



Kent Academic Repository

Vougioukalou, Sofia Anthi (2008) *Ethnomedicine and the dynamics of knowledge transmission and plant conservation in Atiu, Cook Islands*. Doctor of Philosophy (PhD) thesis, University of Kent.

Downloaded from

<https://kar.kent.ac.uk/94710/> The University of Kent's Academic Repository KAR

The version of record is available from

<https://doi.org/10.22024/UniKent/01.02.94710>

This document version

UNSPECIFIED

DOI for this version

Licence for this version

CC BY-NC-ND (Attribution-NonCommercial-NoDerivatives)

Additional information

This thesis has been digitised by EThOS, the British Library digitisation service, for purposes of preservation and dissemination. It was uploaded to KAR on 25 April 2022 in order to hold its content and record within University of Kent systems. It is available Open Access using a Creative Commons Attribution, Non-commercial, No Derivatives (<https://creativecommons.org/licenses/by-nc-nd/4.0/>) licence so that the thesis and its author, can benefit from opportunities for increased readership and citation. This was done in line with University of Kent policies (<https://www.kent.ac.uk/is/strategy/docs/Kent%20Open%20Access%20policy.pdf>). If you ...

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in *Title of Journal*, Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our [Take Down policy](https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies) (available from <https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies>).

**Ethnomedicine and the dynamics of knowledge transmission
and plant conservation in Atiu, Cook Islands**

Sofia Anthi Vougioukalou

**Thesis submitted in fulfilment for the degree of Doctor of
Philosophy in Ethnobiology, Department of Anthropology,
University of Kent**

September 2008

Abstract

This thesis examines the link between the traditional medical knowledge and medicinal plant use in Atiu, Cook Islands. Indigenous knowledge systems and medicinal plant populations have been reported to be under threat from international organisations, social and natural scientists alike. An interdisciplinary perspective using anthropological and ethnobotanical methods was used to empirically assess the effect of healing practices on ethnomedical knowledge transmission and medicinal plant conservation.

This study shows that despite socioeconomic changes and the decline of traditional practices in general, traditional medicine in the Cook Islands continues to be used across social and geographical boundaries without posing a threat to medicinal plant populations. This effect is attributed to the adaptive properties of the healing system that maintains some traditional elements such as family ownership of medical recipes and absence of monetary reward for healing while allowing for innovation as demonstrated in new recipes for new illnesses and flexible knowledge transmission patterns. The family ownership of medicinal recipes facilitated the conservation of both ethnomedical knowledge and medicinal plants as specific families operated as custodians of specialised knowledge and associated plant populations. The sense of obligation to the community's wellbeing and divine guidance that accompanied the practice of traditional medicine contributed to the operation of a moral and spiritual driving force behind this form of cultural and biological preservation.

In short this study shows that engagement with traditional medicine is positively associated with the transmission of ethnomedical knowledge and the conservation of medicinal plants, as Atiuans strive to conserve medicinal plants in order to acquire the elevated social status associated with traditional healing. These findings contribute to the ethnobotanical literature on the conservation of biocultural diversity by highlighting the impact of knowledge transmission on plant management.

Acknowledgements

I wish to thank many people in many countries for their contributions in this thesis.

My deepest thanks and gratitude go to my supervisor, Professor Michael Fischer for his scholarly guidance and input. He remained very understanding and supportive of my most ambitious and 'atypical' ideas and facilitated with great patience their accomplishment.

The generous feedback of my friends and colleagues in the Department of Anthropology is greatly appreciated. The comments of Dr Neville Colclough, Dr Miguel Alexiades, Dr Wenonah Lyon, Dr Melissa Demian and Dr Stefanie Klappa on earlier drafts of the thesis were particularly insightful and enlightening. Departmental support and advice was provided from Christine Eagle, Nicola Kerry-Yoxall, Shelley Malekia and Susan Simpson.

My friends Maria Tsitsoni, Marianna Orfanidou, Imola Antal, Tamar Bajgielman, Janicken Tromborg, Peter and Jovanna Miralles Wilkin, Piers Locke, Andy Wilkes, Sarah Keeler, Marcello Mollica, Laura Robson, Giannis Somaripas and Aris Anagnostopoulos gave great moral support and encouragement.

I owe special gratitude to all the people in the Cook Islands who assisted in my research and especially Gerald McCormack, the Director of the Cook Islands Natural Heritage Trust, Ngatuaine Maui, my research associate in the Ministry of Culture; Kau Henry, fieldwork assistant and Environment Officer; Tupuna Tuariki, my host mum in Atiu, Matangaro Arai, Margarita Simpson, Tai Potoru, Vincent Peters, Boy Kea, Ake Pati Kaiaruna, and the staff of Atiu hospital and Enuamanu School. I would like to extend a special thank you to the grandmothers of Atiu who shared their knowledge with me and particularly to Mama Itinga Maurangi, Mama Ngamata Tangata Uatopa, Vouvou Kapuvai, Mama Taumana Rakei and Mama Tuatai Koronui.

Financial support was provided by the ESRC-funded project: Research in Interactive Ethnography: Interactive data collection-reproduction/ Transmission of environmental

knowledge project and employment in various research grants at the Centre for Social Anthropology and Computing.

I am very proud of, and thankful, to my parents Despina and Stelios, sister Manolia, grandmother Sonia and aunt Semeli who were very supportive throughout my PhD research, while I was in Greece and at Kent.

Last but not least I would like to thank my previous tutors at the University of Leeds and especially Dr Bill Kunin and Dr Steve Compton, as well as my fellow researchers Anna Portch and Samantha Staddon for introducing me to the Cook Islands and the delights of fieldwork.

Glossary

‘Ei- flower garland

‘Enua- polysemic term denoting land, placenta and local when used as the modifier of a binomial

CICC- Cook Islands Christian Church, Protestant church, main denomination

Kōpū tangata- the extended family

Kōrero- oral traditions, traditional lore linked to genealogies

Māmā- mother, generic term for senior woman

Maki- illness, ill

Makatea- forest on fossilised limestone, lit. stone white, attributed to the colouration of the limestone

Mana- supernatural source of power, associated with *tapu*

Marae- ceremonial site

Māori- generic term widely used to denote local, Cook Islands, Polynesian or Pacific origin

Māoro- massage

Ora- health, vitality

*Pāpā-*father, generic term for senior man

Papa ‘ā- generic term denoting European or Western

Rākau- plant

Repo kino- bad dirt-perceived as an illness causing agent

Tapā- barkcloth made from the outer bark of *Ficus* and *Artocarpus* spp.

Tapu- sacred, attached with behavioural prohibitions

Tauma ‘a- curse

Ta ‘unga- expert, frequently used to denote specialist healers

Tītā- rubbish, also refers to plants with no use

Tūpāpaku- the spirits of the ancestors

Tumunu- bush beer ‘school’

Ture- law, prohibitions attached to protocol

Tūtaki- payment, reciprocity

Vairākau Māori- locally referred to as maori medicine, denotes local medicinal practices of varying origin

Umu- earth oven

Table of contents

1 Introduction 1

1.1 The problem	2
1.2 The global and local significance of the problem.....	3
1.3 Atiu and the Cook Islands.....	5
1.4 Overview of methods and results	7

2 Theory and methods14

2.1 Introduction.....	15
2.2 Ethnobiology and biocultural diversity	16
2.3 Traditional knowledge in literature	21
2.4 Anthropological and ecological approaches to ethnomedicine.....	30
2.5 Current issues in medicinal plant conservation	35
2.6 Aims, objectives and research methods	40
2.6.1 Approach to fieldwork	41
2.6.2 Positioning the participants and the researcher.....	45
2.6.3 Access and ethics	46
2.6.4 Archival research & biodiversity reports.....	47
2.6.5 Participant observation.....	48
2.6.6 Interviews.....	49
2.6.7 Questionnaires.....	56
2.6.8 Field surveys	57
2.6.9 Data Analysis	59
2.7 Conclusion	61

3 Atiu: island life and colonial history64

3.1 Introduction.....	66
3.2 Geographical background.....	66
3.3 Cook Islands History	70
3.3.1 The pre-contact era	70
3.3.2 Missionary period	72
3.3.3 Independence	78
3.4 Social organisation on Atiu	81
3.4.1 Kinship and the extended family	82
3.4.2 Residence patterns	83
3.4.3 Land tenure	84
3.4.4 The village	85
3.4.5 The tribe	87
3.4.6 The <i>tumunu</i> - the drinking clubs	89

3.4.7	The church and community groups.....	90
3.4.8	Education	91
3.4.9	Governing bodies	92
3.4.10	Law enforcement	92
3.5	Local livelihoods.....	93
3.5.1	Daily life on Atiu	93
3.5.2	The household.....	96
3.5.3	<i>Tutaka</i> - the household inspection	98
3.5.4	Division of labour	98
3.6	Rites of passage and the Atiuan life cycle.....	100
3.6.1	Birth rituals	100
3.6.2	Adoption	102
3.6.3	Naming.....	103
3.6.4	Hair cutting ceremony.....	105
3.6.5	Death and mourning rituals.....	105
3.6.6	Gift exchange in rituals.....	107
3.7	Conclusion	108

4 The Atiuan ecosystem: people, plants, animals and spirits 110

4.1	Introduction.....	112
4.2	People and the environment.....	113
4.2.1	Geology	113
4.2.2	Habitats, land use and medicinal plants.....	114
4.2.3	The coast	116
4.2.4	The makatea	117
4.2.5	The taro swamp.....	118
4.2.6	The inland lowlands.....	118
4.2.7	Inland uplands.....	119
4.2.8	The villages.....	120
4.2.9	Dirty and clean spaces: the home, the homegarden and ‘down the land’ 121	
4.3	People and plants	122
4.3.1	Plant values and principles of onomastics	123
4.3.2	Plants and spirits	126
4.4	Plant uses	127
4.4.1	Medicinal plants.....	129
4.4.2	Ornamental and aromatic plants	130
4.4.3	Food plants.....	131
4.4.4	Craft and technical plants.....	131
4.5	People and animals	132
4.5.1	Terrestrial animal diversity	132
4.5.2	Animals and ghosts.....	134
4.6	Conclusion	136

5 Medicinal plants: use and conservation.....137

5.1	Introduction.....	139
5.2	Ethnomedical practice: rules and taboos of behaviour and plant use.....	140
5.2.1	Illness diagnosis.....	141
5.2.2	Plant harvest.....	142
5.2.3	Recipe preparation.....	143
5.2.4	Medicine administration.....	145
5.3	Medicinal plant populations on Atiu.....	147
5.3.1	Plant origin.....	147
5.3.2	Plant life forms.....	148
5.3.3	Medicinal plant abundance.....	148
5.3.4	Medicinal plant distribution.....	150
5.3.5	Use frequency.....	151
5.4	Homegardens and plant conservation.....	152
5.4.1	Medicinal plants in the homegardens.....	153
5.4.2	Family-owned medical traditions and homegardens.....	154
5.4.3	Homegardens and social networks.....	155
5.4.4	Homegardens as sites for experimentation and innovation.....	157
5.4.5	The socio-cultural role of homegardens.....	157
5.5	Case studies where medicinal use facilitated conservation.....	159
5.5.1	Specialised use and cultivation in the homegardens.....	160
5.5.2	Rare wild plant populations transplanted in the homegarden.....	161
5.5.3	Wild populations harvested sustainably.....	162
5.5.4	Tending spontaneous growth.....	163
5.5.5	Experimenting with new plants.....	164
5.5.6	Using and exchanging plants.....	165
5.5.7	Maintaining plant populations for the use of others.....	166
5.5.8	Use of rare wild plants.....	167
5.6	Conclusion.....	169

6 Traditional medicine: principles and knowledge transmission 172

6.1	Introduction.....	174
6.2	Maori medicine in the Cook Islands.....	175
6.2.1	Maori medicine as an institution.....	175
6.2.2	Becoming an expert- ta'unga.....	177
6.2.3	Knowledge distribution within the community.....	179
6.2.4	Healing knowledge and power.....	181
6.2.5	The self in Polynesian culture.....	182
6.3	Key concepts.....	183
6.3.1	Mana <i>and</i> tapu.....	183
6.3.2	Family ownership of recipes and secrecy.....	186
6.3.3	Payment for Maori medicine- <i>tūtaki</i>	190
6.3.4	Healing with 'all your heart'.....	192

6.3.5	Perceptions of efficacy.....	194
6.3.6	Delivering specialist services: mana, money and time	197
6.4	Knowledge transmission.....	200
6.4.1	General patterns of knowledge transmission	200
6.4.2	Knowledge transmission within and between families.....	201
6.4.3	The instantiation of knowledge transmission	206
6.4.4	The eight types of ethnomedical knowledge transmission	208
6.4.5	Knowledge acquisition through dreaming.....	212
6.5	The new generation.....	215
6.5.1	The role of traditional knowledge in the lives of young people	215
6.5.2	Children's involvement in traditional activities.....	219
6.6	Conclusion	222
7	Medical pluralism and health-seeking behaviour.....	224
7.1	Introduction.....	226
7.2	Illness and health	227
7.2.1	Medical pluralism in South Pacific.....	227
7.2.2	Maori medicine versus western medicine.....	230
7.2.3	The concept of illness & health in the Cook Islands	232
7.2.4	Mental health	233
7.2.5	Depression and suicide	234
7.2.6	Perception of illness.....	236
7.3	The health providers.....	237
7.3.1	Western medicine: the doctor, the nurses, the hospital.....	237
7.3.2	Maori medicine: common, specialist and spirit healers and massage specialists	241
7.4	The patients	244
7.5	Illness treatment.....	249
7.5.1	Paediatric conditions.....	249
7.5.2	Gynaecological conditions.....	251
7.5.3	Skin ailments.....	253
7.5.4	Ophthalmological and otolaryngological ailments	255
7.5.5	Gastrointestinal ailments.....	256
7.5.6	Respiratory ailments	259
7.5.7	Urogenital ailments.....	260
7.5.8	Myoskeletal ailments	261
7.6	Causes of illness.....	263
7.6.1	Natural causes	266
7.6.2	Spirit-induced causes of illness.....	268
7.7	Conclusion	275

8 Traditional medicine and knowledge transmission in the context of socio-environmental change.....277

8.1	Introduction.....	279
8.2	Traditional knowledge and change	280
8.2.1	Demographic changes in the Cook Islands.....	280
8.2.2	Outmigration and the land	282
8.2.3	Migrant life and social networks.....	284
8.2.4	Meeting points for the resident and diaspora population.....	287
8.2.5	The contemporary importance of traditional knowledge.....	289
8.3	New knowledge, new illnesses and new plants	291
8.3.1	Changing traditions at home and abroad	291
8.3.2	Atiuan ethnomedicine in a transnational context.....	295
8.3.3	The 'new' traditional knowledge.....	300
8.4	Socio-environmental change and health issues on Atiu	303
8.5	Conclusion	307

9 Conclusion 310

9.1	Summary of results.....	311
9.2	Biocultural diversity in the Pacific	315
9.3	Assessing knowledge and plant loss	316
9.4	Issues in plant conservation	318
9.5	Ethnomedicine and knowledge transmission	321
9.6	Ethnomedicine and medical pluralism	325
9.7	Traditional medicine and socio-environmental change	329
9.8	Recommendations for further ethnobiological research.....	332
9.9	Policy recommendations.....	335

10 Bibliography 339

11 Appendix 355

11.1	Methods timetable.....	355
11.2	List of Atiuan names for illnesses & description	357
11.3	List of Atiuan names of body parts.....	362
11.4	Maori and English names for plant parts.....	363
11.5	Maori and English names for flowering stages	364
11.6	Maori and English names for leaf shapes.....	364
11.7	Medicinal plant ecological distribution.....	365

11.8	Medicinal plant use and frequency	369
11.9	Household survey interview questions.....	373
11.10	Healer interview.....	375
11.11	Specialist plant use interview.....	376
11.12	Ethnoepidemiological survey.....	377
11.13	School children questionnaire.....	378
11.14	Literature review table for five Polynesian ethnomedical systems	379

Table of figures

Figure 1:	Topographic map of Atiu Island.....	1
Figure 2:	Conceptual representation of the social and environmental role of ethnomedicine in Atiu.....	9
Figure 3:	Underlying concepts of thesis chapter organisation.....	10
Figure 4:	<i>Enua Manu School students taking part in ethnobotanical field trip</i>	14
Figure 5:	Conceptual representation of interdisciplinary approaches to ethnomedicine	32
Figure 6:	<i>CICC church altar decorated with common and rare plant varieties for Harvest festival</i>	64
Figure 7:	Geographical location of the Cook Islands (source: http://www.atiu.info) .	67
Figure 8:	Map of Atiu Island (source: Atiu Motel).....	69
Figure 9:	Population changes in Rarotonga after the arrival of the Europeans (data adapted from Mc Arthur 1961).....	73
Figure 10:	Population numbers on Atiu in the post- colonisation era (data extracted from McArthur 1961: 181.....	75
Figure 11:	<i>Clockwise from left: taro swamp, Ake Simpson making Maori medicine in her homegarden with her adopted grand-son playing nearby, homes in the village and ancestral graves in the homegarden</i>	110
Figure 12:	Landform types and relative area occupied in Atiu	114
Figure 13:	Number of plant species per use category	128
Figure 14:	Percentage of medicinal plant species with exclusive medicinal uses and multiple uses (including medicine).....	128
Figure 15:	<i>Boy Kea with his sons Breamt and Charlie and nephew Teokotai harvesting meika ve'i in the makatea</i>	137
Figure 16:	Medicinal plant species diversity of plant parts used.....	143
Figure 17:	Medicinal plant species' origin	147
Figure 18:	Number of medicinal plant species per life form.....	148
Figure 19:	Abundance of medicinal plant species' island populations.....	149
Figure 20:	Medicinal plant distribution per habitat	151
Figure 21:	Use frequency of medicinal plants	152
Figure 22:	Medicinal plant harvest location types.....	160
Figure 23:	<i>Local healer, Ake Pati Kaiaruna warming up macerated plants enclosed in a leaf bundle over an electric stove</i>	172
Figure 24:	Number of reportage of secrecy levels associated with ethnomedical recipes	188
Figure 25:	Recording frequency of different levels of payment associated with	

ethnomedical recipes.....	192
Figure 26: Reportage frequency of ethnomedical knowledge transmission types ...	209
Figure 27: Ranking exercise on the importance of Maori medicine in school children questionnaires in Atiu and Rarotonga.....	218
Figure 28: Percent of school children in Atiu and Rarotonga assisting their elders in making Maori medicine	220
Figure 29: Identified locations of medicinal plant presence from school children in Atiu and Rarotonga	221
Figure 30: <i>The staff of Atiu hospital, Teariki Boaza, Ake Takaiti, Ina Tangaroa and Dawn Ngatokorua in the hospital's garden after an interview</i>	224
Figure 31: Hospital consultation frequency per disease from January 2003 to November 2003.....	240
Figure 32: Number of remedies recorded per illness group	247
Figure 33: Recipes for paediatric conditions.....	250
Figure 34: Recipes for gynaecological conditions.....	252
Figure 35: Recipes for skin ailments	253
Figure 36: Hospital visitation rates for skin ailments	254
Figure 37: Recipes for ophthalmological and otolaryngological ailments	255
Figure 38: Recipes for gastrointestinal ailments.....	257
Figure 39: Hospital visitation rates for gastrointestinal diseases between January and November 2003.....	260
Figure 40: Hospital visitation rates for respiratory diseases between January and November 2003.....	260
Figure 41: Recipes per urogenital ailments	261
Figure 42: Recipes for myoskeletal ailments.....	262
Figure 43: <i>The Catholic scout group from Atiu on the last day of their visit to Mitiaro</i>	277
Figure 44: Graphical depiction of international knowledge transmission.....	294
Figure 45: Graphical depiction of the transmission of new ethnomedical knowledge	298
Figure 46: Hospital visitation rates for NCDs between January and November 2003	304
Figure 47: Monthly hospital visitation rates for high blood pressure.....	304
Figure 48: Monthly hospital visitation rate for diabetes.....	305
Figure 49: Monthly hospital visitation rates for gout	306

Table of tables

Table 1: Habitats, main human activities and characteristic plants.....	115
Table 2: Comparison of definitions of health, illness and disease.....	229
Table 3: Model of Atiuan notions of illness causation and medical efficacy	264
Table 4: Knowledge transmission of 'akari 'ava'ava recipe in space and time.....	294

1 Introduction

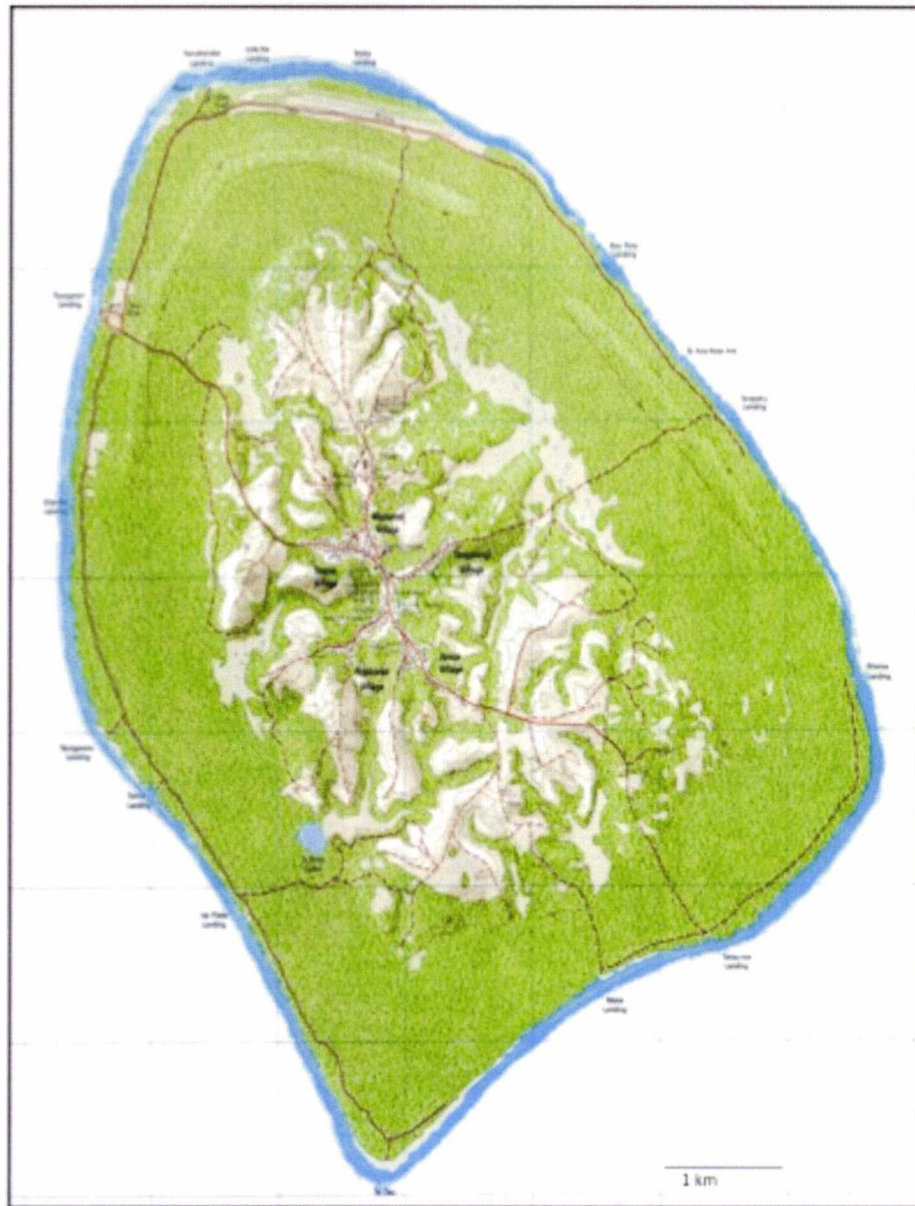


Figure 1: Topographic map of Atiu Island

1.1 The problem

The erosion of ethnobotanical knowledge and use is nowhere more rapid than in the realm of medicinal plants (Akerele et al. 1991; Sumner 2000). The reported erosion is not isolated from social and environmental changes that affect cultures and nations on a global level. Ideas and behaviour related to sickness and healing are a significant part of every culture, involving a functional integration of the components of health care institutions within society's cultural matrix, social organisation and political system (Helman 2001; Singer 1989). A study of medicinal plant use requires the techniques and methods of ethnobotany, social anthropology, medical anthropology and ecology; such an interdisciplinary procedure becomes particularly relevant in considering the transmission of traditional environmental knowledge.

Traditional environmental knowledge (TEK) has been researched and contextualised by wide range of sciences over the last three decades (Agrawal 1995; Dove 2002; Inglis 1993; Zent 2000). Yet the characterisation of TEK remains problematic because of the diversity of methodological, theoretical and problematic orientations that have been employed to define what is commonly regarded as a 'special' kind of knowledge (Ellen & Harris 2000). This confusion is particularly evident in the plethora of names and combination of names (traditional, indigenous, local, environmental, ecological) that are employed to describe this kind of knowledge. This is a cross-discipline problem. Even though anthropologists highlight the role of indigenous knowledge keepers in maintaining biodiversity and the conservation of useful plants (Ellen 2007b; Etkin 2002; Zent & Zent 2004), some biologists/ecologists tend to see plant use by indigenous peoples as threatening biodiversity (Redford 1992; Soule 1995; Ticktin 2004). What is needed is a combination of social, cultural and biological perspectives on the applications of TEK and management of biodiversity; and this study aims to address this need.

In this thesis, I identify the ecological and social factors that influence the contemporary use of medicinal plants in Atiu, Cook Islands, and conservation implications of such use. Specifically, I examine:

1. the use of plants in traditional medicine;
2. the transmission of traditional environmental knowledge in ethnomedical practice;
3. the integration of ethnomedical practice in social and cultural organisation;
4. the impact of globalisation on both knowledge transmission and plant usage;
5. the consequences of traditional knowledge and medical practice on conservation and biodiversity.

In this chapter I will give a brief overview of the state and significance of TEK and biodiversity loss, discuss particular issues associated with the Pacific Islands and situate this study within this context. I conclude with a main outline of the thesis argument and a summary of the thesis chapters.

