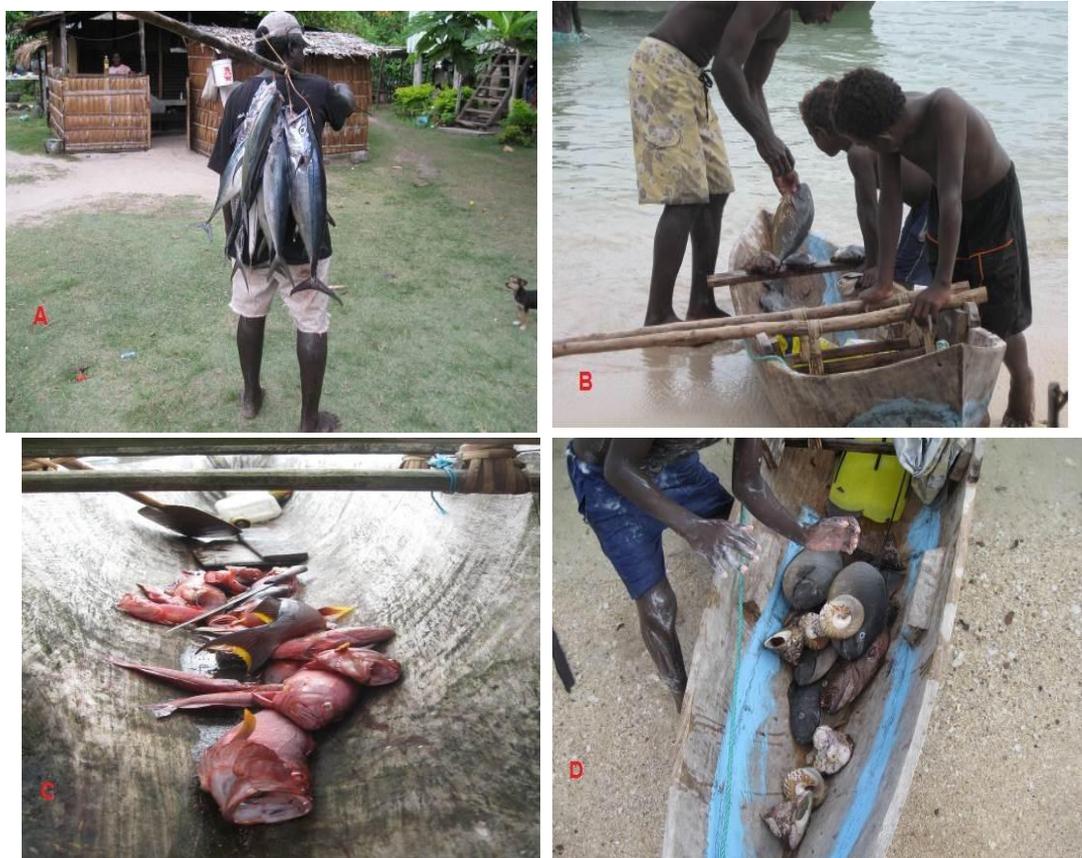


Figure 17. Fishers display their catches using the different fishing techniques A: Outboard motor trolling fishing, B: Spear gun fishing, C: Hook, lure and line fishing and D: Reef gleaning and spear-gun fishing

(Photos taken by the author)

Fish is the only source of cheap high quality animal protein (see Figure 17) that is essential for healthy development in rural Solomon Islands. In the case of Toumoa, given its isolation from urban centers, fish is relatively inexpensive

compared to any other protein. Food plays a central role in island culture; it represents prosperity, generosity, and community support. As such fish in the form of food is often given as a gift, and a refusal of food is considered an insult to the host or giver.

It is frequently admitted that the root cause of food insecurity is poverty in the village. The people who are most vulnerable to food insecurity are those living in isolated rural areas, including existing fishing communities. The communities in Toumoa are still underprivileged socially, economically and politically, despite being an organised community.

For the reason that there are limited statistics available and much is unknown it is impossible to estimate the fish consumption in the village. However, I was told by some informants in the village that subsistence fisheries yield perhaps ten times larger catches than the commercial harvests, provide a major source of protein for the villagers directly and contribute significantly to household food security.

As such, the villagers have suggested that the existing traditional *tabu* reef regime may now need to spread out to other open access reefs in order to cater for the growing demand for food supply and provide food security for future generations.

6.4.4 Nonexistence of support from Ministry of Fisheries and Marine Resources

Most people in the village told me that they are aware that the Fisheries Act is a supplementary management system to their existing traditional management system, to safe-guard their resources. While MFMR respects their *kastom* ecological knowledge and practices they should in the same way respect the Fisheries regulations and these regulations should not be taken as a threat to overwhelm their *kastom* environmental knowledge and practices.

Even though enforcement is less structured, it is a common practice for villagers to report those have committed offences in the village to their traditional leaders. As they do not have a police post in the village, the chief and his elders use *kastom* law to deal with crimes on the basis of their severity. Serious criminal cases are referred to police officers who are posted at Korovou center, in the

inner Shortland islands. The chief and his council have their own way of handling domestic conflicts and disputes through the village council.

As population increases, the use of destructive fishing gear and techniques as well as poaching are often easier for inexperienced fishers than techniques requiring training and skill. For most of them, it is only when they see the damage that is done that they realise their practice is unsustainable, and this was evident when I was talking to the fishers. For most of them, they were willing to see more partnerships with, and initiatives from, Fisheries officers using participatory techniques so that they can improve and increase understanding of the reasons for national laws against destructive fishing techniques, as one woman shared:

It is important to manage the resources properly and not harvest undersize species which will lead to extinction. What I have noticed here in the village... people are starting to collect undersize trochus and that is bad management. (TFY9)

With the existing communal system already in place in the village, the villagers would like to see MFMR support their traditional *tabu* as this informant explained:

I strongly believe it will be a huge morale boost for our village to have Fisheries officers visit us frequently to explain and share with us the existing Fisheries regulations and reasons for some of the bans they've taken. Our fishers will be enlightened to be educated with new ideas and our people will see that we have a government that cares for us. (TKIYM2)

Fisheries officers often lack funding and capacity to carry out research, monitoring and assessments on inshore fisheries activities in and around the country. Forming partnerships with village resource users is a realistic alternative to boost villagers' morale. When fisheries regulations are breached by villagers they often go unnoticed and unpunished. During one of my informal storytelling sessions with a nurse in the village she mentioned that, "when communities are well-informed, and the dangers to the stocks are understood, fishers who violate regulations will be more likely to be subjected to strong social pressures to stop at an early stage"¹⁶.

¹⁶ In 2010, giant clams illegally exported to Honiara from Fauro Island were intercepted because MFMR and NGO staff were there working with the community and were able to report at their request and MFMR intercepted in Honiara (Mr Cletus Pita, WorldFish Station Manager, based in Nusatupe, Western Province, pers. comm. 2010)

When fish are caught for subsistence, the desire for food among fishers is satisfied but when fish are caught commercially, fishers tend to catch more fish in order to earn more money. A community sense of moral responsibility to protect their marine resources is the only possible counterbalance for this hunger but with some sort of support from the MFMR.

6.5 *Current trends and challenges that have impacted the management practices*

In this section, the research participants' outline the different aspects of the daily challenges that they face that have impacts on their management activities in the village

6.5.1 *Unsustainable harvesting of resources*

The villagers told me that there is great potential for short-term monetary gain through the sale of popular seafood such as fish or clamshells, as well as ornamental souvenirs, including corals, turtle shells and other reef-dwelling organisms. As a result of consumer demand, many species are now harvested from inshore and offshore marine habitats in an unsustainable manner.

The unsustainable harvesting of reef resources for ornamental souvenirs, cash or sustenance poses a severe threat to the health of the village near-shore and the reef habitats. I've noticed that the exploitation of key species (predators and herbivores) has caused a decline in certain species resulting in conditions for ecological shifts, leading to an abundance of undesirable organisms such as sea urchins and algae in the shore front of the village. The villagers complained that this has never happened before but only noticed in recent years.

The exploitation of giant clams for shells to sell to external buyers has been observed by fishers to markedly reduce local populations. They say that not only are the clams less numerous but they are now also difficult to find in nearby reefs. One has to paddle further towards the outer reefs and dive deeper to get them. If these stocks are now below a critical population density, natural recruitment will be threatened. The reefs all over Toumoa village are renowned for their high biodiversity and are the home environment to some endangered species such as dugongs and hawksbill turtles. Nowadays biodiversity is considered to be declining as this informant shared:

It is evident that our marine resources have declined. Even to catch a fish using a spear gun is impossible. As soon as the fish saw you they took off. I believe they now know what a spear gun is. For example, when I went spear fishing, there were a lot of fish but as soon as they saw you with the spear gun they took off. If we talk about clam shell it is all gone because of the market in Bougainville. If there wasn't any market in Bougainville surely there will be still a lot of clamshells in our reefs. (TKIOM5)

Dramatic changes in the marine habitat are often obscured when key species are harvested but eventually over time serious degradation will occur to the ecosystem. For example, the popularity of particular seafood dishes has already led to serious declines of giant clam shells, trochus, and certain fish such as groupers, snappers and jacks right through the nearby reefs closer to the village. Compounded by other prevailing ecological problems, over-consumption can negatively impact the wellbeing and potential of the same natural areas that entice and support the villagers in the first place.

Most of the villagers agreed that overfishing has hurt fish stocks in recent years as this man emotionally summarised:

We have ourselves to blame...We are overdoing it and targeting undersize species...when I was a kid there were only few of us from Fauro who lived on this village with our parents but now we have members of our families who married outside of the village. Some married to other villages in Shortland and even as far as Malaita. Nowadays, it is a trend, we harvest fish, clam, and turtles and sent them over to the families of those we married to. Our in-laws would ask us to harvest and send seafood to them...but before it was not like that it is only for us to eat them here... at the present time whenever a canoe leaves for Shortland those of us who are married there will send a basket back to our in-laws...you know the attitude... It is our culture. Even those who married to the other islands did the same too. (TMO6)

Many motives have been attributed to the decline of marine resources, including increasing demand for fish and cash, ineffective monitoring of open access fisheries and poor management, the globalization of markets for marine resources, technological innovation, over capacity and poaching.

6.5.2 *The market in Bougainville*

Apart from the collection of trochus for sale to local buyers in the village, predominantly undertaken by men and boys, the sale of smoked fish and

clamshell provides an important alternative source of household income for the fishermen in Toumoa. The market factor has caused significant impact on the livelihoods of the community, especially the fishermen. As noted, because of their isolation from urban centres in Solomon Islands, they venture across the border to Bougainville Island in PNG for the opportunity to sell their smoke fish and clam shells in Buin town on Saturday mornings (see Figure 18).



Figure 18. The wharf at Kagu, in Bougainville, Toumoa fishers board the vehicle on their way to the market in Buin Town

(All photos taken by the author)

The demand for smoked fish and clam shell for consumption at the market is relatively high. As a result, this was the persuasive factor driving the local fishermen to exploit their reefs. The prospect of accessing the market was voiced by a fisherman:

It was the market in Bougainville around 1980. The demand for fish and clamshell was so high. Our people start to see the opportunity to get a lot of Kina (PNG local currency) from these resources at the market at Buin town. (TMY1)

The market provided an opportunity generally for all Shortland islander fishers to make cash. As a result it encouraged and drove the fishermen to harvest their

resources more frequently. They use all sorts of fishing techniques to maximise their catch. For that reason, a lot of fit and young fisher folks spent a great deal of time and effort searching the reefs for targeted species. It is also evident that they tended to catch more fish than their older colleagues. This is because they paddle further towards the outer reefs and today use outboard motor engines for trolling and targeting pelagic species. As one older fisherman explained:

Before there were a lot of turtles but nowadays if turtles saw you from a distance they immediately disappeared in the sea...because (he sighed)...There were a lot of people desperate to look for these resources and now the animals are smart enough to run away. Older people like me cannot afford to kill a turtle. Nowadays it is the young and energetic youths who are capable to kill turtles. (TMO7)

Dependence on marine resources for cash income reflects the inaccessibility of the village, as they have greater reliance on marine resources (especially fish, shellfish and turtle). The site specific factors are also important because the range and quality of habitats present at Toumoa determine the subsistence resources available for exploitation.

Conversely, because of the geographical location of Toumoa village, the marine environment quality is alleged to be in good conditions by the villagers compared to those that are closer to urban centers. However, over harvesting of certain key species for cash income has decreased the number of these species in nearby reefs. While there is a perception among the villagers that the marine resources in the area are over-exploited, the over-exploitation is indulged by the fishermen because that is the only way they can make cash to support their families. This is despite villagers' admitting that the problems require urgent attention.

The fishers kept reminding me that the money they obtained from their market produce is not a lot; income from the market provides cash to purchase small household items such as rice, tinned fish, kerosene and soap. Some canteen owners in the village go over to trade and bring back food items and other cargo, which are relatively cheaper on Bougainville than goods transported from Gizo or Honiara.

A good number of the fishermen in Toumoa have wantoks and blood relatives in Bougainville. It is a practice and *kastom* whenever they go over to the market or just to visit, to bring along with them additional cooked sea food as gifts and in

exchange they bring back cooking pots, clothes, tinned food, and rice. When the fishermen return back to their respective villages with surplus Kina, they trade their Kina for Solomon Islands dollars. The village exchange rate is one Kina to two Solomon Islands dollars.

Many young people nowadays are more ambitious to see themselves better off than their parents; however they are confronted with extra responsibilities such as school fees, family obligations, cultural expectations and daily household needs. There is a desire for more consumer goods and modern lifestyles and access to cash is now essential for fulfilling expected obligations such as bride prices, mortuary payments and other community social obligations.

6.5.3 Disregard for, and questions about, leadership

In the villages, the respect and honour given to the chief is often acknowledged on key attributes such as his personality, public knowledge and leadership quality. However, the usefulness and relevance of this respect for daily decision making is increasingly questioned especially by a few individuals in the villages. Through informal discussions, some male and female participants quite often mention that the existing marine management in their community is influenced by the social structures, situations and circumstances of the communities involved. According to the villagers, it is important to have a responsible and committed leader in the village to support them to successfully manage their natural resources.

It is crucial not to represent the Toumoa community uncritically as a homogenous and 'faultless' entity; like any community there are also dissensions and problems. For example, during my stay some members of the community (mainly male youth) expressed frustration and anger towards the chief and his existing committee, arguing that their voices and concerns were not heard. One informant shared his frustration with me:

We need good leaders who are not scared to confront people because I believe our community will be strong and we will respect each other. I believe if you inherited the chiefly status you will have the power and not be scared of anyone when he causes trouble. I noticed that our current chief is a bit weak and I feel that if he is not careful our community in future will be weak. I made this comment because I noticed the difference after he succeed his late father. (TMY5)

Another informant shared his view on the current harmony of the village:

I'm scared about the unity of our community. I mean we are all one people in this village. I like to see our reigning chief to be upfront and fair in all his decisions. Let me tell you this...his father the late chief is a very respectable and honest person. He has no favoritism. He corrects people when they do something wrong. There was no nepotism. He treats everyone in the village equally and that's what I like to see. (TMY1)

He further explained that although most of the villagers respect the views of the chief and culturally could not challenge him, their daily struggle is getting tougher and it is affecting them in many other ways. Another elderly participant expressed his fear of the current influx of school drop outs that were roaming around the village now:

Our village is still well intact compared to our two neighboring villages in Fauro Island but in my own opinion, in the near future, our children will face a lot of difficulties if they married outside of our village. New ideas, new ways of thinking and attitude problems will creep into their brains. Like now we have some of our kids bringing ideas which oppose our way of thinking and lack of respect. (TMO7)

Two other female participants expressed concern that women wearing trousers or tying their hair were seen as culturally inappropriate and were not accepted. Modern clothing fashions are another example of external forces that some older research participants mentioned. This is mediated through the process of modernisation. Although this was mentioned, I hardly saw any women wearing pants or trousers in the village when I was there.

It is to be expected that as population continues to grow rapidly and as people become entangled in the cash economy their relationships to the land and sea resources will adjust significantly. This is because these resources will be seen as material goods to generate cash income. The most obvious current example is the change in peoples' attitudes to land and forest in the village where both are now increasingly being seen as commodities that can be explored for cash. Several customary landowning groups in the village have already logged their forests which resulted in sedimentation and siltation in the near shore during rainy days in the southern end of the village. Some of these landowners have now invited foreign mining companies to carry out mining explorations for gold. I was informed that they've received royalties for the stage one of the explorations.

6.5.4 Competitive participation in harvesting of marine resources

The traditional lifestyle of the people (subsistence and pre-cash economy) had almost negligible impact on the marine environment, but recent socio-economic developments have led to its marked deterioration. Overexploitation of inshore resources for commercial intentions is of recent origin in the islands. With the increase in population growth and increased demand for commercial reef marine products, the pace of development has increased at a significant rate in the village, during the last nine years.

The existing situation as described by those interviewed is that there is no comprehensive programme for the management of other reef resources apart from the prevailing one, for Rosae reef. Already, the community members have considerable concern over the depletion of certain reef species in other reefs and the effects of putting more pressure on them. They are currently collaborating with the WorldFish Center to implement additional management measures. The community has chosen to increase the number of reefs that they want to *tabu* and to adopt some rules about gear use and size limits. They have identified measures that they believe have potential to produce good results, and will monitor the impact of these over time.

In the coming years, if there is a scarcity in marine resources, villagers will not willingly allow their fishing grounds to be used by other groups. The existing social customs and regulations in the village do not limit access to fishing. The residents are not restricted to fishing within their area. Most of them know which parts of the sea area belongs to their village and, consequently, individuals know where to fish, as well as places they must seek permission from the other two neighbouring village chiefs for access.

Fully aware of their dependence upon the marine environment, the community had learnt to appreciate their environment. However, with the beginning of commercial exploitation of resources and an accelerated pace of development, the environmental situation has changed considerably. The poaching of marine resources by 'outsiders' was an indication showing that their village reefs have been over exploited, and they are keen to look elsewhere for commercial marine resources for cash economy to feed their families. Mainly, most of them are from other islands who reside because of inter-marriage. I was told that on a few occasions the villagers caught people from the island of Bougainville poaching

but they were afraid to confront them because they were aggressive and they had guns in their boats.

6.5.5 Climate change and natural disasters

It is important to recognize the role of nature and the potential contributions of environmental changes as influencing the context of local ecological knowledge. Toumoa is one of the many villages in the Western Province in Solomon Islands that is vulnerable to natural disaster and the likely effects of climate change. Despite climate threats, there are a growing number of people, buildings and houses along the foreshore. Over recent years they have witnessed a number of negative impacts on their area and on their lives. The villagers have already seen devastating impacts of the rising sea levels such as coastal erosion along the shoreline of their village.

It would appear that possibly “human-induced climate change” may indeed have had an extensive range of negative impacts on peoples of Toumoa, including the following which have been observed by community members:

- loss of coastal land and infrastructure due to erosion, inundation and storm surges.
- increased frequency and severity of storms with risks to human life, health, homes and communities.
- changes in rainfall patterns with increased droughts in some areas and more rainfall with flooding in other areas.
- threats to drinking water supplies due to changes in rainfall, sea-level rise and inundation and;
- loss of swamp taro and cassava due to extreme temperatures and rainfall changes.

Other evidence is found in the memories of those residents over 60 years old, of which there are very few remaining.

One of them exclaimed;

The sea is eating all our sand, our reef is dirty because a lot of debris was thrown into the shoreline. Some of the trees along our beach have fallen down and you will notice their trunks are now right on the sea. When I was a little boy we used to climb the tree (see Figure 19a) and jumped into the sea but

now it is all gone laying on the beach where it used to be before. The sea level is rising steadily. (TMO2)



Figure 19. Evidence of sea level change and erosion
(Photos taken by the author).

Likewise, another informant articulated the evidence of erosion caused by sea-level rise;

Before there were a lot of coconut trees in front of the village but now they were no longer there. Their evidence is found with their roots under the high-water mark now (see Figure 20). (TKIOF8)

An old man complained and recalled his youth:

When I was a young we used to play on that tree (see Figure 19a and b). The shoreline was about two to three metres from where the tree was. Now it was in the sea. I noticed that this was the result of sea level rising. The sea has moved our shoreline inwards now. You might think it was an activity of bulldozer but that was nature. (TMO7)



Figure 20. Evidence of sea-level rise as the stumps of Coconut palms were seen under the sea
(Photos taken by the author).

In addition, some women complained about their swamp taro, which is dying due to salinity of the swamp and sandy soil along the coastline where they planted them. They reiterated that much of their shoreline was now covered by water as a result of sea-level rise.

In another informal story-telling session with a group of boys at the men's meeting house they told me that during the April 2007 tsunami disaster, the waves hit the village. They recorded six houses as well as 14 local kitchen buildings that were washed away including the people's cooking and eating utensils. The church building in the village was partly destroyed. The clinic, its medicines and the staff house were also washed away. The tsunami destroyed about 75 per cent of the village. Not only the village that was destroyed but many reefs and mangrove patches were also damaged in the disaster. This was summarised by a female:

In my observation, the tsunami in 2007 had destroyed our reefs and even up to now they haven't fully recovered. If you dived along the edge of the reefs you will notice a lot of rubbles and dead corals. You will see a lot of fish but their homes were been destroyed by tsunami. (TFY9)

Similarly, all garden crops are not growing well as a result of changes in weather patterns and also from wild pigs. Today, the villagers cannot make their gardens far from their houses because they fear their hard working efforts will be wasted by the wild pigs. Now and then, I was told, wild pigs came at dawn looking for food and destroyed the backyard gardens near their houses. The women of the village reminded me that this never ever happened before. They believed this was the result of the commercial logging. Every second day each garden was

invaded by these wild pigs as a result of the logging of the virgin forest behind their village and removal of habitat for the pigs.

Most of these villagers believe that the current changes, disasters and water surges are signs of the prophecy in the new testament of the bible while others believe that the future, though grim, is assured because God promised in the Book of Genesis that there would never again be a flood like the one experienced by Noah.

6.6 Factors that will facilitate effective marine resource management

To conclude this section, I look at the social and environment conditions that the community considered will facilitate sound management of their resources and what they would like to see implemented to enable them as resources users and owners.

6.6.1 Social conditions that will influence better management of resources

A general level of peace and social harmony throughout the village is the result of traditional values of respect, evenhandedness, the promotion of relationships and caring. A former school teacher in the village told me that, "Truthful decision-making has a significant role in any organised society". In Toumoa, the traditional society and its *kastom* is based on a hierarchical system. Community governance structures exhibit high levels of organization and unity, with the paramount chief having the highest political role in the community and the greatest power. The grouping of the villagers in Toumoa into social units makes them quite distinct from other communities in the Shortlands and in Western Province.

Leaders build up their reputation for leadership through activities in many areas, including the organisation of events such as feasts, community labour, and dispute management. They lead by example and that's one thing that really stood out with the current village chief in Toumoa. He has the ability to speak and direct group activities and this shows a basic quality of traditional leadership. When referring to leadership in the community, most of the research participants told me without prompting that, "experience is vital but quality and authority is more important in any leader in the village".

Traditional leaders today, especially those referred to as chiefs (inherited through birth), continue to be the primary leaders of group activities at the village level, including development projects of all kinds. These leaders are regarded as head of the village, and they are well versed in land recordings, families' genealogies, represent group interests and are good mediators in dealing with social issues and conflicts in the village.

Community activities and social gatherings are well participated in by all the members of the community once they are told and asked to carry out tasks. While the community considers itself to be self-managing the marine environment, outside interventions like advice and assistance from other organisations or institutions, including the government and NGOs were acknowledged, including provision of scientific information and facilitation of community discussions as necessary interventions.

Additionally, religion plays an important role in the village and individual households. Indeed, one of the chief's eldest sons is the catechist of the church, with the village adhering to the Catholic faith. The Catholic Church arrived in the early 1900s and helped to establish Christian leadership and religious doctrines throughout most villages in the Shortland group, including Toumoa. In addition to religious values, the churches have also contributed to awareness raising in relation to such matters as gender, social and cultural issues. The church also played an important role in rebuilding the village clinic after the tsunami and also assisted the village primary school. Most of the people are devoted to attend all the church activities and church celebrations. The villagers often dived at the *tabu* reef (when permission was granted by the chief) to provide reef fish as part of their food contribution towards any bigger church gathering in Shortlands.

6.6.2 Environmental conditions that influence better management of resources

In the village, the chief and his committee are responsible for resolving conflicts or disputes. When a dispute or a conflict occurs, the paramount chief will be the first to be informed. Normally, he will call a meeting immediately, although this may depend on the seriousness of the case. The dispute or the conflict is then heard and a decision is made. A person found to be in the wrong is punished accordingly. In the case of the marine *tabu* area, the chief and his council impose fines on individuals or groups found to break the *tabu*. The current punishment for

breaking the village-based marine resource management rules ranges from simple admonition to monetary fines and/or if a person or persons are caught red handed all the things in the boat including the harvest will be confiscated and when the fish or trochus are sold the money is kept for the community. The current *tabu* reef also draws upon blessings from the church which serves to further increase dedication and respect for the *tabu*.

I asked, “what does it feel like being caught doing something wrong and facing the chief and his elders?” One informant who has been caught poaching told me, “it is an enormous humiliation and embarrassment for me and my family after being summoned and fined by the chief”. He told me that it took him a long time before he got the “guts” to get out of his house and walk freely around the village. It illustrated that the respect for traditional authority remained intact. That respect generally tends to be still very strong in the village.

In the last decade, the leaders in Toumoa have acknowledged and noted that the existing traditional protected area cannot support the growing population and the fishing pressure that they have put on some of their reefs. To work against the trend of over exploitation, the leaders have developed alternative approaches to assist them to address the issue because simply protecting reefs alone can be costly and unlikely to achieve long-term community benefits, as one elder explained:

One of the ways to improve the condition is through the assistance that the WorldFish Center has given to us, to educate us to look after and keep our marine resources. The other way would be for the government to come down to us in the village level to carry out awareness program....I think the way the government just put articles on newspaper regarding awareness on marine resources is good. But most of us are illiterate and won't understand it until and unless they came down to do the actual awareness. Our illiterate people will understand and appreciate it through the demonstrations of what message they wanted to put across. I believe through that way our people will understand more about the Fisheries Act and regulation...it is the responsibility of our community through consultation with WorldFish and the government. (TMO8)

Most of the village fishermen are keen to effectively manage their marine resources. When the property rights of resource owners are clearly defined and recognized by the central bureaucracy, the resource owners become better able

to ensure that maximum benefit is realized from exploitation of their resources, while ensuring that those resources are not diminished for future generations. An education program conducted by WorldFish, about the reproductive biology and population dynamics of species commonly targeted, assisted villagers to better understand the importance of certain restrictions to fishing. Villagers were keenly interested to learn. As one woman shared:

I like to see our people work together. I like to see our chief establish a good relationship with all the villagers and for all the villagers to respect our chief. So far it is ok but I want to see it more stronger (our unity). (TFY9)

A good communication process is fundamental, too, for conflict resolution in the village according to the chief. In many cases it will be very time consuming, especially when dealing with individuals who have had little education, those not used to negotiating and those unwilling to negotiate. Community meetings and partnerships with all representatives, guided environmental excursions, on-site education, advisory committees and management plans that involve all village stakeholders are effective ways of communicating.

6.6.3 Cooperation

As mentioned earlier (in Chapter 3), marine resource management in Toumoa is not new, as demonstrated by Rosae reef that has been managed for more than 30 years by the chief and his people. But currently, according to the chief, the traditional governance is evolving in an attempt to adapt to the changes brought about by developments in the village. These changes according to an elder are to provide safeguards, precautions and protection to the community as he further clarified:

The current modern governance structure is not favorable to us in the rural area because it is always being a top-down approach, insensitive to our local needs, bureaucratic and inadequate in providing better service to our community. We need to work together with the current system. (TMO11)

The villagers did express during the focus group discussions that the modern changes have both positive and negative impacts on their lives and they urgently want to see integration and collaboration of their traditional system into the western one. One particular fisherman suggested:

We need our government both provincial and national to actively involve us the local communities in discussing and designing hybrid systems that build on the strengths of each and address some of the weaknesses that have emerged. (TMY10)

He further acknowledged that one of the key roles of the present government is service delivery, e.g. through health, education and other development services although this is thought to be insufficient in part because of incompatibility with the existing isolated situation of the village.

The villagers still strongly acknowledge the key attributes such as accountability, transparency, and conflict management in their traditional setups. In addition they want to see the integration of their local governance system to merge with the western system, in order to deliver against maladaptation of traditional roles which are under pressure from development. They also consider information sharing as an important component of establishing effective community-based resource management. The villagers, the primary stakeholders in coastal areas, like to be involved and be empowered to play a more prominent role in the national environmental policy formulation (e.g. through formally instituted networks). Currently there are no proper mechanisms for the villagers to voice community concerns or seek redress. Similarly, communities should be given a greater responsibility and accountability in the management of their resources.

In 2008, the current village chief was invited to a workshop that was held in Gizo. A number of chiefs and village leaders from around Solomon Islands were given the opportunity to share their experiences in community based management and meet interested people and those with established expertise in resource management at the workshop. The workshop was on the effective route to sound management of marine resources.

In return, the workshop enabled the chief to make informed decisions when he got back to his village. He invited a team from the WorldFish Center to conduct awareness and resource management training for his villagers. The villagers were keen to see more inclusive adaptive management on top of their existing traditional *tabu* reef. The effectiveness of co-management rules can be evaluated by the extent of power transfer, the level of community participation, and equally the community's capacity to exercise its authority and responsibilities.

When the participants were asked to share their ideas on how individual or organised groups can support their current marine resource management, both the men and women that participated in the focus group discussions expressed that it is important that they have support from outside organisations to shed light on scientific information. Another suggestion that was also highlighted was that it should be possible for government or other institutions to provide them alternative livelihoods, such as tools for gardening and boats to enable them to go over to the markets to sell their products. They want the assistance from the Government to help them find ways to sell their fish, help them communicate information to other outside communities and assist them in documenting their *tabus* etc.

Apart from the MFMR, Toumoa community has already established closer bonds with WorldFish Center. Together with MFMR and other NGOs; these institutions came together in 2003 under the umbrella of the Solomon Islands Locally Managed Marine Areas (SILMMA) network (see Chapter 4). Ways have been found to facilitate management activities, such as through communication and workshop initiatives by these partners or by obtaining ideas from other communities such as those like Toumoa who are implementing some form of management already.

On my final day before I left the village, an elderly woman came visited me with some cooked food and asked if I had accomplished my research in the village. I asked her, “What else do you think I need to know that is missing in my study of this village?” She sighed and argued:

Our current community governance structures will only exhibit high levels of organisation and unity, if our people together with the church and our government (both provincial and national) work together. Our paramount chief needs support from everyone to guide him to make a positive influence towards sustainable management for us here in the village today and for our future children. (TKIOF9)

6.7 Summary

For the purpose of this study, it was important to categorise the findings into the preceding themes because they provided a comprehensive insight to the villagers’ perceptions, attitudes and practices associated with their beliefs and experiences. The use of the various methods of data collection provided a rich source of data into these attributes of the villagers’ in their everyday interaction with their marine resources and the reefs. Despite growing reliance on imported

food products, the livelihood of the people of Toumoa is primarily still centered on subsistence activities of gardening and fishing (food collection). The essence of community is very much active because of the communal system in the village. They live in housings close to their extended family, and living and working together with family is of high importance.

To date, the daily life in Toumoa still revolves around living off the resources of the island. This is demonstrated in taking the outrigger canoe out for fishing in order to feed the family, cutting fire wood, harvesting coconuts or breadfruit, or making houses from sago palm leaves. The island and surrounding sea provide everything, from food, shelter, clothing, furniture, to medicine. In much of the village, this traditional lifestyle is everyday existence, governed by the extended family unit and the village chief and his council.

In the past, the lifestyle of the village was very simple and had almost insignificant impact on the natural environment. However, in recent years the increasing population and other related socio economic developments have impeded the fragile and delicate ecosystem. Together with the marine environment, the lives of the rural people are more vulnerable to the threat of global warming and sea level rise. Therefore, effective environmental planning and management need to be in place immediately. The marine resources have historically made a significant contribution to food security, providing employment and income to these villagers either directly or indirectly. They desire to continue to be able to use them in this way.

CHAPTER 7: FINDINGS FOR LIANGAI VILLAGE

7.1 Introduction

This chapter will examine the social attributes of the Liangai community that affect people's relationships with their marine resources. It explores a classic example of one of the many communities in Solomon Islands that have experienced decline in their traditional marine resource management systems because their traditional *tabu* (fishery control) systems have disappeared. The chapter gives an overview of the current social and cultural attributes obtained from the different methods of research outlined in Chapter 5. The chapter describes the reef and of the ways the people use and manage it. These include recent changes in reef usage, aspects of reef surveillance, and rational reef management techniques.

7.2 Background

In Liangai there were 33 households with a population of 192. The total number of people per household ranges from 5-8. There were more adults in the village compared to primary school children (see Table 19) and 67 per cent of the population surveyed were adults 18 years old and over. The majority of the respondents over the age of eight (187) had gone through some form of formal education at either primary or secondary level (Table 20). Six of the respondents have had tertiary level education through Solomon Islands College of Higher Education with certificate or diploma training, while eight other respondents had vocational education (Rural Training Centre) and only one stated no education at all.

Table 19. Age distribution by gender of Liangai household members from 33 households

Age group (years)	Male		Female		Total		
	No. of males	% of males	No. of females	% of females	No. of respondents	% of respondents	
≤18	30	31	34	36	64	33	
>18	68	69	60	64	128	67	
	98	100	94	100	192	100	

Data obtained from household census (2010)

Table 20. Education status of household members, by gender, Liangai community

Education level	Male		Female		Total	
	No. of males	% of males	No. of females	% of females	No. of respondents	% of respondents
No education	1	1	0	0	1	1
Primary	61	73	72	69	133	71
Secondary	15	18	24	23	39	21
Vocational	3	4	5	5	8	4
Tertiary	3	4	3	3	6	3
	83	100	48	100	187	100

Data obtained from household census (2010)

The community agreed that while poverty does not exist in Liangai, hardship does. Although the perceived level of hardship present in individual households varied widely, the most widespread definition of hardship, common for all the households, was the lack of economic opportunities. The importance placed on opportunities to obtain cash incomes highlights the degree to which the community needs revenue to access basic needs such as food (e.g., rice, flour, and sugar), church offerings and payment of school fees. In response to questions regarding livelihoods, the majority of the household heads responded that their primary occupation is gardening and making copra. Each household in the village has its own garden to support its members. The rural villagers depend on subsistence agriculture for sustenance. Therefore, agriculture and fishing are the mainstays of village life. All of the respondents in individual interviews stated that fishing was primarily for consumption and a handful stated that their catch is primarily for sale. Any surplus food or fish is bartered within the extended family in the village or sold at the market at Jones Adventist College (JAC)¹⁷. Dugout wooden canoes are the dominant medium of transportation for visiting family members in nearby villages, going to the gardens, carrying out fishing activities, visiting the clinic and for children going to the school (see Figure 21).

¹⁷ JAC is a boarding secondary school caters for students from year 7 to year 12. The school is located 5km from the village and every Thursday afternoon there is a school market and the women in the village paddle their respective wooden canoe to sell cooked food and garden produce to the students and staff of the school. This is one of the ways in which the women in the village make money. There is a lot of preparation to be involved in the market. The husband's will go fishing on Wednesday night and the women will cook the food early Thursday specifically for the market.



Figure 21. Wooden dugout canoes are used for a lot of purposes in the village; particularly for fishing; children's means of transport to school and villagers going to the garden or visiting family members

(Photos taken by the author).

7.3 Values and attitudes of villagers towards management practices

This segment will present the villagers' perceptions of, and feelings about, values they place on their resources and management principles. These were based on the information provided by the research participants.

7.3.1 Traditional values attached to resources

In Dovele and particularly in Liangai, a person's affiliation to a tribe is very important because that can link him or her to their land, culture and social grouping (see Chapter Three). The tribes attach great importance to their traditional values, morals and institutions. Most of them have great concern about their community. In tribal areas, resources are mostly owned by the community as a whole. Hence, the decision on the use of available local resources is

normally made by the community and not by individuals. The skills developed over the years were suited to the particular environment in which they live.

The importance of coastal and marine areas to Liangai people, cultures and economies cannot be overstated. They are the focus of social and customary systems, and subsistence and cash economies. Land, sea and people are traditionally connected as a system. Land is central to culture, identity and survival and as such is highly valued in the village and integrally related to all aspects of daily life. According to a key informant, "Land and sea resources were not only a source of food, but also a source of income and wealth". (LK1OF2)

The tribal economy is mainly subsistence in nature. Traditionally, yams, cassava, and taro (all known as root crops) are the main staples in the village. These are usually eaten with fish and other edible marine resources as sources of protein together with vegetables such as greens. The local diet does not differentiate between the meal times. What is eaten is usually what is available at that time. Solomon Islanders do not use many condiments in their cooking except for coconut milk and iodised salt. During harvesting seasons, taro, yam, cassava and ngali nuts (*Canarium indicum*) are gathered, eaten or bartered.

Owning more land guaranteed a sense of security for the tribes and their individual members. Access to resources was commonly found to be highly structured for land, and less structured for marine resources. One elderly man reflected on the situation:

The marine ownership boundaries were clearly defined in the past but nowadays, there is considerable overlap in claims of ownership causing much dissention and conflicting opinion among and within the tribes. (LMO11)

The coastal areas of Dovele district are highly diverse ecosystems, but are extremely fragile and vulnerable to change. Past logging activities and local physical developments are causing changes to the natural systems. This combination of factors is resulting from the rapid exploitation of the natural environment (forest, soil, land and reefs) and the increasing level of conflicts and disagreements between resource users and owners.

Traditionally, the villagers believe that their ancestors are still around and present within them in the village even though they are invisible to be noticed. Therefore, one can spiritually seek their help should they be in need or request their

assistance to negatively affect one's opponent. Animism was practiced before the arrival of Christianity on the islands. For those who believe in animism, they view living things have a mutual relationship with one's ancestors and the surrounding environment. Animism has declined since the arrival of Christianity in the village but a handful of people believe their ancestors are still around with them in the village.

7.3.2 Attitudes towards resources management

In the village, the older women and men who I've talked to hold common views on how resources are used today and how they were used in the past. The uses of resources were generally consistent across this group with some very minor distinctions according to different uses of reefs and land for cash livelihoods (e.g. trochus, copra and timber milling). In the past resources were entirely used for subsistence. The marked difference in the present is that although resources are still primarily used for subsistence (e.g. building houses, food for families, carving paddles and axe handles, weaving baskets, and medicine) they are also used for cash income (e.g. milled timber for construction, food for marketing, carving for marketing, and copra for milling).

The older people convey stories of how in the past there were strong rules and restrictions (*tabu*) on the areas that could be exploited, the timing of harvest and quantity of resources that could be used. Participants described how planning processes still exist for gardens managed by women. However, there is little perceived planning, or structure around how other natural resources are currently managed or harvested. Many resources are currently harvested on an 'as needed basis' and customary rules are non-existent or rather commonly ignored. When asked what has changed between the past and the present, women and men were all quick to cite the shift to a cash economy. The effect of the shift was described by a woman:

In the past men and *mere* (women) go fishing and gleaning on the reefs for *kaikai* (subsistence); today we harvest the marine resources for *selem* (cash sale). The change is money.
(LFO5)

Participants stated that remaining natural resources are under increasing pressure due to:

- Increasing need for cash (to pay school fees, health and church contributions).
- Increasing population (starting to intrude onto the land and sea units).
- Effects of external pressures of extensive logging/mining.
- Downfall of the sustainability of the practice shifting cultivation as populations expand and land availability is reduced, cutting the length of fallow periods.
- Weakening and absence of respect of traditional power structures (e.g. the chiefly system).

There was a clear link between access to natural resources decisions and the different fields of responsibilities held by women and men in the rural community. Today in Liangai, landowners, particularly the men, are perceived to hold the most rights to accessing all customary land and reefs and are perceived to hold power and influence over land development or transactions. As times change and external livelihood pressures change, positions of leadership and power structures have also been transformed. In the present system, the *lariken men*¹⁸ and the provincial/ national political leaders exert more power and influence in domains where chiefs and elders previously reigned. Therefore, it was commented that in Liangai, the chiefly system and respect for it were eroding.

Men hold the power over the distribution of benefits from natural resources. The more lucrative the natural resource product, or value-added product, the less influence women and young people have over decision-making about the resources, and they have less access to the benefits. The cash women can accrue from natural resource assets is limited to minor benefits from marketing garden crops or from fishing.

The community in Liangai has a strong sense of the severity and the complex range of effects caused by unsustainable resource management practices (e.g.

¹⁸ This term is from old Solomon Islands Pidgin and can be translated to describe certain individuals who often undermine the village elders and are very manipulative in community. Many of these people often have some formal education or experience of “work in town”, etc. They claim to be “big men” and use this to draw their legitimacy. They tend to be greedy for individual wealth and search for improved social status. I used the term “Lariken men” for this study because in Solomon island *Pidgin* we don’t have an alternative term to describe this type of people.

logging) can have on their livelihoods. While participants want access to, and participation in, sustainable markets they are unsure what activities will provide sufficient income to meet their contemporary needs. Suggestions commonly include adding value to natural resources.

7.4 Constraints to existing marine resource management practice

In this segment, I examine the constraints that the people in Liangai confront in relation to the existing resource management practices they have.

7.4.1 Cash economy

Human population growth rates have increased substantially during the past two generations, placing accelerating pressure on marine resources. New technology has been introduced and export markets developed. The introduction of commercial fishing, the rise of trochus, beche-de-mer, and shark fins as important exportable resources, and the introduction of new fishing gear and faster boats have all brought new management challenges which traditional arrangements are not always able to cope with.

The villagers consistently reminded me that the resources were decreasing because of increased exploitation to meet subsistence and commercial demands. The modern governance and power systems that have emerged, largely from foreign values and practices, along with the cash economy, have changed the way people view communalism—which was the basis of traditional governance and decision-making

One elderly informant reflected on the situation:

In the past the chief sat in the middle and everyone sat around him; everyone respected the decision he made. Now it changes, the politicians, church leaders and *lariken men* have more power than the chief. We have many more people making decisions and it damages the chiefly system. (LMO11)

Reflecting on the past, an elderly woman commented on the influence of different stakeholders in today's decisions, many of whom are outside the chiefly system.

Decisions made about our natural resources are different from in the past. Many people are now involved in influencing decisions for land and forest. This includes people with money from logging, middle men and the politicians. The *mere*

(women) are only consulted by the husband, but the big decisions are made by these big people. (LF03)

A man commented:

In the past chiefs, elders, tribal leaders and landowners jointly worked together to make decisions. There were no big disagreements or disputes as there are today now when people are desperate to invite investors or new projects for community. (LM08)

One other thing that was also highlighted in respect to population growth was the number of fisher folks. It had increased and the average size of trochus and other organisms had become significantly smaller and the quantities collected were less. One woman remembered that 15 years ago she could fill a basket from within a small area during one hour, but now she had to paddle far for several hours just to fill a small bowl, and several other collectors corroborated this observation.

7.4.2 *New fishing techniques*

Most people report that the reef has been in noticeable decline in the last two decades, and villagers tell of how the reef, once abundant with fish and shell fish, no longer yields high catches. They say that not only are the fish less numerous now, but also that those caught are of much smaller size than in the times of their parents or grandparents. This change has happened, with many community members recalling a much higher diversity and greater availability of fish when they were children, telling tales of once being able to fill whole canoes with fish and hauling baskets upon baskets of fish up on the beach. One indication of reduced fish numbers is the fact that some people who formerly enjoyed fishing activities now spend little if any time on the reef, saying that there are only small gains to be had from a lot of effort expended.

As with Toumoa, modern times have brought several technological innovations to the rural fishermen. Store-bought nylon string, metal hooks and lead sinkers all have advantages over their traditional fishing counterparts. In much of Western Province modern nylon woven nets, and, in particular, gillnets, have had a large impact on ease of fishing. One major change to marine harvesting regimes in the area has come about through the availability of snorkelling gear and the use of improvised spear guns, which enable people to dive for fish and invertebrates in the deeper, previously inaccessible, waters of the outer reefs. The fishermen in

the village utilised a wide range of fishing gear compared to their female counterparts. The women and children on the other hand, use line and hook from either the shore, standing on the reef or from a canoe and spearing or shooting fish whilst walking the reef.

Some fishers would use one fishing method but groups on fishing trips often used more than one. In Dovele, the fishermen hardly used fishing lines anymore compared to the other nearby villages. Instead they preferred to use modern diving gear which enable them to stay as long as five minutes under water to spear a fish. New fishing techniques, gear types and fishing vessels have helped weaken local management systems and traditional authority. These pressures particularly occur as a result of gillnet fishing which is a non-selective method and locals complained that fishing nets are now used because hooks and lines are ineffective as they will spend a lot of time but catch less.