1.2 The global and local significance of the problem

The significance of TEK (and the risks of knowledge extinction) has been globally recognised by international institutions (WHO, UNESCO, WWF), especially in the last decade, as cultural and biological diversity is rapidly decreasing. The most prominent areas of recognition of the significance of TEK are: biomedical and natural product research, biodiversity conservation and development. Consequently, emerging issues in these areas cannot be successfully addressed if TEK remains poorly defined.

In recent years there has been considerable debate about the need for an integrated approach to human use of natural resources as it represents a dynamic interaction between the natural world and human culture (Carlson

& Maffi 2004a). Traditional environmental knowledge systems are increasingly considered as biocultural systems; that is systems that have been shaped jointly by biological and cultural dynamics (Maffi 2004: 12). Ethnobiological research is in the forefront of demonstrating the inextricable link between biological and cultural diversity and highlighting the centrality of traditional knowledge in the conservation of biodiversity (Ellen 2006a; Stepp et al. 2002). Atran and Medin note that knowledge loss comes as a consequence of diminished human contact with nature, a phenomenon described as Nabhan and St Antoine as ‘the extinction of experience’ and Louv¹ as ‘nature-deficit disorder’ (Atran and Medin 2008: 1). They further proceed to argue that whether people choose to protect biodiversity depends not only on the placement of utilitarian values on nature but on sacred or protected values as well (ibid: 263). A key question I will be addressing is the relationship between knowledge *transmission* and biodiversity management and the sacred values people place on the transmission process.

Rapid socio-economic transition has lead to the degeneration of TEK and reduction of biodiversity in many parts of the world. On a local level, interdisciplinary studies of natural resource use have collated useful information on local cultural and biological diversity and aid in their long-term conservation. In the field of medical ethnobotany, research is particularly urgent. Medicinal plant knowledge and medicinal plants have been reported to be under threat due to the rapid change in local socio-economic systems and land use practices. International conventions such as the Convention on Biological Diversity (CBD) and the Convention on Trade in Endangered Species (CITES) acknowledge not only the need to preserve biodiversity but also the contributions of biodiversity conservation to poverty alleviation and sustainable development. Ethnobiological research has the potential to directly aid local governments

¹ Richard Louv in *Last Child in the Woods* (2005: Alonquin Books) further suggests that children’s diminished contact with nature in the United States results not only to knowledge loss but also a wide range of behavioural problems such as aggression and attention-deficit disorders.

to develop and implement action plans to meet these targets. The island of Atiu, in the Cook Islands, is typical of such a threatened environment.

1.3 Atiu and the Cook Islands

Atiu, one of the fifteen islands that make up the Cook Islands, is a small volcanic island (21km circumference) surrounded by a reef. Atiuan settlements are concentrated in five contiguous villages on the top of the central flat-topped hill, at 72 m above sea level (Kautai et al., 1995: 167). The modern day health care system of the Cook Islands is a combination of allopathic medicine and traditional practices. In Atiu, like the rest of the Cook Islands, traditional medicine is very widely practised through an intricate system of medicinal plant recipe ownership (Whistler 1985).

Whistler documented ethnomedical practices and recorded medicinal uses for forty-nine species of plants. In *Polynesian Herbal Medicine*, he compared techniques and plant use in different Polynesian nations, and reported that some of the plants used medicinally are now scarce. Using examples from Polynesian communities, he documented that scarcity of plant species has led to the loss of knowledge of functional uses of plants (Whistler 1992).

The flora of the Cook Islands is relatively limited because of the islands' isolation and size and most plant species are introduced (McCormack, 2004). The subsistence system in Atiu, like other indigenous subsistence systems in the Pacific, can be characterised by four systems: annual plant cultivation with emphasis on root crops, arboriculture of trees and perennials, animal husbandry of pigs and goats, and hunting and gathering for fish, birds, medicinals and other raw materials (Yen 1998).

Throughout the Cook Islands, including Atiu, the collapse of agricultural exports in 1988, coupled with the restructuring of the civil sector in 1996,

led to migration to the urban centres of New Zealand and Australia. The population of the island of Atiu shrunk by 35% (Cook Islands Statistics Office, 2001). The lack of workforce became an increasing constraint in developing the island's infrastructure. Currently, agricultural production is shrinking towards subsistence level and the resident population is becoming dependant on imported food that is purchased with remittances from overseas. As a result, the Cook Islands have extremely high cases of diabetes and high blood pressure (Ulijaszek, 2002).

In Atiu, medical treatment (like the daily diet) is a mix of the modern and the traditional. Limited social services provide allopathic medical treatment, which is used in addition to traditional remedies. Much of this traditional medical care is based on the use of local plants. This, in turn, is based both on traditional knowledge and existing local biodiversity. Research on the traditional medical system of the Cook Islands has mainly addressed the natural and supernatural elements of illness causation with limited ethnobotanical contributions (Baddeley 1985; Clerk 1995; Hecht 1985). However, in 2001 an extensive participatory biodiversity recording operation was undertaken by the Cook Islands Natural Heritage Trust, of the government of the Cook Islands, which produced an extensive national database cataloguing plant diversity and uses associated with different species, including medicinal plants.

Underlying the project design for this research was the active interest of the Cook Islands in defending their ethnomedical cultural heritage and conserving their medicinal plants. This research followed up the findings of the National Biodiversity Strategy and Action Plan (NBSAP) that was carried out by the Cook Islands government as part of the implementation of the Convention on Biological Diversity. It was conducted through participatory workshops in eight islands of the Cook Islands. The NBSAP team collated local environmental knowledge and identified local aspirations for biodiversity conservation. Medicinal plants were the primary group targeted by the local people for conservation plans (McCormack 2002). This information was used to supplement the online

Cook Islands Biodiversity Database (CIBD-
<http://cookislands.bishopmuseum.org/>) which currently contains information on 4,456 species of plants and animals including information on 1,176 plant species and 641 species of marine fish. The CIBD also contains a small amount of cultural information on medicinal uses for 148 plant species in the island of Atiu.

1.4 Overview of methods and results

The aim of this research was to identify the ecological and social factors that influence the contemporary use of medicinal plants, with a view to understanding changing patterns of use and conservation implications.

An interdisciplinary approach was taken to address the problem of cultural contextualisation of natural resource use. A combined methodology from the disciplines of ethnobotany, medical anthropology and ecology was employed in order to gain an in-depth understanding of medicinal plant use and relate these practices to local medical beliefs and the natural environment. More specifically, I focused on both illness and plants as units of analysis and in the transmission of traditional medical and plant knowledge.

This wide spectrum of data collection allowed me to evaluate the partial and fragmentary information relating to the Atiuan traditional medical system and situate this information within the wider cultural context. This way I was able to address the effect of ethnomedical knowledge transmission on medicinal plant conservation on Atiu. Illness and health are such personal and significant human concerns that extend well beyond the limits of the medical domain, into virtually all aspects of the social and natural environment. I favoured a holistic approach, which allowed me not only to evaluate local ethnomedical practices, but also to explore issues that initially appeared irrelevant or inappropriate. Such issues are for

example the effect of land tenure systems on plant harvest patterns or the effect of illness prevalence on ethnomedical knowledge transmission modes. It was the documentation of these issues that shed new light on other areas of ethnobotanical investigation.

The Atiuan ethnomedical knowledge consists of interlocked human and non-human subsystems such as kinship, land tenure, religion, economics, medicine and plants. It is shared by migrant populations and facilitates social cohesion between demographically fragmented but well-networked populations. Choice of treatment reflects social relations and is a symbolic activity irrespective of its therapeutic value. Atiuan ethnomedical knowledge is dynamic and changing, it incorporates innovation while maintaining a recipe prototype that allows for the classification of new recipes as traditional. New, imported ethnomedical knowledge is not treated differently from old and local recipes. While innovation allows for the system's persistence and adaptation to socio-environmental change, the traditional elements allow for the sustainability of the practice. On a pragmatic level, knowledge and plant availability provided infrastructural constraints in health-seeking behaviour.

In this thesis I will demonstrate that the practice of traditional medicine among Cook Islanders proliferates across geographical and social boundaries despite the negative press it receives from health authorities and the freely available western medical treatment. The traditional medical system is a dynamic therapeutic system capable of adapting to socio-environmental change. Traditional medicine maintains some traditional elements like the family ownership of recipes and absence of monetary reward for healing while at the same time allowing innovation like the incorporation of new recipes for new illnesses and flexible knowledge transmission patterns. Adaptation ensures the system's relevance in a changing world whereas tradition allows for its sustainable persistence. This is in contrast to ethnomedical systems in S. America and SE Asia that are no longer practised due to knowledge loss as a result of disrupted

transmission processes or plant loss as a result of overharvesting (Bodeker 1997).

In the subsequent chapters I will demonstrate that the practice of traditional medicine with the above principles has a positive effect on the maintenance of social networks and medicinal plant conservation on Atiu. The positive effects on the maintenance of social networks is demonstrated by the increased social capital acquired by healers and their apprentices; and increased social cohesion between family groups on the island and the highly fragmented diasporic populations. Engaging in ethnomedicine serves as an identity marker thereby contributing to the collective formation of a cultural identity. The positive effects on the conservation of biodiversity consist of the stewardship of plant populations in the wild by appointed healers and the active management of medicinal plants in the homegardens for the wider use of the social network (graphically represented in figure 2). Plants and knowledge are used as exchangeable commodities within the social network, thus allowing for the negotiation and regulation of social relations.

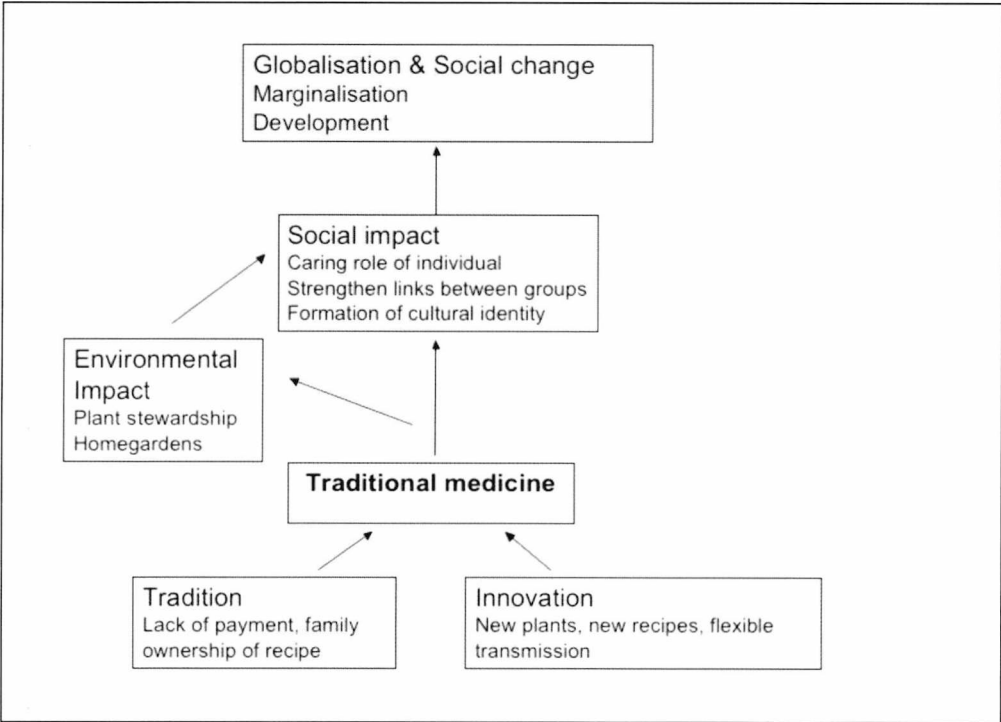


Figure 2: Conceptual representation of the social and environmental role of ethnomedicine in Atiu

I was able to identify the beneficial role of traditional medicine in the conservation of biocultural diversity because I tailored the methodological design to trace the origin of knowledge and plants in ethnomedical practises by including questions on the knowledge transmission and plant acquisition process. Failure to acknowledge the presence of outside influence is to regard a society's medical culture as 'closed' and 'static' as opposed 'open' and 'dynamic' (Jansen 1981), which are notions that used to be commonly associated with traditional knowledge systems. However, more recent studies highlight that ethnomedical knowledge systems are dynamic and resilient (Glaskin 2005; Nordstrom 1989; Sowerwine 2004) and this thesis supports this trend.

The chapter organisation aims to capture the breadth and the depth of the social and ecological aspects of ethnomedical practices on Atiu (figure 3) and therefore address the aforementioned key issues in ethnobiology.

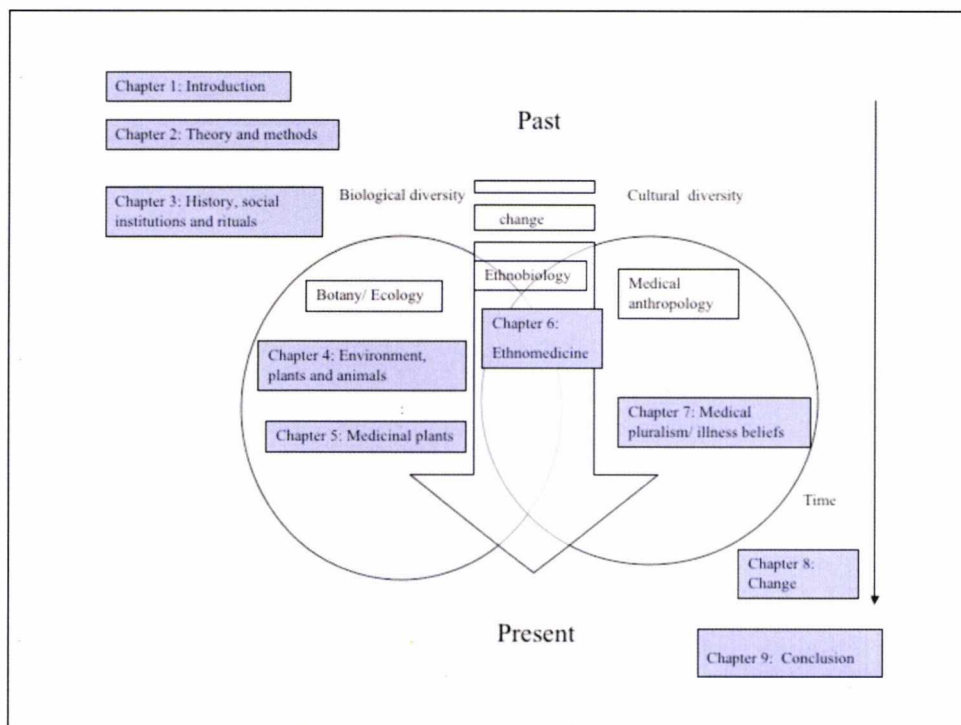


Figure 3: Underlying concepts of thesis chapter organisation

Research material is arranged as follows in the thesis chapters:

Chapter 1 introduces the scope of this research, outlines current trends in medical ethnobotany and situates the case study.

Chapter 2 discusses the current state of affairs in medical ethnobotany, critically examines anthropological and botanical approaches to ethnomedicine and investigates the need for an interdisciplinary focus. These issues are then problematised in the South Pacific where the Cook Islands case study is situated. I continue with a detailed description of the overall organisation of the research and methodology employed. Methodological additions, omissions and innovations were pivotal in the quantity and quality of data generated and are therefore discussed in detail in order to address the argument for the need for inter-disciplinarity.

Chapter 3 lays out the ethnographic setting for the study. It provides a brief introduction in the social and geographic setting of the Cook Islands, overviews historical factors that have shaped contemporary affairs and describes the key elements of contemporary social organisation of Atiu. Finally, a description of customs and rituals associated with life stages from birth to death is investigated. This analysis highlights the role of social institutions, kinship, residence and land tenure in the transmission of ethnomedical knowledge and the conservation of medicinal plants, which are analysed in subsequent chapters.

Chapter 4 lays out the environmental setting of the island and looks at the role of plants, animals and humans within the Atiuan ecosystem. Cultural perceptions of plants and animals are analysed. Then a detailed description of the island habitats, types of land use and vegetation distribution is provided. Medicinal plants did not constitute an exclusive subset of the local flora. Plants used in ethnomedicine were also used and managed for their alimentary, decorative or other technical uses. This chapter therefore provides the ethnobiological and ecological context within which medicinal plants are situated.

Chapter 5 introduces ethnomedicine on Atiu as a system of plant use. Ethnomedical practice is analysed in terms of plant harvest, recipe preparation and administration. Medicinal plant use is determined on one hand from concepts of illness causation and treatment (which are discussed in the two subsequent chapters) but on the other hand it is also determined by environmental factors that influence the distribution and abundance of medicinal plants. This chapter addresses these factors by looking at land use and the distribution of medicinal plant populations. Finally, the impact of knowledge transmission on plant conservation is addressed by the detailed investigation of seven case studies where medicinal use facilitated conservation.

Chapter 6 examines the social and therapeutic role of ethnomedicine on Atiu and the impact of knowledge transmission in the reproduction of this system. Particularly, the family-ownership of the recipes and taboos concerning unauthorised use of recipes and plants were key elements facilitating the sustainable use of medicinal plants. The chapter finishes with an analysis of knowledge transmission patterns to the younger generation.

Chapter 7 looks at medical pluralism, illness treatment and ethnomedical practice. As illness treatment was identified to cure not only illness symptoms but also causes, a detailed analysis of the causal illness agents is provided. In this chapter, the primary point of investigation is illness events and their treatment. Health-seeking behaviour is situated within the realm of traditional medicine and biomedicine as Atiuans use both systems for the treatment of most illness in a serial or simultaneous fashion.

Chapter 8 contextualises this socio-environmental system within the broader changes affecting the island's society highlighting the dynamic nature of this system. The diaspora maintains close links with the resident island population. Ethnomedicine is therefore addressed as a system of knowledge and practice among the international Atiuan community and not

solely within the small island of Atiu. It is further contextualised within the contemporary social setting of outmigration and unemployment.

Chapter 9 sums up the main findings of this thesis, situates this case within theoretical issues in ethnobiology and offers suggestions for the further development of the discipline.

2 Theory and methods



Figure 4: Enea Manu School students taking part in ethnobotanical field trip

2.1 Introduction

In recent years there has been considerable debate about the need for an integrated approach to human use of natural resources as it represents a dynamic interaction between the physical environment and human culture (Carlson & Maffi 2004a). Growing concern over traditional knowledge and its preservation was expressed in the World Conference on Science that was organised by Unesco in 1999. Specifically, it was stated that:

‘traditional and local knowledge systems are dynamic expressions of perceiving and understanding the world that can make and historically have made a valuable contribution to science and technology’

and that there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge (International Council for Science 2002: 1).

The most prominent areas of recognition for the significance of TEK are: biomedical and natural product research, biodiversity conservation and development (Posey 2000). Sillitoe advocates that the practical significance of the theorisation of indigenous knowledge is to produce ecologically informed ethnographies that can be used in development projects to promote both culturally appropriate and environmentally sustainable adaptations to environmental problems (Sillitoe 1998). Consequently, solutions to these problems cannot be successfully addressed if indigenous environmental knowledge remains poorly defined.

Ethnobiologists have highlighted the role of local people as indigenous knowledge keepers that positively contribute to biodiversity and the conservation of useful plants, particularly medicinal plants. However, conservation biologists and ecologists tend to see the role of indigenous people as threatening biodiversity by their usage. Increasingly this is seen as too simple. This is a cross-disciplinary problem challenging both the theory and

methods of the disciplines employed. What is needed is a combination of social, cultural and ecological perspectives and how they impact biodiversity and plant conservation.

2.2 Ethnobiology and biocultural diversity

Researching TEK associated with medicinal plants is a particularly compound and multi-faceted endeavour because it requires an in-depth exploration of the link between culture and nature. People have always been dependent on the great diversity of plant life that provided the vegetative cover of the places in which they lived. Forests in particular have contributed to the livelihoods and quality of life of people at a local and national level because of the material and nonmaterial uses and benefits they provide.

In the anthropological and biological literature there is considerable concern about the loss of traditional environmental knowledge and the decline of plant diversity respectively (Akerle et al. 1991; Ellen et al. 2000; Nazarea 1998). The cultures and livelihoods of indigenous people and nature conservation have sometimes been perceived as contradictory rather than mutually reinforcing. However, in many local religious belief systems there is no clear dichotomy between nonmaterial spiritual and material economic use of natural resources (Byers et al. 2001).

Research in medicinal plant conservation shows that in our era of rapid socioeconomic transition, medicinal plants that have important utilitarian and cultural uses are driven to extinction, contributing to lower self-sufficiency and loss of valuable knowledge in communities across the globe (Akerle et al. 1991). Indigenous peoples have made enormous contributions to the maintenance of many of the earth's most fragile ecosystems and indigenous knowledge is considered increasingly important for the conservation of biodiversity (WWF 1996).

In the last decade, the significance of indigenous knowledge systems (and the risks of knowledge extinction) has also been globally recognised by international institutions such as WHO, UNESCO and WWF. This recognition stems from the persistent failure of many development projects, the emergence of 'stakeholder participation' and the advancement of policies targeting the poor (Sillitoe & Bicker 2004: 1).

While anthropologists are concerned with the positive social role of traditional medical systems on the health of local people (Berlin & Berlin 1996; Shanley & Luz 2003), some biologists consider local people responsible for over-harvesting medicinal plants and suggest the need for regulations to limit these activities (Lagrotteria & Affolter 1999; Sheldon et al. 1997; Shinwari & Gilani 2003; Ticktin 2004). These opposing stances are particularly interesting as claims that biological and cultural diversity are inextricably linked has become almost a truism.

Both claims are based on solid research presented in peer-reviewed journals. Is it that the methods used reveal different aspects of the same 'reality'? Or is it that disciplinary priorities make scientific research *de facto* subjective? Could it be that socioecological systems are so complex that the limited theory and methods of each discipline can only account for small parts of these complex systems? It is these questions that led me to explore further what constitutes the acclaimed link between biological and cultural diversity.

Research has shown that rural communities have played an important role in generating knowledge based on a sophisticated understanding of the environment (Milliken and Albert 1997) and devising mechanisms to conserve and sustain their natural resources (Warren 1992). Ethnobotanical research, particularly in the field of plant conservation, has demonstrated that the application of ethnosciences enables effective management and partnerships between local people and conservationists without which conservation would be completely ineffective (Cunningham 2001). Indigenous knowledge and

biodiversity are now widely recognised as complementary phenomena essential for human development (Carlson and Maffi 2004).

Therefore questions of key ethnobiological importance that require further qualification are the following:

- 1) Is traditional knowledge being lost due to outmigration from rural areas or lack of interest from young people?
- 2) Are medicinal plants lost due to land use management or overharvesting?
- 3) What is the link between the loss of ethnomedical knowledge and the loss of medicinal plants?

Ethnobiological studies that integrate biological, cultural and linguistic studies address these issues and promote the integration of traditional and indigenous communities in conservation projects (Cunningham 1993). In the domain of medicinal plant use, ethnobotanists from a natural science background have frequently commented on the need for 'cultural' medicinal plant use data to be backed up by biochemical analyses (Elvin-Lewis & Lewis 1995; Heinrich et al. 2005). However, with the advent of biopiracy accusations, others question whether ethnomedical data can be published at all (Alexiades 2004: 290). This further complicates the endeavour to scientifically establish the link between cultural and biological diversity but also to assess the impact of its loss.

Even though the loss of biocultural diversity is a priority in conservation and development agendas, what qualifies as loss is subject to interpretation. Knowledge loss can be considered a problematic term as some anthropologists view loss as a natural phenomenon that leads to cultural adaptation and innovation (Alland 1970; Boyd & Richerson 1985).

In the Pacific, the choices of traditional knowledge elements to be maintained or discarded are conscious choices embedded in post-colonial realities. Linnekin views tradition in the Pacific as a selective representation of the past, that is fashioned in the

present and responsive to contemporary priorities and political agendas (Linnekin 1992: 251). Therefore loss is not a passive process, involuntarily enforced upon indigenous people by the inexorable forces of globalisation. On the contrary, Demian argues that the Suau of Papua New Guinea claim culture loss as a consequence of their attempts to engage with colonial interests, rather than claiming culture loss as a process of dispossession (Demian 2006: 507). In this context, if 'loss' is desired by local people, on what grounds should action plans for its prevention be justified? If we assume that cultural systems, including ethnomedical subsystems, have been in a state of constant change, then probably we cannot even talk about loss at all.

Traditional medical systems were typically viewed as past-oriented but recent studies depict them as dynamic and capable of creative syntheses (Frankel & Lewis 1989a; Nichter 2003). Furthermore, an increasing number of researchers highlight how traditional healers engage with new knowledge and incorporate innovation (Florey & Wolff 1998; Nordstrom 1989: 53). Contrary to common assumptions, recent ethnobiological studies show that traditional botanical medicine is not spatially confined to the old forest nor temporally confined to ancestral knowledge (Sowerwine 2004: 293).

I argue that new knowledge and new plant management techniques are part of the 'traditional parcel'. Traditional environmental knowledge systems can be considered as biocultural systems; that is systems that have been shaped jointly by biological and cultural dynamics (Maffi 2004: 12). How do we measure adaptation and identify biocultural interactions in ethnomedical systems and further document the effect of these processes on plant populations? This thesis contributes to the growing trend in ethnobiology that recognises the dynamic nature of socio-environmental systems by providing evidence of an ethnomedical system that consists of a dynamic knowledge system that adapts to changing social and environmental parameters (chapter 8). Furthermore, it shows that this adaptability contributes to local plant conservation (chapter 5).

Pacific island communities have undergone rapid modernisation with increased outmigration movements to the urban centres (Appleyard & Stahl 1995). In the last decade, studies of cultural construction in the Pacific have highlighted the continuity of new practices with previous customs that are readapted to current needs (Glaskin 2005; Linnekin 1992). Although this process has been identified in social issues such as identity, kinship and land tenure, it has not extended in the domain of plant use and still lies under-represented in the ethnobotanical literature.

A collection of ethnographic research examining traditional medical systems in the Pacific Island states of Samoa, Tonga, Tuvalu, Vanuatu, Solomon Islands, East Futuna, New Zealand, Cook Islands and Tahiti explicitly challenged the indigeneity of Pacific ethnopharmacopoeias and discussed current practices within the context of colonial history and the adaptation of local medical practices (Parsons 1985a). Traditional medicine is viewed by Pacific Islanders as beneficial for the community and particularly for migrant marginalised communities that reside in urban centres (Abel et al. 2001). Rapid socio-economic transition has led to new social and health problems such as teenage suicide and an outbreak of obesity and related lifestyle illnesses. These issues are correlated with ethnomedicine, as Pacific Islands constantly seek new solutions for emerging new problems, utilising the available resources.

While a considerable amount of ethnomedical research has been conducted in the Pacific, it is focused on Papua New Guinea (Eeuwijk 1992; Frankel & Lewis 1989a; Timi 1994). Studies in Polynesian medical ethnobotany are limited and the impact of traditional medical systems on plant population distribution has been poorly addressed.

A review of the literature on Polynesian medical systems shows that there are very close similarities in beliefs about illness causation, treatment and plant use as well as the linguistic terminology associated with illness and healing (for details see comparative table in Appendix 11.14). Polynesian ethnopharmacopoeias such as those of Samoa, Tonga, Tahiti, Hawaii and the Cook Islands consist of secret oral bodies of knowledge that are transmitted to specific people within the extended family group. Furthermore, the

recipes are administered free of charge and consist of fresh plant mixtures as well as counselling on social relations (Cox 1991; Whistler 1992). The reviewed case studies consist of 28 anthropological, ethnobotanical and/or ecological studies of Pacific ethnomedical systems. Each of these disciplinary approaches uses different theories and methodologies and is ultimately produced with different criteria and a different audience in mind. In the next section I will examine anthropological and ecological approaches to ethnomedicine and compare and contrast how different disciplines examine the same research subject: an ethnomedical system.

2.3 Traditional knowledge in literature

Traditional knowledge is rapidly transformed as global trends and modernisation infiltrate every aspect of small, semi-independent communities (Ellen & Harris 2000; Pei 2001). The loss of biodiversity and associated knowledge calls for the urgent need of a truce between disciplinary 'civil wars' as combined inter-disciplinary approaches could offer increased benefits to TEK research and its applications. A plethora of names and combination of names (traditional, indigenous, local, environmental, ecological) have been employed to describe this kind of knowledge. What does this terminological variation reflect? What exactly are these names attempting to describe?

Indigenous knowledge was a term first introduced by Chambers in 1979 and has been an issue of academic debate since its introduction because of the ambiguity of what can be classed as indigene (Sillitoe 1998:223). The politicisation of the term was evident in the International Indigenous Peoples' Summit on Sustainable Development in 1989 where the international bodies representing the interests of indigenous people met. They defined indigenous people in Article 1 of the International Labour Organisation's, Convention 169:

'on account of their descent from populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonisation or the establishment of the present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.'

Sillitoe and Bicker comment that this definition is very different from the one used in development contexts where any community which relies on local resources is regarded as indigenous, irrespective of its historical status (Sillitoe & Bicker 2004: 13).

The wide variety of names describing this knowledge, and the inconsistency of analyses of this knowledge, can be attributed to the conceptual biases that the different theoretical perspectives, particularly in ethnoscience and human ecology, held by the researcher. For example, research bias can arise from a wide range of perspectives that present indigenous knowledge as being synchronic, homogeneous, holistic, homeostatic, formal etc (Zent 2000).

Specifically, Ellen suggests that indigenous knowledge is generally:

'local, orally transmitted, a consequence of practical engagement reinforced by experience, empirical...shared but asymmetrically distributed, largely functional, and embedded in a more encompassing cultural matrix' (Ellen & Harris 2000: 4).

The term indigenous knowledge is now being used interchangeably with local knowledge. Dove questions the validity of the concept of indigenous knowledge by examining the origins of knowledge which can be 'extra-local' (Dove 2002: 349). Does indigenous/local knowledge consist of a body of knowledge embedded in a cultural matrix or is it based on values that are shared by more than one culture despite historical ties to particular localities? Atiuans acquired ethnomedical recipes from Cook Islanders who resided in other islands, from Tahitians and other Pacific Islanders that they met in urban migration centres. Consequently what kind of knowledge qualifies as Atiuan

ethnomedical knowledge in contrast to other Cook Islands or Polynesian ethnomedical knowledge? As I further discuss in chapter 8, this is very hard to define.

Ellen has argued that part of the problem is that the knowledge to be retrieved is empirical knowledge about particular things or groups of things rather than a set or procedures for discovering and modifying the natural world for human benefit (Ellen 1996). I propose that when describing holistic knowledge systems that account for organisms or processes of the natural environment that are embedded in a sociocultural matrix, this knowledge is neither traditional, since it does not belong in the past, it simply has originated from the past; nor environmental, since the environment has inextricably coevolved with human culture. In what ways, then, is TEK different from other kinds of cultural knowledge?

One difference that has been identified is that indigenous knowledge has a segmentary distribution (Ellen & Harris 2000: 9). Segmentary or asymmetric distribution is a characteristic of general cultural knowledge. By the term fragmentary and asymmetric, I mean that knowledge is differentially distributed across the community according to gender, age and social role. Atiuan ethnomedical knowledge is a typical example of asymmetric knowledge distribution, as different families have knowledge to treat only specific illnesses and strict taboos guarded this inter-family knowledge differentiation (chapter 6).

Cultural knowledge is not accessible to everyone and that is a fundamental difference between cultural and scientific knowledge, which is transmitted mainly through formal education systems. Indigenous knowledge is complex and rich as is all applied knowledge. Applied cultural knowledge requires interactive decision-making within a constantly changing environment, which implies a systemic process. Indigenous knowledge is valued because it provides access to powerful processes and structures, for example by enabling individuals to exploit their environment in a sustainable and successful manner. It can therefore be argued to have an operational potential. The International Council for Science defined 'traditional' knowledge as

‘a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment’ (International Council for Science 2002: 3).

While this specific kind of knowledge has been accumulated and transmitted by past generations, one of its most important characteristic, (and one that should not be underestimated), is its dynamic capacity to adapt and change.

Cultural transmission is a process of social reproduction in which the culture’s technological knowledge, behaviour pattern and cosmological beliefs are communicated and acquired (Ruddle 1993). Indigenous knowledge is structured by the tension created by the intersection of different modes of cultural transmission which is highly varied across cultures (Inglis 1993). Hewlett and Cavalli-Sforza make an explicit distinction between vertical and horizontal modes of knowledge transmission. They consider vertical cultural transmission from parent-to-child to be highly conservative and contributing to the maintenance of the *status quo*. On the contrary, a horizontal mode of transmission, in which the transmission is between two individuals irrespective of their relationship, facilitates the transmission of novel trends in popular culture (Hewlett & Cavalli-Sforza 1986).

Atiuans openly claim that ethnomedical knowledge transmission occurs predominantly in a vertical mode, which is associated with a strict authorisation process ensuring its potency. However, when I conducted further research into the healers’ origin of knowledge, a breadth of horizontal knowledge transmission patterns of similar strictness was revealed (chapter 6). However, Atiuans did not classify recipes according to the way knowledge about them was transmitted. Either newly invented or old, Tahitian or Samoan, transmitted from a grandparent or a friend, all recipes belonged to one system, that of *vairākau Maori*, the local ethnomedical system. Describing indigenous knowledge as a system requires some further qualifications for the adoption of this term.

Culture and traditional knowledge are concepts developed and advanced by anthropologists over the past century or so. However, they have recently been used and appropriated in ways never envisioned by anthropologists before (Fischer 2004: 19). Traditional environmental knowledge in particular has been recently appropriated by a wide range of sciences such as conservation biology, geography, medicine, sociology and psychology. In a comprehensive review of the evolution of indigenous knowledge discourse, Zent highlights the diversity of methodological, theoretical and problematic orientations which have contributed to our appreciation of local knowledge but which have also hindered the scientific community from reaching consensus positions on its proper role and significance (Zent 2000: 15). Despite the popularity and appropriation of TEK from a wide range of social and natural sciences its characterisation remains problematic because of the diversity of its application that extends far beyond its traditional use in anthropology and development (Sillitoe 1998).

The use of TEK in ethnobotanical studies is localised in the direct investigation of plant use by local people. However more recently, ethnobotany has moved its focus from the use of plants to the relationship between people and plants which includes use, cognition and ecology (Davidson-Hunt 2000: 3). Emerging textbooks (Shultes & Reis 1995, Cotton 1996) and methods manuals (Alexiades 1996; Martin 1995) have contributed to the development of a scientific framework for describing and analysing TEK beyond cataloguing plant uses.

The characterisation of TEK as 'scientific' or 'non-scientific' has been an issue of considerable debate and researchers are still trying to understand and define what is commonly regarded as a special kind of knowledge (Agrawal 1995). Ethnobiologists in the quest to defend indigenous people's rights and by consequence their knowledge have rushed to prove that TEK is scientific because it has a hierarchical structure comparable to that of 'scientific knowledge' (for a review of debates see Nazarea 1999). Concerning research efforts that seek to disambiguate truths and belief systems, Fischer argues that the similarity between indigenous knowledge and scientific knowledge lies not in their structure but in their power to provide access to powerful processes and structures. He

argues that a knowledge of spirits cannot be shown to be true based on most empirical knowledge of the world. But a knowledge of spirits can be operative and powerful if it provides access to powerful things, powerful people or powerful social institutions. Scientific knowledge provides similar privileged access to powerful people and powerful institutions (Fischer 2004: 24).

Should traditional knowledge then only be studied within its ecological setting, meaning as a subsystem of a wider ecosystem? The term *ethnoecology*, rather than *ethnobotany* or *ethnobiology*, refers to a very specific study of knowledge and behaviour associated with interconnected biological entities. Conklin first introduced the term *ethnoecology* in 1954. The prefix *ethno-* came to denote not merely a localised application of a branch of study but also a serious attempt toward understanding of a realm of experience (Nazarea 1999: 1). Martin defines *ethnoecology* as a discipline that encompasses *ethnobiology*, that studies ‘local people’s interaction with the natural environment’ (Martin 1995: xx). A decade later Ellen defines *ethnobiology* as:

‘the study of how people of all, and any, cultural tradition interpret, conceptualise, represent, cope with, utilise, and generally manage their knowledge of those domains of environmental experience which encompass living organisms, and whose scientific study we demarcate as botany, zoology, and ecology’ (Ellen 2006b: 3).

These two definitions illustrate a part of the paradigm shift in the science of *ethnobiology* during the last decade. ‘Local people’ are no longer seen as a special kind of people and ‘the natural environment’ is no longer seen as exclusively natural. Academic research in small semi-independent communities has investigated the effectiveness of TEK in the practical use of natural resources, and *ethnobiologists* have demonstrated that social and environmental systems are interconnected and forests have been historically modified by humans who have contributed this way to their diversity (Balee 1954; Berkes 1999; Berkes & Folke 2001; Zent & Zent 2004).

Berlin argues that traditional knowledge is a reflection of how people organise their knowledge of the physical universe (Berlin 1992) and this can be established by developing ethnotaxonomies that reflect indigenous classification systems. However, Ellen argues that the interpretation of those classifications are an outcome of the theoretical position that researchers take; structuralist, ethnoscientific or utilitarian paradigms can each lead to classificatory bias (Ellen 2006c). An example of a classificatory bias is the misperception that plants are used as food or medicine when quite regularly they are used simultaneously.

Focusing on the classification of plants alone can lead to other important omissions. Etkin notes that ethnobotanists frequently omit the preparation of plants when describing plant consumption, when in fact preparation can have direct effects on reducing the toxicity of a plant or transform its nutrient content. Scientific but reductive co-evolution models have been adopted that assume that the extent of the use of a plant is directly proportional to its nutritional or medicinal value (Etkin 1998).

I would like to advocate the relevance of another pragmatic value, which is the social value of plant use. As I will demonstrate in chapter 6, Atiuans do not use medicinal plants only because they have a direct medicinal value. They also use them because they are associated with social, genealogical and spiritual values of efficacy. These additional motivations materially impact actual aspects of life such as health-seeking behaviour (chapter 8).

Consequently, a behavioural account of other people's environmental lore and practices cannot adequately address development issues since it does not necessarily account for in-depth culturally specific analyses like symbolic interpretations (Sillitoe 1998). Practices may have latent meanings that cannot be understood without a fuller understanding of the culture as a whole (International Council for Science 2002).

'Culture' has been defined as a system of socially transmitted behaviour patterns that serve to relate human communities to their ecological settings (Geertz 1969: 203).

Culture, then, forms an internal model of reality that helps the individual understand and order the world; it is a working model (Keesing 1974). Culture is a system in which complex domains such as ecological, demographic, ideational and other subsystems are interconnected.

Despite the huge variation, the anthropological description of culture within a specific group is always abstract and composite, an idealised body of competence differentially distributed in a population (Keesing 1974). Sociocultural systems are patterns of life of communities or enactments of ideational designs-for-living. Fischer argues that cultures can be studied as systems of knowledge that account for the ideational codes lying behind the realm of observable events (Fischer 2002).

Each systemic culture pattern contains coherent subsystems of knowledge. Each system has an associated semantic domain, which is an organised set of words. This notion of the system is very similar to that of schemata used in cognitive anthropology (D'Andrade 1995). It is an efficient way of compacting and storing information without inhibiting its quick access. More specifically, I consider schemata to be equivalent to the subsystems described earlier and frames (by frames I mean conceptual abstractions using both schemata and rules) are the equivalent of the system. A schema serves as a prototype; meaning a stereotypic, or generic representation of a concept that serves as a standard for evaluating the goodness-of-fit. For example, the prototype of an ethnomedical recipe in the Cook Islands is a recipe that uses fresh plants, in multiples of three, prepared using a mortar and pestle and administered by an authorised healer.

The concept of a prototype can therefore be used to describe a typical example of a folk classification domain. A useful concept that applies to folk classification domains is that of schemata. Schemata are both data structures and data processors and they can be universal, idiosyncratic or cultural (Casson 1983: 429). They are the cognitive building blocks that mediate between internal ideational models and external modes of manifestation. Taking these concepts in mind, in my data analysis I used schemata as cognitive apparatus in order to describe the complex knowledge subsystems that

constitute part of ethnomedical knowledge. In the case of traditional medical recipes, innovation in plant use was incorporated in existing ethnomedical schemata and consequently transmitted in a similar fashion to other unmodified traditional recipes. In this case it would be appropriate to conceptualise knowledge transmission not as a serial process but as an interaction of interlocked subsystems.

Linear sentential models of the brain cannot account for the speed and efficiency with which we perform daily tasks and cope with familiar situations. The problem of understanding indigenous knowledge systems emerges from employing methodological approaches that see the activity as a serial process of analysis carried on along a single line by a single processor (Bloch 1990: 190). Popular techniques such as rapid rural appraisal have been criticised to be quick fixes that are not able to describe the complexity of local practices from either a contemporary or evolutionary perspective (Ellen 1996). My perspective when analysing traditional knowledge systems, is to view knowledge systems such as the ethnomedical system of Atiu, composed of interlocked subsystems that encompass constantly changing theory and practice. Examples of these systems are religion, the modes of subsistence, medicine, kinship (chapter 3) and non-human systems such as plants and animals in the environment (chapter 4 and 5).

In her doctoral thesis on Ovambo healing in Angola, Davies argues that one area of the medical system cannot be sufficiently understood without reference to other parts because a fundamental homology exists between them (Davies 1994). It is for this reason that elements of the ethnomedical knowledge system are discussed in their 'homologous' role in other local knowledge systems. For example the role of dreaming as a revelation of ethnomedical recipes is contextualized in the wider role of dreaming in other domains of Atiuan life (chapter 6).

2.4 Anthropological and ecological approaches to ethnomedicine

The term 'ethnomedicine' was first used in 1968 by Hughes to describe

'those beliefs and practices relating to disease which are the products of indigenous cultural development and are not explicitly derived from the conceptual framework of modern medicine' (Rubel & Hass 1996: 113).

Ideas and behaviour related to sickness and healing are a significant part of every culture. There is a functional integration of the components of health care institutions within society's cultural matrix and its social organisation and political system. The Cartesian dualism of the mind and the body is absent from most non-western medical systems. The main causes of illness in the non-industrialised world range from sorcery, soul loss, and breach of taboo to the intrusion by a disease object or spirit (Murdock 1980). Health-seeking behaviour is very varied as well. It can be illness-specific where a wide variety of therapies are sought for one illness, or health provider-specific where assistance is sought from one type of resources for many illnesses (Lock & Nichter 2003).

Ethnomedicine not only examines the cultural context in which an illness is analysed but also provides an understanding of how cultures construct illness (Helman 2001). The linkage between medical knowledge and social context becomes considerably more complicated in a medically pluralistic society. There is a dynamic process by which patients view treatment efficacy and accept, reject and adapt information provided by health care providers (Kleinman 1980).

In Atiu, health-seeking behaviour and beliefs of illness causation largely affected patterns of medicinal plant use, as plants were harvested in response to specific illness events (chapter 6). This case study serves as an example where a belief system (concepts of illness and health) directly affects an ecological system (medicinal plant populations)

whose services in turn determine whether this belief system will instantiate and turn into practice. If medicinal plants are not available, then they cannot be used for patients' treatments. The power of ethnobotanical research lies precisely in this domain: the interface between cultural and biological systems. However, the weight researchers give to contributions of either system depends on their disciplinary inclinations.

As ethnobotany becomes increasingly established as a science, ethnobotanical projects increase in number and geographic breadth. Publications, conferences and project reports create an arena of lively debate where anthropological interpretations of plant use are juxtaposed against the biological interpretations. Anthropological research, through prolonged fieldwork and linguistic competence, aims to present the 'insiders' perspective of natural resource management whereas biological research presents data that have been processed, tabulated and coded to fit a scientific model of credible and replicable research.

Medical ethnobotany as a strand of medical ethnobiology is a multidisciplinary study that encompasses western/botanical and ethnotaxonomic classifications (Berlin 1992), assessments of how medicinal plants are perceived and used in changing sociocultural contexts (Alexiades 1999, Milliken 1997), constituent analyses and investigations of pharmacologic activities (Heinrich et al. 2005), ecological effects of medicinal plant uses (Anderson et al. 2005) and examinations of the physiologic or clinical impact of plant use on human health (Etkin 1988b). Assessing medicinal plant use as part of the treatment of a health condition requires further considerations that need to account not only for the classification of illness but for the classification of medicinal properties of plants as well (Berlin & Berlin 1996). In this diverse academic arena, Ellen has been a keen advocate that plants have to be understood not only according to their cultural uses but as part of the ecosystem as well using a broad culturally-contextualised approach (Ellen 1996: 457). Furthermore, a further insight into plant preparation and administration is essential, as it can provide an understanding of the ritual or other signed elements of healing and treatment efficacy as a result of the combination of different plants.

Efficacy is an indicator of some combination of symptom diminution, resolution of discomfort, or restoration of health. Medicinal and other uses of plants can be considered effective if they meet the culturally defined expectations of the patient, the curer and social group. Even though efficacy is commonly attributed directly to the active compounds of medicinal plants (Elvin-Lewis & Lewis 1995), Etkin argues that efficacy is also culturally constructed and that there are specific criteria that determine how or when some prevention or treatment works and that differs considerably among populations (Etkin 1988b). She further highlights that limited plant use interpretation, lack of clear distinction between emic and etic categories of efficacy, lack of a broad focus on plant selection, little account for multiple uses of plants and a poor understanding of bodily functions constitute some problems of medical ethnobotanical studies (ibid.). Generally, research in traditional medicine has been conducted either by medical anthropologists or botanists, each school using either illness or plants as a respective focal point of investigation (figure 5).

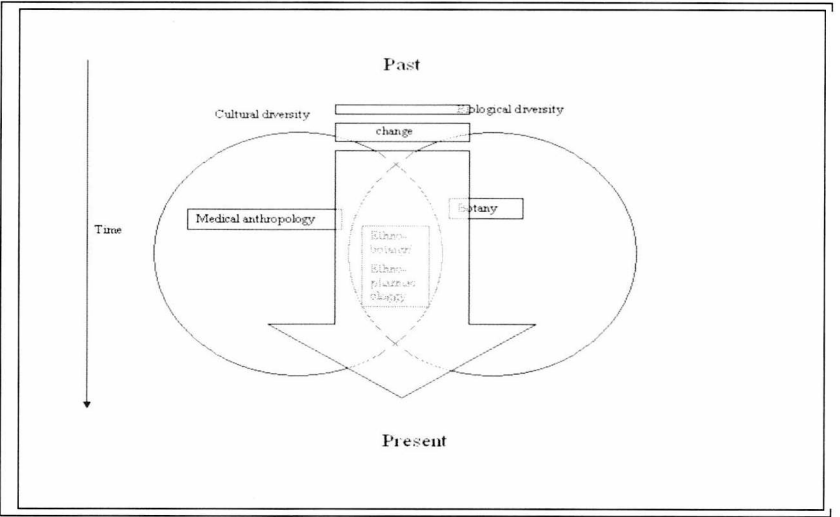


Figure 5: Conceptual representation of interdisciplinary approaches to ethnomedicine

Practices such as medicinal plant use can mobilise extremely complex knowledge structures and therefore a synthetic analysis of illness causation and plant use is necessary. However, an interdisciplinary study requires significantly more time and

resources. Starting with anthropological approaches to ethnomedicine, medical anthropology has provided very important insights in cultural attitudes towards illness and health

Specifically, medical anthropology examines

‘how people in different cultures and social groups explain the causes of ill health, the types of treatment they believe in, and to whom they turn if they do get ill’ (Helman 2001: 1).

Medical anthropologists have traditionally studied ethnomedical systems as a function of symbolic concepts of illness and treatment and spirit causation of illness, focusing on the illness causation and treatment as a unit of analysis (Csordas 1996; Landy 1977). For example, Murdock compiled a world survey of theories of illness, where he analysed a wide range of medical systems from different regions and systematically organised their theories of disease causation (Murdock 1980). In a similar fashion Eeuwijk’s work in Papua New Guinea looked at traditional medical practices as symbolic structures known to priests who had the ability to interpret the world of the spirits (Eeuwijk 1992). In a recent review of the contributions of medical ethnobiology to medical anthropology, Waldstein and Adams argue that medical anthropology has traditionally focused on the symbolic role of traditional medicine in illness treatment, ignoring more practical means of healing like the use of plants; and they provide a comprehensive literature review to support this argument (Waldstein & Adams 2006). I support Waldstein and Adams’ conclusions, however instead of advocating a limitation in the breadth of medical anthropological research I would like to acknowledge the depth that this body of research has achieved in terms of ‘getting inside people’s heads’ and contextualising the meaning of local health practices, especially of those practices that have been commonly regarded by outsiders as ineffective and even harmful to human health.

In terms of ‘getting inside people’s heads’ anthropologists have the unique benefit of participant observation during prolonged fieldwork (Bernard 1994; Watson 1999).

During this process, anthropologists are able to situate local practices and uses of plants within a wider cosmological belief system. They can check, recheck and re-observe their data during the course of their fieldwork, and in this way validate their data. However, anthropological research is non-replicable and it is an experience unique to the researcher.

Data is ideally collected in the local language and linguistic terms are used to validate the data. Presenting direct quotations from the informants is considered evidence for what people actually said, supporting the claims the researcher makes. According to Biggs, anthropological research must carry the conviction that conclusions are based on observed data and an understanding of the distinction between what people say they do and what they actually do (Biggs 1985: 110-112). Consequently, linguistic competence and participant observation are considered as primary tools to tap into local worldviews.

A common misunderstanding is that fieldwork and participant observation is just 'hanging out with the locals', a process that is openly accessible and does not require any particular skills. On the contrary, ethnographic fieldwork is quite difficult, risky, unpredictable and certainly not open access. Sillitoe and Bicker argue that it is not just a question of the time it takes to learn language, cultural repertoire, social norms and so on, but also the investment needed to win the trust and the confidence of people who frequently have reason to be extremely suspicious of foreigners and their intentions (Sillitoe & Bicker 2004: 4). Less fortunate fieldworkers have faced deportation, public humiliation and official accusations of espionage and biopiracy.

In contrast, biologists take plant voucher specimens, record as accurately as possible biodiversity by transects and quadrats and statistically test their data for significance in order to validate them (McClatchey et al. 2004; Salick 1995). Biological research is in principle replicable, producing 'scientific' results through hypothesis testing and statistical significance verification. Ethnobotanical studies that do not have a strong quantitative element have been criticised for lack of rigour and scientific credibility by advocates of quantitative research (Phillips & Gentry 1993: 16). Ecologically informed

ethnobotanical research is oriented towards the conservation of medicinal plants and for arguments in the field of biological sciences statistical significance is an essential prerequisite.

Ernest Haeckel first introduced the term 'ecology' in 1869 and it was used to denote the study of the interactions between organisms and their environment. A more informative definition was suggested by Krebs in 1972 defining ecology as 'the scientific study of the interactions that determine the distribution and abundance of organisms' (Begon et al. 1996: x). The disciplinary interest of ecologists in ethnomedicine is identifying the factors that affect the distribution and abundance of medicinal plants. Consequently, ecologists look at ethnomedical systems as functions of plant properties and/or plant distribution, focusing on plants as a unit of analysis and the interactions with their environment (Anderson et al. 2005; Sumner 2000; Ticktin 2004).

A typical example is the work of Boulos who produced a very detailed inventory of medicinal plants of North Africa. This inventory consists only of a very extensive list of plants their description and medicinal properties (Boulos 1983). Similarly, Whistler through short periods of fieldwork and rigorous botanical identification in *Polynesian Herbal Medicine* gives a brief account of ethnomedical practices, using plants as his analytical focal point (Whistler 1992). This type of research directly contributes to the conservation of threatened medicinal plant species.

2.5 Current issues in medicinal plant conservation

The erosion of native ethnobotanical knowledge and use is nowhere more rapid than in the realm of medicinal plants that affect bodily functions (Schultes & Reis 1995; Sumner 2000). Two global, inexorable processes threaten medicinal plant existence and knowledge: the disappearance of tropical forests and other natural vegetation and the rapid change of local subsistence and medical traditions (Padoch et al. 1991). This loss of

knowledge and plants is considered to have an unprecedented impact on human health and welfare.