In the village, gillnets are not always used appropriately. They may be left unsupervised in the water for excessive periods of time particularly in areas where fish move along in distinctive and restricted routes such as reef-passages and estuaries. Some nets are placed at spawning aggregation sites and this has impacted the number of certain species of finfish. Many villagers would like to see the use of gillnets to be properly regulated. However, for some of them, it is an easy method to catch more fish in a given time, to feed their family and generate more cash income.

7.4.3 Notions of traditional governance and management practices

As time passes by and external livelihood pressures change, positions of leadership and power structures have also adapted. In the past, the respect children held for their parents, uncles, aunts and the elders in the village was enormous and significant. The fathers were the head of the family and children would not even say their names and obey them all the times. Any conflict and dispute in the village would be taken up to the chief so that he settled the matters with the parties and dissolved it with his blessing. Everyone was said to be loyal and trustworthy towards one another in the area.

Today, all the participants that I interviewed noted that the chiefly system and respect in the village is eroding because the *lariken men*, church leaders and the provincial government members of the ward, wield more power and influence in

domains where chiefs and elders previously ruled. According to a key informant in the village, “The changes associated with modernisation are eroding our traditional marine management and are marginalising the lore and customary practises with them”. (LMY6)

It was revealed that one of the factors contributing to the overexploitation of the resources is the breakdown of tradition which has led people to disrespect and disregard both *kastom* and the authority of chiefs. With children no longer being taught by their elders, traditional knowledge and values are being lost, and evidence of the breakdown of traditional beliefs can be seen in the decreasing use of traditional fishing methods, and a higher incidence of people breaking *tabus*, such as attempted reef closures that are not respected and poaching at night.

Lariken men now generally neglect and commonly disparage local knowledge and show disrespect to the older people. One tribal chief told me:

Before, people have a lot of respect for the chief and if he gives instruction people will obey and follow him because they value his leadership. Now when I ask people to do something they will not follow. They will stand up and argue with me. This is not the *kastom* of our people. People now days have lost their *kastom* and their respect. (LMO7)

These days, as you walk into the village you will see that nearly all the girls in the village are wearing shorts. However, before the cultural norm for women and young girls was to dress in culturally appropriate ways (cover their entire body) whenever they moved around the village. As one old lady commented, “The church and modern education are two institutions which I blame for the breakdown of traditions”. (LKI0F2)

One theory for declining chiefly authority suggested by some of the people I talked to is that modern, western-based education causes people to become more stubborn, giving them an inflated sense of their own intelligence and causing them to question or disregard the decisions of their chiefs. Many people in Liangai, however, were keen to assert that the problem is not that modern education is bad, but that when children participate in formal education their traditional education is neglected.

In addition, I witnessed while in Liangai and in the two nearby villages of Dovele during the time I carried out this research that church pastors and elders were

given the highest respect. When the villagers were instructed by the church keepers to do something for the church or in the name of the church, every villager would attend, except for those with genuine reasons. The church plays a very important role in village decision-making.

According to one key informant in the village:

Many of our cultural activities and norms began to alter due to internal and external influences such as Christianity, the modern system of government, modern education, and economic development. Christian principles were embraced by the villagers, causing them to do away with their cultural traditions that were contradicting Christianity. (LKIOM3)

As he stated, in many ways, various aspects of their lives were changed from what they used to be prior to the introduction of the Christian faith. The church activities cover several hours each day in the village. They include many programs, including women's clubs, as well as youth and social, cultural, and economic activities. Considerable amounts of money are spent on church contributions, with most going towards various church activities and administration costs. People sacrifice a considerable amount of their time undertaking church activities, from simply cleaning the surroundings of the church building to actually spending time outside raising money to meet church targets. Today, Christianity pervades the community.

The traditional diet has changed significantly in the village. Rice has become a staple diet; one can have with tea and also with either canned meat or fish. A locally canned fish was the preferred source of protein, named Solomon Taiyo. In the village, meal times are not specifically followed, as villagers observe, "it follows the tummy". Traditionally most families socialised as they ate their meal, however the practice of sitting and eating at the table is becoming a norm nowadays.

7.4.4 Lack of enforcement of Fisheries Act

It was argued by many people I talked to in the village and the neighbouring communities that the present government both at the national and provincial levels does not provide enough support for the community in Dovele, either in terms of awareness programs, aid or development projects. The lack of support (fiscal, educational or other) received by the area from government was

discussed by the villagers with the general sentiment being that “the government has forgotten us”. Evidence of this was elucidated by allocation of aid after the earthquake and tsunami in April 2007 which affected much of the Western Province including Liangai. Community members noted that many other affected areas in Vella la Vella received assistance from the Government after the event but not the people of Liangai who were forgotten or as some suggested ignored.

It should be noted that most of the examples given by villagers of the lack of government support in the area referred to development projects rather than to education awareness campaigns. Some people acknowledged that sometimes government officials would occasionally visit their side of the island to give advice and training, but these visits were supposedly quite rare and had little impact. This was evident in the words of one who mentioned that once ten years ago a group of government officers, including a provincial fisheries officer, stopped over in the village and the officer had a chance to talk to them about sustainable resource management:

One visit every ten years from an fisheries officer is not going to make us become more involved in sustainable management because we have a lot of stubborn people that won't take things on face value but will need a lot of convincing and collaborations. (LMY1)

Unfortunately the attitude amongst the people that the government is not interested in helping them does not merge with MFMR's mandate to focus efforts on communities as articulated by Kilé *et al.* (2000 5) that:

the Solomon Islands *Fisheries Act* (1998) stresses the need for the government to give more power to the resource owners so that they can take responsibility for the management of their own property. That is, the focus has shifted towards basing management on the property rights of traditional resource owners. Furthermore, the government feels that it is more cost-effective to keep fisheries management decentralised and to maintain control in the hands of the community.

Lack of dissemination of information has also led to people not understanding the rationale behind some fisheries regulations and therefore results in them purposefully disregarding them. But according to the Permanent Secretary of MFMR, “The Ministry of Fisheries and Marine Resources is committed to form partnerships with the communities for resource management”.

The MFMR however, often put a lot of effort on the enforcement aspect of the fisheries regulations, without considering the importance of sustainable reef management, and that is to regularly visit the rural people, and disseminate information on the importance of respecting their resources, and why it is important to promote best management practices at both economically and biologically sustainable levels. The resource owners of each customary fishing area are responsible in looking after their reefs and managing them. When the question was put forward on how the villagers want information from MFMR to be disseminated, one replied:

The most effective way to disseminate information is for them to come and meet with us (the people). This is very important because when we saw them with our eyes, we can tell the Fisheries Officer has some concern over our marine resources and thus has lowered themselves to our level, willing to eat and sleep with us and to sit with us in our village to discuss ways to achieve sustainable management. (LM011)

This is how a Fisheries Officer can gain respect from the people, especially the community leaders in each tribe who own the reef and to establish working co-operation with the people.

One of the main aspects of customary rights is that the protocols are exerted within the local level and not from outsiders. Protocols that are formulated at local level are more functional than those exerted from MFMR. This is because these local protocols are initiated by the rural people themselves to fit their current situations. This helps to build self-confidence amongst villagers, and creates a working partnership with MFMR to sustainably manage their resources for themselves and for future generation. This collaboration can be achieved through talking, listening, and learning from the villagers.

However, the difficult aspect of such a combined effort is to form the good relationship between MFMR and the villagers. It is important to note that precaution is vital when discussing these initiatives with the villagers, as often they become defensive in their views, when they assume that their local management strategies are being over-looked and not suitable to meet modern development needs.

7.5 Current trends and challenges that have impacted management practices

This section outlines, the different developments and challenges identified by the research participants that they feel have impacted the management activities in their community.

7.5.1 New settlements – (people build new homes on different locations)

The population of Liangai is not equally dispersed, but clustered and becoming overcrowded as the population expands. The traditional settlement pattern automatically concentrates some human-induced environmental problems, which become unmanageable when the population places pressure on the land concerned and has tended to push people into their own separate settlements. Problems of land shortages and over-crowding, sewage disposal, and declining freshwater quality and quantity are becoming an issue for the people living in the village.

The trend that was seen in the last few decades was families moving out and building their new homes along the coastline and away from the large village. Concerns surrounding disputes and divisions between tribes as well as within families were common in the communities which resulted from this movement. Land issues and social problems were evident in the main village and therefore one by one families gradually moved onto their individual lands or areas.

Some female participants complained saying, “the gardens are not bearing as good produce as before”. While others protested, “there is not enough land to plant in the village”. Various socio-economic factors contributed to the movement of the families. Without prompting, one man who has moved out of the village with his family stated:

There are lots of mouths to feed in the village and it is impossible to please everyone therefore by moving out of the village, my nuclear family can focus more on our daily activities and keep our children from peer pressure in the main village. (LMY2)

When reflecting on how and why decision making has changed, mothers were concerned about young girls’ safety within their communities. Stories of boys in the community using violence and sexually assaulting young girls were shared.

Women shared commentaries of once united mind sets that are now transformed to more individual rather than communal interests.

Community members felt traditional roles and values, land ownership and women's leadership opportunities, were modified and the matrilineal and chiefly systems eroded with the introduction of resource extractive activities, including past logging activities, corresponding with increasing demands for money for means of survival.

The relationships within and between families are different from what they used to be. Nowadays, theft issues are more noticeable in the village and therefore participants saw this as an excuse to move out from what they considered to be chaos. Ever since the relocation and the migration of families away from the main village, it was evident that community and church activities in the village became less well attended and participated in as a result of some key members now being scattered and living in isolated settings. According to a village elder:

Communication is becoming a stumbling block as it is difficult to pass information or call urgent meetings or activities and plan for the welfare of the community. (LMY6)

The medium of transportation to these new settlements is dugout canoes but it is strongly weather dependant and travel among settlements along the coast is often disrupted.

7.5.2 Right to use fishing grounds

I was often reminded by the participants that it is central to understand the direct genealogies (still oral) because they historically link people with the land and in this case, the reef. The reefs in Dovele region were reportedly owned by tribes. While the tribes collectively owned the reef within their boundaries, reef management was predominantly handled by certain leaders of the tribe for their people. Some of the leaders resided in Liangai. The owners had the primary marine rights through birth, over the land and the reef.

Previously, bans were imposed on the exploitation of marine resources as a result of cooperation between the chief and the tribal leaders who deliberated over the recommended ban on the harvesting of certain resources. They also decided on other matters affecting their communities. Once a decision was agreed upon it was communicated to the members of the community who

responded accordingly. The resolutions were made known to all the people including neighbouring villages and may have included instructions on which reefs are open for fishing and at what times.

Fishers from the region have full and free access to all the reefs, while people from nearby villages may freely join in fishing. However, there are cases where villagers from distant villages will seek permission to fish on the reefs. Today, there are many disputes over the ownership of the reefs as explained by a chief from one of the original tribes in the village:

In the past there were only two tribes in the village and then intermarriage started in the last two decades and now we have a lot of tribes and a lot of claims of ownership to the reefs... *it is* hard for us to manage the reefs. No one wants to be honest and listen to the truth. (LMO9)

Genealogies are the basis of tribal land affiliation and are relied upon almost solely during disputes involving claims and transfers. Some villagers had secondary rights to the reef based on marriage and residence. For instance, in the case of any member of the tribe married outside to another village, their partners and their children from the marriage would have secondary rights. Likewise when it comes to relationships, extended family members of the tribe who lived in another village can always invite their family members to fish. Nowadays, secondary marine rights were even given to those who are not originally from any local tribe but have lived in the village most of their lives.

Apart from the primary and secondary right holders, nearby villagers from north Vella la Vella were reportedly seen by some fishers fishing in the reef quite often but were not chased. However, outsiders who are not from Vella la Vella who wish to fish on the reefs need to seek permission otherwise they will be chased away. Nonetheless, it is a trend nowadays that poachers (fishers who are not from Vella la Vella) came at night to fish for trochus, beche-de-mer, crayfish and Maori (humphead) wrasse and little is done to discourage them.

7.5.3 Traditional boundaries and ownership of resources

Most people I talked to in the village raised their frustration about the past logging activities that happened on their land. One participant described how during logging in their area, the company paid money to trustees (men who act on behalf of women landowners) for the use of customary land for commercial

logging. They also described how this provided the catalyst for many disputes. One such dispute is currently being heard in the High Court involving one land owner trying to prove matrilineal genealogy to the land against another.

The man described a land dispute over logging:

We became enemies in our own families, brothers and sisters were arguing over land and logging. The land owner woman wasn't given any of the money, and the brother took it all. Our sisters went into the kitchen and talked about our brother and got very angry; even though we own the land, we have no benefit of the land. (LMY10)

Some people in the village complained and said that the traditional roles, boundaries and land ownership which include leadership opportunities, were altered during negotiation and introduction of resource extractive activities such as the logging operations, synchronised with demands for cash.

Past experience of land disputes over commercial logging in their areas meant that some participants, particularly men, were guarded in expressing concern over logging activities. The women on the other hand could clearly see the links between mismanagement of natural resources and the effect on the social realm (the human/environment interface). In this way, women were more likely to focus heavily on the social consequences of natural resource mismanagement, while men were more likely to focus on the political context in which natural resources development transactions take place.

Current concerns surrounding disputes and divisions between tribes, as well as within families, were common in the community especially where individuals were negotiating or renegotiating logging/mining contracts. A young boy explained:

Some people have bad and selfish attitudes while others have concern for everyone. It is impossible to go forward together with selfish people in our community. (LMY2)

Another young woman explained her thoughts relating to the reason why disputes occur:

Ownership hasn't changed but the role of a landowner has changed. While men always controlled land consultation on behalf of the women, the men now behave more like they are the landowners. (LFY5)

An elderly man commented on the impact of intermarriage on disputes:

In the past we have fewer arguments and disputes but then intermarriage started and brought a lot of land disputes and some changes in land ownership. (LM011)

The traditional matrilineal society was described where the first born son provided leadership in warfare and protection in times of peaceful coexistence while the other sons held more of a priestly role. Women's roles were centred on the provision of social strength, responsibility regarding ceremonial matters and women were the diplomats for their communities. Bloodlines were extremely important and women and men were perceived by all participants to traditionally hold mutually important and complementary roles. Leadership positions in the past were both ascribed and earned. When the role was earned it was based on characteristics such as warrior ability, hard work and physical strength.

7.5.4 Inclusive participation in the harvesting of marine resources

The harvesting of sea cucumber (beche-de-mer) and trochus is a non-traditional fishery in the Dovele district. In the colonial era and since, it has been forbidden to harvest these resources because of the Seventh Day Adventist (SDA) church beliefs, based on the Bible doctrine¹⁹ (see Deuteronomy 14: 9-10). However, It is one of the examples of a scarcely exploited resource being rapidly used up once its income earning capacity was realised, in this case solely as an export product. As Liangai is a SDA village, it was not necessarily that the community fished for beche-de-mer and trochus but there are a few "back sliders" and "others" who seemed to grasp the opportunity to make quick money out of it. As has been indicated previously these commodities are an important source of cash for Solomon Islanders, especially in the isolated villages since the demise of the copra industry. The first reported extraction of beche-de-mer from the Dovele reefs was in late 1985. Nowadays these resources are rare in any given area of the reefs in the region because there are a lot of users from nearby villages and also poachers who come from as far as Gizo. This is reflected in the comments from a leader in Liangai:

We have fishers from all around Vella la Vella who came and dive these commodities in our reefs. We even caught people

¹⁹ Based on their doctrinal beliefs, SDA people can only eat sea creatures that have both fins and scales. This includes only freshwater fish, reef fish and deep sea fish.

from Gizo using compressors. Today if you are lucky you will find one or two in the reefs...Otherwise *it is* gone. (LMY4)

Fishing activities differed by gender. Fishing itself was, and still remains, a male dominated activity that takes place in both inshore and offshore from dugout canoes, by free diving, or from the shore. The majority of women who fished informed me that their fishing activity is basically to put protein in their family's diet, as often the diet is mainly starch food from the garden. In comparison, men fished frequently. Recently they have moved further out into the deeper sea areas. They spend more time paddling out than actually fishing because the sites are quite far from the village and that's where they believe they catch more compared to the inner lagoon.

There was a clear distinction between which fishing techniques women (including female children) engaged in and which they did not. Some research participants argued that gender and fishing in the past have also had management implications because women engaged only in reef gleaning activities and targeted fisheries. Moreover, they fished only during low tide and engaged only in very basic fishing techniques such as fish poisoning (using local materials) and line and hook and seaweed collection. More importantly not all women engaged in fishing, as culturally they were also expected to look after the household and ensure a daily food supply for their family.

Men used to go out to sea alone, fish in groups of two to four, or cooperate in larger groups depending on the methods and target species. Many different techniques were used ranging from traditional methods using stones, lines and homemade hooks with bait, to modern lures and outboard engines for trolling. The men in Dovele are renowned for being outstanding spear gun fishers. In every household in the village one will see improvised spear guns. The elderly males mostly use gillnets as primary fishing methods. As fish are regarded as an open access resource, there is no control on where and how people fish, or the amount they catch. The resource seems abundant but preservation is problematic. Nevertheless, according to an informant and from what I observed, fishers generally caught more than enough to show and demonstrate to their families that they are "good fisherman". The boldness of catching just enough to feed the household is no longer valued. Rather catching more fish than they can immediately consume or distribute among relatives or neighbours is now admired.

On the other hand, according to some respectable fishermen, they have noticed that the fish have reduced in size and are not plentiful. One respondent whose husband fished almost daily complained:

When we first married my husband caught very big fish (Maori wrasse). Now the size is small and is very difficult to catch. I noticed nowadays a lot of people in the village use spear-guns and fished at night while the fish are sleeping. So it is easy to catch and therefore their population has dramatically decreased according to my husband. I'm sad...because Maori wrasse will soon be wiped out. (LKIYF)

Fishers can fish any day of the week, except for Saturday for the Sabbath keepers and Sundays for others. Friday is an exceptional day in any active rural SDA community. It is a day of preparation for the Sabbath day (Saturday) and therefore everyone will go out and look for food in the garden and in the sea. Large numbers will scatter everywhere in the sea trying their very best to catch fish. It is a trend where you will see more than 60 dugout canoes out on the reefs and roughly around 200 to 250 fishers using every different type of fishing method to exert pressure on the reefs. As an elderly man told me one Friday when we were informally telling stories:

Already...the fishing pressure has increased significantly...the reefs remain the same but now with less resources. Our fishing ground is outnumbered every Friday by the growing population...before we had management so it is easy... now everything is hard. (LMO9)

In a situation where communities have identified scarcity of a resource, the sharing of it with other village communities may become a major issue in the future. In the existing social customs and regulations, most of the reefs do not have limited access to their fisheries. All residents in Dovele are not restricted to fishing within any reef or fishing grounds.

7.5.5 Influences caused by human activities

Land disputes over access and rights to land and resources have been heightened by transition from traditional farming to cash crops and market crops and also the logging activities which had taken place in Dovele. Land conflict resulting from socio-economic impacts has vivid consequences for land, sea and biodiversity degradation. Already the negative impact of forest conversion by logging and deforestation is evident, When asked, 'what do you think of the current challenges for the exploitation of resources and resource ownership?' the

resounding response was *'hem no gud (it is no good)*'. Without prompting, women and men were able to explain the complexity of natural resource related issues and how those issues link to their livelihoods. The participants agreed that major issues relating to natural resources exist. Current land disputes within the village and also within different tribes, and uneven distribution of past commercial logging royalties meant that some participants, particularly men, were guarded in expressing concern over what has happened to their communities. According to a female informant, "The logging activities have caused a lot of misunderstanding and have not resulted in equal benefit to the relatives and extended families". (LKIYF)

Some members of the communities have had to seek court injunctions to reclaim customary land. Such claims and their processes are long and complex. Stories were shared of fake claims of tribal genealogy and implications of difficulties in defining land boundaries as knowledge of exact boundaries has not been recorded and has been lost. When participants were asked what else has changed natural resource uses and roles, women and men frequently referred to:

- Introduction of resource extractive activities such as logging and mining.
- Growing population.
- Greed for individual wealth and improved social status.
- Inter-island/provincial marriage.
- Decline in the amount of land available for gardening in nearby areas.
- Technology (e.g. chainsaws, outboard motor engines).

I was talking to a school dropout one day and he explained:

Everything has changed; I no longer have faith in our leaders. I lost trust in them when they help themselves and their family with the royalties. My mother who is one of the rightful land owners never ever received a cent. (LMY10)

As populations expanded and available land for cultivation has diminished, the practice of shifting agriculture has ceased. Past practices that respected rules and *tabu* have now been eroded. Unlike the government, church missions have done a lot for the people and this has had a lot of influence in the community. They have provided schools, clinics, church buildings, and overall good will to encouraged villagers to become good stewards to look after their resources.

7.5.6 Natural disasters

Like other village activities, fishing is strongly weather dependant. Fishers explained that the weather pattern has a strong influence on the fishing activities. While tropical cyclones are not frequent in Western Province, the months from November to April are considered to be the stormy season and therefore not a good time to go fishing (strong winds, rough seas). The southeast wind dominates during May to August. For Dovele communities, their fishing grounds are sheltered and favourable during the south-easterly period. The northwest winds blow occasionally and can be strong and powerful but do not last long; this is the worst time to go out fishing as most of the reefs are exposed and vulnerable to strong currents and large surges at the fishing grounds.

The villagers complained that natural disasters such as unusual sea-level rise, earthquakes, tsunami and unusual weather patterns such as increased intensity of tropical storms threaten natural habitats, cause loss of habitable and agricultural land, coastal erosion, decreased food and water security, and had adverse impacts on human health. According to an informant:

In the last ten years there is evidence of habitat destruction as the conditions necessary for plants and animals to survive are significantly compromised or eliminated...It is beyond our control. (LKIYM9)

During the focus discussion, a few women stated that the large earthquake and tsunami that struck the western Solomon Islands in April 2007 caused a lot of damage and disruption in their community. Fears were still growing as to when the next one will hit the village again. The amount of damage, caused by this disaster, to marine habitats varied among different locations along the shoreline towards the deeper reefs. In Liangai and the nearby villages of Suantali and Boro, fishermen told me about the underwater landslides that removed coral from reef slopes and fish were no longer as plentiful as compared to before.