According to the World Health Organisation, 80% of the people in the developing world rely on traditional medicine to meet their medical needs (Farnsworth & Soejarto 1991). Yet many medicinal plants face extinction or severe genetic loss. For most of the endangered medicinal plant species, no conservation action has been taken. A complete inventory of medicinal plants has not been produced for most countries (Akerle et al. 1991). This issue has been directly addressed on an international level by IUCN (International Union for the Conservation of Nature) in 1994 when the Species Survival Commission formed the Medicinal Plant Specialist Group (Leaman 2001: 4). This group is particularly devoted to addressing issues concerning threatened medicinal plant species and promoting these issues on an international level.

In the developing world, plants are very widely used in traditional medical systems. About half of the world's medicinal compounds are still derived from plants. Furthermore, plants have been particularly useful in modern medicine as sources of direct therapeutic agents, starting points for the elaboration of semi-synthetic compounds, models for new synthetic compounds, and as taxonomic markers for the discovery of new compounds (Plotkin 1991). The latter argument is frequently used to persuade countries in the developed world to fund conservation projects in the tropics as tropical forest loss is perceived to result in the loss of potentially economically very profitable resources that could be exploited by multinational companies.

As the growing demand for herbs, phytotherapies and naturally derived pharmaceuticals increases, both traditional cultures and their biological resources become increasingly vulnerable to the pressures of market economies. Even though some medicinal plant species are very prolific and others are cultivated, the supply of medicinal plants is being depleted in many tropical regions due to habitat destruction and overharvesting (Sheldon et al. 1997). This increased demand from international markets raises the need for medicinal plant conservation strategies.

In the face of ecological disasters and climate change, biodiversity recording and database cataloguing have become issues of international importance. For sessile populations such as those of plants, rarity is one of the most important status determinants that are used to inform sustainable harvest policies. Assessing plant rarity is not a straight-forward procedure and rarity indices vary according to the sampling scale and techniques used (Hartley & Kunin 2003: 1559). Sampling plant diversity in foreign, previously unmonitored environments is particularly challenging, and relying strictly on plant counts can contribute to distorted population estimates. For the task of defining identification and abundance of plant species, local people have been frequently consulted for their increasingly recognised 'traditional knowledge' (UNCTAD 2000). Taking these issues in mind, I investigated the effects of ethnomedical practices on plant populations in Atiu. I recorded plant diversity, incorporating local environmental knowledge using participatory methods. I found this method particularly beneficial for the documentation of rare plant populations that I would otherwise miss using standard habitat surveying techniques alone (for example such as those described in Elzing et al. 2001).

In our era of rapid social and environmental change, sustainable use of natural resources is seen as the only way to prevent plant extinctions from environmental degradation and over-harvesting. Sustainable harvest policies are very often externally imposed strategies, which ignore the scientific basis of local practices and the long-term reasons for population declines (Balee 1998). Medicinal plants are frequently used in large-scale initiatives for conservation in the tropics because their extinction would lead not only to the loss of valuable biodiversity and associated indigenous knowledge but also to local health insecurity (Hamilton 2003: 5).

The case study of Atiu is an example of traditional medical practices that incorporate conservation. Similar cases, although limited in number, have been reported in Zimbabwe, Nigeria, Samoa and Mexico (Balick & Cox 1996; Byers et al. 2001; Etkin 1998; Finerman & Sackett 2003). Social scientists argue that what threatens medicinal plant conservation is not traditional practices but commercialisation and land

development. Ethnobiological research has explicitly shown that unsustainable use is often linked to exogenous sources such as migration and rapid social and economic change (Maffi 2004: 11). However, these allegations do not undermine the urgent need for medicinal plant conservation strategies, as accelerating loss of biological diversity leads to a breakdown of ecological processes and life support systems. Even though extinction is a natural process, and the 600 million-year fossil record shows a pattern of continuous evolution and extinction, the present rate of species extinction is considered to be 100 times greater than the natural 'background' rate and humans are accused of causing the first major extraction of global plant diversity since the origin of life (Sumner 2000: 182). In this context, are medicinal plants as a group particularly prone to extinction?

It has been estimated that 25,000 plant species are being used in traditional medicines worldwide (Heywood & Davis 1995: 1). Rural communities in most of the world harvest medicinal plants from home gardens, forests, alpine pastures and other habitats. Even though most of these remedies are harvested in small numbers, supplies of wild plants are becoming limited by deforestation from logging and conversion to plantations (Hamilton 2003: 7). Furthermore, plant sources for the expanding international market of medicinal plants are harvested in increasing volumes. Of the 21,000 plant species listed on CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), 14 species are directly threatened because of their medicinal plant use and 230 of the listed species have medicinal uses (Leaman 2001: 9).

Even though primary forests are sources of medicinal plants, people often use plants from other more managed, easily accessible habitats such as homegardens. It is currently commented upon that home gardens have been ignored and recent literature demonstrates their plural social and ecological value. Over the last two decades, homegardens have received moderate attention but almost exclusively from the field of agroforestry.

In 1985, Brownrigg, published a literature review on the value of homegardens in development with several hundreds of references (Brownrigg, 1985). In 1990, the United

Nations University Press published *Tropical Home Gardens* based on the proceedings the international homegardens conference in Bandung, Indonesia (Lauder and Brazil 1990). After a quiet decade the homegardens returned to the focus of attention. In 2004, the Livelihood Support Programme of the Food and Agriculture Organisation of the United Nations published a report aiming to incorporate homegardens in a strategy to alleviate food insecurity and reduce poverty (Mitchel and Hanstad, 2004). Finally in 2004, Kumar and Nair published an article in the journal *Agroforestry Systems* reviewing the existing homegarden literature since 1990 and suggesting ways forward (Kumar & Nair 2004).

Traditional agricultural systems commonly exhibit great plant diversity. Medicinal plants grow in a wide variety of environments and a wide variety of people know about them (Padoch et al. 1991). Medicinal plants tend to be common, perennial, widespread and easily recognisable. Foods and medicines tend to come from plants with different growth characters (i.e. annual/perennial). Perennial plants are more likely to contain anti-fungal, anti-viral, insecticidal or herbicidal chemicals than annuals, and it is these chemicals that make plants useful as medicines (Moerman 1998; Sheldon et al. 1997). In a biological study of medicinal plant use among the Dao in Vietnam, On *et al.* concluded that while there was a substantial medicinal plant resource base for the local people, much of it was associated with species occupying modified, open-canopy habitats and plantations typically at lower elevations (On et al. 2001: 300). However, these managed habitats are usually excluded from conservation areas such as parks and protected areas due to their 'disturbance'.

Creating parks and protected areas has often been viewed as the main land management strategy for conserving biological diversity. However, interest in conserving species outside protected areas is growing since protected areas have a very limited size and do not suffice to conserve most biodiversity (Berkes & Davidson-Hunt 2006). Yet there is increasing recognition that conservation should target whole ecological communities, adopting an ecosystem approach (Convention on Biological Diversity 1998). Linking conservation and economic development has been considered as one strategy to motivate

conservation outside of protected areas. This strategy is based on the view that material values and direct economic benefits are required to motivate conservation (Byers et al. 2001: 188). The concept of using extractive reserves as a tool for conservation has received a lot of attention. In large development projects in Belize, Madagascar and Peru medicinal plants have been promoted as flagship species to assist conservation (Akerele et al. 1991; Sheldon et al. 1997).

The problem with these approaches to conservation is that even though there is an established demand, the supply of medicinal plants has not been established. Harvest rates are dependent not only on the medicinal plant distribution but also on operating land tenure systems that grant access to the land and its resources. In the Cook Islands, like most of Polynesia land is communally owned by different extended families (Crocombe 1971a), and in the case of Atiu, medicinal plant harvest is limited to family-owned land (chapter 5). Transgression taboos such as illness caused by ancestral spirits ensured that people respected land boundaries and deterred trespassing (chapter 6). The case of Atiu provides further evidence that traditional knowledge serves as an important determinant of medicinal plant use, which consequently can be used to provide a deeper understanding of the sociocultural factors that drive medicinal harvest and/or conservation. In order to address these issues fieldwork was planned with the following aims and objectives in mind.

2.6 *Aims, objectives and research methods*

The aim of this research project is to identify the ecological and social factors that influence the contemporary use of medicinal plants, with a view to understanding changing patterns of use and conservation implications.

To achieve this proposed aim, I assessed (chapter 6):

1. the distribution of medicinal plant knowledge and transmission patterns
2. the current use of medicinal plants

and situated knowledge and practice by assessing ecologically (chapter 4 and 5):

3. the biotopes that host medicinal plant communities
4. the diversity and abundance of medicinal plants in relation to the local flora

and culturally (chapter 7 and 8):

5. the perception of illness and health
6. health-seeking behaviour within a medically pluralistic health care system

An interdisciplinary approach was taken to address the problem of cultural contextualisation of natural resource use. A combined methodology from the disciplines of ethnobotany, medical anthropology and ecology was employed in order to gain an in-depth understanding of medicinal plant use and relate it to local medical beliefs and the natural environment. More specifically, I focused both illness and plants as units of analysis and the transmission of traditional medical and plant knowledge. In the next section I will provide a detailed account of methods I used.

2.6.1 Approach to fieldwork

Interdisciplinarity and triangulation

The choice of methods was designed to access and assess people's knowledge and activities from many vantage points, ranging from surviving myths and stories, day-to-day activities, formal and informal interviews, habitat surveys and questionnaires. In the first months of my fieldwork I tested and modified my proposed methodology according to local codes of conduct.

Various ethnographic methods were initially discussed with key informants who expressed an interest in being directly involved in my project. These initial discussions were important in ensuring that the language, concepts and mode of expression employed were validated in the local context.

I adapted my methodology not only to the fieldwork location but also to the people's daily life activities. The four main principles upon which methodological revisions were made were:

4. the importance of cultivation and the fear of the wilderness
5. the highly stratified social structure
6. the privacy concerning health matters
7. the suspicion concerning ethnomedical inquiries

Consequently, forest transects were replaced with homegarden surveys as Atiuan identified homegardens as spaces of increased importance as medicinal plant repositories. Evening interviews in locations other than people's home were avoided, as people were cautious of malevolent spirit activity. Furthermore, interviews on medicinal plant recipes were conducted only with recipe owners and not with people who just knew of them. People who were aware of others people's recipes were not at ease talking about this subject as they were cautious of *tapu* restrictions. Consequently, suitable candidates who were authorised to talk about specific subjects were sought.

Bearing in mind the complexities of sociocultural systems, in order to investigate change I aimed to follow the principles of 'event ecology'. Event ecology focuses on the environmental events or changes that researchers want to explain and then works backwards in time and outwards in space so as to enable researchers to construct chains of causes and effects leading to those events or changes (Vayda & Walters 1999: 169). Event ecology has been used to look at changes in subsistence, investigating events such as the expansion of aquaculture. Nevertheless, I found this concept particularly useful to look at changes in medical systems, investigating illness treatment as an event and

starting to work backward in time and outward in space in order to be able to construct chains of causes and effects that lead to the contemporary responses to illness. This approach allowed me to attribute these causes by exploring 'without a priori judgements' the social, economic, political or even environmental changes, in the case of the use of medicinal plants as possible causes of change in illness treatment and knowledge transmission. Having established good interpersonal relationships with specific households I researched illness episodes as events and explored them 'backwards in time and outwards in space'. Illness treatment was a process involving many members of the patient's extended family, so I explored how social networks operate in the event of an illness episode. Specifically, when I researched illness treatment episodes I traced back the origin of knowledge and plants and tried to identify: where is the knowledge coming from? Where are the plants coming from? And finally why did patients choose to use this particular treatment?

Selecting informants & adapting methodologies

Selecting informants and sampling was purposive and based on the distribution patterns of environmental and medical knowledge within Atiu's sociocultural structure. I used snowball sampling to identify important informants. In snowball sampling, the researcher locates one or more key individuals and asks them to name others who could be likely candidates for the research. Snowball sampling is used in studies of social networks and also in studies of difficult-to-find populations (Bernard 2002: 185). For example, some of the healers interviewed were identified in the ethnoepidemiological surveys by the patients. Snowball sampling was used to locate key individuals who possessed specialised medicinal plant knowledge. Snowball sampling enabled me to find suitable individuals to interview through informants' personal connections. Furthermore, it allowed me to detect exogenous medicinal plant information flow such as from inter-group and inter-island knowledge sources (chapter 8).

Through observation and interviews, I was able to look at the size of people's network, the services they offer each other as well as gender, age and kinship relations. This allowed me to identify 'typical' profiles of knowledge transmission, illness causation and plant harvest. These profiles were then related to aspects of social life such as personal relationships, social support and types of help-seeking behaviour that members use regarding their health (chapter 7). This analysis enabled me to find bridges between social organisation and plant use and further investigate the flow of medical knowledge especially between the resident population and the diaspora, which was proved to be a very important element in ethnomedical knowledge transmission on Atiu (see chapter 8).

Each research topic was first approached using exploratory participatory methods in order to establish a basic understanding of cultural domains and cognitive patterns. Then I employed formal methods that aimed at testing models concerning the ways that these patterns influenced actual behaviour. Concerning data analysis, information on local people's perceptions about medical issues and the environment was analysed qualitatively. The supportive data from ethnographic and ecological methods was quantified and tabulated to demonstrate prevalence and significance.

Language

Most Atiuans, particularly the ones less than 50 years of age are effectively bilingual in Cook Islands Maori (employing some Atiuan dialect) and English. Most Atiuans converse daily in Cook Islands Maori, interspersed with some English phrases. Newspapers, signs and other written material are often a mix of English and Cook Islands Maori. Language barriers were not a major issue in this research, however it was very clear to me from the initial stages of fieldwork that not being able to speak Maori would be a major obstacle in communicating with the people and integrating in the community. Within the first weeks of my stay on Atiu, it was repeatedly stressed to me: 'You cannot stay for nine months on Atiu and not understand our language.' I studied two Maori language-learning books that I had purchased from Rarotonga (Tongia 1991; Tuperu Carpenter & Beaumont 1995). In two months, I was able to hold basic conversations in

Cook Islands Maori and progressively become more competent. Once rapport was established most of the interviews were conducted partly in Maori and partly in English. In a few cases where I interviewed people over 70 years of age who did not have any knowledge of English I asked one of their younger relatives to assist in the translation. I found that language learning was one of the most important channels of communication between the local community and myself.

2.6.2 Positioning the participants and the researcher

All participants contributed information voluntarily. They were approached formally or informally and asked if they would like to be interviewed. During the beginning of each interview, I explained my academic position and the scope of my study. In the interviews concerning ethnomedical recipes, concerns were expressed from the participants as to whether the recorded information would be commercialised and used in the development of new drugs. I assured them that the commodification of their knowledge was not the scope of my thesis and that the details of their recipes would not be published in any way that could lead to an independent bio-prospecting initiative. Participants' information was often in opposition and sometimes contradictory. All different vantage points were considered worthy of research efforts and taken into account. All information was treated with strict confidentiality in order to avoid causing tensions in the community.

Anthropologists have repeatedly emphasised that ethnography and qualitative research is the subjective experiences and interpretations of the researcher. The emphasis of the employed methodological design was particularly tailored to decrease the level of subjectivity by shifting the design emphasis from limited but in-depth research to a broader and more holistic analysis of the different contexts under which knowledge was transmitted and plants were used.

Throughout my fieldwork, I made very conscious efforts to integrate into the local community and assume multiple roles not only as a researcher but also as a member of my household and as a volunteer teacher in the local high school. Furthermore, I assisted and prepared food for many community events and also tutored senior pupils with their college assignments.

2.6.3 Access and ethics

A one-year research permit was granted from the Cook Islands government and I was assigned a government official as my research associate. In Rarotonga I worked with Ngatuaine Maui from the Ministry of Culture. When I decided to conduct my fieldwork on Atiu she contacted the island mayor. A committee of local government officials and traditional chiefs met and judged the approval for my visit. The Environment Officer, Kau Henry was appointed as my local associate. On arrival on Atiu, I visited the mayor and the island secretary and introduced myself and the topic of my research. I explained the broad ethnobotanical focus of my thesis and I clarified the absence of bioprospecting motives. Once I was granted permission to conduct my research the Environment Officer contacted the Island Councillors and progressively I started the formal part of the research.

Before departing for my fieldwork I had read, understood and committed to adopt the Ethical Guidelines for Good Research Practice of the Association of Social Anthropologists of the UK and the Commonwealth (Association of Social Anthropologists of the Commonwealth 1999) and the International Society for Ethnobiology, Code of Ethics (International Society of Ethnobiology 1998). I tried to minimise disturbances both to the informants and to the informants relationships with their social environment by ensuring the confidentiality and anonymity aspirations of my informants.

I requested the informed consent of my informants continuously throughout my research. Furthermore where granted appropriate, I shared the recorded information with my informants for consultation and feedback. When I used technical data-gathering devices such as audio/visual recorders and photographic records, those recorded were made aware of the capacities of such devices and were free to reject their use. Local people were encouraged to actively participate in the planning and execution of the research project. For example, I designed my questionnaires in consultation with local people who helped in the translation of my questions from English into Maori. Young people particularly enjoyed working with me using the laptop as a medium. I found that technological gadgets captured the attention the people I worked with in a very positive way.

Investigating the use of medicinal and other useful plants enabled me to understand the relationship of people with natural resources. I recognised and treated local people as the guardians of these ecosystems. The protection of the intellectual property of the people of Atiu was a primary consideration during my research and throughout my writing up period. The design of the research and its deliverables such as this thesis, were adjusted with the protection of the intellectual property rights of my informants, and particularly of the owners of specialised ethnomedical recipes in mind. In order to ensure that the intellectual property rights of my informants are protected, I have not presented the collected information in any format that could lead to the inappropriate use and unauthorised commodification of this knowledge. More specifically, information about the particulars of remedies such as doses and preparation techniques are omitted. Where such information is mentioned, it is information that already belongs to the public domain.

2.6.4 Archival research & biodiversity reports

I initially spent two and a half months in Rarotonga where I met with staff from the Cook Islands Natural Heritage Project (CINHP) and discussed current biodiversity issues in the

Cook Islands, collated anthropological and botanical information from Cook Island Natural Heritage Project's database and received training in botanical identification of the local flora. I also met with officials from the Cook Islands government to discuss desired outputs and contributions to the implementation of the Convention on Biological Diversity. I reviewed local archives, library references and government reports on the general geographical, political, religious, demographic and economic characteristics of the Cook Islands.

Further bibliographic material was acquired from Templeman Library at the University of Kent, Haddon Library at the University of Cambridge, the Centre for Anthropology at the British Museum, the Economic Botany library at the Royal Botanic Gardens Kew, the library of the National Tropical Botanical Gardens of Hawai'i in Kauai, the National Museum and Library in Rarotonga and the library of the University of the South Pacific in Rarotonga.

2.6.5 Participant observation

Participant observation is considered the foundation of cultural anthropology and the primary method for gathering data on people's activities (Bernard 2002: 322). I used participant observation during my fieldwork which allowed me to assess the wider role of plants in everyday life and special occasions. I attended formal celebrations such as church hall openings, funerals, 21st birthday celebrations and unveilings as well as observed and participated in everyday island life. I participated in feeding pigs, weeding plantations, harvesting medicinal plants from the *makatea*, collecting shellfish from the reef, making traditional crafts such as brooms, baskets, painting pareus and many more. Throughout all these tasks I noted both the operation of social networks and also the use and role of plants.

Participant observation in certain activities proved to be more difficult than others. Particular habitats such as the taro swamp are considered a male domain and the *makatea* is feared because it is considered an area of ancestral spirit activity. The presence of a female foreigner in these habitats was initially viewed with discontent. During a drinking social occasion a middle-aged man I had never seen before told me:

‘I saw you today in the taro swamp. You were with *pāpā* and his family. When I saw you weeding their plantation, I hid so you couldn’t see me. I was ashamed, a *papa’ā* woman weeding a taro patch? It is not right. We must show respect to you, not make you work. I was so ashamed I left the taro swamp.’

The disapproval of men towards women working in the plantations extended to local women as well. The relationship between gender, land and shame will be further discussed in chapter 4. On the contrary, activities that local people openly approved were the preparation of ‘European foods’ such as cakes and pizzas that I frequently prepared for the workers of the church hall, the *Tutaka*-the women’s household inspection group, prayer meetings and other social events.

2.6.6 Interviews

Household surveys

Before making structured interviews, I conducted a baseline household survey (Appendix 9, part 1). One household survey was conducted per household, irrespective of the number of household members interviewed in the consequent fieldwork. A total of 31 households were surveyed, which accounts for nearly one quarter of occupied dwellings on Atiu. Specifically, for each household I recorded:

- the name, age, sex of each person
- ethnic identification of the adults

- education of the adult
- labour migration status of family members
- religious affiliations
- physiological status (pregnant, disabled)
- physical indicators of household quality (TV, stereo, water tank, gas cooker, toilet)
- location or name of settlement

This basic socio-economic census gave me an opportunity to introduce myself to the different households and provided a reasonable index of suitable informants for more intensive interviewing. This early stage survey also provided the foundations of a more comprehensive overall survey of the social frameworks of health care provision that were further investigated in subsequent fieldwork. Also, the household surveys enabled me to attach specific individuals to particular households and also be able to monitor their consequent relocations as residence patterns are particularly fluid on Atiu. People were very keen to participate in household surveys. They enjoyed talking about their family members and household features.

Interviews on illness episodes

After conducting a household survey, I asked the interviewees opinions on Maori medicine and biomedicine and what was the perceived difference (Appendix 11.9, part 2). Structured interviews were conducted in order to elucidate local ethnomedical explanatory models of recognised illnesses. I enquired specifically about five illness episodes, as people could not recall ten that occurred in the household, and for each recorded the following medical information:

- cause and onset of illness
- health provider
- signs and symptoms by which an illness is recognised
- complications
- prognosis

- seasonality of occurrence
- special groups affected
- treatment alternatives
- curing resources
- dietary and behavioural recommendations and prohibitions

The questions were adapted from the ethnoepidemiological survey used by Berlin and Berlin which uses Kleinman's Explanatory Model of Illness (Berlin & Berlin 1996: 71). Overall I conducted 17 illness episode interviews. Interviewing provided me with information on cultural categories of illness, medical systems that are being advised for illness treatment and the network of people involved in treating a patient. This information enabled me to have a general understanding of the local health situation and to identify changes in illness treatment.

Women played a key role in illness treatment on the island and this was clearly shown in the surveys. During the surveys, women frequently directed me to the healers they consulted, to homegardens where they harvested plants from and to other patients who had received similar treatments. I found using the categories of the Exploratory Model of Illness very efficient in collecting information on illness episodes and informants responded very positively when asked about the different variables included in the illness model.

Interviews with health personnel

I interviewed six nurses and two doctors in Atiu, Mitiaro and Rarotonga in order to record their views on Maori medicine and biomedicine, situate the role of the hospital as a treatment provider and finally validate the illness names and severity of their symptoms. An illness directory was compiled with information on the illnesses present in the Cook Islands (Appendix 2). For the compilation of the illness directory, I consulted an initial unpublished illness inventory authored by Gerald McCormack (Cook Islands Natural Heritage Project) and also consulted Manson's Handbook of Tropical Diseases

(Cook 1996). The health personnel provided me with detailed information on the prevalence of different illnesses on the island and their issues with medical pluralism. Furthermore, in Atiu I was provided with copies of hospital reports that were sent monthly to Rarotonga.

All the above information led to very interesting comparisons between the health accounts of hospital staff, traditional healers and patients (chapter 7). I conducted most interviews in the afternoon after health personnel had finished their consultations. The interviews were conducted in a semi-informal manner while drinking tea in the area where staff usually have their break. I placed the mini-disc recorder in the middle of the table and asked information on each of the illnesses I had compiled in my inventory. This was a very lengthy process that lasted around eight hours in total and was conducted in four visits.

Healer interviews on medicinal plant use

Having established a general understanding of medical beliefs and the medical systems in operation, I started a more specific round of enquiry on the specialised domain of medicinal plant knowledge and use. The informants for this type of interview were mainly identified through participant observation and previous interviews. Semi-structured interviews were used to obtain specific information on the qualities and uses of medicinal plants:

- conditions treated
- visitation frequency
- details of healers' teacher (age, relation) and knowledge transmission circumstances
- details of healers' teachers' teacher
- harvest location and method
- treatment provider
- treatment preparation
- quantities of ingredients required

- associated taboos
- cultural importance
- origin of ethnobotanical knowledge

I conducted interviews with 21 healers on Atiu, four in Mitiaro and five in Rarotonga. This round of interviews provided information on more specialist medical knowledge and ancestral spirit interference. I also asked my informants to identify the reported medicinal plants in their natural environment. I developed this particular set of interview questions as I progressed into the second half of my fieldwork. I aimed to document medicinal plant use as tri-partite system of practice, knowledge and plants (see Appendix 11.10). Based on this model I further developed the plant use interview (Appendix 11.11), where the same sets of questions were adapted to cater to the wider documentation of plant uses, such as weaving, making 'ei, cooking and carving.

Interviews with school personnel

In Atiu I interviewed the school principal, the Maori teacher and the Agriculture teacher of *Enuamanu* High School in order to establish the role of the school and school initiatives in literacy and the transmission of traditional knowledge through the formal school curriculum. In Rarotonga I interviewed the Maori teachers in the high schools of *Nukutere* and *Tereora* College on the same topics. In Mitiaro, I interviewed the school principal as I was informed that the school is active in teaching the pupils how to prepare medicinal oils.

Furthermore, I participated in the *Karere Turamarama* week, the 'culture' week on the island where experts from the community are asked to give workshops to the school children. During this week, I was assigned a small group of students and we produced a small video on the activities that were taking place in the school that week. Throughout my fieldwork I was closely linked with the school for a wide range of reasons. I lived with a schoolteacher and her house was adjacent to the school. I regularly visited her in

the school and also accompanied her to all school social events in the village hall. Also, I was a volunteer Arts and Crafts teacher for one semester and a volunteer Science teacher for the second semester. During my Science class, I conducted a lot of activities where I encouraged the students to compare local knowledge and ethnobotanical classification to scientific knowledge and botanical classification. Furthermore, I was well-acquainted with most of the school personnel, used their library extensively and ended up interviewing most of the teachers as they were very knowledgeable healers and/or gardeners.

Visit to Mitiaro

The island of Mitiaro has historically been very close culturally to the island of Atiu (see chapter 3). I visited the island as part of a formal visit with the Atiuan Catholic scouts. I had the opportunity to participate in various social and church events as part of my visiting group as well as to conduct a small ethnographic study of the island community. The aim was to compare it as a proxy to the Atiuan community and also identify channels of inter- island information and plant transfer.

In the island of Mitiaro, I interviewed the two chiefs of the island on their role on the island and land tenure; the Environment Officer on environmental issues; the island nurse on health issues; and four traditional healers, one expert basket weaver and one expert canoe carver on their skills and knowledge transmission. I have used this information mainly in comparison to practices on Atiu.

Cultural domain analysis for illness and plants

Participatory techniques were used to analyse the cultural domain of illness and medicinal plants. They were used mainly during household surveys at a later stage, as they required formal participation from the side of the informants. I compiled free lists in a wide range of situations like waiting in the post office queue, getting a lift in someone's truck, hanging out with civil servants who were not very busy, or more formally as part of an interview. Freelisting and pilesorting is typically used to provide an insight on how

people categorise illness and medicinal plants (Martin 1995: 213). Many of my informants found it very confusing to be asked to list all the illnesses and plants they knew and the length of the lists they produced varied significantly in size depending on their mood. Consequently, I shortened the 'free lists' to lists of ten illnesses and ten plants.

I compiled 15 sets of cultural domain analysis for plants and 15 sets for illness with separate groups of people. Freelisting is considered an effective tool to elicit information on the most culturally salient plants (Phillips et al. 1994). On the contrary, I found it most useful as a tool to identify plants that were never mentioned in interviews and rarely used. When asked to list illnesses, people frequently proceeded in recounting stories of personal experiences of illness treatment and details of plants used in these treatments. When asked to list medicinal plants, people frequently looked puzzled and looked in the surrounding landscape to find plants to mention.

Pile sorting was used to progressively retrieve the principles of classifying illnesses and medicinal plants. I wrote the names of the illnesses or the plants on coloured pieces of paper and asked the participants to make piles according to separate groups they identified. I allowed the participants to make as many piles as they wanted. After each sorting task, the plant and illness names were tabulated and similarities and differences between different participants were addressed. A variation that I encountered is that some people use a much larger number of categories than others (the 'lumper/splitter' effect). In order to overcome this possible problem, I asked the participants that sorted many piles to combine different piles and produce a nested arrangement of piles (after Schensul et al. 1999). People enjoyed sorting out coloured cards and I found it quite a pleasant way to end an interview.

Participatory maps

Local people were asked to map the natural environment of the island on a piece of paper denoting the different habitats and indicating associated land uses (adapted from: Selener

et al. 1999). People were very familiar with the distinction of habitats on the island and there was no significant variation over the names of the island habitats. Furthermore, I asked the pupils in my Science class who were aged 13-14 to draw maps of the island. They clearly marked the same habitats that adults had mentioned. They also showed very good map drawing skills that they learned at school.

These maps enabled me to understand how local people perceive their island environment, identify the infrastructure and the boundaries of the community and other physical characteristics. The habitats of the island were well defined and there was consensus on their names and the reasons for their differentiation.

2.6.7 Questionnaires

To assess traditional knowledge transmission, a questionnaire was distributed to secondary school children. This idea started in the high school of Atiu through my close involvement with the school. A total of 109 young people: 58 from Atiu and 51 from Rarotonga aged between 13 and 17, took part in a survey of their involvement in assisting specialists in their household who made traditional medicine, eel traps, baskets and fans (Appendix 11.13). The questions were centred around the knowledge transmission process; whether there was someone in the household who had these specialist skills, whether the students had helped them, knew what plants were used and where they grew, how old were they when they started learning and finally if they valued these activities. In Atiu, I initially distributed the questionnaire to my Science class and after seeing the positive response it received, I co-operated with the Maori and Agriculture teachers to distribute the questionnaire to more high school students. In Rarotonga I attended the Maori classes in the high schools of *Tereora* College and *Nukutere* College. In both islands I sat in the classroom with the students, explained the scope of the questionnaire and answered their questions. In the end of the period I collected the completed questionnaires.

I avoided using impersonal ways of distributing questionnaires such as giving them to teachers to distribute to their pupils, as this way of collecting information has been criticised for yielding results that can be inconsistent with demographic and social parameters. An example of such a case was reported in a study of spiritual values associated with biodiversity in Zimbabwe, where informants were unwilling to disclose information on a piece of paper and that hindered the use of questionnaires as data collection tools (Byers et al. 2001: 206). In my study, I insisted on being present in the class during the distribution of the questionnaires so that the pupils could ask for clarification in case they did not understand the questions or if they wanted further information on the scope of my research.

2.6.8 Field surveys

Habitat surveying

Having established a general idea of the different biotopes on the island, I carried out a detailed habitat survey of the island in order to be able to accurately refer to different locations on a geographic map. I trekked around the island with the Environment Officer locating all the major biotopes identified from people's narratives. In order to describe and compare different habitats I used two indicators: the degree of specialisation (the diversity in the vegetation), which was measured on a 10-point scale; and human disturbance (the impact of human activities), which was measured on a 5-point scale (adapted from: Ellen 1990).

Through habitat surveying I familiarised myself with different habitats and types of activity that took place all over the island. Through the habitat surveying, I was able to access remote areas that are not frequently visited and identify the location of ancient *marae*, burial caves in the *makatea*, previous types of land use and stories linked with the land.

Belt transects

Belt transects are commonly used to establish the distribution, abundance and population structures of plants (Elzing et al. 2001). They are long and narrow belts of vegetation which are surveyed quantitatively (Martin 1995: 156). I used plots as a rapid sampling technique to support characterisation of the vegetation types of the island.

Sampling units (20m x 10m rectangular plots) were aimed to be independent of each other. They were spaced far enough apart so that measurements were not spatially correlated. I conducted transects in as many different habitats as possible, using restricted random sampling. For this sampling technique, I determined the number of sampling units (provisionally assigned 3 per habitat, later reduced to 2 or 1). Then I identified the source of disturbance and used that area, which was usually a road or path, as a line of reference and placed the transects perpendicular to that line but randomly along that line. Since many of these segments were disturbed habitats, as a line of reference I used the road. Therefore each plot had one side on the road and this will enabled an assessment of the effect of disturbance on the plant communities.

For each transect, I recorded both biotic and abiotic factors. Specifically, I recorded:

- local and latin name of plant
- type of vegetation
- growth stage (seedling, non reproductive, reproductive)
- use of plant
- estimation of canopy height
- disturbance (primary/intact forest, secondary forest/thicket vegetation, mostly cleared/replanted)
- environmental data (altitude, slope, geology)
- indices for canopy cover (closed canopy (>75%), partial canopy, open canopy (<10%))

Conducting belt transects was useful in gaining an understanding of medicinal plant distribution on the island. Furthermore, I was able to familiarise myself with plants that

are not commonly used and gain information on past uses of plants. Unidentified plant specimens were collected and taken back to the village where village elders were consulted on the plants' identity and uses. Forest transects were supplemented with homegarden maps as the 'wild' was not the only source of medicinal plants. Mapping plant distribution was important in establishing two further variables, plant availability and accessibility, in understanding medicinal plant use from an environmental perspective.

Homegarden maps

Homegarden surveys involved walking around the garden with the owner and talking about each plant in the garden, who planted it, when and for what purpose (adapted from: Das & Das 2005; Finerman & Sackett 2003). Outdoor interviews proved to be very effective as plants and objects in the gardens provided cues to instigate additional discussions. Because of the unstructured nature of the garden survey interview, I followed up interesting or unusual garden surveys with subsequent visits to ask specific questions.

I also mapped 12 gardens, mapping the location and relative abundance of the garden plants. I asked questions about household income, kinship as well as plant species and their uses in order to determine the relationship between plant distribution and use. Furthermore, participant observation and intimate engagement in daily life activities provided the basis of the central role of homegardens on Atiu.

2.6.9 Data Analysis

Basic equipment for this documentation and data storage consisted a camcorder video camera that was used to record ethnographic material, a digital camera that was used particularly to create an electronic database of medicinal plants, a portable computer (ibook) sufficient for processing and displaying digital images, and a minidisk sound

recorder that I used while conducting some of the interviews. In storing, coding and indexing all fieldnote material onsite, I used Notebook, Word and Excel.

Information from the wide range of methods employed provided me with different kinds of data and through triangulating the different data analyses I was able to generate research hypotheses. Qualitative ethnographic data from informal interviews and participant observation were stored electronically in the form of fieldnotes using the Notebook programme and were analysed using keywords. Quantitative ethnographic and ecological data were transcribed in tables and spreadsheets from which graphs were produced.

Information from interviews, together with information on other cultural uses of the plants was indexed to compile an ethnobotanical database with information on plant use and ecological distribution. Plant specimens and local names provided by the owner were converted to corresponding scientific names using *Cook Islands Ethnobotany* (Whistler 1990) and *Flora of Rarotonga* (Wilder 1931). I confirmed plant names with experts within the community, particularly specialists in specific plant uses. Finally, I confirmed findings with the Cook Islands Biodiversity Database of the CINHP, whose species information has been validated by tropical botanists and international specialists. Due to research permit restrictions and the absence of a national herbarium, I did not store or export any voucher specimens, thereby complying with established research ethics agreements.

Furthermore, I employed the triangulation strategy (Pelto & Pelto 1996) and gathered data concerning a particular research question using more than one technique, in order to be able to make corrections as well as systematic comparisons. Different forms of data (i.e. qualitative, quantitative, observations, counts, frequency of events) were collected and collated in spreadsheets where the information on illness and plants were organised. I produced separate illness and plant databases from the same data sources in order to gain an insight and understanding that could not be achieved by examining the data of one type of method alone. For example, important information on plant use was provided to

me during participant observation in daily life, attending church events or having informal chats on the side of the road and not exclusively when researching plants. Similarly, I collected important information on health and illness when conducting habitat surveys and plant transects and not only when specifically asking direct questions on illness treatment. Therefore, the information entered in the plant and illness databases includes a synthesis of information yielded from a wide variety of methods.

2.7 Conclusion

This chapter introduced the theory and methodology used during fieldwork and discussed the practical constraints encountered when applying different methods in the field. Taking into account the value of anthropological and ecological perspectives in the study of ethnomedical systems, I selected an interdisciplinary methodology to assess the impact of ethnomedical knowledge transmission on medicinal plant conservation in Atiu.

I extensively analysed the employed methodology because of the pivotal role methods play as a data-generating tools: conclusions are drawn based on information collected, this in turn depends on methods employed (Fischer et al. 2007). Dealing with a large amount of heterogeneous data proved increasingly difficult. The magnitude of this problem is attributed to the highly varied patterns that knowledge was socially distributed within the community and plants were spatially distributed in the environment. Furthermore, the distributions of both ethnomedical knowledge and medicinal plants were constantly changing with time.

Interestingly, it was anthropological methods that elicited very important data concerning plant conservation, and botanical methods that illuminated issues of illness causation. For example, while accompanying people to feed their pigs in their pens in the forest, I was narrated illness episodes, whose cause was ancestral interference because of moral transgressions. Similarly, during ethnoepidemiological surveys, the management of rare wild plant populations was discussed. Therefore, it did not seem appropriate to classify

data collected through 'illness treatment surveys' as 'illness treatment data' as some of the information was directly relevant to plant conservation. Ellen raises a similar point:

'the empirical evidence for the existence of such a dynamic multidynamic classification system lies in the results we get when we invite informants to perform identification tasks, or open pile sorts. Formal kinds of consensus analysis do not prejudge the criteria people use in allocating categories or percepts to particular groupings and often tend to merge classifications based on disparate criteria' (Ellen 2007a: 7)

Even though this point was raised with particular reference to classification tasks, methods oriented to elicit data on a particular type of pre-conceived category can be considered a classification task too. However, the relationship between the method used and the type of data collected is not as straightforward as it appears in textbooks. In order to deal with this non-linear relationship of types of methods used and types of data yielded, I re-organised the information recorded to suit the different issues I wanted to discuss and the types of methods I used. To capture the complexity of data yielded from different methods, I compiled two inventories: one for illnesses and one for plants, and information on either, irrespective of method used to elicit information, was entered into these separate inventories.

The pre-planned methodology was adapted to different situations and different personalities. I can roughly say that out of the 14 different types of methods that I actually used during my fieldwork only half of them were planned. I view methods as instruments used to record information. The employment of specific methods depended on the level of access and the familiarity I had with my informants. I also found that the development of operational categories for quantitative ethnobotanical methods could only be effectively developed after extensive qualitative research.

Bernard argues that the validity of data is tied to the validity of the instruments (Bernard 2002: 50) and valid instruments include not only mathematical formulas and statistically

significant results but analyses that are not the product of the researchers' pre-conceived ideas. On an empirical level, there is a fundamental difference between methodological practice in social sciences and natural sciences: people need to be asked first and agree to participate in a method whereas that does not apply to plants and animals. Therefore, methodology needs to be adapted not only to the fieldwork location but also to local systems of social organisation and knowledge distribution in order for meaningful results to be obtained. As I will analytically describe in the next chapter, hierarchical structures in kinship, land tenure and residence strongly shaped access to ethnomedical knowledge not only for myself but also for members of the local community.

3 Atiu: island life and colonial history



Figure 6: CICC church altar decorated with common and rare plant varieties for Harvest festival

'This island is cursed...this is why there are so many wild pigs destroying the crops and so many couples cannot have children.'

'This is paradise. It is the promised land. We are God's chosen place and we give thanks to God every day.'

'For us here in the Cook Islands family is very important. We love our parents and respect our dead. Living and dead are all part of the kōpū tangata-the extended family'

'Sometimes the dead get jealous. If you give too much attention to the living and ignore them...then they get angry.'

'When a child is born, we take the 'enua (placenta), bury it in the garden and plant a fragrant bush over it. Usually it is the father who does it. This plant over there is for my first-born. The 'enua of the second one is in Rarotonga. I don't know, my cousin was insisting that we bury it in our house there.'

Conflicting claims were peculiarly prominent in daily life on Atiu. Sometimes Atiuans claimed the island was blessed and other times cursed. Sometimes they expressed feeling very privileged to be on the island and other times desperate and left behind. Young people were confused: should they choose a 'free' life of planting and feeding pigs or a 'paid' life in an urban ghetto and a job in a factory? Beliefs and anticipations changed unexpectedly and fluid demography made it impossible to pinpoint a particular set of beliefs in time. Ethnomedicine was embedded in a system of bilateral kinship and land tenure, fluid residency and extended families whose membership ranged from distant relatives in New Zealand and Australia as well as deceased ancestors in the forms of spirits, pigs and centipedes. The relationship between the self and the social and natural environment proved to be not only a key element in understanding knowledge transmission and plant use but also very hard to define.

3.1 Introduction

This chapter provides an introduction to the island of Atiu and the Cook Islands and gives an account of the island's history extending to contemporary patterns of social organisation and land use. Even though ethnographic literature on the Cook Islands has mainly focused on the capital island Rarotonga (Baddeley 1985; Clerk 1995; Lange 1982; Ulijaszek 2002) and the remote northern-group island of Puka Puka, (Becket 1971; Borofsky 1987; Ruddle 1993), a few but significant pieces of research have been written about the island of Atiu, with particular reference to its active and vibrant social life (Kautai et al. 1995; Pragnell 2003; Stephenson 1976).

Social institutions on Atiu are important channels of information transfer and play key roles in knowledge transmission. In Polynesian cultures, the individual is considered inseparable from the community (Hogbin 1961). In Atiu in particular, I found that the individual's position and role within the household, the extended family, the village, the church and other institutions determine potential eligibility for material and immaterial inheritance. Therefore, a study of social organisation formed an integral part of this ethnobotanical study because as I will later demonstrate, it is through kinship and residence that people become potential receivers of specialised knowledge including ethnomedical recipes. Furthermore, it is through land tenure that they gain access to natural resources such as medicinal plant populations. Therefore, this chapter sets the cultural context for following chapters which focus on traditional healing and the utilisation of the associated knowledge and plants (chapters 4-9).

3.2 Geographical background

The Cook Islands are composed of 15 islands spread over the middle of the South Pacific, to the west of the Polynesian triangle (figure 7). They are small, isolated tropical atolls mainly of volcanic origin (Whistler 1985: 239).

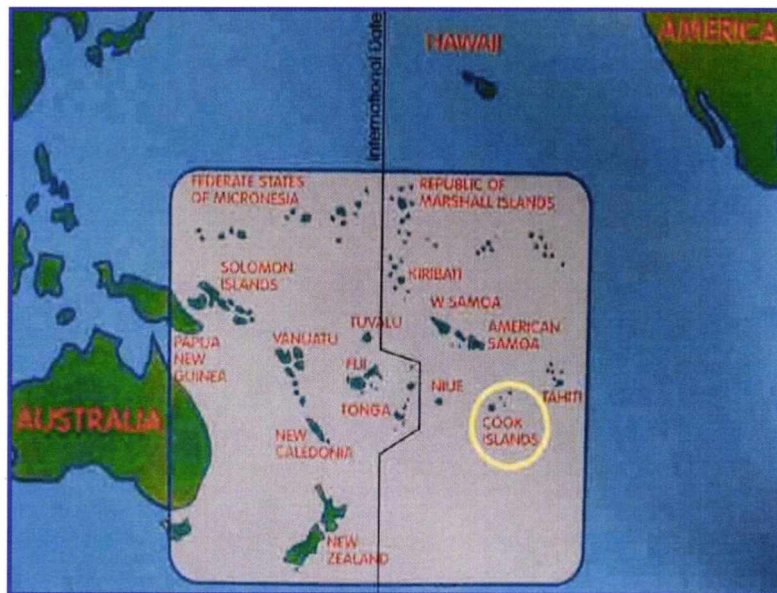


Figure 7: Geographical location of the Cook Islands
(source: <http://www.atiu.info>)

The population is estimated to be 15,000, half of which resides in Rarotonga, which is the capital of the Cook Islands (Cook Islands Statistics Office 2001). The indigenous population is Cook Islands Maori with a small minority of New Zealand and other Pacific Islanders. The majority of the Cook Islanders belong to the Protestant Cook Islands Christian Church but there are numerous other Christian denominations as well. Most people speak English and Maori, as the Cook Islands are a former British colony. Currently they are an independent state and have a free association with New Zealand, which allows Cook Islanders to travel and work in New Zealand without any visa restrictions (Appleyard & Stahl 1995).

Rarotonga is the administrative capital of the Cook Islands. It has a population of 7,500 people, which accounts to half of the total population and sustains a very vibrant tourism industry. Cook Islanders from the outer islands migrate to Rarotonga to further their schooling and search for employment. For the young workforce arriving from the outer

islands, Rarotonga is frequently a stop over before migrating to New Zealand or Australia. Links with an extensive social network facilitate population movement and access to schooling and the overseas labour market (Crocombe 2003: 13). Contemporary Cook Islands society is a rapidly modernising society, whose history in the western sense is highly compressed. It exhibits most of the problems that have been observed for larger nations undergoing change; excessive migration to the capital (and abroad), increasing problems with civil order, new challenges to health resulting from globalisation and massive problems in market participation (Crocombe & Crocombe 2003). However, the livelihoods in the outer islands are very different to Rarotonga.

Atiu, one of the fourteen outer islands was the primary study site (figure 8). It is socio-economically very different to Rarotonga. It is a 'small' volcanic island (21km circumference) surrounded by a reef. Atiuan settlements are concentrated in five contiguous villages on the top of the central flat-topped hill, at 72 m above sea level (Kautai et al. 1995: 167).

On the use of smallness when referring to small territories or small-scale societies Benedict noted that 'small' is a relative term. When applied to territories it usually refers to either area or population or both (Benedict 1968: 23). He identified two major types of small-scale societies both composed of chiefly or primary groups. In the first type of small-scale society such as Tikopia, the total social field is small. In the second type of small-scale society such as the Tiv of Nigeria, which consist of a million but still referred to as small-scale, society is composed of a series of interlocking similar small groups which extend through a considerable populations (ibid: 24). As a starting point, I consider Atiuan society as a small-scale society based on the size of island's small territory and social field. However, as I further discuss in chapter 8 the social field extends across to neighbouring island' populations and diasporic communities in New Zealand Australia, reaching a population however of not more than 100,000 people.

Most of these products, with the exception of coffee, are grown for local consumption. Handcrafting is an important female activity. Handicrafts are given as gifts and rarely sold. Private enterprise on Atiu is composed of four main centres for tourist accommodation, two coffee producing business, a sawmill, two local craft businesses, two main stores and a series of smaller stores selling food from their homes.

The flora of the Cook Islands is relatively limited because of the island's isolation and size and most plant species are introduced (McCormack 2004). The subsistence system in Atiu, like other indigenous subsistence systems in the Pacific can be characterised by four systems: annual plant cultivation, arboriculture, animal husbandry and hunting and gathering. In the Pacific, plant cultivation and animal tending have always been inseparable from hunting and gathering (Yen 1998). Atiuans and Cook Islanders in general take great pride in the island's natural beauty, which they associate with their strong belief in the Christian God. The tourism industry and the local residents alike refer to the islands as 'paradise'.

3.3 Cook Islands History

3.3.1 The pre-contact era

The Cook Islands have an oral culture and subsequently there are no written records of the period prior to colonisation. The only records of the Cook Islands' past come from missionary reports which portray a very savage culture dominated by inter-tribal warfare (Gill 1995 [1894]). Intra-group hostility, warfare, infanticide, cannibalism and sorcery were depicted as dominant characteristics of the 'aboriginal period' (Beaglehole 1948: 387). Atiuans refer to the pre-contact period as the 'olden days' and are keen to distinguish themselves from that period. They openly admit that their ancestors were primitive, engaged in killings and cannibalism and believed in the 'old gods'. The islands of Manuae, Mauke and Mitiaro were under Atiu domination prior to missionary arrival

(Mokoroa 1995b: 17). Local legends about ancient Atiuan chiefs and battles between island groups are very much alive. The majority of stories and legends of inter-island wars in which Atiu was involved concerned battles for supremacy over Mauke and Mitiaro (Kura et al. 1984). These 'wars' are still enacted in social events including events of religious nature. The supremacy of Atiu in tribal warfare and the legends of the achievements of 'Atiu warriors' prior to colonisation is glorified and attributed to the islanders' strength and vigour. However, Atiuans consider colonialism and the introduction of Christianity as a step towards development and modernisation.

The Cook Islands is the most dispersed group in Polynesia. Each isolated island community has developed its own culture but inter-island voyages with canoes allowed extensive cultural exchanges to take place (Whistler 1992: 8). More isolated islands like Rarotonga, Aitutaki and Mangaia were rarely visited. Evidence also shows voyaging between the Society, Tuamotu, Cook and Austral Islands within the past 1,000 years. Also contact must have been established between Rurutu and Mangaia since there are very specific architectural parallels between the house-*marae* complexes of the two islands (Bellwood 1974: 279). Evidence of inter-island Polynesian travels could also account for many similarities between Polynesian cultures including ethnomedical practices.

In the pre-contact period social control remained with the *ariki*, the chief, who was supported by the *mataiapo*, the heads of subtribal groups who were supported by the *rangatira*, heads of extended families (Crocombe 1964: 26). The group though constantly challenged the chief's power. The tribes were interrelated but intertribal allegiances changed from time to time. At that time only males were eligible for chieftainship and chiefs were believed to have descended from gods. The *marae* were important ceremonial grounds and the sites were treated with extreme respect because they were considered the residence of the ancestors. Very little is known about these sites and most of the information is sourced from archaeological excavations (Bellwood 1969).

The Cook Islanders worshiped the Polynesian Gods *Tangaroa*, *Rangi*, *Rongo*, *Tane* and

'Io (Makirere 2003: 110). The missionaries attempted to eliminate any element of the old religion. On Atiu, however, incantations to *Rongo* and *Tane* are still being conducted prior to activities of high cultural importance such as the construction of traditional sailing vessels (Lyon 1995: 9). The only god whose form we know from the old religion is *Tangaroa*, the God of the sea, which is depicted in wood-carved statues that are mainly oriented to the tourism industry. Now, there is limited knowledge on a few pre-contact rituals that were performed to mark passages of life such as birth, puberty and death (Ama 2003; Tatuava 1995; Vini 1976).

3.3.2 Missionary period

The first European missionaries arrived in Rarotonga in the 1830's introducing Christianity. It is difficult to establish an accurate picture of the health situation of the Cook Islands prior to European contact because there are no written records, long lasting artefacts or building structures. The main source of information on the pre-contact period is missionary reports. Along with the new religion, disastrous diseases and epidemics were introduced and they had a major impact on the islands' population.

Diseases such as typhus and dysentery, as well as invasions of locusts and caterpillars that attacked the taro and coconuts accompanied the initial arrival of the Europeans in Rarotonga. The population decreased through a series of epidemic introductions coupled with the effect of natural disasters such as hurricanes and storms (figure 9).

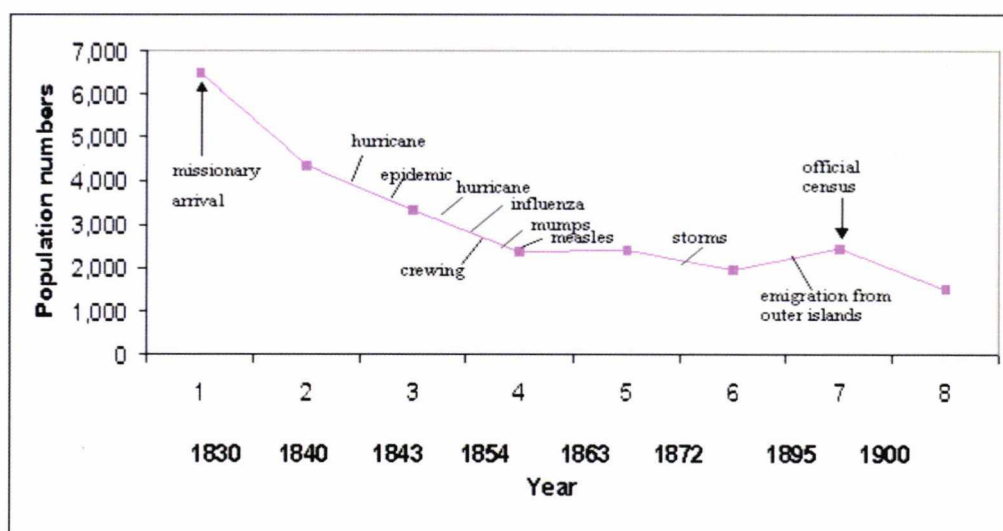


Figure 9: Population changes in Rarotonga after the arrival of the Europeans (data adapted from Mc Arthur 1961)

Due to the adverse living conditions in Rarotonga in 1847, men were leaving the island as crew to ships. The official census of the New Zealand government in 1900 was 1,500 people, which indicates a decrease of 23% decrease in the population within 70 years after European arrival (McArthur 1961). Interestingly, none of my informants accounted for these events. The colonisation era is glorified and recounted as a period that had a positive impact on island livelihoods. Atiuans showed no recollection and no intention to critically examine the politics of the process of colonisation.