A village elder complained that the root crops he planted in his garden cannot bear good fruits compared to the past because of a long spell of droughts. A group of boys told me of their concern about new pests which are hard to control as they continue to destroy their garden produce. Villagers also noticed certain types of beetles and insects that ate root crops and other edible fruit trees. These have not been seen before.

Others complained about the northwest wind. It is more prevalent than previously and as a result big waves have washed-out sea walls and eroded coastlines. Relative sea level rise mostly caused by subsidence was currently causing substantial loss of lands and as a result people have moved inland. From personal observations, it appears that the shoreline in Liangai village has indeed been shifted inland and during high tide, some of the kitchen houses in the village are now inundated with sea water whereas before I was told they were 50 metres from the shoreline. This became apparent following the 2007 April earthquake.

Like any other low lying islands, over the long period of time the islands progress from the seaward edge of the shoreline towards the lagoon as the sand is blown and washed towards the calmer shore. By watching the positions and conditions of islets on the reef, it is not difficult to determine the direction of the prevailing winds. Many reefs surrounding the islands serve to protect the coast from storm surges, but degradation of these reefs due to these natural disasters and climate change also leaves coasts vulnerable.

7.6 Factors that will facilitate effective marine resource management

Finally in this section, I look at the social and environmental circumstances that the research participants considered will facilitate sound management of their resources and empower them as resources users and owners.

7.6.1 Social conditions that will influence better management of resources

The villagers reported that the loss of respect for chiefs and elders made it difficult for them to develop some constructive strategies to protect their reefs for management purposes. According to the leaders of the village, the only governance structure that is still intact is the church. It was also expressed by some members of the community, especially the younger ones, that the title of the chief in the village is just a tag with no power and esteem as compared to before. However the church pastor has the villagers' reverence.

The village still retains a strong communal spirit with people still willingly sharing possessions, and with everyone knowing everyone else's business. Interactions are frequent when walking through the villages and it is considered a common courtesy when crossing paths with person to inform them of where you going or where you have been, or what have you been doing.

In many respects, the men still hold most of the influence in decision-making even though the land tenure system is matrilineal. The supremacies in landownership systems and matrilineal relationships do not extend to power and influence in major decisions relating to land and reef uses. This is despite women in matrilineal systems being perceived by both women and men as inheriting the power of the life (*kastom*) of the land. Traditionally, under the chiefly system, women felt they were more respected and had higher levels of access and influence in decisions concerning all land types and developments. It was also noted in Liangai that the women felt they were simply consulted more, but not necessarily more respected.

Furthermore, many fishers complained that they were never consulted or included in decision making regarding the management of the marine resource suggesting that there has been little opportunity to contribute much of what they know. They want to see more participation from the community at large in deliberations on issues affecting their community. As one young man offering his views on why people fail to obey rules observed:

Time has changed, the village needs everyone's' input in order to facilitate good management and understanding about our resources and ways to look after them sustainably. Let's not leave out anybody when it comes to our land and reefs.
(LMY5)

The women suggested that they would like to come together more often for social cohesion and skills sharing. One of the setbacks is that the village has no common meeting hall. A community hall can play an important role in assisting social cohesion. Some participants explained that old ways of gaining each other's support had been removed with the introduction of new technology. Their comments reflected that, "the ways in which technology influences the community fabric are both positive and negative".

Men acknowledge that women are good land and reef administrators and are closely connected to the environment and the natural resources because of their concern for their communities and for their families. Women work longer hours in the garden and have better knowledge regarding planting and harvesting than men. However, women see their role as natural resource managers as being informal and 'not regarded as important' by the men. Traditionally women have shown how they protect natural resources and as such stand at the core of the sustainability paradigm if it is to move forward.

General perceptions in the village about governance were found to be very different between women and men. Perceptions between younger generations and older people did not tend to differ greatly. However, young men and young women had more transformational visions that shifted power and leadership roles within their communities than their older counterparts. Women and men, young and old, carrying out different roles in the community have access to natural resources (e.g. using land for gardening), but different levels of access exist alongside as is the case with influence in decision-making.

In general, many of the villagers I talked to identify that the way to move forward must include taking the best attributes of the power structure from the past systems and finding a way to combine them with the best characteristics (strengths) of the current system and new ideas.

7.6.2 Environmental conditions that influence better management of resources

Reactions were shared about having clarity on the area's boundaries which prevents conflict with other resource owners, facilitates better resource knowledge and production of maps and other helpful tools can be decisive for the success of community based management and gives the community greater confidence about their resources.

At the same time the more precise the peoples' knowledge of the reefs and their elements, the better the planning and regulations of their uses. The traditional accumulated knowledge of the area, along with information on climate, geography, sociology, anthropology, ecology and the use of biodiversity elements, among other things, is essential for the designing and governance of the resources according to the younger men.

Women identified that approaches for moving forward need to be based on strengthening organised parts of existing systems and organising financial management schemes and training to support diversified livelihoods, agricultural education and simultaneous action for sustainable resource management livelihoods, and more inclusive decision-making roles.

Since conflicts are very common in the aspect of dealing with natural resources. It is vital to engage in developing venues to enable the community to resolve

internal conflicts in a creative and transparent manner. This can be done through having regular dialogues and frequent monitoring of resources.

In rural villages people can easily identify individuals who tend to use destructive fishing methods. Once they claim rights over the management plan, they can exert pressure to those who breached the plan. Women and men understand concepts of sustainability. Sustainability as a concept held a lot of meaning within traditional subsistence societies as sustainable practices were a matter of survival.

At present both pro- and anti-loggers know that commercial logging activities are detrimental to community stability, relationships between *wantok* and their ability to sustain their growing families into the future. Despite some very challenging situations people still have hope and feel that on an individual basis that they can contribute to change. Possession of differing levels of power and influence over natural resources was not found to affect willingness to manage the environments sustainably. Indeed in the village, women and a few young men were highly likely to express their ability and desire to contribute as change agents towards sustainable natural resource initiatives. Women want to manage land sustainability irrespective of their land tenure.

The modern use of the *wantok* system (see Chapter Three section 3.4) presents a potential strength as well as a challenge to harnessing the existing social capital in communities. While the strength of the *wantok* system is that it provides collective human care, support and security for all people, its weakness is that it is more frequently open to corruption and nepotism particularly by people in powerful positions

7.6.3 Empowerment

Despite the challenging circumstances the villagers are still optimistic and feel that on an individual basis that they can contribute to change. Women and men, young and old, have the desire to engage in their community in general, beyond the church groups, for improved livelihoods and sustainable management of natural resources.

The community members do not face difficult times and crises alone, but rely on various institutions to assist them. The households ranked their families, relatives, and church the most important in providing assistance during

immediate hardship. These institutions and their existing ties to the community can serve as the foundation on which to build an enhanced community capacity to address hardship.

Collaboration among government, NGOs and communities to manage marine resources sustainably reduces government costs, increases compliance with regulations, and provides a means of gathering and networking important assessment and monitoring information (see Govan *et al.* 2011; Govan *et al.* 2009).

Associated with the concept of collaboration is the notion of *wantokism*. It unites and connects individuals with common languages, relatives, extend families, tribes, clans, island and provinces for a common cause. Its social pliability means that it can be applied in more than one situation especially when one needs help or is new to a place or unfamiliar to a group of people.

The differences occurred on some issues related to natural resources uncovered the breadth of impacts that resource mismanagement has on communities while highlighting differences in gender perspectives. The issues men and women identified reflected their gender roles. Women's perceptions of the impact of natural resource mismanagement reflect their gendered roles of food providers and child carers. Women's natural resource issues and their perceptions of cause and effect reflect women's interest in how natural resource issues affect the social cohesion of the community. Women made clear links between natural resource mismanagement and increased population and low education, as well as the effect of inequitable cash benefits from natural resources on disputes, youth alcohol and drug abuse, theft, and general disharmony in the community. Men's discussions were focused primarily on the environmental degradation caused by natural resource mismanagement with social concerns as a secondary focus.

Finally, as I walked over to catch my transport back to Gizo on the beach on my final day of research in Liangai, I met my oldest informant. He stopped me and gave me an improvised spear gun as a gift but moreover his final words to me summarised what I gathered from all my informants in the village:

My dream for the future is for my people to take ownership of the reefs and the marine resources; that older and younger generations understand that negotiations made now determine future wellbeing, so that we can manage our

resources decisively and with care. Fisheries and marine resources need to be well managed in order to maintain their social, cultural, environmental and economic values. (LKIOM11)

7.7 Summary

In the past, the lifestyle of the people in Liangai was relatively simple and had almost negligible impact on the environment. The community now faces a number of development challenges. The lack of services and economic opportunities has fuelled migration to urban areas. Cash economy has increasingly replacing the traditional subsistence lifestyle, and this reflects a society in transition as observed in the movement of the people. Within the setting of extended families and close-knit communities, the traditional subsistence life styles depend entirely on having access to land and marine resources.

Today money plays a significant role in daily living. What is seen now is that concern for members of the extended family is decreasing, and awareness of traditional and transitional skills is being eroded. The changes are having enormous impacts on the structure of the community. Growing dependence on, and struggle for, cash is having a different impacts on the community, and social stratification is increasing. Many of the people in the village who are facing the greatest difficulties include the sick, handicapped, mothers, children, large families and elderly people who live apart from their families.

As population increases, together with the introduction of modern fishing gears and methods, the marine resource has declined significantly. This indicated that fish and other marine species are caught faster than they can reproduce. It is evident that unless a proper management plan is in place it will be hard to contend the fragile and delicate ecosystem. It is the result of growing demand for protein and cash for rural villagers, combined with poor management of fisheries and the development of new, more effective fishing techniques. If left unimpeded, unsustainable practices will destroy the marine environment and threaten the food security for many poor people that primarily depend on marine resources as their source of protein. Conserving the fragile ecosystem and rich flora and fauna is urgently what the locals want to see as they have witnessed many changes in their marine and land resources.

The next chapter will discuss and evaluate the findings from the two communities with emphasis on the contrasting degrees of customary marine tenure based on traditional ecological knowledge.

CHAPTER 8: DISCUSSION

8.1 *Introduction*

In Chapters Six and Seven, I presented the findings obtained from the four methods of data collection; focus group discussion (FGD), semi-structured interviews, *stori nomoa* and participant observation. In this chapter I will discuss and evaluate the findings from the two communities with an emphasis on contrasting degrees of customary marine tenure based on traditional ecological knowledge. I also will assess the sources of exploitation and mismanagement of critical habitats by the villagers through examining the patterns of direct use of the resource mediated by the wide range of external factors outlined in Chapters Six and Seven respectively.

8.2 *Breakdown of tradition and the authority of villager leaders*

Throughout the research it was revealed that one of the biggest factors contributing to the exploitation of the reefs is the breakdown of tradition which has led people to disrespect and disregard both *kastom* and the authority of chiefs and village elders. According to the older people in the villages, the collapse of traditional marine resource management practices was fuelled by cultural vicissitudes resulting from western contact. In this segment I will explore the different aspects that have influenced the degradation of *kastom* and authority in the villages.

8.2.1 *Decline in traditional roles and values*

A good number of respondents I encountered during my study mentioned that prior to western contact nearly all land and ocean resources were held in trust by tribal chiefs with harvest rights overseen by them. They were also accountable for the management of the marine resources in each village.

In Solomon Islands most villagers have the rights to the resources for subsistence and tributes. Although the chief originally considered to be merely a manager of the reef resources, the term eventually came to mean landlord/chief of the village (United Nations 2002). The chief generally got his advice from the fishers and hunters because he valued their knowledge and wisdom. With their insight, village chiefs discussed with their elders matters concerning management of their marine resources for their community. In traditional management systems

the chief uses indigenous knowledge (values and customs) to watch over the natural resources. However, today it is evident in both villages that increased mobility, education, “new religion” and adoption of western values have largely eroded this tradition.

Respect for elder men and women, particularly in rural areas, is a cultural obligation but my fieldwork revealed that it is deteriorating. The roles of women and men in the villages are defined by traditional norms and *kastom*. This was observed in both of the villages. Women are more responsible for domestic chores such as gardening, weeding and planting while men on the other hand are engaged more in physical activities such as clearing the land for subsistence gardening, building and repairing houses, hunting and fishing. There has been a distortion in traditional roles as villagers are confronted by the influences of the western lifestyle. Many of their children, however, do not challenge traditional roles, rather they attempt to reconcile these roles with their new ones such as being a nurse in the local clinic, primary school teachers, or even elders and pastors in the churches.

Previously, traditional harvesting was restricted only to subsistence and fishers visited certain fishing spots or areas only during a particular time to harvest. This was in order to maintain the continuous supply of important target fish stocks and to minimise possible over harvesting. Some fishers, with their elderly counterparts, use traditional knowledge to predict the weather patterns, with their variability in space and time to provide vital information for their survival. Over the years local knowledge was passed down from one generation to another as it contained key information on the local areas and the natural cycle that occurred (see also Johannes 2002; Jokiel *et al.* 2011; Veitayaki 1997). Fishing skills were handed down through families using oral traditions and direct teaching based on detailed experiences. Fishers acquired their skills through years of training and were taught to identify changes in conditions of the marine resources. More precisely, their training over the years enabled them to understand and obtain knowledge of the marine life cycle, fish feeding habits, growth conditions and types of methods to harvest different species at different times.

Today this is not really manifested in either of the villages. Those that have acquired the traditional knowledge and the skills tend to keep them to themselves fearing that their experiences and knowledge are no longer seen as important and valued by the younger generation. I also noted that some adults and youths

in both villages no longer value their traditional upbringing. Most male fishers in Toumoa are unaware of some of the fish aggregation sites in their reefs, or fail to memorise the specific days of the month and time of the day when the hawksbill turtle (*Eretmochelys imbricata*) would come up to nest on the beach compared to the older folks. In Liangai, the majority of the males cannot accurately disclose the best time to plant taro and yams in their respective gardens.

The indication of the collapse of traditional knowledge is also witnessed in the course of fishing trips made by young men and women. They spend almost the whole day out in the reef but catch less fish compared to their older counterparts who spend less time at specific reef location and come back home with a basket or an outrigger boat full of fish. I've overheard and observed the young fishers complaining that there are no more reef fish on the reefs but on the other hand the older fishers kept reminding me that you just have to master your fishing spots (and that comes with experience) in order to return home with a good catch.

In both of the villages, the elderly people and a few youths blamed the contemporary western based school system for alienating children from their environment and *kastom*. In Liangai for example, during the northwest wind and five days before the new moon, coral trout (Serranidae) used to come up the reef to spawn but most young men that I talked to weren't aware of it. However, over the years, older people observed and assimilated their understanding of the oceans into self-sustaining management practices (see Aswani and Hamilton 2004; Jokiel *et al.* 2011).

What was comprehended in Liangai village is that while the local governance regime may help in managing the natural resources in a sustainable way, there are potential drawbacks that have resulted from externally imposed institutional arrangements. These drawbacks are characterised by the inconsistent assumption of benefits and exclusion of weak actors seen in the village. These negative outcomes grow even bigger in the absence of law enforcement and efficient monitoring reflecting information asymmetries, where the powerful ones not only capture benefits at the expense of other community members but in the process also enhance their influence. This was seen in logging issues in the past years in Dovele. As a result, social disparities among resource users and resource owners are intensified and environmental destruction becomes more serious.

Furthermore, the findings showed that despite the fact Liangai village is made up of families who are closely related, they are not necessarily unified as a whole. Despite the community members' vision of a small, integrated community, internal differences have affected their resource management outcomes. Even though the villagers of Liangai belong to a single community, the same church and share the same fishing ground, they are heterogeneous and very dissimilar, a disconnect that has been reported from other settings outside of Solomon Islands (see Gough *et al.* 2010; Ostrom 1990). This study has shown that differences in views, which relate to knowledge and information, affect choice in resource management and the capacity to agree in collective action. The differences also affect power, status and economic interests in the village. The dynamic patterns of interaction over time reflect how various forms of heterogeneity intensify and coincide and create motives for action among the tribes in the village. Today, any resource management is being undermined by factors such as the emphasis on production, participation in the cash economy, an increased capacity and demand for resource exploitation, lack of information on which to base management, and the socially destabilising effects of the cash economy.

8.2.2 Modern and traditional attributes

It is important to note too that tradition is associated with specific notions over a period of time (Veitayaki 1997), and therefore changes over time. This suggests that community based adaptive management (CBAM) systems that can change over time, if properly adapted and sanctioned, can be the basis of suitable management arrangements (see Andrew *et al.* 2007; Veitayaki 1997) and therefore become part of a contemporary tradition.

In both of the villages women made up half of the population and are responsible for caring and staffing their households; therefore women will be significant players in any community-based marine resource management systems. However results showed that women are marginal in all decision making in Liangai, a feature described as a constraint to CBAM for the Pacific Islands in general (Veitayaki 1997). In Toumoa on the other hand, the women are consulted separately by the chief once a decision was made in the village. According to Veitayaki (1997 126), "women's persistence, determination and perseverance are notable features of traditional community life". They are active members in the

communities and their contribution is important to assist their male counterparts to effectively manage their marine resources (Hilly *et al.* 2012).

In Solomon Islands much of the science of marine resource management is based on the ecologically sound traditional wisdom of fisher folks, which enables fisheries to continue to supplementing other livelihood options for their families (see Aswani and Hamilton 2004; Ruddle 1998b). Johannes (1998) concluded that traditional values which are sustainable in nature need to be appreciated alongside values of modern systems. This appreciation is likely to be able to be used to greater effect by the people of Toumoa where people still promote and practise traditional values of resource management. In Toumoa the wisdom and understanding of elders and old fishers are still highly respected in the traditional management system compared to Liangai village and the over-arching Dovele district where such respect and knowledge has largely disappeared.

In Liangai for example, the traditional system, based on cooperation for the good of the community, was slowly replaced by commercial forces and competition to benefit each individual household. Sharing the catch for free with extended family members and village elders was a predominant cultural practice in the past. There has been a significant shift from this traditional practice because of the increasing need for money and the introduction of commercial value to some marine species. As Jokiel *et al.*(2011 4) observed in Hawai'i, "the subsistence-based, locally governed economy was converted to a partly cash-based economy controlled by market demand". The introduction of technology and more efficient fishing gear further accelerated the shift from subsistence to profit-based economies and these trends have also been noticed in other small Pacific island countries (Ruddle 1998b).

In the South Pacific Islands, and particularly in the Melanesian countries (Asafu-Adjaye 2000; Cinner *et al.* 2005), customary uses of natural resources are structured through a multifaceted system of customary institutions and traditional practices which in the past ensured social equity, enforced social norms through social pressure, shared value systems and defined notions of property and territoriality, as well as defined roles for men and women in the village or community (Aswani 2005). However, today young people in the study villages were sometimes described by elders as either "ignorant" or "not taught and lazy" and therefore showing negligence and disregard towards the significant values of their inheritance and traditional management systems.

Effective monitoring and managing of proposed *tabu* on reefs and nearby coastal areas has failed generally in Liangai and the surrounding villages in Dovele district in recent years. Although there were several attempts, it has been established that there were only a handful, if any, of villages in Western Province that are currently trying their very best to manage their reefs and marine resources and this group includes Toumoa village.

8.2.3 Big men, larikens and wantoks

One of the downfalls of the modern society in Liangai has been a problematic disintegration of authority. An elderly woman in Liangai explained:

There are now too many big men in the village, each of them likes to boast about their notions as the best, however, they don't work collectively together. There are a lot of misleading stories/rumours/gossips that impedes trust within the community especially coming from the respective leaders themselves which also contributing to the lack of cooperation among and within the different leaders in the community. (LFO3)

As a result, the leaders are inclined to blame and point fingers at each other when problems and issues arise in the village and this ultimately endangers sustainability within their community. Whiteman (1995) explained that Melanesian societies are structured on the basis of kinship, a distinctive characteristic of tribal societies around the world and which provides the basis for interaction among kin group members. Within each cultural group "there are usually smaller groups of more closely related people whose loyalties to one another are greater and who interact more frequently with one another than they do with other groups" (Whiteman 1995 106). The *wantok* system is closely related to the kinship relationships.

According to MacDonald (1995) the *wantok* system metaphorically represents relationship that existed between individuals and group of people. *Wantok* refers to people who speak a common language, and understand and support each other (Ipo 1989). The term characterises a tie among individuals with a basic sense of community, a kinship community, speaking the same language, living in the one place and sharing common values (MacDonald, 1995). This communal value system has an impact on the current day to day fundamental livelihoods of the village system and its leadership with both positive and negative influences.

Malasa (2010) observes that this socio-cultural system has undermined the prevalence of democracy in many communities within the context of Solomon Islands, where respect for persons, freedom and social justice have limited room to exist. The contemporary system is one of social representation by strong male dominance in any leadership position whether it be in the community or in school. This male seniority is sustained by and influences the behaviour patterns of leaders in their decision making.

This dominance in leadership is clearly visible in both of the villages. It is also combined with a strong belief about gender roles that has also undermined the selection and recognition of women to be in leadership positions throughout the villages. Male dominance is common across societies in most other islands and provinces of Solomon Islands (Pollard 2000). The traditional construction and recognition of male dominance in leadership roles is attributed to women's values and practices in the village as compassionate and they are more associated with caregiving responsibilities at home (Douglas 2000).

Malasa (2010) further articulated that the *wantok* system has proved to be one of the main hindrances nowadays in any successful leadership in Solomon Islands and this is particularly true in the rural villages. The concept revolves around prioritising the needs of your own ethnic group and clan members before meeting the needs of other people from any other ethnic or kinship group. Within the context of this case study, this socio-cultural system has placed an absolute obligation on individuals to focus on just supporting their family members and extended family members before serving the rightful needs of others. Most of the decision making favours the same groups of people or family. The "others" are always unfairly treated in terms of opportunities and other money driven activities. Therefore this tends to divide the groupings in the villages.

Furthermore, in addition to the *wantok* system modern influences have been also problematic in terms of good leadership. According to Theesfeld (2009), the different interests and talents possessed by individuals can lead to possible misuse of power and reciprocal distrust. In Liangai for example, there are nine different tribes in the village and this hampers, in the end, collective action in the village. The contemporary influences have contributed to the misuse of power that leads to personal benefits but decrease in trust, producing a downgrading effect on collective action, or in short destructive leadership. Ostrom (2007 190) explains,

in contrast to the early stages in a process of collective action, inequalities in distribution of benefits may, however, reduce trust and cooperation later in the process. The core relationships affecting cooperation are between reputation, trust, and reciprocity.