In a similar situation in neighbouring Tahiti, Europeans introduced epidemics to which the Pacific islanders had no immunity. Epidemics like syphilis, kyphosis leading to hunchbacks and lockjaw had severe effects on the local population that forced them to accept western medicine. As a reaction to the new changes to Tahitian society, Mamaia, a traditionalist movement appeared, preaching their beliefs in traditional medicine. All

cult members were eventually killed by smallpox after refusing to accept vaccination (Lemaitre 1994: 82).

It is still uncertain whether herbalism existed in the pre-European era. The only ailments that have been reported to be treated medically were fractures and wounds that were considered 'normal'. All other ailments were attributed to deities were diagnosed and treated by the priests. It is believed that the priests diagnosed by psychic means, either by revelation from friendly spirits or by clairvoyance. The use of plants was mainly ceremonial. Whistler claims that the medicinal use of plants was initiated after the missionaries introduced the natural causation of illness. Consequently, local priests in an attempt to maintain the status of the healer in the society, developed herbal remedies to treat the new ailments (Finau 1994; Whistler 1992: 17).

Contrary to Whistler's speculations, Cox argues that the absence of records on herbal treatments of diseases could be due to the lack of botanical experience and linguistic ability of the missionaries. There is no archaeological evidence of herbalism because only fresh plants are used in Polynesian pharmacopoeias. However, there is ample evidence from the ethnomedical traditions across Polynesia. There are similar words for plant remedies, similar concepts of plant preparation, usage and delivery indicating that knowledge has been very well diffused and incorporated in cultures of geographically distinct areas. This pattern of knowledge distribution required extensive inter-island voyaging over a long period of time (Cox 1991: 165). Cook Islanders report that their traditional medicine pre-dates the arrival of the Europeans and it has been handed down from generation to generation.

European contact started in 1777 when Captain Cook initially discovered Atiu. When some of his men went ashore to collect fodder for the animals on board, they were welcomed in a distinctive manner and escorted into the village by armed men (Mokoroa 1995b: 12). The missionary John Williams first visited Atiu in 1823 and chief *Rongomatane Ngakaara* assisted Williams and the other mission teachers to convert the people of Atiu and Mitiaro to Christianity. McArthur reviewed the missionary data on the

early population counts in the Cook Islands. He notes that the first count by the London Missionary Society in Atiu estimated the population around 2,000 people, which later progressively decreased (see figure 10). The population had almost halved by 1843 and then stabilised.

Around 1852 there was strong resistance from the chiefs to Peruvian slave traders and no one was taken from the island. Historical records show that Atiuans were quite difficult to ‘tame’: they lived in the forest near the taro swamp and the schools were rarely attended. When the island of Mauke was devastated by a storm, which caused famine, the warriors from Atiu invaded the island and the conflict resulted in a dreadful massacre. The latest massacre by Atiu warriors occurred in 1881. The official estimate in 1902 by the New Zealand government was 370 people (McArthur 1961: 181).

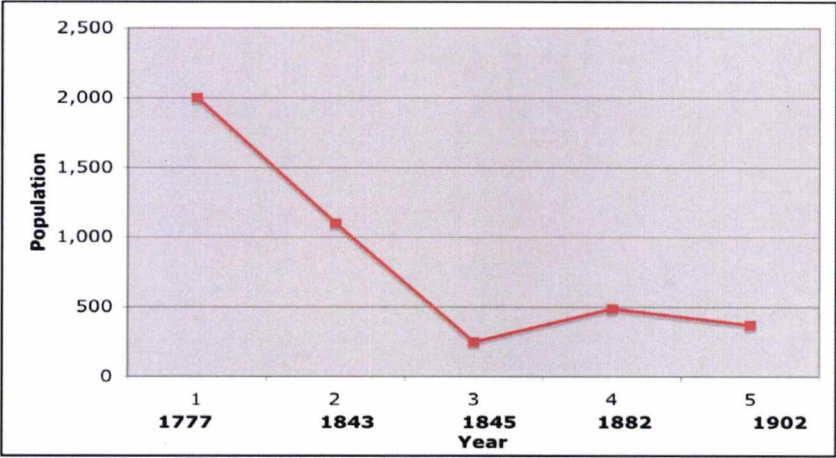


Figure 10: Population numbers on Atiu in the post- colonisation era (data extracted from McArthur 1961: 181

Social changes introduced by the missionaries included the abolition of warfare and human sacrifice, new conventions of clothing and housing, and laws on sexual morality (Beaglehole 1948: 388). Overall Cook Islanders did not strongly resist the Christian mission. Guiart argues that the willingness of Pacific Islanders to adopt the new religion was in order to equalise with the technological advancements of the Europeans (Guiart 1962: 398). With fears over a possible French takeover from Tahiti, some *ariki*, chiefs of

the Cook Islands favoured British protection. On the 27th of September 1888, Atiu and the Southern group of the Cook Islands were declared British protectorate, for the first time under the name Cook Islands (Crocombe 1967).

In 1919 the first land court was formed under colonial rule. As one of the key institutions of the colonial period it began an investigation into Atiuan lands awarding occupancy rights to families that resided and used plots of land (Crocombe 1964). The introduced land courts disconnected the real power of the *ariki* over the people. The political and economic powers of the church were similarly eroded over this period. The same year a Roman Catholic church was founded on Atiu by a Maukean priest and a Seventh Day Adventist church followed 10 years later (Pragnell, 2003: 55). With the arrival of the Europeans the people were taught to live in ill-adapted houses, wear imported clothes, eat bread and drink alcohol. Commercial agriculture also started leading to erosion and the spread of exotic vegetation (Forsberg 1991).

Crocombe's article on Atiuan politics in the missionary era is probably the most detailed account of social reforms that took place in Atiu this period. He highlights the highly influential role of the London Missionary Society in giving rise to the first notions of the Cook Islands nation and the creation of a national identity. Trained ministers and teachers were despatched to the outer islands, making Takamoa, the central theological college in Rarotonga. The English missionaries left their Tahitian counterparts in charge and the Polynesian pastors often married someone from the chiefs' family. Chiefs resided in the same houses as their subjects and there was immediate distribution of goods. The accumulation of wealth was an unknown concept to Cook Islanders. The chiefs after the arrival of the missionaries became involved in trade, emerging as the new middlemen. The pastor progressively diminished the role of the chief, as he became the mediator between God and the people. The British Resident Agent aimed to abolish the *ariki* system of power and establish a representative government. Atiu then received money in aid for the establishment of courts and police (Crocombe 1967).

After British colonisation in the 1830's, the settlement structure of Atiu changed fundamentally. People had been living in the forest near the taro swamp, which was intensively cultivated. The highly influential Protestant missionaries moved all the settlements to five continuous villages on the top of the island and built the church in the middle of the settlements in order to augment social and religious control. Similar settlement restructuring took place in the islands of Mitiaro and Mangaia (Johnston 1953: 117).

The new type of housing incorporated newly introduced concepts of aesthetics and cleanliness that were introduced by the colonial administration. Local chiefs relied to a considerable extent on English missionaries to draft new legislation and advise on the administration. Crocombe argues that there were some structural homologies between the British and the Polynesian systems that reinforced the colonisation process. Specifically, he notes that during colonisation

‘the hierarchical precedents from Polynesian societies were reinforced by the feudally derived precedents of Victorian England and the patriarchal precedents of the Bible.’ (Crocombe 1971b: 71)

Similarly, I noted that Atiuans viewed British rule and particularly British constitutional monarchy as a system compatible with Polynesian social organisation due to its hierarchy. Atiuans perceived that the British Queen and King had an equivalent role to that of their local chiefs, the *ariki*; and that the aristocracy was equivalent to the lower chiefs, the *mataiapo* and the *rangatira*.

Atiu became part of New Zealand in 1901, which was the turning point for the island's politics as new laws were introduced. The Resident Agent (Lieutenant Gudgeon) drafted an act on the economic policy of the island but confirmed the chiefs' key position in economic affairs. He used threats if chiefs did not accept his rules. He became the Justice of Peace as a step forward to break the *ariki* courts. There was no attempt to train islanders and give them opportunities to adjust to new requirements. Atiu moved from

being the 'supreme centre of a small universe' to become insignificant and subordinate (Crocombe 1967: 109).

Migration waves out of the Cook Islands began when New Zealand and Australia established phosphate mines in French Polynesia in the 1940's. Cook Islanders were recruited to work on the mines. The income they earned set the context for a permanent migration wave to New Zealand (Appleyard & Stahl 1995: 20). These migration patterns are typical of a migration system maintained by the circular and return movements of people thus creating an interdependency between countries by the huge remittance flows to poorer countries (Fawcett 1989). This type of migration system has dominated the Cook Islands' economy and society ever since. The interesting contribution of this migration movement to Atiuan ethnomedicine is that many Atiuan workers returned from the phosphate mines with Tahitian wives, who in turn brought with them their own ethnomedical traditions, which fused with the respective Cook Island traditions. Furthermore, consequent migration to New Zealand and Australia in the post-independence era led to a further enrichment of the local ethnopharmacopoeia as Atiuans occupied common residential and occupational spaces with other Cook Islanders in the new urban centres and through this contact learned new recipes (further discussed in chapter 8).

3.3.3 Independence

The Cook Islands became an independent country in 1965. The free association between the Cook Islands and New Zealand provides Cook Islanders with New Zealand citizenship. The opening of the Rarotongan International Airport in 1971 caused emigration to escalate rapidly with Cook Islanders and especially outer Islanders taking advantage of their new citizenship and the relatively high wages of New Zealand (Pragnell, 2003: 65).

Workers from the Cook Islands and Fiji were among the first to be recruited in the 1960's and once in New Zealand they sponsored their family members. However, by 1970 labour shortages were acute and their workforce experiences have been adversely affected by the restructuring of industries in which they were initially employed (Appleyard and Stahl, 1995: 7). Migrants' earnings were invested in buying building materials for the concrete block-tin roof houses that replaced all the thatched roof houses in Atiu. After working overseas for some years, migrants would then return back to the Cook Islands to build their family home.

In the 1970's a new pineapple industry was initiated as part of a UN development scheme in Atiu (Kautai et al. 1995: 176). The slopes previously vegetated by fern *tue nue* (*Dicranopteris linearis*), were replanted with pineapple plantations. The new cash crop was expected to bring economic development to the isolated outer island of Atiu. Foreign plant stock and pesticides were imported and the plantations were sprayed without protective equipment. Atiuans claim that spraying was the cause of lung cancer and other respiratory ailments for many pineapple cultivators. An ex-planter commented:

'You see this old *pāpā* that died, they say it is cancer. But what caused this cancer? He is the last of the pineapple cultivators to die from lung cancer. All of them died, one by one. Do you know why? Because when they were bringing the pineapples and showing us how to spray them, they never gave us any protective equipment. All of the old *pāpās* were spraying with bare hands and no mask.'

In the late 1980's the import strategy of New Zealand changed and expanded to the cheaper markets of South East Asia for pineapples and orange imports. The agricultural production of the Cook Islands was restricted by small land areas, an isolated position in relation to major trade routes, the absence of harbours and the limited supply of local labour; thus rendering exports uncompetitive. That resulted in the collapse of the pineapple cultivation in the Atiu and devastation of local livelihoods. The Island Secretary explained:

‘It was a disaster. The pineapples were rotting on the trees. There were so many we did not know what to do with them. Rarotonga [the capital island] said they would buy them from us. We took crates and crates to the harbour and waited for the boats to come. The boats never came and pineapples were rotting on the harbour. The whole island smelled of rotten pineapple. In the end we gave them to the pigs.’

Reckless interference with forest cover has raised many problems that accelerated soil erosion in other islands of the Cook group as well (Johnston 1953). In Atiu, the bare slopes were vulnerable to soil erosion. Heavy rainfall washed the topsoil down to the taro swamps leaving the slopes bare and clogging the taro swamp’s irrigation system (Mehlgarten 1999: 15). The swamps are considered the ‘island’s bread basket’ because of the centrality of taro as a major staple in the islanders’ diet. In an effort to combat soil erosion development projects initiated pine plantations that would not only reforest the slopes but also provide an economic plant for the Atiuans to process. However, the planted pine trees altered significantly the slope’s habitat. The pine needles formed a thick layer above the ground that did not allow any other plants to grow. The Agriculture Officer of Atiu, mentioned that even nowadays, the pine trees cannot be harvested because of fears of reoccurring soil erosion as there is no other vegetation to keep the topsoil in place in the case of heavy rainfall.

The collapse of agricultural exports in 1988, coupled with the restructuring of the civil sector in 1996, led to a major migration wave to the urban centres of New Zealand and Australia. The population of the island of Atiu shrank by 35% (Cook Islands Statistics Office 2001). The lack of workforce became an increasing constraint in developing the island’s infrastructure. Population loss, especially from the outer islands, is of growing concern to the Cook Islands government.

Furthermore, agricultural production is shrinking towards subsistence level and the resident population has become dependant heavily on imported food that is purchased with remittances from overseas. As a result of social and lifestyle change, the Cook

Islands have extremely high cases of diabetes and high blood pressure (Ulijaszek 2002). The cost to the National Health Service is increasingly high and a new programme by WHO was launched to raise awareness on these lifestyle-generated illnesses.

Other major issues include poor delivery of basic social services to outer islands, shortages of skilled labour and a narrow economic base. The aforementioned historical factors continue to shape contemporary livelihoods for the resident population of Atiu as well as the diaspora. In the next section I will describe the central elements of social organisation on Atiu in order to provide the reader with an understanding of the social framework within which ethnomedicine is utilised.

3.4 Social organisation on Atiu

Kinship, residence and land tenure in the Cook Islands emerge from a complex set of cross-cutting ties within a comparatively egalitarian framework. This pattern facilitates sharing the island's limited resources while at the same time diffusing disruptive inter-group conflicts (Stephenson 1976). On Atiu today, a wide range of alternative organisational patterns exist for handling these pressures including the village (*oire*), extended family (*kōpū tangata*), the church (*ekalesia*) and the drinking club (*tumunu*). The way Atiuan society is organised and the way people acquire land and access to its resources relates to the way ethnomedical knowledge is being transmitted and medicinal plants used on Atiu, as it is through kinship and residence that people become potential receivers of this specialised knowledge. Furthermore, it is through land tenure that they gain access to medicinal plant populations. In this section I will introduce the main institutions that regulate social affairs on Atiu.

3.4.1 Kinship and the extended family

The term 'family' as used in this thesis refers to the indigenous term for extended family, *kōpū tangata*; literally meaning 'stomach people'. It is a loose term as the most apparent aspect of the extended family in the Cook Islands is its ambiguity (Borofsky 1987). The term has different connotations in different contexts. It has an ancestor-oriented as well as ego-oriented focus.

The ancestor- oriented focus of the concept of *kōpū tangata* is evident in family reunions where the descendants of an apical ancestor (*pu mua*) meet. The ego-oriented focus of the extended family is more evident in carrying out daily activities and the term refers to distant relatives who have good working relationships, which people for instance are allowed to use plants from other families' homegardens. The term can refer to virtual categories (e.g., the families in New Zealand) or actual groupings of people (e.g., the stakeholders of a piece of land). This flexibility is of particular interest because Atiuans are well aware of their genealogical links and adults can trace their ancestry back five generations.

Kōpū tangata membership especially in the ancestor oriented focus, is constructed through land claims based on genealogical links, the duty of care of older siblings towards the younger ones, and the reciprocal obligations associated with the exchange of materials and services. These constructs facilitate the negotiation and adjustment of genealogical relations to the actual needs of individual households. Bilateral and flexible descent systems are considered typical of Malayo-Polynesian societies (Donner 1992: 319). Atiuans try to maintain a diverse set of kinship ties to keep their options open. These ties are actively pursued on the island as well as with emigrant relatives. Different *kōpū tangata* and households within them have different specialised family-owned traditions. These traditions whose particular details are secretly kept from other families include fishing, planting, weaving, sowing, cooking, healing and many more (Hartan 2002). Even though these skills are not easily shared, specialised services are. Atiuans strongly believe that one should help all relatives, especially if they are close or if they

are in need, and this is a prime motivation for the practice of traditional medicine and the sharing of exchangeable resources such as medicinal plants.

3.4.2 Residence patterns

Residence on Atiu is organised into five distinct but continuous villages: Ngatiarua, Tengatangii, Mapumai, Teenui and Areora. Villages constitute clearly defined corporate groups and they play a major role in the island's organisation. Each village selects by secret ballot one member to represent the village on the Island Council, the primary decision-making body for matters of island-wide concern. Each village lays claim to land stretching from the heights of the island where the human settlements are located, down to the sea, including different reef segments. Hence, the village not only includes houses and homegardens but sections of the forest, taro swamp, beach and reef as well. Membership of a village is predominantly exclusive. Patrilineal ties play a role in determining household residence, however the abandonment of patrilocal residence is quite common whenever a married woman needs to care for her elderly parents or there is lack of space in the husband's parents' home. The resulting female natolocal residence provides continuity and reinforcement of the connection of women with their birth home.

Members of a household eat, sleep and carry out domestic duties together. Although the number of members in a household may vary considerably, families usually have established genealogical ties to a particular unit, dating back one or more generations. Husband and wife share the same food-sharing unit, but a few of their children, while still living at home, may belong to other units, either in their own village or in other villages. Children and young people frequently change homes temporarily as foster children, locally referred to as 'feeding children' (*tamariki 'angai* lit. children feed) or, in the case of a late life adoption, permanently. Adopting a child is expressed by the term *angai*, which denotes 'to feed', emphasising the local view of the essence of parenthood (Siikala & Siikala 2005: 147). Feeding children eat and sleep with their new family and assist in daily jobs such as agricultural labour, feeding pigs and maintaining homegardens tidy.

'Lending' your child to other food-sharing units helps to strengthen ties with other relatives, obtain foods for the household that are only available in certain areas, and/or strengthen inheritance claims to particular pieces of property. These children constitute a set of cross-cutting ties between separate food-sharing units. Furthermore, children are divided between the mother's side and the father's side. Customarily, the first-born child belongs to the father's side and second-born to the mother's and this pattern of alternate birth order lineage allocation is applied to the rest of the offspring. Each side has priority in naming 'their' children and also deciding their religion in the case where the parents had different religious affiliations. Nevertheless, parental rights were shared among a number of kinsmen.

3.4.3 Land tenure

All land (*'enua*) in the Cook Islands belongs to different *kōpū tangata*, and cannot be bought or sold (Crocombe 1964). It is inherited bilaterally and parents can declare all their children as successors to their inheritance. Laws made by the colonial administration in the past give every child the same right to inherit land which allows every member of the family the right to succeed the shares from the family land. This practice is against traditional rules and causes a lot of problems due to multiple ownership and dividing land in small patches. As a result, small pieces of land often belong to many people, which renders large-scale agricultural development almost impossible.

The land can be leased to an external agent for development for 50-60 years for a small amount of money. At the end of the term, the occupant can apply to renew the lease. This is usually how foreign entrepreneurs set up businesses. With this mechanism the land is effectively always in the hands of the local people. If someone wants to develop or build on a piece of land, they have to call a land meeting where all the landowners have to agree to the claimant's request. Usually the person who calls the meeting is granted the right to develop the land, but they get a smaller area than requested. When someone

acquires a piece of land they usually plant coconuts at its boundaries as landmarks. The land meeting takes place in the house of the member of the extended family who acts as the office holder of the group. Rights to land are traditionally articulated through social hierarchy with a chief office holder representing each group at each level (Crocombe 1971a: 17). Similar processes were described for the island of Puka Puka (Borofsky 1987).

In Atiu, land acquisition is becoming increasingly important. Although the levels of tourism are quite low, easing the pressure on land development, many Atiuans that live overseas wish to secure a piece of land for their future return. People tend to lay claim to a property near their natal residence. This is partly a matter of convenience but also involves an emotional tie to a locality, especially since the ancestors are buried in the homegarden near their residence. Across the Cook Islands, the spirits of the dead, the *tūpāpaku*, are believed to communicate with and influence the lives of the living (Clerk 1995). Their graves are very well looked after and frequently decorated with fresh 'ei, flower garlands. Atiuans strongly believe that one should help relatives and often do so by letting them stay or cultivate their land. But this generosity has a down side in that one's guests may gradually outstay their welcome and become the property's permanent users through usufruct. The fluidity of the extended family and the residence patterns does not provide a fixed structure of access to resources such as land products.

3.4.4 The village

Stephenson noted that despite the villages' proximity, Atiuans view the villages as having individual characteristics that are accompanied by strong stereotypes (Stephenson 1976: 100). Inter-village competition and rivalry was still very prominent and each village has its own distinct identity. Ngatiarua is considered the primary village because it contains the house and *marae* of the *Ngamaru Ariki*- highest chief on the island. Tengtangii is considered the most traditional village due to the age of its population. It is also the base of *Rongomatane Ariki*-the second highest chief. Mapumai, the 'modern' village contains

the school, a wide range of family businesses and is the base of *Parua Ariki*-the third chief. Teenui is the largest village on the island and has a very religious and socially active Protestant community. Finally, Areora is a predominantly Catholic village, where the Catholic church is situated. Each village has a meeting house that is used for village activities such as church feasts, tribe meetings, prayer meetings and hosting guest groups from other islands (*tere*). Not all villages are equally socially active. Some villages have the fame of being 'slack' and not contributing much to the community. The hosting village usually feeds visiting guests and the feasting arrangements are organised by a committee.

Organised competitions, especially among villages, are extremely popular on Atiu. There are numerous competitions ranging from the *tutaka*- house cleanliness inspection which concludes with the nomination of the cleanest village, *tivaevae* competition-where the women of each village's Vaine Tini (women's craft association) have to sow a *tivaevae* and display in an annual show where points are collected per village and sports competitions like football tournaments. These competitions are the driving force behind the up-keeping of certain individual skills that would otherwise be abandoned in the relatively uniform rhythms of a small, rural community. Villagers demonstrate their strength and skills through success in such competitions. And it is the skills of these groups that enable inter-island competitions or even international competitions. Inter-island competitions included groups travelling to or coming from other islands in the Cook Islands for sports, crafts or dancing competitions. International competitions include groups from Atiu travelling to New Zealand, Australia, and Fiji for these competitions. In July 2004 a school dancing group went to Germany for two weeks and for that trip the whole island fundraised in Atiu and Rarotonga and the families communally prepared their dance costumes. These national and international trips contributed significantly to the horizontal transmission of ethnomedical knowledge (elaborated in chapter 8).

3.4.5 The tribe

On Atiu there are three political, quasi-hereditary units locally designated as *ngati*, which Atiuans translate as tribe. Chiefs reside in purpose-built spacious homes provided by the community. These homes are referred to as 'palaces' and they are situated close to the tribe's *marae*, the ancestral ceremonial meeting ground. Atiuan *marae* consist of flat open platforms made of stalagmite, coral chips, volcanic stones and limestone (Kura et al. 1984: 58).

The first tribe *Ngati Paruarangi*, is the tribe of *Rongomatane Ariki*. The 'palace' or chiefly home adjacent to the tribe's *marae* is located in the village of Tengtangii. The second tribe is *Ngati Te Akatauira* that is headed by *Ngamaru Ariki*. The 'palace' of the Ngamaru Ariki, who is considered the highest chief is in the village of Ngatiarua. The third tribe is *Ngati Nurau* (*nurau* denotes rainbow) headed by *Parua Ariki* who currently resides in New Zealand, much to the discontent of the Atiuan community. The *Ngati Nurau* is based in Mapumai but does not have a 'palace' for the chief's residence. In 2004, the members of *Ngati Nurau* were in the process of planning to build (with the financial help from the New Zealand community) a 'palace' for their 'king'. The terms palace, king and queen were very frequently mentioned, denoting a structural homology with the British royal family.

The Atiuan 'class system' positions the *ariki* at the top, followed by the *mataiapo*, then the *rangatira* and finally the ordinary people (Mokoroa 1995a: 22). The acquisition of the title of a lower chief- *mataiapo* is hereditary as well, however not openly acknowledged. Similarly, every *mataiapo* needs to know who are their lower chiefs- the *rangatira* and assign them jobs or other responsibilities. Sometimes people purposely disguise their status in the tribe to avoid the responsibilities associated with the title. A 52-year-old woman who was a *rangatira* described her situation:

'I know I am a *rangatira* and I know who my *mataiapo* is but I will not go and tell him. It is his job to know and I have too many jobs anyway to bother with these

things.'

Other people expressed similar views too. During the interviews, the chiefs mentioned that their role was 'to look after their people'. They described that their duties were not limited to the island of Atiu as they had to ensure the well-being of all the Atiuan communities in Rarotonga, Tahiti, New Zealand and Australia. Guesthouses for the Atiuan community, called 'Atiu halls' were built in Rarotonga, Tahiti and New Zealand. The chiefs exercise their powers through the Atiu Island Trust that manages the uninhabited island of Takutea as well. There are appointed community representatives everywhere Atiuan people are.

Pyramidal structures supporting ranks and chieftainships are common in Polynesian cultures. Sahlins notes that in Melanesia chiefly qualities had to be personally demonstrated on a day to day basis, whereas in Polynesia they were socially assigned to office and rank (Sahlins 1963: 210). Atiuan chiefs were humble and active in community life. They had previously lived in New Zealand before and returned to Atiu to get the title and resume their responsibilities. Like many Cook Islanders who previously lived in New Zealand, they initially had some difficulties adapting to the island lifestyle that is based on feeding pigs and growing taro. They were always present at formal events but never exercised any political authority. The church and particularly the Protestant church, has played a major role in diminishing the authorities and powers of the chiefs. The belief in the power of the chiefs and the tribe has merged with belief in the Christian God and the church. An example is the adaptation of the traditional ceremony for the investiture of a new chief. The chiefs after their investiture in the *marae*, attend a service at the Protestant church to receive the 'real blessing'. The church is nowadays seen as the main organising unit in Atiu and Atiuans commonly claimed that the primary allegiance needs to be to God.

3.4.6 The *tumunu*- the drinking clubs

Another social institution in Atiu is the *tumunu*, the predominantly male drinking clubs. The name refers to the trunk of the coconut (*tumu* denotes trunk and *nu* denotes coconut) and is named after the material that they used to make the first barrels in which to put the bush beer. A *tumunu* was originally made from the stump of a coconut palm, hollowed out to contain a potent fermented brew of oranges and other fruits (Koteka 2003: 184). There are seven *tumunu* drinking clubs on Atiu. The practice originates from the time of the missionaries, where drinking was prohibited so drinking parties would meet in the 'bush', outside the village.

Drinking is called *kai kava*, which literally means 'to eat the kava', an expression that points to previous consumption of *kava* (*Piper methysticum*) before the introduction of alcohol. This traditional institution was outlawed by the London Missionary Society in the 1850's and *kava* across the island was uprooted in efforts to stamp out the practice (Mokoroa 1995c: 74). Nowadays, *kava* is rare on the island. Healers who still use *kava* for traditional medicine prefer to purchase *kava* root in a powdered form which they obtain from supermarkets in Rarotonga.

The *tumunu* hold a very important organisational role in the community as a male institution. The bushbeer is made from malt, hops, sugar and yeast. The *tumunu* as an institution is an exclusive Atiuan phenomenon not found in other outer islands. All *tumunu* have a committee (chairman, secretary and treasurer) and membership. *Tumunu* membership frequently correlates with village membership and occasionally members' wives join the drinking sessions too. Each *tumunu* has its own secret recipe for brewing beer. Secret knowledge is highly valued on Atiu and permeates a very wide range of activities, not only traditional medicine.

The *tumunu* are important meeting points for men to meet and socialise. Even men whose religion prohibits them to drink often attend *tumunu* sessions to socialize with other men. A 42-year-old planter described some reasons for choosing where to drink: 'I go to this

tumunu because that is where the old people go. I am going there because I want to learn from them.’ In Atiu, men go to the *tumunu* usually straight after the work in the plantation. At the *tumunu* usually there are some snacks, coconut, some fruit, drinking *nu* young coconut and on some special occasions barbecued fish. The *tumunu* are considered as the ‘gossip centres’ for men, where information on planting techniques and health matters are discussed among many topics. Land issues are also discussed or disputed.

Tumunu have a very bad reputation not only because they contribute to men’s lack of productivity in agricultural labour but also to domestic violence. That was a common phenomenon, allegedly incited by the wives’ anger when their husbands would come home drunk after a long drinking session. Men who attended the *tumunu* expressed tiredness from the heavy workload in the plantations, especially since there was shortage of working hands as most of the young males had emigrated. Wild pigs eating their crops and the battle against the weeds were a constant concern and the *tumunu* was a place to discuss these matters.

3.4.7 The church and community groups

Most households on Atiu belong to a specific church denomination. There are four main churches on the island: Cook Islands Christian Church (Protestant church established by the London Missionary Society) which is supported by 60% of the population, the Catholic church which is supported by 22% of the population, the Seventh Day Adventist church (7%) and the Apostolic church (1%) (OMIA Ministry 2003: 6). There is also a newly established Jehovah’s Witness church, which has a very small number of supporters. Women’s groups are mainly organised through the churches. CICC is by far the most dominant of the four churches in terms of influence, historical importance and congregation size. Many leaders from other institutions hold leadership positions in their respective churches. Elected, religious, economic and tribal leadership positions often overlap with one another. Community work is also extended to assisting the church, which can take priority over village work. Observance of the teachings played out in the

Christian Bible also extended into other realms of control. Indicative of this is the importance placed on working hard for one's family and community, represented in the form of village work.

There are several community groups on Atiu that are primarily organised by different religious denominations. Churches are the largest non-government organisation in the Cook Islands. They serve specialist roles for education, youth, women, social welfare and culture (Crocombe 1990: 5). Women attend craft groups and children attend sports, scout, singing and dancing groups. Each group has a committee that consists of a chairman, a secretary and a treasurer. CICC has a women's group in every village, the *Vaine Tini*. The CICC and the Catholic Church have uniform organisations for the youth such as the Boys Brigade and the Scouts respectively. There is a sports association, which organise regular games of several leagues, like volleyball, netball, rugby or touch. Because of the limited number of people on Atiu sports clubs are not always running.

3.4.8 Education

Atiu has a pre-school, primary and secondary college. The average number of students enrolled in Enua Manu School is 200. The numbers change as the students move between different households in Atiu, Rarotonga and New Zealand. Primary education is taught in Maori and secondary education in English language. There are six primary school teachers and six secondary school teachers.

The school hosts the *Karere turamarama* week twice a year where experts from the community are invited to give weeklong workshops to the students. This week is important in the upkeep of some traditional skills with decreasing popularity such as weaving eel traps, baskets and fans.

3.4.9 Governing bodies

Local government functions on the island are conducted by the Island council and overseen by the chief Executive Officer appointed by the Ministry of Outer Islands in Rarotonga. The Island Council consists of elected representatives of each village, the Mayor, the Chief Executive Officer, two members of parliament, the representative of the *Arongo Mana*, the two chiefs that live on the island (*Ngamaru Ariki Henry* and *Rongomatane Ariki Ada*). However, chiefs have no right to vote. With the implementation of the ongoing devolution process in the Cook Islands, the responsibilities of the Island council have increased. The Island Council has the power to make, alter or revoke by-laws to govern the island.

The Cook Islands have two Members of Parliament that represent them in parliament. One for the villages of Mapumai and Teenui and one for the villages of Areora, Tengtangii and Ngatiarua. The island also has a Mayor, Island Secretary and Treasurer, who represent to the main government in Rarotonga the concerns of the five Island Councilors (one for each village). The Atiu Island Council, meets every two months to take decisions and includes the aforementioned and the three chiefs. The government also employs a Welfare Officer, Youth Officer, Environment Officer, Bills officer and a Women's Officer. Part of the civil sector is also the Ministry for the Outer Islands workers that are preoccupied with producing island crafts. The government is offering a wide range of employment opportunities as an incentive for people to stay on the island. The government workers are considered affluent by the other islanders because they have a fixed salary.

3.4.10 Law enforcement

Crime in Atiu is almost non-existent. The tight knit community is self- patrolling and young people are under constant surveillance from the adults of the extended family network. The only form of crime is crop theft. Two police officers are on duty and they

mainly deal with accidents and minor complaints. Under New Zealand's legislative requirements a 'jail cell' was built in the 1970's. The cell is currently being used as a relaxation area by civil servants as it is very cool. The concept of removing a misbehaving member of the community for punishment is alien to Cook Islands culture. Members of the community, young and old, are integrated in family affairs and this integration is continuously affirmed through customs and rituals as well engagement in daily life.

3.5 Local livelihoods

3.5.1 Daily life on Atiu

Daily life on Atiu starts between 5.30 and 6 in the morning, before dawn. Devout church members attend early morning church services. Tasks performed in the morning include tidying up the bedding from the living room floor where the family members like to sleep, sweeping the house, raking the dry leaves from the garden, getting the children ready for school, combing and plating the girls' long hair and having breakfast. Some men go fishing. School and civil service offices start at 8am. Subsistence farmers go to their plantations. The afternoon is a period of minimum activity due to intense heat. Pupils finish school and most people have finished work by 2pm and have an early afternoon rest. Around 5pm people go to the plantations, collect shellfish from the reef, women engage in craftwork and children feed the pigs. For young people, the evenings are packed with sports competitions and church youth activities. The local television station transmits programmes from around 9 to 11 pm and these are the hours that the whole family gathers in the living room.

Sunday is a day dedicated to rest and for most families the Sabbath is followed strictly. On a typical Sunday schedule the families wake up around 5am and prepare the earth oven, *tao te umu*. This involves piling and burning firewood over volcanic stones,

wrapping food such as pork, taro and taro leaves with coconut cream in banana leaf bundles, placing the bundles over the hot stones and covering them with a wet blanket. Once the food is in the 'oven', people get ready for church wearing their best clothes. After the church service the families return home, 'open the *umu*' and eat. Families stressed the importance of preparing and consuming large amounts of food on Sundays, as it was a day of rest, devoted to strengthening from the hard work of the week. After the Sunday feast, people usually sleep or snooze in front of the television or under the shade of trees in the homegarden. In the afternoon children and young people get involved in scout and other youth church group activities. Evening church services start around 6 pm and then everybody goes back home to eat the leftovers from lunch. The rest of the evening is spent watching television or visiting relatives. Sunday is regarded a special day of rest and activities such as swimming, washing clothes are prohibited. Not engaging in any activity that involves labour on Sunday is considered an act that 'respects the Sabbath'.

Most adults on Atiu frequently commented upon the difference of lifestyle that they experienced when they were young. Adults enjoyed describing their childhood years as years of hardship and adventure at the same time when adults and children alike were constantly busy day and night. During the week 'mundane' activities involved planting, weeding, feeding pigs and fetching water. 'Exciting' activities involved fishing, searching for coconut crabs in the forest at night and collecting shellfish on the reef. On Saturdays the whole family would spend the day 'down the land' tending the plantation and the animals. Women would wash the clothes in the stream and then prepare the *umu*, where they cooked freshly picked taro, taro leaves with coconut cream and the freshly processed pig meat. When the daily jobs were finished the family would eat their meal in the taro swamp and take a nap under the shade of the coconut trees. Additional fresh food resources and firewood were carried to the villages in preparation of the *umu* early on Sunday morning.

Nowadays, these activities do take place on Atiu and they are an important part of the life on the island, but the families are not exclusively dependent on subsistence for the

provision of food and materials. Adults and children enjoy more leisure time since some of the daily tasks for which children were largely responsible are no longer necessary, for instance carrying water (water tanks have been installed in most of the households), preserving food (most houses have freezers and can afford to buy imported goods), cooking exclusively on the open fire (most houses have gas stoves) and replacing the thatched roof (people live in cement block and lamina houses). As the time frame is more relaxed, women, men and young people have more free time. Women meet and talk, men go drinking and young people are allowed more time to spend in organised sports, dance practices and various church activities. However, these liberating changes in Atiuan livelihoods come with a price.

Indulging in the freedom of leisure and consumption of imported foods that are high in sugar, salt and fat has taken its toll on the health of Cook Islanders. The health effects of this 'new' lifestyle are detrimental. Obesity, diabetes, high blood pressure and gout are very prevalent on Atiu. The unforeseen 'side-effects' of economic progress have taken the islanders by surprise (further discussed in chapter 8). They frequently commented that in the past there was no illness on the islands and their forefathers were strong and healthy.

Commodities that were once considered luxury items like tins of corned beef and powdered milk are nowadays considered daily necessities. Workforce limitations have a very strong effect on the life and engagement with subsistence of the people living on Atiu, as there are not enough working hands to cultivate the land, feed the pigs and engage in construction work. As a result many agricultural fields have become fallow and previously domesticated animals like pigs and chickens become feral. Most households engage in root crop cultivation. They also rely very heavily on imported goods such as domestic equipment, food, clothing etc. Young people are apprehensive of the 'island ways' and the amount of labour that is demanded from them.

At the same time though, the tourism industry has encouraged the production of local crafts and other products, as well as dances, songs and other examples of 'traditional

culture'. Still, traditional dancing and costume making is one of the young people's favourite activities. It remains an essential feature of most social events and is further commercially exploited at 'island nights' and fundraising activities. Atiuans and other outer islanders are seen as the guardians of 'traditional culture' and they are generously supported in all their fundraising activities in Rarotonga, New Zealand and Australia.

3.5.2 The household

The household consists of a complex of independent dwellings such as the houses where the family sleeps (*are moe*, literally 'house sleep'), the washing area (*are vai*, literally 'house water'), the toilet (*are repo*, literally 'house dirt'), the outside kitchen (*are umu*, literally 'house oven'). These houses and particularly the sleeping house are kept very clean. Family members and visitors alike always remove their shoes and flip-flops before entering the house. Soiled footwear, clothing and equipment together with plants and animals brought for consumption are left in the homegarden. Water tanks from where the families get their water (as there is no central water and sewage system) and the graves of the departed ancestors are also situated in the homegarden. The gardens are not gated or enclosed other than with a living fence of hibiscus (*Hibiscus rosa sinensis*) or panax (*Panax spp.*), and people freely walk in other people's gardens.

The main unit of the household is *are moe*, the sleeping house. The walls of the Cook Island homes are fully decorated with framed photos, all indicators of the family's genealogy. The houses are decorated with colourful fabrics and hand-made tie-dyes. Photo frames of deceased ancestors are decorated with shell necklaces. The wooden sofas are accessorised with pillows with hand made pillowcases or tie-dye sheets. The living room also contains many beds, which are used to accommodate visiting family members. However, on a daily basis most family members prefer to sleep together on the floor on the mat with a pillow and a sheet. Even family members who have separate rooms with beds, will usually fall asleep on the mat after the evening television program has finished. The sofas and beds are maintained in an immaculate condition. Except sofas, beds and

tables, the houses are largely unfurnished. Most of the clothes are kept in big plastic travel bags.

The house is daily cleaned using the *kikau* broom, a broom made from the rachis of the coconut leaves (*Cocos nucifera*). It is swept and bedding from the previous night is packed away early in the morning when the family members wake up. Every house will have a mat in the living room. Synthetic mats have replaced locally made pandanus (*Pandanus spurius*) mats, as the people say 'they last longer and have nice designs'. The households are usually left unlocked during the day but locked at night. Theft of household items is very rare on Atiu, and when it occurs the stolen items are usually food or washing powder. People know each other very well and watch each other's property; if a theft were to take place everybody would know the culprit.

Most household activities are carried out in the homegarden not in the house. On a daily basis homegardens are a space for domestic activities. Such activities are peeling vegetables, cleaning fish, grating coconuts, cooking in the open fire, washing clothes. They are also a space where special operations that involve many members of the extended family take place like carving canoes, dyeing sheets, drying cassava starch, processing coffee beans, preparing traditional medicines and many more. The homegardens are also an important space for recreation where relatives meet and exchange the daily gossip, mothers bring their babies to play, senior ladies engage in craftwork and singing, senior men have their drink and recite genealogies and stories from 'the good old days'. Throughout all these activities and between their numerous after school activities, children and young people are keen observers and participants.

Pigs are kept at the back of the homegarden where they are daily fed coconuts and scraps. Feeding pigs is a central activity of daily life on Atiu and the location of pig rearing areas strengthen people's links with specific land pieces. Pigs must be kept at least ten metres away from the house. This restriction, based on hygiene grounds, is imposed and checked upon by the household inspection committee, the *tutaka*.

3.5.3 *Tutaka*- the household inspection

The interior and the exterior of the houses and homegardens alike are inspected for their cleanliness and maintenance during the *tutaka*, which is the household inspection, carried out four times a year. The *tutaka* team is a voluntary body that comprises the environment officer, the health inspector, a public health nurse as well as committee members from each village. The female-dominated *tutaka* team inspects all homegardens to ensure that pigs are kept at an acceptable distance from the house, the grass is short, the fire pit is empty and there is no disused equipment lying at the back of the garden. The team also ensures that all dried leaves are swept, rubbish in the pit is burnt, and that the pigpen is kept clean with no excess coconut husks from feeding the pigs. Each household receives points that count towards the village total. The winner of the honorary title of the 'cleanest' village is the one with the highest number of points. The *tutaka* started as an initiative from the *Vaine Tini*, the women's group, to ensure that certain standards of living were being kept. The aim was to prevent cockroach and rat infestation of the household and ensure that old people and young children have safe and clean facilities.

3.5.4 Division of labour

Most activities on Atiu are gender segregated. Women are responsible for less physically demanding tasks such as cooking, cleaning the house, washing clothes, looking after the children and making elaborate crafts. It is mainly women and younger members of the family that tend homegardens. The association of women with homegardens is similar to what has been widely reported elsewhere (Marsh 1998; Seeth et al. 1998; Talkuder et al. 2000). Even though women primarily tend the homegardens, they are used by the entire extended family that dwells in the household. The composition of the resident family varies because, as I mentioned earlier Cook Islanders are very mobile people. This consequently renders the function of homegardens fluid, as their maintenance and use is

highly dependent on human labour and the needs of the people that dwell in the household.

Men are responsible for more physically demanding jobs such as growing taro, feeding the pigs, fishing and building work. Many of these jobs involve going out 'in the bush' and engaging in hard physical labour. Men and women usually do not get involved with each other's tasks. As a 43-year-old government worker mentioned after a homegarden survey:

'My wife looks after the homegarden. I am not interested in it. Can you eat the flowers? I don't think so. I am only interested in growing taro. If you don't grow taro, then you are not from Atiu, you are from another planet.'

Masculine labour is seen as better suited for commercial agriculture than tending the orchard. On the other hand, women, older men and children handle those species with social and cultural value, as is the case with ornamental, medicinal and ritual plants. Daily tasks are clearly assigned to different people and the performance expectations are high. A man is expected to be a good planter and provide the household with enough taro. Similarly, women are expected to maintain the house clean at all times and prepare all the meals. Most jobs are gender and age specific.

Atiuans frequently say *'Mā te kō 'ure, rave te 'anga 'anga'* which is locally translated as: 'if you know how to wipe your bottom, you can do all the jobs'. This saying suggests that once a person is no longer an infant, he or she has no excuse not to be able to perform tasks assigned to their age or gender. These tasks are associated not only with daily life but also with special features of social life and in the next section I am going to provide a detailed account of rituals accompanying the Atiuan lifecycle.

3.6 Rites of passage and the Atiuan life cycle

Rituals and customs associated with the different stages of life are very prevalent in Atiu and they provide clues to understand the individual's relations with the wider community and ways by which illness and health are affected by the quality of these relations. Idiens noted that in the Cook Islands, at the level of the individual, life focused on the extended family system, each household consisting of a composite group of related persons who acknowledged a complex network of obligations to each other and society as a whole (Idiens 1990: 10). Plants frequently accompany these rituals as part of the ritual ceremony or the associated gift exchange.

3.6.1 Birth rituals

The most prominent birth ritual is the burial of the babies' placenta, *'enua*, in the homegarden (Tatuava 1995). The baby's father usually buries the placenta and also plants a fragrant shrub on top. This plant belongs to the child and serves as a reminder of its association with the land of its extended family. A retired nurse mentioned that when she came to Atiu in 1956, local women considered the *'enua* very precious and burying it after birth was considered as an important ritual of social life. She mentioned that even nowadays, when mothers give birth in the hospital in Rarotonga, the nurses keep the placenta in a jar and give it to the family. A study of infant health care practices in New Zealand showed that Cook Islanders, Tongans and Samoans considered the burial of the placenta an important ritual despite their emigration to new urban centres away from home (Abel et al. 2001: 1141).

A 73-year-old mother of nine children who originally came from Manihiki, an atoll in the northern group, mentioned that on Manihiki, where plant diversity is exceptionally limited, in the absence of fragrant shrubs people usually plant coconut palms on top of the buried *'enua*. People are prohibited from picking mature coconuts from the *'enua* palm until the child picks the first crop. Atiuans have similar prohibitions associated with

the management of some 'enua plants'. If a wild taro variety, *taro puraka*, is used, they do not dig it up until the child is five years old. When they eventually dig up the taro, which has grown considerably in size by that time, they give it to the pastor or the chief.

These birth rituals originated from more elaborate birth rituals that were practiced in the past. Low reported that in Mangaia in the forties an old mat was folded over the placenta from corner to corner. The bundle was tied with cord made out of *au* (*Hibiscus tiliaceus*) bark. The bundle was buried in the family cemetery. The ritual was considered equivalent to a funeral as the placenta was regarded as the sub-body of the newborn child. Furthermore, the umbilical string of the child was placed in a matchbox and taken by the father of the child to sea on his next fishing night. The matchbox was weighted with a small stone and thrown in the sea. It was thought that if the ritual did not occur then the child would never learn how to swim (Low 1943). In Samoa, the placenta used to be buried in the earth-*fanua* which also refers to land, field and afterbirth. Nowadays it is thrown in the sea. Samoan people perceived that if something happens to the placenta, then something might happen to the baby as well (Kinloch 1985: 209).

Older women enjoyed recounting birth rituals of the past. For the first-born baby there were special preparations. I was told that in the past, people made *tapa* cloth from the outer bark of the *ava* (*Ficus prolixa*) for the pregnant woman to sit on. They used to make a cord from the *oronga* (*Pipturus argenteus*) to tie the umbilical cord. Another plant used for cordage in the past was pineapple (*Ananas cosmosus*). Long pineapple leaves were used to make birthing ropes..

During pregnancy, there were certain taboos prohibiting the consumption of a wide range of foods. Pregnant women were not allowed to eat coconut crabs and wrasses, such as the *marari* (*Anampses geographicus*). It was believed that the consumption of *marari* would cause the skin of the new-born baby to be spotty and rough, resembling the skin of the fish. Another common practice for pregnant women is the consumption of diuretic potions, *vairākau mimi* at the end of the month; and laxative potions, *vairākau akaeke*. New-born babies are massaged with a particular coconut oil, 'akari ira that is believed to

give them a healthy skin and keep them safe from ghost sickness, *maki tūpāpaku*, caused by the spirits of the ancestors (further discussed in chapter 6).

3.6.2 Adoption

In the Cook Islands, adopted children, *tamariki 'angai*, have the same rights as their siblings to inherit land. Similar principles apply to the inheritance of specialist knowledge such as ethnomedical recipes. Adoption of children is a customary procedure. It is a social activity that enhances social cohesion and ensures that all children are cared for. Records show the adoptions were made between distant relatives to strengthen relationships and make new links between chiefly lines. Big feasts and gift exchange always marked adoptions. Adoption was one of the few areas where traditional authorities such as the extended families still had control and new legislation, requiring all adoptions to be registered, was not welcomed at all (Baddeley 1985).

The inheritance and descent system in the Cook Islands, like the rest of Polynesia is bilateral. Formally, adopted children maintain the right to inherit from both sets of parents. The adopted child's clothes and belongings are being removed to symbolise separation from its biological parents. In the case of the adoption of a newborn baby, it is not allowed to breastfeed from its biological mother and the adopted parents bottle-feed it. Adopted children with blood ties are automatically accepted in the new family whereas those without any blood ties had to be formally admitted. An adoption request can occur at varying stages of a young child's life. One young Atiuan recalls his adoption process:

‘When I was seven my new parents came to my mum to ask for me. I don't know why they wanted me. They came with food, presents, hand made tie dyes and presented them to my mother. They said this is how serious we are about this child. We will take good care of him.’

The admittance procedure requires the consent of the *kōpū tangata*. The adopted children

are given a particular portion of land as a gift on the instance of adoption. As earlier discussed, adopted children are referred to as *tamariki 'angai*, which literally means feeding children. Food is central to the Cook Islands' society and being fed, like the adopted child (and also the rest of the children), creates an obligation, which is expected to be repaid later on in life.

The request for adoption was being made first to close kin. The closer the relationship between natural and prospective parents the harder it was to refuse. Sometimes it was thought that if the biological parents refused adoption, then the child would get *maki tūpāpaku*, 'ghost sickness' that would be cured if adoption was eventually allowed. The parents could allow the prospective parents only to name the child.

A study of adoption in Mangaia, reveals a historically strong pattern of adoption processes. Hickling noted that in 1945 in Mangaia, about half of the couples on the island brought up biological and adopted children under the same family unit. Children were usually adopted at birth since the the adopted child's gender was an important decision-making element of the adoption process. Grandparents tended to adopt the children of single mothers. In other cases, the child was reared by the adopted parents but then returned to its biological parents. In Mangaia, like in Atiu there is a loose concept of the word family. There were five main reasons for adoption: inheritance of land, company for older couples, reciprocal adoption to establish links, marking an event of importance and for naming (Hickling 1945).

Adopted children can inherit land from their adopters and have full membership in the adopters' family. Adopted children also had rights to inherit specialised ethnomedical recipes as they were 'formal' members of the *kōpū tangata*.

3.6.3 Naming

A 'wrong name' was identified by Atiuans as a prevalent cause of illness. Naming in the

Cook Islands is a customary procedure. Children were given names ranging from one syllable to one sentence. Parents seldom confer names indicating affection or beauty; it is more usual for the names to indicate events and people (Hickling 1945). In Atiu the infant's first name was selected a few days after birth. The first child was named by the father since it customarily belonged to the father's side. The second child was named by the mother since it customarily belonged to the mother's side. Family side allegiance based on alternate birth order extended beyond naming rights to church and tribe membership. One of the parents could ask a close relative to name the child and this type of request would be usually placed a few weeks before birth. The child's parents could refuse the name if they thought it was inappropriate.

In the course of their lives Atiuans would add further names to their birth names as for example commemorative death names upon the death of kin. At marriage the bride's parents select a new name for the groom and vice versa. The Atiuans believe that the spirits of the dead remain in the vicinity after death and can influence the lives of the living. The names given are frequently related to a deceased ancestor. For example the name *Pati vai* that means 'beg for water' could be acquired by a person to remember the constant request of the deceased during his last illness or to remind the spirit that he was the person that fetched the water. Birth names also represent a deceased relative as a special attribute of honour, an illness that the person has passed or a journey.

When schools were established in the Cook Islands in 1923 the teachers were confused and did not know how to refer to the pupils. A big effect on the naming system of Atiu was the government-funded citrus scheme. Since it provided long term financial assistance to Atiuans the individuals had to retain the same name for a long time. The main function of the traditional naming system were to highlight passages of life such as birth, marriage and death, dates of historical events as well as the establishment of social relationships (Crocombe & Rere 1959).

Names that are considered ill-fated were abandoned in later life. For example if a child bears the name of a deceased person and it suffers, then the family may consult a spirit

medium to discover whether the name was the cause of trouble or an illness. The role of naming as a cause of illness is further discussed in chapter 7.

3.6.4 Hair cutting ceremony

The 'hair cutting' ceremony, *pakotianga rauru*, usually takes place between the fifth and twelfth year of a boy's life. It is quite common on Atiu to see young boys with very long hair, signifying that they have not had their hair cutting ceremony yet.