8.2.4 Reputation and status

An aspect of interest to the present analysis is the reputation of a leader; in particular, considering someone dishonest and “two-faced”. The village pastor explained:

When people do not trust institutions, it is for good reasons. The best existing proxy for low trust I have been able to find is corruption.

This underlines why some villagers in Liangai, particularly the younger males and the women, are not content with their village leaders because they were often misled by their stories and actions. They say one thing but fail to act upon it and therefore some of the villagers find it hard to respect them. An old man summaries his frustration by saying:

Our leaders are not honest. When they received goods and free hand-outs for our community they never shared them with us. Most time when they represent us in meetings, they fail to tell us the significance of the meetings they attended. We were often being told or informed by “others”. This is not helping our community. (LMO7)

I was reminded by an informant that a long time ago, the village chief’s words were like a command and all the villagers would listen and respect what he suggested or instructed. Today there are lots of “so called” leaders who believe they are smarter and wiser and they often disagree with the chief’s ruling. In Liangai, most villagers I conversed with, observed that almost all of their leaders have been directly involved in logging before and have neglected their own people. According to Theesfeld (2009), the misuse of power can displace trust and disturb collective action within a group.

It seems all forms of logging have significant social impacts on the communities involved with disruption of traditional livelihood strategies and a tendency for rapid change in values and priorities that can lead to strong internal tensions and generational conflict (also see Kabutaulaka 2000) and this was noticeable in the

entire Dovele district. Logging often has a detrimental impact towards customary land, reef and coastal resources (Townesley P *et al.* 1997).

Furthermore, analyses were made of the villagers' perceptions of the reputation of various formal actors and their integrity as their leaders. In Toumoa for example, the outcome of the 2010 national general election has caused a lot of division and suspicions amongst the villagers themselves. The disunity in the community is between those who supported and voted for their reigning national member of parliament (MP) and those who didn't. Those who supported their MP were issued with solar panel kits for their houses and those who failed or didn't vote for their current MP during the elections were marginalised and received nothing. One of my female participants clarified the difference this has caused:

As soon as the election result came out there has been a lot of discrepancy erupted and have continued to disrupt community cohesion especially after the distribution of equipment (Solar) which was supposed to be given to everyone. Instead only the supporters of the reigning MP received them. The rest of us because we vote for another candidate we were categorically left out even though he is our national representative. (TFY9)

A lot of the voters in the village are easily dragged towards the shrewd campaign of most of their intending candidates because they were promised outcomes and services that were never intended to be delivered. The reality is, once the winning candidate is announced, everything in the village is back to square one. In other words, the reality is that, the village people were used as rubber stamps for the Member of Parliament. As one informant explained:

As soon as the voting is over, that was the last time we see our winning candidate and we have to wait for the next election for the campaigning fever again. (LMY1)

The *larikens* took advantage of the poor rural dwellers. In principle, there is nothing tangible happening in terms of development in the village. In both communities, the villagers have very high expectations of their politicians (both provincial and national) for free hand-outs. Theesfeld *et al.* (2009 3) explained that, "collective action is often enhanced by political elites and leaders being a bit better endowed and a bit wealthier than the average community members". Furthermore, the level of differences amongst political groups is of great significance because it encourages them to be vocal in decision making in the community. Leadership as one component of social and political process can

have many faces; it can be linked to power and influence; it includes those individuals that have supporters, or individuals who are ready to perform the functions of making decisions; it may be shaped by situation (material, demographic, historical or immediate); and leadership can also typically be imbued with socially and culturally significant expectations (Watson-Gegeo and Feinberg 1996).

In Liangai, the different tribal leaders (*lekasa*) continued to work single-handedly with their own allies (tribe members) in the village and these will continue to affect the future community aspirations. Overall, community activities are missing, except for church activities and the activities that involved rewarding participants with food and/or money. In comparison to Toumoa, the community retained a strong spirit of community mindedness, and the principle of sharing and lending a hand to one's neighbour is still entrenched in their culture. Therefore what is seen in Liangai nowadays is that they are moving away from the communal way of living to a more independent self-serving community. In Toumoa on the other hand, a high level of cooperation remains, for example when organising an event such as Christmas activities or feasting. It is customary for each household to contribute towards the event and give generously a large basket of root crops, bunch of bananas and sea food. They pool their resources together. During marriage, women sang and carried out other rituals of custom celebrations.

8.2.5 Modern democratic institutions

In both villages where trust has previously been the backbone to resource user rights, the new institution (i.e. church) has rapidly become the focal point of most of their community activities. Traditional leaders in Liangai no longer play the same role as previously as their powers have been usurped by modern religious and democratic institutions, though in Toumoa many traditions are still intact. Church and modern education are greatly blamed for the breakdown of traditions, and indeed in many other parts of north Vella la Vella and also in Shortland islands, most older people are very concerned about what they perceive to be culturally and socially corrosive effects of church and education. For example, in Liangai when you are a "backslider" from the church you are seen as an outsider and therefore you are not felt to be part of the community since many of the Sabbath keepers will not like to associate you with the church and therefore in most instances the backsliders become victims of exclusion and hatred. This

particular differentiation which is an artefact of church did not exist in traditional society.

A further difference from traditional leadership that was observed is the great respect that is rendered to church leaders. It is difficult to draw a line between the aspects of society that represent modern culture and the traditional within both villages as the two are intricately interwoven. Christianity was brought into the islands in the early 1900s and while it was readily adopted, many traditional norms were retained (Allan 1957; Hilliard 1974). Christianity now adds an extra layer of governance to the lives of the villagers. In the case of Toumoa where people have less access to urban centers, and are regarded by other Solomon Islanders as being from the “outer islands”, it is apparent that people still have a lot of attachment to their traditional upbringing compared to the villagers in Liangai that have more accessibility to the urban centres of Gizo and Honiara.

In the world today, global environmental changes threaten to cause environmental problems such as climate change and depleted resources (Bell *et al.* 2006). Such impacts will also influence the study villages along with globalization, development and rapid population growth (Roberts *et al.* 2002). According to Watson-Gegeo and Feinberg (1996) old patterns usually do not fully vanish under pressures of modernity; instead they are transformed as they are integrated into novel structures, and they play a major role in shaping the new structures that are, at the same time, shaping them. This supports my findings to suggest that many traditional leadership structures could thus be adapted under a new form of community leadership, facilitating a potential transfer of learning as to how to make improvements in governance especially as the demands of managing resource competition intensify (Ratner *et al.* 2012).

Exchange of deferential behaviour is highly esteemed in Toumoa village as compared to Liangai and is observed at all times by individuals. Silence is part of their tradition. The culture of silence which is particularly strong for women (see Vunisea 2008) may result in confusion during meetings and workshops since silence can range over a wide range of responses from little understanding of the issues at hand to disagreeing or failure to reach a consensus. There have been circumstances in both villages respectively where individuals do not agree with the chief or the meeting's motion but become part of the consensus out of respect. As such, leaders often initiate key processes. According to Chemers (2008 376), this type of leadership is “a process of social influence through which

an individual enlists and mobilizes the aid of others in the attainment of a collective goal". On the other hand, Kellerman (2004) argues that cooperation is the dominant institution and therefore people often worried about the prevalence of "bad" leadership because it often divides the community during the self-organizing processes in ecosystem management.

8.3 Marine tenure, perceptions of threats, access and the management of reefs

Whilst customary marine tenure, fishing methods and resource management practices have survived in Toumoa and Liangai, inshore fisheries have been transformed over the past years by a number of factors. Encounters and confrontations related to the rights over the use of land and water have been important to the human issues throughout recorded history (see Pomeroy *et al.* 2007).

Traditional marine resource management employs knowledge which the ancestors took centuries to work out and accrue (Aswani and Hamilton 2004; Cohen and Foale 2011; Jokiel *et al.* 2011) and this was observed at Toumoa with respect to their *tabu* reef. The data indicated patterns of understanding of traditional management slightly differ in the two villages while suggesting that both communities have 'some certain shared understandings' of the importance of marine resource management and certain ecosystem functions. According to Warren-Rhodes *et al.*(2011 493), "the key socioeconomic variables, namely village and religion, have influenced the specifics of the knowledge". However, Toumoa community has the better understanding of sustainable resource management with regards to the social conditions and the maintenance of social influence of governance, as observed by Cohen and Foale (2011) throughout the Pacific Islands regions as the main reason for the success of their *tabu* area. Understandably achieving sustainable marine resources was easier in the past because people were fewer in numbers, had fewer needs and had more limited capacity for consumption (FAO 2004b). This was obviously true for both the Toumoa and Liangai village as stated by the older people in the villages (see Chapters Six and Seven respectively).

The findings of this study highlighted the intensity of inshore fisheries harvesting has been exacerbated by an increasing demand for cash from rural populations with limited economic opportunities. Similar findings have been observed in recent assessments of fishing communities in other parts of Solomon Islands

(e.g. Brewer 2013; Weeratunge *et al.* 2011). For these villagers there is a growing external demand for marine products, not only for export but also among increasing populations of families and relatives in urban centres who lack ready access to the sea. Before fishing was not a daily activity and not carried out with such intensity as today. Fishing was done for a purpose and when that was accomplished fishers returned to other pursuits until another such occasion arose. In the absence of regulatory controls and the lack of public awareness of their vulnerability, inshore fisheries are particularly prone to over exploitation (Gillett 2005). Policing and enforcement of management and control regulations is often difficult to achieve due to the inadequate legal, administrative mechanisms and isolation.

The two villages have distinguished types of reef ownership despite of the existing traditional land and marine tenure system. Overall, Toumoa exhibited the 'stronger' form of customary land and sea ownership, with a single strong tribal leader (chief) responsible for the reef ownership, access, management ('caretaker' or 'custodian') and enforcement for his community. People in the village were well vested with their genealogy and ownership and therefore there was a clear knowledge of who stood out to be the caretaker and the leader of the grouping. The villagers don't dispute their chief because of their respect for him.

Liangai on the other hand displayed a more moderate to weak form of customary ownership, with the heads of families (of some tribes in the village) holding individual responsibility claims for some of the reefs and islands they 'owned' or occupied, subject to oversight by chiefs from several tribes. Furthermore, Liangai village is situated within the Dovele district where high population pressure and villages in close proximity with one another complicate reef and resource access and user rights within the district. These and other contributing factors have led to ostensible governance, managed by multiple tribal "*lekasa*", manifesting a weak form of tenure that in reality functions as open access, a feature also noted in Talakali, in Malaita Province (see Warren-Rhodes *et al.* 2011). Internal conflict within the community is one of the key factors that undermine their management competence. Differences often arise over disagreements in leadership and often over customary rights either over the land or the reef. The disputes are not necessarily over user rights but obviously are linked to power and authority.

The most predictable and respected 'rule' or 'traditional' reef management practice is the obligation to ask for *prior* permission from 'landowners' for access

and use of resources. The landowner to whom one asks permission varies; it may be the chief or the individual (family/tribal) landowners, although many respondents indicated such permission was rarely sought nowadays. Most landowners indicated they usually grant permission for collection, especially for subsistence needs, although more stringent rules are in force in Toumoa where their traditional management *tabu* site is central and well respected.

Another type of ownership claim that I observed in both villages was where a few fishers who went out diving, returned with juvenile trochus and clam shells that they picked from other reefs. On their way back to the village, they released the invertebrates in a nearby portion of a reef visible to everyone in the village. Normally these portions of reef are considered unoccupied or with no clear interest from anyone in the village and are utilized freely. In these cases, individuals who then specifically continued to look after their invertebrates on these reefs gained ownership over the resources, although the reef is still under the custody of the tribe(s), as represented by the chief(s) and/or heads of families.

The community based marine resource management functioned under the customary marine tenure system; however, in most cases it does not ensure viability in rural areas. Reef ownership disputes interfered to varying degrees with marine resource management as Townsley *et al.*(1997 3) explained in relation to the Bay of Bengal:

The intrinsic value of an area's resources appears only of secondary importance. The exclusive right to use resources probably had little meaning until the recent advent of commercialised fisheries and the possibility of generating income through the sale of fishing rights in customary tenure areas. This has implications for the notion of protecting the resources within tenure areas for the future. In a quite profound sense those resources seem to acquire meaning by being shared with others.

Evidence of successful traditional marine resource management strategies were seen where established customs affect an enduring management system that has benefited all community members. This was the case in Toumoa in comparison to Liangai. In Toumoa the traditional *tabu* area (Rosae reef) indicates specific boundaries that are well defined and collectively recognized and respected by other neighbouring communities in Fauro Island and also the larger Shortland island villages.

Their initiatives to protect Rosae reef against its depletion and over-exploitation had paid off because the *tabu* site has been set aside for a number of years now and has continued to support the villagers and assist community needs. This sentiment was expressed by the reigning chief as he clarified the existing fishing rights in the village:

Our fishing rights still exist and it is clearly to the advantage of my people as I kept reminding them to fish in moderation, to ensure future productivity and sustainability on our fishing grounds. In the absence of such controls, it would be disastrous as they would take advantage to exploit and use destructive methods. If they don't, someone else would. Therefore, moderation would be pointless and the resource would therefore dwindle.

The active participation of the villagers in empowering themselves to take ownership and pride of their *tabu* reef has sparked awareness that their management design for their traditional *tabu* reef is appropriate and site specific. Their isolation from the urban centres as compared to Liangai village has enthused their leaders over the years to enforce and encourage their community to look after their *tabu* reef as a means of food security and a community source for alternative income. Therefore, traditional *tabu* and customary marine tenure practices evolved over the centuries to ensure that marine resources were conserved for sustained use.

Furthermore, it is important to note that access to sea areas or resources (e.g. certain species) is controlled and approved by the authority structure of each tribe that has claims over the reefs and in Toumoa's case it is the chief of the village. Access for those who are not from the village or non-community members to a particular area or species could be attained after consent is gained from those who authorise its exploitation. However, the social network that bonds the villages to operate collectively within approved guidelines for the exploitation of marine resources is subject to continuous interpretation and change by community members with due respect to their *kastom*. *Kastom* is a set of contemporary social practices embodied within the structure of a community. As behaviour changes, *kastom* changes, as *kastom* is the pattern of behaviour.

More so from the results, it is important to reiterate and remember that customary marine tenure today has very little in common with customary tenure 40 years or more ago. The evolution of marine tenure in both of the villages, one way or another, is modified by a variety of factors that include population growth, and

changes in community politics, education, influences of church, migration, economics, land tenure patterns and increasing influence from outsiders and governments (Solomon Islands Law Reform Commission 2012) (see Table 21).

Table 21. A brief description of issues captured from the study that contribute to the constraints on marine resource management

Factors	Descriptions	Methods of Collection
Population increases	Lots of people now in the village	Interview/ Observation/ FGD
New fishing techniques	Modern fishing gear and new techniques	Interview/ Observation
Needs for money	Obligation such as school fees, basic needs etc.	Interview
Changing Attitudes	Disobedience, Ignorance and disrespect this	Observation/ Interview
Increased number of fishers	Main source of protein and income so there is a lot of pressure on the reef	Interview/ Observation
Institutional changes	Changes in perceptions of customary tenure system	Observation
Market prices increase	Lucrative prices have increased the fishing pressure	Interview
Frequent fishing	Increase population, easy access to fishing gear and new techniques	Observation
Logging and clearing of land	During heavy rain, sedimentation and eutrophication	Observation
Livelihood options	There aren't many options to get money so the reefs been pressured	Observations/ Interview
Changes in resource uses	The gardens are been destroyed by wild pigs (because of logging)	Observation
Multiple users	Neighbouring villagers fish and dive on the same reefs	Interview/ Observation/ FGD
Poachers	Outsiders came in occasionally and fish	Interview
Rubbish disposal	Wastes dumped into the seafront	Observation
Natural extremes	Tsunami and earthquake in 2007	Interview/ Observation

In Oceania, fishing rights and resource exploitation were usually regulated by families, clans or chiefs (Johannes 2002). In this case study, the customary marine tenure system is classified as primary and secondary. Primary customary marine tenure is applied to the communities that perpetuate marine tenure systems that exist under the traditional authority structure. For example, in Toumoa, the *Lala'aha tegekena* was the central figure who asserted authority over marine resource use rights. Under that type of authority, in the Pacific, the restrictions on fishing were accomplished through restricted access, quotas, seasonal and area closures, restriction on gear type and size limits (Aswani 2005; Cohen and Foale 2011; Hickey and Johannes 2002 ; Jokiel *et al.* 2011).

The secondary customary marine tenure practises on the other hand are contemporary arrangements established by community members that result in collective agreements regarding the use, access and exploitation of marine

resources. Secondary practices function outside the traditional authority structure that has either become devitalized or totally abandoned and replaced with an introduced governing system (Hviding and Baines 1994). Likewise, informal marine resource user arrangements exist beyond the sphere of a formal governing authority. These arrangements are very much akin to the informal understanding employed by certain fishermen from neighbouring villages outside Dovele district, where informal arrangements exist exclusively between marine resource users and the community that owns the reefs. This system represents the vibrant interaction community members have among each other through blood ties. Disagreements over marine territory have been a prominent feature in Liangai village and its neighbouring villages. The exact location of the named boundaries is not often the focus of these inter-village disputes; rather, conflicts centre on differing versions of local history and tenure, and thus rights to a section of marine territory are conferred to different villagers or differ on the precise parameters of shared rights to territory and resource. In my study I observed that an increasing interest in sea boundaries has emerged on a few reefs that have high reef fish diversity and this has caused division among tribal leaders.

8.4 Market linkages and inshore marine livelihoods

In recent decades the inshore and marine livelihoods have been inclined to have a strong market placement; villagers exploit the inshore marine resources in order to sell them or exchange them for other foodstuffs, goods and services. For many fishers around the globe, their livelihood option is marked by the seasonal fluctuation of fish stock which often disturbs their fishing returns influencing them to look for alternative means to support them money-wise (Allison and Ellis 2001). As rural coastal areas linked up with town and city markets, the patterns of marine resources utilization progressively combined with the market demand that range from the fishers to the suppliers (Brewer *et al.* 2012). For example, the high demand from high-value markets overseas of marine resources for consumption, income and ornamental trade is one feature that contributes to the depletion of marine resources and habitat degradation (Brewer *et al.* 2012; FAO 2008; Townsley 2004). Even locally this was seen in the case of Toumoa where fishermen used the opportunity at Buin market in Bougainville to sell their marine products.

Market linkages have always played and, will continue to play a crucial role in coastal and inshore livelihoods, by not only providing markets for producers, but also by providing inputs, credit and security for producers otherwise isolated from institutions and market mechanisms (Townsend 2004). These associations often help facilitate the development of manipulative relationships between market agents and producers but they are rooted in many fishing villages and quite often hard to alter (FAO 2008). Changes in market arrangements appear to be weakening or altering many of these traditional patron-client relations (Fabinyi 2012), not always to the benefit of the poor fishers who may find themselves more unfortunate than they were within traditional systems.

Control of marine resource depletion is likely to involve costs for most villagers involved in inshore resource exploitation in the form of reduced incomes from fisheries (Townsend 2004). These costs are most likely felt by the people involved in the handling and advancement of marine produce from reefs to the consumers and buyers. As noted in other small Island countries (Adams 1998a), in the face of sustained market demand for fish the incentives for the two villages to accept these costs are relatively limited unless viable alternatives become available.

8.5 National challenges and Government support for village-based management

Villagers complained about the present government; both at a national and provincial level,²⁰ which has not provided any tangible support for their communities, either in terms of aid development or awareness programs. In comparison to what the government has done in the rural areas, the churches have done much for the people. They have provided schools, clinics, church buildings, and overall good will. The churches have influenced the community to integrate biblical teachings to be part of their daily lives. The term, “development” to most of these villagers’ is interpreted as what they “see and feel” and it has brought a lot of meaning to their world.

However, most of the examples given by the villagers for the lack of government support in their areas referred to development projects rather than to education or awareness campaigns. In general, few people in both villages acknowledged that

²⁰ The villagers in the two communities make little differentiation between the national and provincial government, and largely refer to them a single entity

sometimes government officials would occasionally visit their village to give advice and training, but these visits were purportedly quite infrequent and of little impact. One of the major set-backs in interpreting the information and awareness kits given to the villagers is the fact that most of the information is too technical and a handful of the villagers are illiterate and thus they favour oral rather than written communication as the preferred medium of information sharing. Experiences have indicated that many written forms of information and awareness materials were just unnoticed and placed in shelves at homes. For some of these villagers, it can be postulated that keeping information to themselves provides tactical advantage, power and control (Brockington 2004).

Like any other Pacific Island fisheries departments today, MFMR comprehends that managing most of its coastal fisheries from Honiara (the capital city of Solomon Islands) is impossible (Ministry of Fisheries and Marine Resources 2010). The geographical extent and customary tenure characteristics of Solomon Islands are not suited to addressing resource management in a purely centralized fashion despite this being the current institutional architecture and pattern of fiscal support (concentrated at the national level). Similarly in Vanuatu (see Johannes 1998), the additional expenses involved in carrying out, research, enforcement and compliance of inshore fisheries, with respect to the number of coastal villages throughout the Solomon Islands, is overshadowed by the possible return benefits from such activities (Govan *et al.* 2011). During one of my informal *stori nomoa* with a primary school teacher, she told me that maybe:

The best way to address this is for the government to encourage a broad based economic development in the provinces and islands. (LKIYM4)

The notion is consistent with the Solomon Islands Government National Development Strategy (NDS) to guide development activities and programmes to build better lives for all Solomon Islanders (Solomon Islands Government 2011). Though conversely, the present government will need to find innovative and creative ways to unlock the significant potential that lies throughout the islands and provinces. The main obstacle to realising the full potential is the geographical complexion of the country. There are costs that the country cannot avoid due to its geographical make up. A further challenge to effective community based marine resource management system in the two villages is establishing a working relationship between the MFMR, the resource users and resource owners. The MFMR relies on the co-operation of the resource users and

resource owners for the protection of their resources. Such a working arrangement can only be achieved through negotiations with the people, which involve talking, listening, and learning from the people (Boso *et al.* 2010; Jentoft 2005; Njaya 2007).

Amos (1995: 8) urged that, “precaution is required when discussing and addressing appropriate sustainable management systems and establishing a form of a working partnership with the people”. As they are the only resources that are readily available for income and food security people get very defensive and apprehensive if their views concerning the management of their resource are over-looked or considered not relevant for modern development needs. It is therefore important to look at the role currently being played by Solomon Islands Government through MFMR in its support for village based inshore marine based management and to give some analysis of how government can best help rural communities in their need to manage their resources, whether through dissemination of information, capacity building of management skills, or increased power of local enforcement (Govan *et al.* 2011).

Despite the autonomy with which most communities continue to manage their marine resources, the MFMR recognizes the potential need to extend assistance to those who are unable to manage them. As Chapters Six and Seven show, one of the contributing factors that weaken their management capability results from internal conflicts within the village. These may concern disputes over customary rights to land and/or reefs or leadership disputes. Foale and Macintyre (2000) and Aswani (1997) report similar disputes respectively in Ngella (in Central Province) and New Georgia (in Western Province). A major part of these problems is related to the heterogeneous composition of Liangai community in relationship to inter-marriage, outside influences, number of tribes, and colonial histories.

A number of projects over the last five years have aimed to encourage more partnership and provide directions across the government ministries and NGOs. The MFMR is beginning to play a vital indirect role in management by working in the villages to help combine local knowledge with modern research-based knowledge to improve village-based management with the help of some environmental NGOs (such as WWF, Live & Learn, FSPI, WorldFish and TNC) which are working on various islands in Solomon Islands.

These NGO's are playing a significant role in bridging the gap between the people and the government in assisting communities to manage their reefs. For instance, with reference to my two case study villages, The WorldFish Center has established partnerships to assist village communities to empower and strengthen community ownership and participation in managing, development and conservation of marine resources. The target of similar partnerships was described by (Govan *et al.* 2011) as being to assist the local community to look after and control the rate of degradation of the local marine environment and to improve, maintain and support its life-supporting and productive capacities where rural communities take the leading roles.

A group of youths I met and spoke with during my second trip to the study sites in October 2011 was full of enthusiasm and started to appreciate their role in managing their resources as resource users and resources owners. It was evident that many villagers are now widely putting aside opportunities to overexploit some of their reefs in exchange for the greater long-term benefits of conserving them. This was shared by an informant:

We've realised our mistake (sigh), our resources have depleted significantly. We have to start somewhere to conserve our reefs. Gone are the days we accused each other for negligence. We need to start small. (LMO11)

They were happy to acquire (adaptive management) the process and understand the role organisations such as WorldFish Center play towards their community. The result shows that MFMR and the people need each other to manage the marine resources. The people are made aware that fisheries management regulation is a supplementary management system to their existing traditional management system, to safe-guard their marine resources. The villagers should not see the fisheries marine regulation as a threat to displace the customary environmental knowledge. While the MFMR respects their customary environmental knowledge and practices, villagers ought to respect the fisheries management regulations too. This was also shared by a resource owner in Liangai:

We need to work together. We (the resource owners) should develop a good working environment with all the resource users in the village plus surrounding village and invite the MFRM to assist us to work hand in hand to manage our resources using the knowledge we had now and the existing fisheries regulation. In that way everyone will benefit. (LMY4)

This study shows that due to lack of funding and fisheries officer, the government depends on the village chiefs, elders and the community to govern and self-regulate their fishing grounds. However, the communities cannot, from their present structure and skills and resources, establish the management needed to mitigate the increasing pressure on their resources by themselves. Therefore, Government-supported, village-based management of marine resources in Solomon Islands is likely to succeed through "supportive management," in which the government fisheries ministry through the different environmental NGOs provides scientific information and advice, while coastal villages assume the bulk of the responsibility for local management.

Bennett et al. (2001 374) conclude that, "It is likely that a close alliance between government and local stakeholders (e.g. co-management) is a pre-requisite for successful conflict management in tropical fisheries." They further state that, "In so far as such an arrangement can strengthen the links between those that use the resource and those that manage or control the resource, co-management of some form may be the best long-term solution to conflict management. Where co-management is able to redistribute power and responsibility in the fishery, potential conflicts related to power relations and allocation of resources might be mitigated" (Bennett *et al.* 2001 374).

Some communities in Solomon Islands have already engaged in resource management while others are teaming up with environmental NGOs and other research institutions (Govan *et al.* 2009). The various organisations team up with the government and empowered the villagers to develop plans and strategies to look after their resources. Many of these organizations and communities are members of SILMMA, potentially an important network to facilitate collaboration amongst local resource management authorities and, to support the government and NGOs to complement customary management regimes. However my study suggested that to date there has been minimal backing and support from the government through MFMR to bridge all the parties in dialogue and collaboration. Ratner *et al.*(2012) in a review of SILMMA suggested that although it has had some triumph in linking fisheries and environment sectors, to date education at the community level has been minimal. Regardless of the attempts by SLIMMA to organise and ensure that community interest is represented in all level of governance, there are still problems with downward accountability that prevented the representation of all members within the set-up in decision-making fora within

the network (Ratner *et al.* 2012). Most rural community groups, have relied entirely on financial, technical and logistical support received via their international or national NGO partners for management activities, and for engagement in the SILMMA network. Therefore community interests may not be adequately represented and the members might not have the assurance to raise their concerns (Ratner *et al.* 2012).

Co-management theory suggests that having a fisheries management strategy developed by the villagers themselves, guarantees it to be effective as they understand the issues and having the desire to protect their resources. If they have other motivations (expecting foreign aid or free goods and services) the project is unlikely to succeed (FAO 2004b). Berkes (2007 15188) also articulated that:

the social systems involved in conservation also are multilevel, with institutions at various levels of organization from local to international. Processes at these levels require different but overlapping sets of concepts and principles, an idea reflected in the commons literature.

Establishing partnerships with resource users in the village is a more rational option than to do nothing. A strong and continuous association with government officials as well as other representatives (e.g., NGOs), supported by improved transport and communication technologies, might thus initially better help those rural communities such as Liangai. It is important to help them find their responsibilities and strengths in terms of community based resource management in the context of a modern Solomon Islands and rebuild community structure, before other socio-political structures may change.

8.6 Population growth and its implications

The exploitation of coastal resources and habitats in the two villages is a partial function of human population size and its level of socio-economic development, a notion shared by Bell *et al.*(2009) and FAO (2002b) in response to reef fishing pressure in the South Pacific. This study argues that land resources are an ultimate alternative to marine resources in the two villages. There is a close bond between land and sea resources in the livelihoods of the people in the rural areas. This means that any changes in either of them can affect the state and the rate of dependence on the other. For example, it is evident in the two case study villages that changes in land availability and pressing land issues such as land shortages to grow commercial agricultural crops such as coconut, cocoa, or

engage in forestry, has caused some villagers to use marine resources to earn income. In addition, the unattractive and unstable agricultural markets have caused more villagers to opt for more attractive marine-based income generating resources such as fish, beche-de-mer, trochus, and shark fin.

Table 22. Trends and challenges with regards to resources and community in the villages

RESOURCES		
Before	Now	Method of collections
The resources are plentiful	The resources are scarce	Interview
Fishers spend less time fishing	Fishers spend more time to catch few fish	Interview
Commercial invertebrate species easy to find	Harder to find now	Interview
Shallow water to catch fish	Deeper waters to catch fish	Interview
Fishers used to fish just nearby reefs outside their village	Fishers paddle further out beyond the reefs to fish	Interview
Easy to catch big fish	Most likely to catch small and undersize	Interview/ Observation
Fisher folks use bow and arrow / spear to fish	Spear gun, gill nets and modern fishing gear	Interview/ Observation
Fisher use outrigger and dugout canoes	Outboard motor engine	Interview/ Observation
Mostly men fishing	Everyone fishing including children and women	Interview/ Observation
COMMUNITY		
Homogenous	Heterogeneous (inter-marriage)	Interview
Respect	Disobedience and ignorance	Interview
Strong traditional; leadership	Weak leadership however Churches have a strong impact on the way people think nowadays	Interview
Easy to organize community activities	Divisions within the villagers (lots of tribes)	Interview

Therefore, it is possible to draw a relationship between the rapidly growing population in the villages and the decreasing abundance of fish and commercial invertebrates (see Table 22). In essence the reef size remains the same but the marine resources are now constantly targeted by a greater number of people than ever before. I was reminded by one of my informants that:

Today, fishing becomes a daily activity in the village. A lot of men, women and children go out fishing in the *sol/wata* (sea) but most of them come back empty handed likewise for others its only one or two fish or trochus. It is now difficult to have a good catch. (TMY9)

Such observations as these expressed by this fisher are not uncommon in both villages as most people I talked to share the same sentiment on decreased catch sizes and quantity with relationship to human population. The effect on marine health of a higher population to reef size ratio can be seen when comparing Liangai with its nearby neighbouring villages, Suantali, Boro and the other small

settlements in the Dovele district. There is an intensive struggle by the fishers to provide everyday protein for their households and earn income as all the reefs along the coasts are shared by the three main villages and their neighbouring communities as far as Iriqila village on the western end of the reef and Karaka village on the eastern end. They also have encountered transboundary effects, crises and issues, which are associated both with poverty to the intensifying fishing effort due to the growing population which placed an increased need for marine products and environment degradation.

Likewise, Toumoa village on the other hand has still been able to maintain for years their *tabu* reef that is spread in front of their village, partly because they don't have overlap of access from neighbouring Samannago village on the western end of Fauro Island and Kariki village on the eastern end on their fishing ground. Compared to Liangai village, they embraced a much larger fishing area of the coastal zone which is predominately accessible only by them. Sometimes, however, they run into intruders from nearby Shortland islands and Bougainville in Papua New Guinea who come in and poach. However, despite this, the people I interviewed and talked to in Toumoa complained that the stocks of their marine resources have depleted dramatically in nearby reefs.

A family of five or more children is not uncommon in both villages with a recurrent explanation that, "the more children you have, the more help you will get in the garden". The notion was true in the past when land was still fertile and sea resources were still plentiful but nowadays, that's not the situation. The reality is almost all the villagers I interviewed are working extra hard to feed their families because it is becoming extremely difficult to support and feed everyone in a household.

The increased intensity of human activities as a result of increasing population have exerted demand for resource use and higher values of coastal land. At the same time, uncontrolled development of coastal areas by families moving into their own areas plus the build-up of unwanted, discharged plastic bags, bottles and direct sewage close to the coast is in conflict with recreational and living-resource uses, including fisheries

The marine environment is affected in unanticipated ways because of human activities. In Liangai and neighbouring Dovele district poorly planned decision making, together with the consequences of high densities of transient and

permanent human populations, as well as industrial-scale logging, have collectively led to greatly increased adverse impacts on natural coastal systems throughout the coastal waters as also noted in Marovo lagoon (Duke *et al.* 2007; Kinch *et al.* 2005).

Another factor influencing the rapidly growing population is that young people are getting married at very early ages; girls sometimes as young as seventeen. The rationale behind these youthful marriages follows two common responses; first the area does not have much to occupy them with, having dropped out from secondary school at early age and being faced with little chance of obtaining wage employment. They therefore view relationships and marriage as the norm. Second, young men and women are given land by their parents when they are married and supporting their own families, thus they marry young as a means of gaining independence and autonomy from their parents.

In terms of food, the depletion of traditional land-based sources of protein such as local free range chicken and pork (for non SDAs) appears to have caused an increased reliance on edible marine resources. Historically, there seemed to be a balanced dependence on the two natural resources for protein but since traditional land-based sources of protein have decreased and cattle and poultry farming is not common, the dependence is skewed towards marine resources.

The overall outcome of the impact of the increasing population in both villages has been declining fish stocks in adjacent nearby reefs close to their villages and unproductive garden areas surrounding the village. For some families in Liangai, this was the defining moment for them to move out of the main village and settle on their own land far away from the main village where the land is more fertile and they have close access to other areas on the end of the fringing reefs. These families felt that an enormous social and economic pressure had been lifted from them because of the competition they experienced in the village with regards to the resources.

8.7 Resources and development

Land and marine resources serve as the two sources of the natural resource-based livelihood strategies the villagers engaged in. The two coastal case study villages rely on both land and inshore coastal resources to sustain their daily subsistence and source of cash income, and much of their traditional uniqueness,

views, and cultural stories are based on components from the land and marine environment.

Land is an extremely important commodity in the daily lives of these two communities and this notion was also similarly shared by other researchers who have seen similar trends in other countries of the South Pacific (see Crocombe 1987; Liew 1986; Maenu'u 1984; Ravuvu 1983). The relationship each family has with their land is like a mother and son or daughter relationship. It is so strong and intact that it is absolutely unbreakable or extremely difficult for land to be taken away from the family because its identity, livelihood and survival depend on it. For example food gardens, the rivers (bathing and drinking), house materials, medicines, cultural heritage sites/shrines, traditional knowledge and social harmony were attached to the land. But, the results of this study show most of the young people nowadays in the two villages, in particular in Liangai, aren't aware of their land recording and they were not fully aware of who are the rightful owners of the land, islands and reefs in their area. To complicate matters I also observed that the young people were sometimes deceived by their elders when discussing land issues in order to gain some advantage. This has caused much conflict and confusion when attempts to manage resources have been made and resulted in family members pointing fingers at each other.

In both the villages, land recording is traced within common ancestry through maternal relations of families and clans groups who are the rightful owners of the land and sea resources. It is through this level of distinctiveness, that primary rights towards land and sea are determined and established through the matrilineal descent (White 2006). White (2006 10) further argued that, "in most cases it is leaders of descent groups who are authorized to speak about land". As the scope of traditional leadership decreases, there is a need to maintain respectable relationships with villagers through effective demonstration of knowledge, presentation of public character and integrity (White 2004). At the village level, recognised tribal leaders, including both men and women, act as representatives of families and kin groups but in most cases today it is the men who supersede the females (Kabutaulaka 2000). "Such leaders are regarded as respected elders and may or may not also be called a "chief"" (White 2004 16).

As in any many rural villages in the Western Province, commercial development (e.g. logging) in any customary land requires the permission from the landowners first. During the initial negotiations with foreign companies, the land owning group

appoints a member to represent them as their 'spokesman'. The person carries a lot of weight on his shoulders because he is trusted to carry all their demands and wishes. As he enters the different stages of consultation and negotiations over these developments, he is required to report back to his tribe to provide updates and progress reports. Most of these negotiations are done in Honiara. But, during the process of feedback, the land owning group will consult the wider community about the development. If there are problems related to the land with other parties in the village they will find appropriate ways to deal and resolve that in the village. In most cases they will be compensated with money. The finance to resolve outstanding issues in the village comes from the logging company as they want to speed up all the processes before they start the operation.

However in most cases, within the village there will be a number of misleading claims made by "other" tribal members often including a few *lariken men* who also establish their claim over the ownership of the land. They contest the ownership and as a result upset the traditional balance of power within the tribe and the village. It may also change the bloodline of subsequent chiefs in these areas by interrupting the hereditary leadership system. According to White (2004 16), "as the scope of authority expands, influence and legitimacy depend upon successful actions and public demonstrations of that knowledge, ability, and character". Despite the fact that the chief may not be able to advocate on behalf of other tribal groups in his village, he still has the right to carry out his roles in resolving conflicts between opposing parties.

There are lots of cases, issues and problems related to logging activities in various parts of Solomon Islands (Kabutaulaka 2000). These problems are not only associated with unsustainable harvesting but also have serious implications that affect the relationships that village members have with each other (Racelis and Aswani 2011). One particular example was in 1990 in one of the provinces of Solomon Islands, Santa Isabel, where initial consultations divided the villages and people because of the disagreements over logging contracts (White 2004). The internal conflicts arising from these impacts are still felt today. This internal conflict in relationship to past logging activities has also been a scar for both Toumoa and Liangai villages. Cases are often brought to court, but only those who have cash or are supported by investors are able to finance their court cases pertaining to land disputes, although they are not necessarily the true land owners. Let me give you an example. Two land owning tribes (let's call them A &

B) both laid claim to a piece of land. One of them got support from a logging company (let's call this group A; not the true landowning tribe) and it got registered without any interference from group B. This has been the case and trend in most islands. Experiences show that rightful landowners were often the victims of land disputes because they are sometimes illiterate and outclassed by their elite counterparts and the *lariken men* in the community. Rather than conducting wider consultations, the *lariken men* in the villages ignore the land owning groups, pursue their own interests and remain ignorant about the desires of other members. In Liangai for example, the community's inability to effectively manage their resources is due to the lack of cooperation and respect villagers have for the leaders, who were predominantly involved in past land disputes and logging. As a result, it is often difficult to compromise when they want to protect a particular reef for *tabu* because of the spill over effects caused by the disputes and claims over the land.

The pooling and redistribution of property, food and nowadays of cash, assists the maintenance of leadership roles in which chiefs or headmen or persons aspiring to increase their socio-political status sponsor feasts or ceremonies involving exchanges of property. The impact of unsustainable harvesting and logging of the land by foreign companies has caused a lot of human, cultural and environmental disruption in itself (Kabutaulaka 2000). Evidence of environmental destruction and internal conflict by tribes and immediate family members may be found in many parts of Solomon Islands when logging has taken place (see for examples Hviding and Baines 1994; Kabutaulaka 2000; Kinch *et al.* 2005). Many rivers have been polluted and coral reefs destroyed (see Thaman 2002).

The effect of the exploitation of the forest and land has seen families and in particular children and mothers who use the affected habitats, suffer the consequences of erosion and sedimentation of rivers. These result in declining quality of soil structure and degraded mangrove and lagoon areas, ecosystems widely valued by Solomon Islanders (Warren-Rhodes *et al.* 2011). In Liangai and surrounding villages in Dovele district, women and children complained about having to walk long distances inland or to paddle for hours to the other side of the village to go and fetch their food from their new gardens. Meanwhile those leaders who prompted the logging activities regret their action as they continue to witness the valuable mangrove ecosystems nearby the village degraded by erosion and sedimentation.

Though reforestation projects were trialled in some of the islands of the Western Province to replace the logs that have been unsustainably harvested, the reality is that it does not compensate for the destruction that has been done. Many of the local leaders I talked to deeply regretted their decision to bring logging into their once pristine rainforest land. Their traditional sources of livelihood are severely disrupted and destroyed forever. Nowadays Lucas Mill²¹ portable sawmills are increasingly gaining popularity and would appear to offer possibilities for environmentally sustainable harvesting of logs with more pronounced positive impacts on local communities but their previous action has done a lot of damage already. Villagers have to walk miles inland to look for good logs to build their houses and outrigger and dug-out canoes.

8.8 Modern and improvised fishing gear and techniques

In the past, the study villages commonly used communal fishing techniques which were tailored to the customary management practices. Traditional fishing gear and techniques limited the number of fishermen who are engaged in fishing. However, in Liangai these days every person can fish anywhere, using the technologies he/she owns and has access to. It is becoming a common activity for everyone. Fishing gear and techniques are no longer as specialised and are readily available in shops. As noted elsewhere in Solomon Islands (Brewer, 2013) this study showed that the situation is being made worse as fish populations decline; stocks collapse and there is increased resource competition, both between fishers and the various scales of fishing in response to a perceived decrease in fish stocks.

Consequently, as the technology employed for subsistence fishing is in transition, small scale fishing methods progressively competing with the advanced sophisticated ones. This has opened the doors to abuse of these resources by individuals with little concern for longer-term sustainability (Townesley 2004). Villagers were seen using prohibited mesh nets sizes (see Figure 22) and selling undersized fish, trochus and beche-de-mer. Even the bans on turtle fishing and

²¹ Lucas Mill machines received an excellent response as a sustainable method for harvesting timber into the future. The sustainable selective harvesting methods that portable sawmills can support ensure that local timber can be used by local people, rather than being removed by large logging companies.

promotion of egg protection are ignored in Toumoa for example. The knowledge about fishing techniques is no longer confidential and the specialised nature and the importance of past fishing techniques have diminished.



Figure 22. Prohibited mesh nets sizes

(Photos taken by the author)

The degradation of these habitats impacted the livelihoods of each and every villager I've interviewed because they directly depend on them and, potentially, on a far wider range of coastal and marine resource users, who exploit species that depend on these habitats for part of their life-cycle. The traditional diets of the villagers have also changed significantly. I was informed that for the older generations root crops were the main traditional staples in the village but now these are being replaced by rice. In the past the diet was more traditional but now they desire store bought food (processed products) and more marine food such as fish, seaweed and shells, particularly in Toumoa as they are able to sell these in Bougainville. The increasing intake of store food means that they have to acquire money to purchase it. Fishing is one of the main sources of income that most villagers resort to.

Although much of the community is in great need of cash sources, a sound or well established market for excess fish and other cash crops still does not exist in these two villages. Despite this, the villagers continue to harvest and exploit the inshore commercial invertebrates (regardless of size) in order to support them to pay for their children's education, medical treatment, transport and general items. Because of the decline of copra market and the loss of economic opportunities

(Central Bank of Solomon Islands 2006) the village people still struggle to make ends meet (see Figure 23). Consequently the conceptualisation of marine resources as a free supply as opposed to the other costly alternatives of land based protein sources that must be purchased from a small number of farmers, contributes to greater stress being placed on the local marine environment.



Figure 23. Copra is one of the other sources of income, apart from selling commercial marine invertebrates

(All photos taken by the author)

Results have shown that introduced fishing and improvised technology have impinged seriously upon the effectiveness of traditional reef management in Liangai. Many others who depend directly upon fishing are likely to be affected should there be a need to reduce fishing pressure to a sustainable level. Therefore management measures must thoroughly be considered before enforcing any regulations (Béné *et al.* 2010). A communal sense of ethical accountability to conserve the marine environment is the only possible offset for this hunger.

Often those with little experience in fishing would find it simpler to use detrimental fishing methods and practices than techniques that would require appropriate training and skill. While some may not care, for some it may be that they may not realize the long term impact of their activities until the damage is done. Fisheries officers should work closely using participatory practices with the villagers in order to increase their understanding of the motives, for having fisheries regulations against destructive fishing practices.

On the other hand, there are some villagers who are very vocal and did express their feelings on their marine resources as 'God given property'. Consequently

they believe they should be free to do use whatever they like and whatever fishing method they want and believed the abundance of the fish to be ultimately controlled by God (see also Foale *et al.* 2011; Foale 2005). They trust that the resources will be replenished as stated in the Bible (see Genesis 9:7).

8.9 Community cohesion - social and environmental surroundings

One of the many challenges to successful marine resources management in the two communities is to find ways to integrate the different dimensions of sustainable environmental management; the social, cultural, biological, physical (terrestrial and marine) and economic dimensions of the way they understand their environment. Nevertheless, the people of the two villages still retained a strong spirit of community-mindedness and for many the principle of sharing and lending a hand to their neighbours' remains. For the older people in particular this is ingrained into their culture. On a day to day basis fish and garden produce are still extensively exchanged on a non-monetary basis which serves to highlight aspect of social resilience and connectivity among the rural people. It shows the high degree of traditionalism in the persistence and preservation of cultural values and social obligations (Sillitoe 1998). For most people in the village this is the form of life that keeps them intact and assisting each other despite the transition to individualism existing in Liangai. Sillitoe (1998) explained that Melanesian culture is a community culture, quite opposite to individualistic cultures of the west. Thus, social and community activities have a central place in the lives of many rural Solomon Islanders. According to Clements and Foley (2008 9), "this notion embodies traditional norms of reciprocity and forms the basis for what social welfare exists in the Solomons – welfare provided mostly by kin".

I would like to share an event which I witnessed in Toumoa that demonstrated the power of ownership by an ordinary villager toward their *tabu* reef:

One night while I was in Toumoa in late December 2009, I was chatting with a group of elderly people on the beach front. It was a very dark night but calm and peaceful with stars shining above. We were informally talking and sharing stories about different issues affecting the village for more than an hour when one of the men in his late fifties, noticed something out in the reef. He alerted the group and walked straight towards the shoreline and aggressively picked up an outrigger canoe that was sitting in the beach front, got on and start paddling towards the

tabu reef. I was really inquisitive but at the same time also confused so I went over and asked one of the men that we were together with, “what was going on with the old man”? They all pointed out towards the reef and told me that a torch light was blinking on and off on the reef crest. I was prompted that there could be someone diving or fishing on the *tabu* reef. I stood there impatiently and curiously waiting to see what would happen.

Half an hour later the old man returned, together with a young lad and his canoe that was half filled with fish and some trochus. He escorted the poacher to the residence of the chief and by then the news had spread around the village that someone was caught fishing inside the *tabu* area. The chief fined him accordingly and sold all the trochus to the local buyer and the money was kept for community activities. A day later I caught up with the old man because of my curiosity; I asked him personally over a cup of tea why he took off so suddenly and paddled up to catch the poacher. He took his time but replied confidently and said:

It is not ok for someone to fish at night in our *tabu* reef unless our chief informs us in our village meeting. It is our village responsibility to care for the community reef. I did that because I have respect for my people and our reigning chief. This is our reef, this is for our community and it belongs to each and every community member. This is our future. It is our bank. It is our saving. This is my life and its part and parcel of my family and their future generation to look after it properly. I will do whatever possible I can to stop and educate people who intrude our *tabu* reef. (TMO2)

The old man and few other reef users in Toumoa told me that poaching has taken place quite a few times but with the quick action from the villagers, the poachers were apprehended and fined by the chief. They observed that there were a few “lazy” people in the place who like to take things into their own hands but in most cases when they were caught they brought shame to themselves and to their families.

Most of the villagers in Toumoa I talked to share a great sense of responsibility to respect and observe their *tabu* reef. They felt it is their responsibility to care for it. They reminded me that the need to increase our understanding of how we interact with our sea environments is a fundamental learning step towards more sustainable marine resource management. The reef may be a particular ecosystem but it also a place of significance, a source of livelihood and also inspiration.

The essence of this notion is that locations and contexts carry with them a range of different meanings, which vary between individuals and between cultures (see also De Blij and Muller 1986; Veitayaki 1997). The idea of place is concerned with the significance of different locations to different people; hence no single way of understanding place is universally valid. Implicit to the concept is the notion that identities of places change over time- they evolve or adapt or are re-created (Agrawal and Gibson 2001).



Figure 24. Villagers collect trochus from *tabu* reef specifically for targeted community celebrations or fundraising.

(Photos taken by the author)

Furthermore, the traditional *tabu* reef in Toumoa has served its purpose over many years and it has helped and benefited the community and some individual family members who were desperate for immediate cash for genuine reasons. Generally, with the consent from the chief, villagers are allowed to collect trochus specifically for targeted community celebrations or fundraising. In December 2009 during my first research visit to the village, the chief opened the *tabu* reef for two hours to fundraise for money to buy a pig for the closing of their Christmas and New Year's celebration and as a result they collected a total of 142 trochus which had a value equivalent to \$SBD 2000 (see Figure 24). The money raised was for the feasting. An elderly man expressed his gratitude by saying:

We were blessed to have this traditional initiative because without this reef we will unable to buy the pig for our community party. This is how it helped us and therefore that is why we respect it so much. (TMO7)

In Liangai, on the other hand, there were few reefs that have been declared *tabu* by those who have claimed them and where the village chief has alerted the neighbouring communities of their intentions but poaching is still carried out by the youths from the village and elsewhere. Part of the problem is that there were still heated discussions over those reefs and also there were overlapping claims from the different tribes in the village. Most of the leaders like to see benefits going through only to their own tribes.

Moreover, there were some family members in the village that still have resentment against their own leaders for being disloyal to them during past logging transactions that had previously taken place on their land. They were not given any share of the royalties from the logging. These had made their children (who poached in the reefs) ignore their leaders for being disrespectful to their immediate family.

Lastly but not the least there were also “others” who do not agree to see those reefs declared *tabu* because they are in a popular fishing area. They rather want to see other unproductive reefs closed instead. They told me that they will keep poaching on the proposed *tabu* reefs.

Like other rural communities in Western Province (Western Province Health Division 2009), both Liangai and Toumoa encountered a number of social problems but they are not as prevalent as in the urban areas in Gizo, Noro and Munda (Rural Development Division 2001). Noticeable incidents reported to me by the respondents were burglary, theft, break-ins, and general social discord among neighbours. Though they felt it was peaceful compared to the urban centres, occasional land disputes and other related problems such as community arguments emerged among villagers. What was evident was during these sorts of arguments was that villagers tended to team up with their close alliances and in most cases their immediate *wantoks*. *Wantokism* is a collective philosophy that brings together, in common cause members within the same tribe and blood ties who will emerge together to support each other in the village. This social malleability means that regardless of right or wrong the youths will be vocal and stand up for their elders. This can apply in more than one situation especially when one is new to a place, unfamiliar to a group or generally in need. It is a concept in which mutual hospitality is shared among and between different individuals and groups.

8.10 Summary

This discussion chapter has focused the findings which are relevant to the research questions that have guided this study. Moreover, the discussion highlighted case studies of two different villages on two different islands but in one province in Solomon Islands, based on data from the individual and group interviews, additional informal storytelling and participant and non-participant observation.

If management means regulating who may fish, when and where they may fish, what methods they may use, and/or what they may catch, then my findings suggest that marine resource management has been practised and widespread for years in these two villages. However, in today's world both villages are facing step challenges in trying to look after their depleting resources.

Overall the findings have reaffirmed perceptions that the traditional system and authority is becoming eroded. For CBRM the question remains have these villagers moved too far from their traditional lifestyles to be able to 'turn back' or to adapt these lifestyles to the changing circumstances of life in Solomon Islands?

The reality of being trapped between past and future without a clear direction for the present may be reduced by enforcement of traditional the leadership and authority. For CBRM, collaboration between the villagers and outside assistance either through Government or other agents who are willing to assist may be required. In the villages, management processes will need appropriate and continuous leadership, useful for all the aspects of community reality and social cohesion.

Despite the fact that the coastal waters around Liangai village in Dovele district and Toumoa village in the Western Province are among some of the most productive and biologically diverse in the whole Western Province, the findings reaffirmed that fishing in the present-day context exploits a wide range of marine resources for consumption and commercial purposes in these two areas and so that situation may not remain for much longer.

The discussion also substantiates the findings that the high rates of population growth, changes of attitudes, rapidly increasing food needs, as well as differing and uneven levels of economic development, resource use, and technological

change, are putting enormous pressures on the two village's coastal resources. These waters are now experiencing increased levels of conflict and social turmoil, affecting both security and environmental sustainability.

Furthermore, both national and provincial fisheries staff find it difficult to enforce fisheries regulations effectively because of customary ownership systems, lack of enforcement officers, limited operational funds and distances between these islands.

The aspects revealed in this chapter cannot be considered independently; as they form a complex network of information, despite the fact that generalisations are wanted and needed, for examples in co-management and collaboration with Government or NGO's. The changes in the villages' everyday lives influencing management regimes are not the same in all villages, and one cannot generalize community concerns because the actions depend highly on the individuals involved. Although traditional respect and social ties are loosening, they do so with varying speed and manner. Apart from reinforcement of the leadership system, the chapter suggests long-term research and assistance based in and wanted by the communities themselves is needed, in order to detect the specific community concerns and integrate them in the management planning process. If respect, social capital and collective action could be rebuilt, this is likely to reap benefits all aspects of future community existence as well as the environment.

In the following final chapter, I recap the key findings of the research, followed by making recommendations for further action and finally present the suggestions for future research to address the issues which have emerged as a result of the findings.

CHAPTER 9: CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS

9.1 *Introduction*

The main purpose of this study was to explore influencing factors from both within and outside the village environments that support or challenge the stakeholders' attempts toward attaining the goal of sustainably managed coastal marine resources. This study used a constructivist interpretive paradigm to investigate case studies that focused at community level through two villages with contrasting degrees of customary marine tenure based on traditional ecological knowledge in the rural Solomon Islands village setting. These two rural Solomon Islands communities have a long history in customary marine tenure; one with a strong chiefly system and the other one with a weaker chiefly system. Their accounts, views, aspirations, opportunities and capabilities aided me to understand their involvement in their day to day activities in the near-shore reef system.

The findings of the thesis generally support the conclusions of previous researchers with regards to concepts of community based resource management (Alcala 1998; Armitage *et al.* 2007; Berkes 2009; Hviding and Baines 1994; Ruddle 1998a; Veitayaki 1998). However, the study has also reached new conclusions on the topic with specific regards to communities that are lacking in strong histories of marine resource management relationships.

Based on the research findings and the successive discussions in previous chapters, a summary of conclusions from the research findings is contained in the first section of this chapter. The chapter also provides recommendations from the study and suggestions for further research.

9.2 *Overview of the study*

As stated in chapter one of this thesis, the following research questions guided this study:

1. What are the values and attitudes of rural Solomon Islands in managing their marine resource?
2. What are the constraints rural Solomon Islands communities face in establishing sustainable marine resource management?

3. What are the trends and challenges the communities in Solomon Islands are facing in managing their marine resources?
4. What are the social and environmental conditions that will facilitate effective sustainable marine resource management in rural Solomon Island communities?

The study sought to gain insight into, and an understanding of, the experiences and lives of the villagers who owned the reefs in the rural villages in a Solomon Islands, Melanesian context. This is important given current debate on the need to address and move forward with the concept of CBRM with regards to the sustainability issues that they are currently fronting.

The study has generated and provided information on the social, cultural and environmental conditions through the learning experiences of the villagers in a rural setting where traditional management systems are still being acknowledged as an important tool but are not being implemented sufficiently well (in the case of Liangai) to meet the needs of the people today. Customary marine tenure is still widely held and all reefs are “owned” by particular groups and tribes who have associated fishing rights; however ‘ownership’ is not always well understood by all. In Solomon Islands, policy-makers often base policy decisions on very little, or no research evidence. The findings of this study have provided empirical evidence that the social and environmental circumstances involved in CBRM are very complex, with strings attached to various levels of organisation inside the villages. Different but with demanding sets of notions and values were required at these levels, an idea being shared in some common writings (Agrawal and Gibson 2001; Berkes 2007; Dietz *et al.* 2003; Kideghesho *et al.* 2007).

Such evidence should be used to inform and improve future policy decisions on the development of CBRM in Solomon Islands. This is in order to identify and assist with the social and environmental characteristics of any rural Solomon Islands coastal communities that express a desire to implement CBRM in the future. The livelihood options for most rural Solomon Islanders depend exclusively on the long-term sustainability of their natural resources.

9.3 A summary of key findings

The findings of this study focused on the perceptions of the two village communities of their willingness to participate in conservation and their ability to engage in marine resource management. The findings are based on recurring

themes that emerged from the questionnaires, focus group discussions, observations and informal narrative interactive storytelling data.

9.3.1 Values and attitudes of villagers in their resources

The findings of the study show the villagers in the two communities were well aware of the depletion of reef resources and saw the need to sustain them. They want to see some means of stringent codes of practice such as establishing more reefs as marine reserves, for the purpose of regeneration of these renewable resources and periodic bans over-exploited species such as grouper, trochus, giant clams and sea-cucumber for their revival.

This study has revealed the importance of coastal and marine areas to the rural villagers' cultures and economies. Land and sea resources were not only a source of food, but also a source of cash income and wealth. Land is a sense of belonging, security and identity. Social relationships, identities, and land are things that matter a lot in villages and are viewed as land, sea and people being traditionally connected as a system. Land is central to culture, identity and survival and as such is highly valued in the village and integrally related to all aspects of daily life. The study shows that a person's affiliation to a tribe is very important because that can link him or her to their land, culture and social grouping. The relationship also associated them to have respect and trust towards each other. Therefore, they are all answerable to look after their area and ensure that they benefit from their natural resources.

This study highlights that the changes in the villagers' livelihoods options have some repercussions in their competence to maintain marine resource management in the village, in particular with respect to the demand for cash, loss of land based resources and population increases. Not only has population pressure increased fisheries exploitation directly, but changes in the land resources available to the villages through previous logging activities has triggered villagers to take advantage in exploiting their nearby inshore resources more heavily than before, as they search for alternative cash incomes and food to feed their families.

The findings showed that in the villages, the older villagers have a higher level of awareness of the marine environment and possess more valuable traditional knowledge concerning fish stocks than their younger counterparts. Similar results

have been observed in other parts of the Solomon Islands and in the Pacific (see Aswani and Hamilton 2004; Hamilton 2003; Jokiel *et al.* 2011). This study draws attention to the fact that these two villages have an enormous dependency on their marine environments and resources. In the current circumstances they are virtually the only commercial resources which can be exploited and developed for the benefit of their community. Managing the pressures from these resources is challenging for the villages and it is vital for the national government and other environmental NGOs to assist and empower the villagers to look after their marine resources properly.

This study displayed that even though these two villages are located in the same Province of Solomon Islands, the relationship between their livelihoods options and customary marine tenure differs. The livelihoods of the villagers have also changed dramatically too. This exemplifies the dynamic condition of the link between the other mechanisms of the livelihoods system with natural resource management under the customary marine tenure system.

9.3.2 Constraints on management decisions and responsibilities: village level

The study showed that though the villagers are keen to manage and conserve their resources, within their villages, there were lots of disputes and glitches that affected their intentions to move ahead with this notion, in particular in Liangai village as stated in chapters Seven and Eight. There seems to be a large number of incompatible dynamics including disputes, disagreements and resource conflicts. They are typically underpinned by strong elements of internal community disagreements, often driven by distribution issues within the community (see Table 23). They are not those simple encounters between villagers, families, tribes and the larger community. They are always embedded strongly within everyday community politics and the history of the villages.

The study also indicated that due to development pressures, the management of natural resources is undergoing swift changes. The pressures are exerted on the people and their tribes in a number of ways, including the introduction of modern gear and technologies, commercialisation of communal natural resources, natural disasters, involvement in conservation and privatisation of rural services. In the village, *kastom*, land and marine tenure are central to these conflicts (see the summary on Table 23). Clashes and disagreements that stem from these

elements are not something that can be avoided or ignored. The resource conflicts are not simple matters, they are not just about greed or simply about externally generated grievances, but much more about balance, trade-off and social relationships (see also Berkes 2004; Dietz *et al.* 2003; Jentoft 2005). They are about relationships with/between people, place and land and cannot be solved by science or an independent, disinterested party.

Table 23. Internal community disagreements, disputes and conflicts

Disagreements over land and reef resource ownership, e.g. between family, tribes and communal land owners;
Disputes over land boundaries between individuals, family members and tribes;
Hidden family and relationship disputes;
Disputes due to natural resource projects being captured by élites and/or those who happen to own resources of a higher quality (logging, trochus) ;
Break down of traditional or community operational rules, fish net sizes, forests, or misappropriation of funds, etc.;
Disputes and conflicts caused by political influence (national, provincial or local);
Conflict between land-owners and resource users;
Conflict between indigenous landowners, and more recent settlers;
Disputes generated by jealousy related to growing wealth disparities;
Lack of co-operation between different community groups;
Internal land ownership disputes ignited by the logging activities;
The introduction of productivity enhancing technologies (e.g. gill net, outboard motor engine)
Contradictory natural resource needs and values, e.g. between marine <i>tabu</i> area and local livelihood security;
Cultural conflicts between community groups and outsiders (resulted from intermarriage);
Disputes over project management between community groups and outside project-sponsors (NGO);
Disputes and disagreement over the unfair distribution of work and profits.
Disputes arising from differences between the aspirations of community groups and expectations of Church or institutions

The relationship associated with the growing population and the high demand for harvesting resources (both territorial and marine) were cited as the main cause of conflicts over natural resources, both amongst village members, and between village groups and tribes. The study revealed that external influences are part of the drawback; increased contest and tussle over land and sea resources is occasionally supported by profound organisational causes within the community.

These include, for example, the disparities characteristic in reef and land tenure, village politics and sociocultural changes.

Lam (1998 100), examines the intrinsic 'flexibility' of traditional management in adapting to changing social, economic, political and ecological circumstance and concludes that "far from being overwhelmed by commercialisation and resource scarcity, many CMT systems in the South Pacific, particularly in the Melanesian countries, appear to have considerable capacity for handling and adapting to new circumstance" (see also Ruddle 1996b; 1998b; Veitayaki 1997). Such a capacity to deal with new circumstances cannot be witnessed in the Liangai village and also generally in Dovele district, and, as previously discussed, the communities' implementation of traditional *tabu* reef are becoming increasingly ineffective in the face of growing populations, gear improvements, and the breakdown of traditional authority. Further proof of the inability of the communities to respond to the new circumstances, and appropriately alter current management practises, can be seen in the imprudent proposal to place a *tabu* at one of their productive reefs, this being the villagers only perceived recourse to increase sustainability. This suggests that not all traditional management systems demonstrate the inherent flexibility that allows them to be more adaptable and resilient to changing circumstance, and the villagers in Liangai, while recognising the need for alterations to their current management regimes, lack the information required to implement such changes.

There are no set rules to govern the resources in Liangai. This study, however, revealed that CBRM in the two villages is inseparable from these principle elements; customary marine tenure which covers and protect their reef boundaries, rights and traditional governance (management), marine resource management practices (traditional knowledge, beliefs, *tabus*, seasonal closures, gender involvement in fishing) and traditional fishing (techniques and gear).

9.3.3 Current trends and challenges in community based management

Land and marine resources are the two main natural resources in the two case study villages. The distribution of land and marine resources in the two villages have changed and their abundance has decreased significantly. The study has indicated that there has been a shift to an increased dependence on marine resources.

There is considerable evidence in this research that human activities intensively impacted the reef resources of the villages. Rapid population growth and its effect on the environment is causing considerable competition for food security among the villagers. Population does have a significant impact on the resources (both marine and territorial), and that is one thing the rural people cannot avoid and need to try and find ways to address. In the light of this challenge it is worth noting that consistent with national initiatives at the rural level (Western Province Health Division 2009) in both villages there were some initiatives underway, such as birth control, to curb population growth.

Though the two communities were endowed with more or less the same varieties of marine reef species in the past, in the present situation the types of reef resources they own and have access to have changed a lot. Various factors have contributed to the decrease in marine resources in the two villages and they have also affected the traditional management systems in the village through rising populations, new equipment and technologies, modern cash economies, political and demographic circumstances, religion and western education and the breakdown of *kastom*.

The introduction of modern fast out motor board canoes together with commercial fishing has put a lot of pressure on the traditional method of management as it was not designed to deal with. It increased the fishing pressure for important commercial resources such as trochus, giant clam shell, beche-de-mer, shark fins and other marine resources in the nearby reefs. The increasing socio-economic activities on the reef, has put an enormous pressure on the communities who have only few options and traditions to resolve the increasing demand on them to manage their resources.

The findings also indicated that women were underrepresented in the villages and were excluded from their rights as a group of people to help contribute to make decisions in the villages as determined by their affiliation through matrilineal descent. There has been little demonstration of social justice evident in the treatment of women, as they are always overridden by socio-cultural factors, such as sex role stereotyping in shaping women's aspirations, to be seen as only responsible for child bearing and house chore activities. Though women are traditionally equipped with traditional knowledge and skills to enable them to have a part in decision making, there is still an imbalance of equal gender representative in leadership roles and women do not have the opportunity to

develop assertive attitudes towards sustainable marine management practices. Bennett *et.al* (2004) acknowledged that women barely have access to the process of management even though they have the capability to make a difference in their communities.

This has resulted from the male dominated hierarchical structure that is practiced in the villages which undermines and suppresses the power of matrilineal rights. Individually and collectively men's attitudes about women's roles could be powerful constrains on women's advancement into positions of authority and leadership. In today's societies men tend to devalue and exploit women's work and contributions for their own benefit.

The study also illustrated that the introduction and expansion of commercial marine product markets and the introduction of new ones have caused more harvesting to take place because there is now a pressing need for cash within the increasingly monetised village economies. In addition, the monetary rewards for the commercial marine species are increasingly attracting more villagers into fishing.

Modern education and Christianity are factors that have also contributed to the fall of the traditional ecological knowledge that has been the focus for customary marine resource management in the two villages. Christianity has influenced many of the traditional beliefs that partly form the basis of customary marine resource management in the villages.

9.3.4 Social and environmental circumstances

The study identified that in the village settings the things that matter most are *lotu* (worship of God), social (kinship), physical (land) and cultural–values and beliefs. In addition, the realisation of an optimistic outcome with relationship to the social, cultural and environmental elements in the villages rests upon good governance through responsible and respectable leadership in the villages. It requires the attention of all men and women to be actively involved, participating and respecting each other's roles in the village that extend to the management of land and sea resources.

Given the two villages political setting in terms of the traditional chiefly system, it was evident from the findings that the type of leadership style approached in Liangai was more orientated towards an autocratic whereby the leadership

discourse tended to dominate most decision making and suppressed any opinions or suggestions from the majority stakeholders of the village. Consequently, the village continued to suffer from re-occurring conflicts and frequent disagreement amongst individuals, groups and tribes who continue to have disagreements on decisions made about their natural resources, particularly the reef and the land. On most occasions community decisions never reached a consensus stage.

In Liangai village, the influence of authority is more focused on certain individuals and their families rather than engaging the entire village (resource owners and users) to participate in decision-making that will help and contribute to the management of their marine resources and maintain good practices in their village. The decisions made were often favorable to their own groupings which disrupt past productive practices of looking after their reefs and marine resources. Self-centered elders and a few *lariken men* suppressed local knowledge based on oral history in the village; as a result the traditional knowledge was destroyed and undermined which later leads to the fragmentation of the local traditional system. The local traditional system has been replaced by a more open system that is infiltrated by new ideas and opinions which can either lead to creation of new knowledge on the explicit management of marine and land resources or ideas and opinions that continue to clash with existing traditional management practices.

There is an explicit relationship among the *lariken men* in Liangai and how they represent knowledge in a way that is in their best interest. For these individuals, having attained knowledge and being educated helped to link them to certain power structures that determined what is to be known and what is worthwhile knowing. In this sense the transmission of knowledge is controlled and the only access is by those village people who are in favor of the dominant leadership group. Changes of attitudes towards sustainable practices for marine resources management will very much depend on how these individuals in certain tribes in the village perceive the type and level of challenge to their values and power base. For example, they would not want to adopt sustainable practices if their actions would make them lose their claimed position as leaders and weakened their identity.

In Toumoa on the other hand, the model of leadership is more “home-grown”, dynamic and community orientated. In the village *Lala’aha tegesena* continued to

play an important role in maintaining peace and harmony in his community. The traditional power structure in the village shared less influence from outside forces but evolved along the Christian church doctrine to love, respect and live happily with each other. The church and the current chiefly system were the major foci of community organisation and provided much of the rhythm of village existence.

The leadership style is centered on listening and involving all members of the village to participate in community meetings and activities. Village meetings are normally held every Sunday afternoon and this encourages dialogue and open communication on issues affecting the village. The meetings were chaired by the chief where he generally made announcements, discussed community issues and activities and generally there was an information sharing opportunity for the entire community. In most occasions, the village meetings and discussions reached consensus outputs rather than being disputed. The final decisions deliberated by the chief often enabled the villagers to see the good aspects of what is proposed for their community, and this is always apt for their local context.

The study identified that the *Lala'aha tegesena's* leadership style is grounded on the basis of listening, attending and providing moral support to the villagers regardless of their gender and status. In other words, in the village, he often tried to ensure that both men and women have an equal empowerment in the acquisition of the social, cultural and economic knowledge to collectively and collaboratively decide on how their natural resources is going to be sustainably utilised and managed.

Resource management is grounded on traditional knowledge as elders kept reminding their children about the prominence of respecting traditional practice as witnessed on their *tabu* reef, Rosae. The study revealed that the village dwellers are willing to take up responsibility to look after their *tabu* reef, and take action against whoever is illegally exploiting the reef, even at night time. Overall, the villagers' visions and options are directed towards seeing how best they can utilise some of their already over-exploited reef and explore other ways of extracting renewable marine resources to seek alternative livelihoods. Apart from temporarily closing other reefs for protection, they have ventured into growing seaweed (*Eucheuma Cottonii*) for export as an alternative livelihood option with help from the Ministry of Fisheries and Marine Resources. This option has been a success because it has enabled everyone (men, women and children) to

participate either individually or collectively to set up their seaweed farm and the *Lala'aha tegesena* and his elders have been supportive since it started in September 2011. Everyone in the village was happy about the new initiatives.

The study showed that good governance with increasing relevance is best when design and implementation of 'smart' community development projects is favorable to everyone, particularly in the area of renewable resource management. The success of this type of traditional leadership is based on values being brought forward from traditional and on-going experiences and equally involving and consolidation all parties in the village as a strategy to minimise disagreements and conflicts in the village.

This example is boosted by the villager's shared norms with the existing institutional arrangements, which is considered as a dominant aspect in their day to day activities that has influence the respect villagers have for each other. These attributes shape a significant part of the villager's collective resources, which has added to upholding the communal structure in the community as well as to the success of their local establishment. The common interest of the community is often upheld through inclusive involvement in village meetings and community activities such as feasting, gardening, church and social activities. Although they've encountered some downfall issues with regards to high school dropouts, unemployment and unnecessary behaviors created by frustrated youths, the community with their *Lala'aha tegesena* still uphold peace and harmony in their village. Pomeroy and Rivera-Guieb (2006) explained that increased dialogue and understanding among all concerned parties can minimise social conflict and maintain or improve social cohesion in the community.

9.4 Recommendations

Based on the findings of this research, I have put forward some recommendations. They are as follows:

- **Projects need to be based on village demand.** The key to a successful village CBRM plan is having the villagers develop it because they understand the issues and wish to protect their own resources. Often, projects are not well taken if the drive does not come from them. Projects initiated by the villages tend to be more successful than those imposed by any external organization (see FAO 1993; Hagmann *et al.* 2002; Wheeler and Domingo 1997). Most villagers are keen to participate and gain knowledge from

projects brought in by outside organisation, however, often, villagers' interests do not last long as compared to the projects that they initiated themselves. Conversely, projects related to resource management are often discussed in depth by the villagers prior to looking for assistance from government agency and local NGOs.

- **CBRM in Solomon Islands is most likely to be successful if it's based on partnership management.** The government (both provincial and national) together with NGOs, and rural villagers need to work together but let villagers take the lead in organising themselves to manage their resources. Almost all traditional village based marine resource management projects are no longer effective and the present government is also faced with many institutional issues. Therefore the direction should then be towards collaboration as a way forward to assist each other one way or another. This should build on what the people have and know about the marine resource management based on their experiences and knowledge.
- **Turn 'conflict' into positive connotations.** The conflicts and disputes that arise in the extraction of natural resources are often stem from disagreements and misunderstanding that occur between, family, tribes and outsiders. In most cases it can be avoided or suppressed should there be a discourse at the initial stages of extraction of natural resources (Warner 2000). In a passive setting it can be viewed as a positive change that exhibits the village is adjusting to a new socio-cultural and advancing society. However, according to Warner (2000) in development models, conflicts are viewed as hindrances to sustainable development but in a given village setting if the undesirable extremes are managed, it can be used as an affirmative driving force to a successful community based project because one way or another they are all wantoks or related.
- **More rational facts are needed behind some fisheries regulations to enable villagers to be more conscious about their actions toward their resources and the ecosystem.** For instance in Toumoa, turtle meat is a traditional food and turtles frequently come ashore on the nearby islands to lay their eggs on the beach. There is a common misconception about the rules and regulations regarding the taking of turtles for consumption, with many villagers believing it is illegal to take any turtle meat and that if caught in such an act the fines are exorbitant. The reality of the situation is that the

Ministry of Fisheries and Marine Resources recognises the right of the people of Solomon Islands to continue consumption of this traditional food source and they place restrictions only on the interference of breeding females and the taking of eggs. But because the people of Toumoa are not properly informed of the regulations regarding this species they resent the perceived curbing of their right to consume turtle meat and since there are no local agencies of enforcement they continue to take not only the turtle meat but also turtle eggs.

- **Knowledge of local dynamics is essential to initiate participation.** The CBRM literature highlighted that it is crucial to understand and recognise the made up of a community, particularly the roles perform by leaders on how they manage the welfare of their community before any work can begin. During the initial scoping process, it is essential to classify the potential sources of conflicts and detect if the social structure is vibrant enough to hold it together. More importantly, as collaborators try and understand the current resource governance setup in order to reduce any misunderstanding that may arise with the locals. Talking to people, who have had worked, lived and done business in the community is another vital method to gather the external viewpoints of the community.
- **One of the significant dissimilarities in the Melanesian countries context to other South Pacific nations is the many different sub-cultures that are represented by different language groups.** In Solomon Islands there are roughly about 87 different languages. Therefore, the argument that context (history, politics, and culture) is important in understanding in these particular cases because of the language barrier and the sub-cultures is very pertinent. In addition, it is important to acknowledge that changes do happen through the process of fine-tuning but often involve costs. As such, each case has its own settings therefore rules and practices from one case may not work for the other but more notably to learn from each other's diverse experiences.

9.5 *Suggestions for future research*

Future study to gain a better understanding of the development of resource management and other rural institutions, and the ways in which policy can affect outcomes in CBRM is important. This study not only achieved its objectives but also identified potential areas for future investigation;

- There is a need for research to focus on core individuals (including women and church leaders), their respective influence, knowledge and character to increase effectiveness of management responsibility delegation.
- There is a need for conflict management research to investigate the influence of claims and rights put forward by different individuals and tribes towards lands and reefs assigned for development or management purposes. The research revealed that disagreements and differences occurred when potential reefs or land are identified for management/development purposes. A lot of people and their tribes tend to place their competing claims and so these differences hinder advancement. How best can conflicts be managed and utilised in the view of the different tribes and institutions in the villages? This has important implications for the success of future development strategies for CBRM.
- Future qualitative study is needed to investigate the socio-cultural impacts of intermarriage on decisions on marine resource governance. The study should help determine conditions on which to accept or ignore influences that will affect the management responsibility and governance in the villages.
- Finally, Community based management systems (traditional) have some setbacks that may prevent any national policies to be executed in areas that are traditionally owned and managed by the villagers. If a conservation project is viewed by the government as a priority in a given customary reef, villagers might not view these measures as precedence, instead they might view the marine resources as traditionally based. There is high probability of conflicts in boundary territories, with the consistent influx of outside payments by the government for resource utilisation. This necessarily means that traditional ownership or rights must be prioritised and integrated into any national government policies. Establishing such a policy is one thing; enforcing it is something else. There is a need for a comparative study to find ways to sustainably improve the connections between marine customary tenure and national fisheries management plans.

9.6 Summary

While this research may true for much of Solomon Islands, the case studies have revealed that external influences from the modern world have had considerable impacts on the traditions and power hierarches of the two case study villages,

and thus, hinder their attempts to manage and look after their marine environment properly. Communal work in the villages and active resource management practices are no longer effective. Attitudes of individuals have changed a lot in the villages as most things nowadays have money value attached to them. Even though the notions of subsistence economies still exist in the villages the trend today is towards nothing is free, and thus people go to the extreme of reaping anything that they came across just to put clothes on their family and food on the table.

Overall, it is evident that in Toumoa village, the *Lala'aha* still continues to play an important role in maintaining peace and harmony in the village. Most of the villages have a lot of respect for him because he showed positive character in his leadership roles. He always involved himself and engaged in the community activities. His people have witnessed the smooth running of their village and benefitted from their traditional *tabu* reef, Rosae.

In Liangai village on the other hand, the influence of authority is more focused on several individuals and their families rather than including all villagers (resource owners and users) to participate in decision-making that will help and contribute to the management of their marine resources and maintain good and moral practices in their village. People appreciated their church leaders more than their village leaders and elders.

In conclusion, this thesis suggests that community involvement in marine resource management is extremely complex, dealing with numerous inter-linkages of social, environmental and economic factors, in a setting that has gradually been made more difficult through modernity. Community-based resource management is grounded on the idea of taking ownership of ones resources and empowering communities to care for their own environment. However, the CBRM approach acknowledges that local communities must be the prime instigators of changes of attitudes to managing and owning the fish and shellfish of the reefs and lagoons adjacent to community settlements. Communities need to understand that they must take responsibility for looking after marine resources and the marine environment. It is evident that the struggles and clashes that happen in the rural villages nowadays are part and parcel of the survival of the fittest; as they come to terms with the rapid vicissitudes occurring in this twenty-first century era. This study provides a

strong, qualitative validation of this assumption as applied within a coastal marine resource management context in these two case studies villages.

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APPENDICES

Appendix A – Ethics Approval

FASS HUMAN RESEARCH
ETHICS COMMITTEE
The University of Waikato
Private Bag 3105
Hamilton, New Zealand

Phone +64 7 856 2889
www.waikato.ac.nz



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Gregory Bennett ←
John Campbell
Mairi Jay

3 August 2009

Dear Gregory

Application for Ethical Approval: **Trends and Challenges for Sustainable Marine Resource Management for Rural Solomon Islanders**

Thank you for submitting by email your response to my letter of 20 July regarding your Application for Ethical Approval to the Faculty of Arts and Social Sciences Human Research Ethics Committee. I received your email on 27 July.

I have considered your comments on the points raised by the Committee and am fully satisfied that the procedures and arrangements you propose comply more than adequately with the University's Regulations.

This letter is to provide formal notification of ethical approval for your PhD project.

With best wishes for your research,

A handwritten signature in black ink, appearing to read 'John Paterson'.

John Paterson
Chair, FASS Human Research Ethics Committee

Appendix B – Information sheet

UNIVERSITY OF WAIKATO FACULTY OF ARTS & SOCIAL SCIENCES

Researcher: Gregory Bennett

This research is a requirement for my doctoral studies, which I am currently pursuing at the Department of Geography, Tourism and Environmental Planning, the University of Waikato, New Zealand. The aim of this research is to investigate the social and environmental conditions that facilitate effective sustainable marine resource management in rural Solomon Island communities. I am interested in examining the way in which you as a stakeholder in the village perceive, interact with and manage the coastal and marine resources in your area.

For this research I wish to conduct and collect information through household census survey, semi-structured interviews, focus group discussions (FGD), participant observation and informal story telling. The interviews and FGD will be approximately 45 minutes to one hour in length. Your ideas and thoughts are important, therefore feel free to bring up issues which you view as important to this research. I would like you to participate in an interview or / and FGD. I would also like to tape record the interviews and FGD so that I have an accurate record of interview.

If you agree to take part in the research, you have the right:

- i. To refuse to answer any particular question, and to terminate the interview at any time
- ii. To ask any further questions about the interview or research project that occur to you, either during the interview or at any other time
- iii. To decline to be recorded and request the tape to be turned off at any time
- iv. To request that material be erased
- v. To withdraw from the research before Gregory leaves the village
- vi. To remain anonymous should you so choose- anything that might identify you will not be included in conference papers, academic articles or any other report about the findings of the research

This research project has been approved by the Human Research Ethics Committee of the Faculty of Arts and Social Sciences. Any questions about the ethical conduct of this research may be sent to the Secretary of the Committee, email fass-ethics@waikato.ac.nz, postal address, Faculty of Arts and Social Sciences, Te Kura Kete Aronui, University of Waikato, Te Whare Wananga o Waikato, Private Bag 3105, Hamilton 3240.

If you would like to take part in the research, I will contact you in the next few days so that we can organise a time to meet. If you have any questions about the research, please don't hesitate to contact me or my Chief Supervisor.

Associate Professor John Campbell
Department of Geography, Tourism and Environmental Planning
University of Waikato
Private Bag 3105
Hamilton, New Zealand

Appendix C – Introductory letter to the village chief

Geography, Tourism and
Environmental Planning
School of Arts & Social Sciences
Private Bag 3105
The University of Waikato
Hamilton, New Zealand
Monday, 15 June 2009

The Village Chief

Dear Sir,

RE: Permission to Conduct Research

I'm writing this letter to seek your permission to conduct some research within your village.

I am a student at the University of Waikato in New Zealand and am currently undertaking research to complete a doctoral thesis. This letter, along with the accompanying "information sheet", will help give you some idea about the project. Please take the time to read it so that you are comfortable and aware of the process and also the details of the research.

The aim of the research is to investigate the social and environmental conditions that facilitate effective sustainable marine resource management in rural Solomon Island communities. It is the intention of this research to collect a range of ideas, thoughts and opinions on how rural Solomon Islanders perceive, interact with and manage their coastal and marine resources.

For this research I wish to conduct and collect information in your village through household census survey, semi-structured interviews, focus group discussions (FGD), participant observation and informal storytelling. These are informal narrative interactions that I hope to conduct with stakeholders in your village.

I would appreciate it if you could consider my request and grant me permission to conduct research with your villagers. Should you have any question please don't hesitate to ask me.

Yours sincerely,

Gregory Bennett (PhD candidate)

Appendix D – Census Survey Schedule

Household Background information

Date: _____ Village: _____

Household General Demographics (Men and Woman)

1. Respondents name _____ *If possible interview Household Head (HHH)*
2. Status in Household (specify): Husband, wife, adult child, niece, nephew
3. Name of Household head (HHH): _____
4. Number of household members: Adults (over 16 years old): _____
Children _____
5. Household members' information (*people that normally reside in the house, including children at boarding school*)

Names	Relation to HHH <i>e.g. Dad, niece, wife, son, daughter</i>	Gender (M/F)	Age	Religion	Ethnicity (* Which village or Island*)	Level of formal education. <i>None, primary, secondary, tertiary</i>	Primary Occupation <i>e.g. Fishing, gardening, wage, student</i>	Secondary Occupation

6. What is your household's most important source of income? (In order of importance)
1st _____ 2nd _____ 3rd _____
7. How many members in your household fish? _____
8. How often do they go fish in a week? _____

9. For how many hours each day? _____
10. How often does your household eat fresh fish in a week? _____
11. How would you describe the current status/condition/health of the following, on a scale from: (5) very good; (4) good; (3) Ok; (2) bad; (1) very bad:

Resource	Rank
Fish	
Beche-de-mer	
Trochus & Shellfish	
Mangroves	
Coral reefs	
Seagrass beds	

12. Do you think your village look after your marine resources well? Yes / No

Appendix E – Focus Group Discussion

STAKEHOLDER AND COMMUNITY ORGANISATION

1. How is your community organized?
(Specify if prompted: Describe you hierarchy structure in the village)
2. Please describe leadership arrangements practiced in your community. For example, the main roles and responsibility of the chiefs, the main roles and responsibilities of Village elders, the role of the community, the church.
3. What are men's role(s) in the community? (Please List)
4. What are women's role(s) in the community? (Please List)

ATTITUDES AND PERCEPTION OF COASTAL AND MARINE ACTIVITIES

1. What things do you see as threats or risks to the livelihood of your community that is based on the marine environment?
2. How would you describe the current coastal reef conditions (this includes sea grass beds, mangrove etc)
(Specify if prompted: changes in reef habitats)
3. What are the major threats to the health of your coastal resources?
(Specify if prompted: Natural or human activities)
4. Apart from threats, what do you see as the major problems facing coastal management in the community? (perceived coastal management problem)
5. What do you see as solutions to this problems (perceived coastal management Solution)
6. What things have worked well for coastal management in the community
(success in coastal management)
7. What things have not worked well for coastal management in the community
(Challenges in coastal management)

OWNERSHIP, MANAGEMENT AND REGULATONS

1. Who owns the reefs?
2. Who has the right over the reefs in the villages? (Specify if prompted: user right access)
3. How are boundaries defined? (Specify if prompted: boundary distinctness)

4. In your community, is the tabu system used to control fishing? If so, what is the process if the tribe or someone wants to taboo one of its reefs? Please describe
5. Are there any reefs that are tabu currently?
6. What penalty is there for tabu reef offenders?
(Specify if prompted: Surveillance and enforcement)
7. Are you free to fish everywhere?
8. Under what circumstances are you not allowed to fish a certain place? Or what management measures are there? *(Specify if prompted: Protected areas, gear restrictions etc)*
9. How important are your marine resources to your livelihood?
10. Are you aware of any fishing regulations in Solomon Islands? If so, please list them.
(Specify if prompted: rules, regulations and penalty)

LOOKING FORWARD: MARINE RESOURCE MANAGEMENT

1. Who do you think is responsible for looking after your marine resources?
(Specify if prompted: for example the local community, NGO, Government (National and Provincial))
2. Do you think you and your community are looking after your marine resources well?
(Specify if prompted: User Inputs)
3. If **YES** why did you think so?
4. If **not**, what do you think needs to be done?
5. List what do you think your community and you should do to ensure sustainability in future?
(Specify if prompted: responsibilities and roles of users)

Appendix F – Semi-Structured-Interview

Marine related activities and Conditions

1. Where do you normally go fishing?
(Specify if prompted: Outer reef, inner reef, lagoon, sea grass beds, mangroves, ocean side etc.)
2. Has there been any change in the locations used for fishing over the past 10 years? Yes/ No
(If so) Describe the change and reasons why locations are changing (use map if appropriate):
(Specify if prompted: Do you fish near the village or you've moved further out)
3. Do you notice any changes to the status of the reef conditions outside your village? Yes/ No
4. How would you describe the current status/ conditions/health of your reef resources?
(Specify if prompted: Ask them to give an example of what they describe)

Attitudes and Perceptions

5. How would you describe the catches of marine resources (fish, crayfish, shells & trochus) over the past months? Explain/ Comments
(Specify if prompted: what is the distribution and abundance)
6. How would you describe the catches 10 years ago? Explain/ Comments
(Specify if prompted: what is the distribution and abundance of catches? Is it more, less or same?)
7. What do you think the catches will be like ten years from now? Explain/ Comments
(Specify if prompted: what is the fishing trend?)
8. Are there any problems with fishing and other marine resources (beche-de-mer, shells, clams, seaweed, crabs, and corals) around this village? What problems?
9. Are there any fishing practices which you think are having a detrimental impact on fish numbers? Yes/ No
(Specify if prompted – night diving; derris root; gill-netting, bait fishing etc.)
(If yes) What?
10. In your opinion, have the reef resources changed from how it was in your parent's generation? Yes/ No
(If so) How?

11. In your opinion, what are the main/major threats to you marine ecosystem health?

Resource management

12. If there are any problems with fishing and with the health of the lagoon,

- (a) What do you think should be done to improve things?
- (b) Who should do it?

13. Are you aware of any Government (National and/or Provincial) rules/regulations on fishing in the area? Yes/ No
(If so) what are they?

14. Are you aware of any tabus in the local area? Yes/ No
(If so) Who set them up?

15. Are you aware of any community rules/regulations regarding fishing in the area? Yes/ No
(If so) What are they?

16. Do you think these rules are effective? Yes / No
Why/ Why not

17. (*Only if Tabu mentioned*) Do you think people from the community have stopped fishing in the Tabus? Yes/ No (If not) Why not?

18. (*If appropriate*) Why do you think the tabus were established?

Conservation & sustainability (defined)

(a) Have you heard of the English terms 'conservation' and 'sustainability'? Yes/ No
(Specify if prompted: if they don't know the terms, I will give a brief definition of each term)

(b) When did you first hear it? Who from?

(c) What do these terms mean to you?

(d) Do you have any ideas about how 'sustainability' and 'conservation' can be achieved in your community marine resources

Community

20. Do you or other members of the household belong to any community groups (Dorcas, church, youth group, Pathfinders, other)? Which ones?

21. What do you think is the biggest future threat to your community?
(Specify if prompted: what do you fear for the future or your community? What are you afraid of for the future of your community?)

22. What kinds of things would you like to see done in your village to make it better?

Appendix G – Participant Observation

This schedule outline some of the things I would like to observe while I'm in the village

- Type of fishing activities
- Type of fishing gear used
- Catches
- Fishing methods
- Reactions of fisher folks in their daily catches
- Reef- related activities
- Location of reef related activities and stakeholders
- Reef resources conditions
- Uses and property rights
- Different roles of stakeholders in the village
- Community participants in village activities