The timing of the hair cutting ceremony varies as the family has to ensure the timely completion of the ceremonial preparations. The extended family members help in the preparation. I attended the hair-cutting ceremony of a twelve-year-old Atiuan boy in Rarotonga. Several hundred of participants are usually invited in the ritual. The boy was dressed in his best clothes. His hair was tied in numerous strands with tiny white ribbons. The priest began the ritual by giving his blessing. The guests were called to cut a strand of the boy's hair. The guests contributed money and gifts that represented their good will to help the boy's future and symbolically express a close relation. For example a distant relative who gave a very good present was an indication that he would like to be considered as close kin. The ceremony was concluded with a very big feast at the end guests were encouraged to take food home with them.

Hair cutting ceremonies are also conducted among Cook Island migrants in Auckland. The new migrants were more likely to take part in these activities to establish themselves in the migrant community. The 'hair cutting' ritual served very well this purpose (Loomis 1983) and still continues to have an important role in social cohesion among the highly dispersed but well networked Cook Islands populations.

3.6.5 Death and mourning rituals

When someone died in Atiu, the relatives gather in the deceased person's house. While

on Atiu, I attended the burial ceremonies of four elderly people. Unfortunately, due to the ageing population of Atiu, funerals are not uncommon. The people who prepare the body would always be the same sex as the deceased. Two groups gather: the mourners and the comforters that engage in chanting, dancing and singing. Accounts of early mourning rituals in Tongareva stress the importance of a long mourning period for the spouse of the deceased (Vini 1976). The body of the dead is anointed with coconut oil and dressed with the deceased's best clothes. The priest is called to say a short prayer. The body is covered with a *tivaevae*, a hand-sown bedspread. It is customary for visitors to bring a sheet of lace and place it over the body of the dead and also contribute a substantial amount of food like a carton of corned beef, a box of cabin bread, a sack of taro or a pig. The amount of material contributions to one's funeral is directly related on the previous contributions of the deceased to other people's funerals. One mourner explained her contributions:

‘When I heard that this *māmā* was dead, I looked in my books. What did she bring when my dad died? She brought a lace and a carton of corned beef. So I just went to the shop and bought a carton of corned beef and a lace and took them there. I told my sister in New Zealand about the death and she said she would cover the costs of our family's contributions.’

The women stay overnight and keep company to the dead. They fan the body using a *rauti* (*Cordyline sp.*) leaf. It is believed that the spirit of the deceased is still around in the house. Seeing a centipede is not considered a good sign as it is thought to represent an irritated ancestral spirit. I had a ‘centipede encounter’ when attending the funeral rituals of one of my favourite elderly informants, *Māmā* Itinga. I was sitting on the floor near the house entrance while the female relatives were singing around her body. I suddenly noticed a small centipede trying to climb on my sandal. When one of the mourners saw the centipede on my foot she said: ‘Oh, *Māmā* Itinga. This is Sonia. Leave her alone.’ After I shook my foot and the centipede left, she added: ‘See...she didn't bite you. It is because she liked you.’

The next day the body of the dead is taken to the burial ground which is usually situated in the garden of the deceased's house. The male relatives would dig the grave. The body of the deceased is carried to the grave wrapped in a mat. The rest of the deceased's belongings are thrown in the grave to be buried. This is done because of the belief that the deceased people's belongings carry their spirit after their death and if not destroyed will serve as vehicles for the spirits' agency after death. The spirits of the ancestors are deeply feared and have to be continuously appeased.

Even though the practice of rites of passage varies between different islands, there are some common features, especially between the birth and death rituals. These features are the participation of a wide social circle of friends and family, the role of the church, the feast and the strict reciprocity of material goods.

3.6.6 Gift exchange in rituals

Gift exchange in Atiu and the Cook Islands in general permeates all aspects of social transactions. Reciprocity is an inherent part of the Cook Islands culture and this is evident by the meaning of payment. The Maori word for payment is *tūtaki*, which also means to pay back, to reward and to treat somebody to something (Buse & Taringa 1995: 531).

What constitutes a gift is very varied. Agricultural produce like taro, sweet potatoes and cassava; animals like fish, coconut crabs and crayfish; craft items like baskets, mats and embroidered fabrics; imported food like corned beef, cabin bread and noodles and imported goods like blankets, stereos and clothes constitute only a sample of what is commonly exchanged as a gift in Atiu. Payment in goods, food or specialist services is a common pattern, historically noted for Polynesian cultures (Firth 1936). Gifts in the Cook Islands are referred to as *taonga rima*, *taonga* denoting the gift and *rima* the hand, signifying 'the gift that I am carrying in my hand'. In Polynesia, cognates of *taonga* most often refer to mats and barkcloth, which in most cases are produced by women and exchanged by women (Weiner 1992).

Exchange is a richly symbolic activity and all exchanges have got a social meaning depending on the context that they take place. A simple gift has meanings that involve class, social mobility, employment, manufacturing processes, issues of style and changing rituals or conventions of gift-giving (Davis 1992). Gifts feature in both types of formal and informal prestations. They can either be donated to reciprocate a past donation as in the case of formal prestations or simply donated to acknowledge someone's voluntary service as in the case of informal prestations.

The symbolic, moral, legal and ritual meanings of exchanges in Atiu and their ramified institutional connections are fairly clearly patterned and in the case of formal celebration the pattern of reciprocating gifts is conducted in a strictly directly reciprocal fashion. It is within this context of exchange that Maori medicine operates as an exchange system. As I will describe in the next chapters, it is provided free of charge but this favour remains firmly grounded within the exchange network.

3.7 Conclusion

This chapter described the colonial past and social organisation patterns in order to contextualise in the following chapters the factors that shaped contemporary medical practices and medicinal plant use patterns.

Social organisation illustrates the role of the individual within the Atiuan society and the importance of providing for the welfare of the society. Kinship and adoption patterns determined who has the potential to inherit knowledge and in particular ethnomedical recipes. Membership in the extended family is not fixed. This pattern is reflected in knowledge transmission processes as well. Land tenure and inheritance patterns influence who has access to which piece of land and its resources. As Atiuans harvest medicinal plants only from family-owned land, land tenure systems have a direct impact on plant conservation. The fluid residence patterns of the Atiuan population are also reflected in

fluid land use. Overall, kinship, residence patterns and land tenure were the main institutions controlling who tends and uses land resources.

Religious beliefs consist of a mixed Christian faith with a strong belief in the power of ancestral spirits to interfere with the role of the living. Faith accentuated the power of the individual over supernatural beings like ancestral spirits, their ability to cause the illness and the humans' ability to heal. The customs and rituals of Atiu reflect how Atiuans experience life and the relationship between the individual and the world. The ritual directly associated with illness is naming, as a 'wrong name' was believed to cause the anger of the ancestral spirits. Rituals are also important points of communication between Atiuans and their extended network where a wide range of objects and services are being exchanged and kin links rejuvenated.

In short, this chapter shows that the Atiuan society is highly stratified and organised with cross-cutting ties ensuring flexibility in accessing and sharing resources including medical recipes and medicinal plants. In the next chapter, I will discuss in detail the environmental features of Atiu, the role of plants and animals in Atiuan society and their role in shaping the ethnomedical system.

4 The Atiuan ecosystem: people, plants, animals and spirits



Figure 11: Clockwise from left: taro swamp, Ake Simpson making Maori medicine in her homegarden with her adopted grand-son playing nearby, homes in the village and ancestral graves in the homegarden

'This plant we call rākau avarevare [Mimosa pudica]. It means the liar plant. Why? Because it is like a liar. When you got close to him, he looks down and shuts his mouth. But when you turn your back to him and walk away he puts his head up and opens his mouth and starts gossiping about you.'

'This flower opens at night. It has a very strong smell. The tūpāpaku like it, so we never plant it next to the front or back doors of the house, always on the side so the spirits don't come in the house.'

'This plant we use it for the Maori medicine. It grows around the taro patches like a weed. But when I see it I never pull it out. I pull out all the others though, so that my patch is nice and clean, not full of tūtā (rubbish).'

'Sometimes at night you can see a cat sitting on the fence outside the chief's house. One day a māmā told me that she went to touch it and her hands went right through. It was a ghost.'

After detailed observations of Atiuan daily life I realised that people, plants, animals and spirits were intertwined in a mesh of ideas and beliefs that guided all types of activities ranging from subsistence and illness treatment to ceremonies marking birth and death. What happened was that consciously and/or subconsciously I was coming to terms with Atiuan cosmology 'in action', and curiously enough (for a novice anthropologist at least) it was not contained in a 'ritual'. Atiuan notions of spirits, their attachments to place and their movements animated the biological and social landscape which people were born into, lived and then died. It is this animated ecosystem that I will describe in this chapter.

4.1 Introduction

Plants and animals are an integral part of Atiuan daily life. They provide the raw materials that are used in different stages of the human lifecycle as tools, gifts, disease causing agents, healing recipes and many more. They have utilitarian, spiritual and ceremonial roles that form part of Atiuan cosmology. It is this belief system that is underlying how medicinal plants and other potent substances are used.

Takhtajan recognises several distinct floristic regions within the Pacific and the Cook Islands belong in the Polynesian subkingdom which includes the Polynesian and Hawaiian floristic regions (Takhtajan 1986). IUCN reports the presence of 284 native vascular plant species in the Cook Islands, 33 of which are endemic (Heywood & Davis 1995: 5). Out of these endemic plants only one (*Geniostoma sykesii*) has medicinal value but was not present in Atiu (McCormack 2004). The majority of medicinal plants are native or introduced by Polynesians and more recently by Europeans (Whistler 1992: 99).

Terrestrial animal diversity is relatively limited as well. Mammal diversity consists of domesticated pigs, cats, dogs, cows, horses and rats. Animal husbandry and particularly raising pigs lays in the centre of Atiuan life, which is typical of subsistence patterns in the Pacific Islands. Animals in the Cook Islands have strong associations with the spirits (Clerk 1995). Spirits are believed to act directly on humans, take the form of pigs and cause accidents or take the form of centipedes and deliver 'warning' bites.

Plants and animals are intricately linked in the social world and they form part of the elaborate social rituals that contribute to the Atiuan social life (Kautai et al. 1995). As described in the previous chapter, the rites of passage associated with the Atiuan lifecycle include birth rituals, hair cutting ceremonies, death and unveiling ceremonies in which plants and animals are being used as consumptive and spiritual resources. In this chapter I will explore the role of plants and animals in Atiuan society and their role in belief systems associated with illness and health.

4.2 People and the environment

The Cook Islands have a tropical humid environment. The four main features are the sub-tropical high-pressure zone, trade winds, the equatorial doldrum belt and the inner tropical convergence zone, the South Pacific convergence zone. Characteristic features of the climate are the tropical cyclones that affect the southern Cook Islands on an average of 1.4 times a year. There is a marked seasonality in the rainfall regime, the dry season ranging from May to October and the wet season from November to April. Annual rainfall averages about 2400 mm (Mehlgarten 1999).

4.2.1 Geology

There are two different kinds of rock, which generate the main landforms on the islands. The volcanic interior is built mainly from olivine basalt, including tuffs, breccias and dikes. The coral limestone is formed by a raised coral reef surrounding the volcanic interior and comprises mainly calcite and aragonite. Upon the coral limestone, the *makatea* supports a dense forest. Limestone forest is a distinct type of lowland rain forest with a distinct assemblage of species growing on raised coral substrates (van Royen & Davis 1995: 521). Landforms and soil types are connected on Atiu. Agronomic surveys distinguish four distinct geographical areas: the *makatea*, the swamp areas, the interior lowland terraces and the interior uplands (figure 12).

The *makatea* covers 57% of the area of Atiu, which is mostly covered by native *makatea* forest. The inner ring of *makatea* (referred to as 'mokoera' soils) is partly covered with alluvial material from the volcanic interior of Atiu. This makes the area useful for agricultural purposes (bananas, coconut etc). The swamp land covers 5% of Atiu and is used for growing taro, the most important staple food on the island. The interior lowland consists of several terraces, covered by soil with good structure, good nutrient supply and good drainage. This very valuable land makes up to 10% of Atiu. The natural creation of

terraces allows agriculture on flat land. The interior uplands that comprise about 20% of the island are volcanic slopes. In the 1980's these hills were extensively planted with pineapple but with the breakdown of the industry the top- and sub-soil was removed (Mehlgarten 1999).

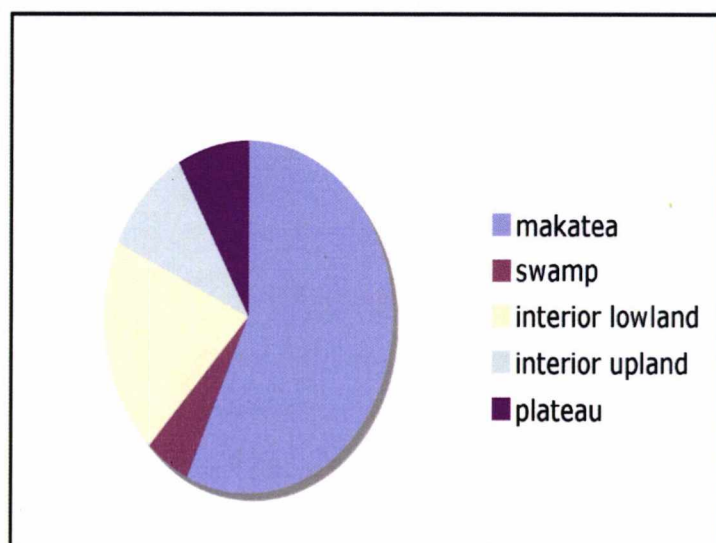


Figure 12: Landform types and relative area occupied in Atiu

4.2.2 Habitats, land use and medicinal plants

Local people recognise six habitats on the island: the coast, makatea, taro swamp, inner lowlands, inner uplands and the plateau. Each recognised habitat has a different vegetation composition and degree of human activity (table 1). Medicinal plants were collected from all habitats. I cross-referenced these categories during interviews with knowledgeable elders and also young people in the school and their views confirmed these six categories.

During my service as a Science teacher in *Enuamanu* high school, I asked my pupils who were aged 13-14 years old to draw maps of the island using pen and paper. In their drawings they clearly marked these six habitats and even provided a key to identify the different regions. Impressed by their mapping skills and classification consensus, I asked

whether they had participated in a similar activity before. They mentioned that they had been asked to do a similar task by the Agriculture teacher.

Subsequently, I surveyed the island with my assistant; Atiu's Environment Officer and we identified the following levels of human activity and vegetation types:

Table 1: Habitats, main human activities and characteristic plants

Habitat	Local name	Human activity levels	Typical Vegetation
Coast	<i>Tai</i>	Moderate	Coconut, beach vine, ironwood
Limestone Forest	<i>Makatea</i>	Minimal	Coconut, banyan, barringtonia, mahogany, rosewood
Taro swamp	<i>Vari</i>	Heavy	Coconut, taro, breadfruit, tree hibiscus, Polynesian chestnut
Inland lowlands	<i>Tanutanu</i>	Moderate	Coconut, cassava, sweet potato, dryland taro
Inland uplands	<i>Kauvai, tuenue</i>	Minimal	Coconut, pines, fern, mango
Plateau	<i>Oire</i>	Heavy	Coconut, gardenia, banana, papaya, hibiscus, rose, frangipani

The different habitat types are arranged concentrically around the island and are associated with altitude. Atiuan toponymic categories reflect types of land use. The coast is referred to as *tai*, which means sea. *Makatea*, literally means white stone, which refers to the limestone upon which the forest grows. *Vari* means dirt and refers to the swamp. Working in the taro swamp had negative connotations as it was considered 'dirty work' resulting from the soiling of the body and the clothes from the mud as a result of working in the plantation. *Vari* was also the name on the ancient goddess of the land who produced other deities from her body (Hiroa 1971 [1934]: 9). On a symbolic level, dirt and moisture was associated with human female procreative power. Sillitoe also observed associations between human reproduction and crop breeding in Papua New Guinea, both featuring the mixture of fluids in warm soft conditions in women's wombs and rain-fed soil respectively (Sillitoe 1998: 229). The inland uplands were referred to as *tanutanu*,

due to the prevalence of plantations in that region. The inland uplands are referred to as *kauvai*, which means body of water because in the past there were water sources in the area. Some parts of the inland uplands are also referred to as *tue nue* referring to the fern *tue nue* (*Dicranopteris linearis*), which was the predominant vegetation type before the introduction of the pine trees. Finally, the island's plateau where the villages are situated is called *oire*, which means village. In the following section I will give a more detailed account of the vegetation, medicinal plant composition and human activity in each of these island habitats starting with the areas of lowest elevation.

4.2.3 The coast

The coast comprises the rocky shores and the coastal *makatea* vegetation. From the coast to the road it is mainly a closed canopy habitat, dominated by large trees such as the *toa* (*Casuarina equisetifolia*), *tou* (*Cordia subcordata*), *ano* (*Guettarda speciosa*) whose leaves are collected for the *umu*, the earth oven; and *ngau* (*Scaevola* species) whose leaves are used for fish poisoning. *Nono* (*Morinda citrifolia*) is very abundant and its fruits are harvested and exported to Rarotonga where they are commercially fermented to produce the medicinal 'noni juice'. Ground cover is composed of woody shrubs such as the *ngangie* (*Pemphis acidula*) and the *pirita* (*Jasminum didymum*) which is used to make the *inaki*-eel traps. The vine *keketa* (*Vigna marina*) on the open canopy coastal rocky shores is collected for a wide variety of medical uses. All along the coast three species of fern are well established: the largest fern species *kota'a* (*Asplenium nidus*) is commonly used for wrapping food in the *umu* and the medicinal ferns *tūrei 'aua* (*Davallia solida*) and *tūrei mangamanga* (*Phymatosorus scolopendria*) are collected for their uses in tiedyeing patterns and medicine. The coastal *makatea* is separated from the inland *makatea* by the circular road that surrounds the island.

Nine medicinal plant species are harvested from that area. Medicinal plant harvest in the coastal areas is usually combined with other activities. The coast is visited on a daily basis for a wide range of activities such as swimming, fishing, collecting shellfish,

feeding pigs or collecting papayas and coconuts. Medicinal plants particularly associated with the coast are 'ara tai (*Pandanus tectorius*), keketa (*Vigna marina*) and toa (*Casuarina equisetifolia*). 'Ara tai is considered to be a special variety of pandanus that grows near the sea. The fruits of the pandanus are used in Maori medicine and also in making 'ei-garlands. There were local concerns that the 'ara tai population is in decline because when the fruits are in maturity people cut the tree to obtain them rather than climbing the tree and cutting only the fruiting body. In response to this rare case of unsustainable harvest on Atiu, the Environment Officer issued a motion that forbade cutting the 'ara tai trunks, which was announced in the local radio, whereby local people would be sanctioned if caught upon the act.

4.2.4 The makatea

The inland *makatea* consists of a relatively undisturbed forest growing on the fossiliferous limestone. The main trees characteristic of the *makatea* are *tamanu* (*Calophyllum inophyllum*), *ava* (*Ficus prolixa*) and *mati* (*Ficus tinctoria*). The ground cover consists of the *ko'ota* (*Asplenium* spp). There are no tracks to access the interior of the *makatea*. The main human activity is harvesting timber, banyan root verticals and searching for the *unga*-the coconut crab (*Birgus latro*). All these activities have a minimal impact on the environment, as they are labour intensive and carried out in low intensity. The *marae*, stone-built ceremonial grounds and the burial caves where human bones were deposited in the past (and can still be seen) are also situated in the inland *makatea*. The *makatea* is avoided at night because it is believed that the spirits of the ancestors, particularly those buried in the burial caves, dwell on the land.

Twenty-eight medicinal plant species are harvested from the *makatea*. The *makatea* is an area also visited for the harvest of large timber trees and coconut crabs. Furthermore, the difficulty in accessing the interior of the *makatea* discourages frequent visits. As a result, where possible medicinally useful species were transplanted in the homegardens. Medicinal plant harvest is particularly associated with the harvest of the root tips of the

strangler fig *ava* (*Ficus prolixa*), and the leaves of the medicinal ferns *tūrei 'aua* (*Davallia solida*) and *tūrei mangamanga* (*Microsorium grossum*).

4.2.5 The taro swamp

The swamp is the area predominantly associated with the cultivation of *taro* (*Colocasia esculenta*), the main staple food of the island. The taro swamp is a mixed system of taro cultivation and arboriculture. Commonly planted trees that are harvested for medicinal purposes are guava, breadfruit and coconuts. The edges of the taro swamp and unattended taro patches are covered by weeds such as the *poro puaka* (*Solanum americanum*), *vavai* (*Abelmoschus moschatus*) and *pitorea* (*Ludvigia octovalvis*), which are used in Maori medicine. Weeds, some of which are actively maintained because of their medicinal use, cover the edges of the taro swamp and unattended taro patches. Another common weed around the taro plantations is *mauku* (*Commelina diffusa*) which is harvested for feeding pigs. In the small ditches between the taro patches young people fish for the *tirapia* (*Oreochromis mossambicus*) a small fish that is eaten as a snack. On rainy days men place the *inaki*, eel traps to catch eels, locally called the *tuna* (*Anguilla obscura*). Some swamp lands are heavily cultivated but others are completely overgrown by weeds due to low population numbers on the island. Another factor discouraging taro cultivation is significant crop damage by the wild pigs. Disused taro swamps are used for goat herding. Overall, twenty plant species with medicinal values grow in the area of the taro swamp. The taro swamp is visited almost daily by most families and is commonly referred to as 'down the land'.

4.2.6 The inland lowlands

These terraces are the most fertile areas on Atiu. The soil built by alluvial material allows a good yield of *māniota* (cassava, *Manihot esculenta*), *kumara* (sweet potato, *Ipomoea batatas*), *meika* (banana, *Musa spp.*), *tarua* (dryland taro, *Xanthosoma saggitifolium*), *'ānani* (oranges, *Citrus sinensis*), *nono* (*noni*, *Morinda citrifolia*) and some more recent

tomato, watermelon and cabbage plantations. Coffee plants are situated mainly in the shade of *Albizia* trees. Intercropping with coconut or banana is common and often pigs are kept beside the fields. Large parts of the terraces are not in use due to the decreasing population. Areas not used for agriculture are covered with sedges, scrubs and thickets of tree hibiscus (*Hibiscus tiliaceus*) or java plum trees (*Syzygium cumini*). Thirty-one medicinal plant species grow in the fertile inland lowlands. The inland lowlands support a wide variety of medicinal plant populations because of the wide range of habitats that co-exist: open/closed canopy and wild/cultivated/fallow areas.

4.2.7 Inland uplands

The inland uplands extend to the back of the home gardens. It is a relatively disused area where pigs are kept. The ground cover of the inland uplands is covered mainly with shrubs and tall grasses as it is not a heavily managed area. The ground cover is often covered by the vine *pokutekute* (*Mikania micrantha*) a recently introduced invasive species. Main trees are the *nu* (coconut palm, *Cocos nucifera*), *vi* (mango, *Mangifera indica*), *akasia* (*Acacia mangium*) and *arapitia* (*Falcataria moluccana*) introduced for timber, *tuava* (guava, *Psidium guajava*) planted for its fruit and *pitipitio* (*Adenanthera pavonina*) whose bright red seeds roasted are eaten as snacks. Coffee plantations, *kaope* (*Coffea arabica*) are usually maintained under the shade of taller trees. Some slopes are dominated by the introduced *paina* (*Pinus caribaea*) which is responsible for the decline of the fern *tuenu'e* (*Dicranopteris linearis*).

Twelve medicinal plant species, which are found in the largely disused inland uplands are linked directly or indirectly with the homegardens. Human activity is minimum and medicinal plants harvested from the inland uplands are associated with areas adjacent to the homegardens with spontaneously grown plants.

4.2.8 The villages

All five continuous villages of Atiu are situated at the top of the island. The habitat is heavily modified with houses, tarmac roads and gardens. It is an open canopy habitat, highly disturbed and managed. Houses, gardens and small plantations of bananas, cassava and sweet potatoes are characteristic of the top of the area. The main large trees are the *nū* (*Cocos nucifera*) the most important tree in the Cook Islands used for drinking, making the *tai* 'akari-coconut sauce, feeding the pigs, making roofs from the leaves and many more uses. Other trees present are *vī* (*Mangifera indica*), *tipani* (*Plumeria obtusa*) whose fragrant flowers are used for making 'ei, *arapitia* (*Falcataria moluccana*) used for timber, *katu* (cashew, *Anacardium occidentale*), *kuru* (breadfruit, *Artocarpus altilis*) an important staple food, and *kaika* (*Syzygium cumini*) the 'apple' of the Pacific whose leaves are frequently used for medicine.

Homegardens in particular are stratified systems with a rather sparse and fragmented upper canopy. The top layer (3-10 m) consists of varieties of *vī* (mango, *Mangifera indica*) and *nū* (coconut, *Cocos nucifera*). The medium layer (1-3m) consists of smaller trees like guava, banana and papaya. The ground level consists of a mix of shrubs, herbs and ferns. Typical shrubs are the *tiare* Māori (Tahitian gardenia, *Gardenia taitensis*) and *roti* (rose, *Rosa sinensis* hybrid) as well as herbs like *miri* (sweet basil, *Ocimum basilicum*) and ferns like *koota* (*Asplenium* sp).

Forty-nine medicinal plant species, the highest number of medicinal plants found in a particular habitat, were recorded in this area. The homegardens in particular provide the families with a very wide range of frequently used medicinal plants. Because of the gardens' proximity to the household, the healers and their families cultivate and transplant from the wild medicinal plants that are used not only by the household members but also by their extended network.

4.2.9 Dirty and clean spaces: the home, the homegarden and 'down the land'

The homegardens serve as a transition zone between the 'dirty' land/outdoors and the 'clean' home/indoors, where a wide range of 'cleaning' and 'processing' activities take place. These activities include storing and processing agricultural produce, killing and skinning animals, preparing food, washing clothes, preparing medicines or doing craftwork. The homegardens serve as a 'social' transition zone as well where guests are entertained and children allowed to play freely without interrupting the privacy of the house.

In Atiu, maintaining the homegarden in a neat and orderly fashion is the family's duty towards the community. Diverse and well-maintained homegardens reflect the status and the aesthetics of the household, especially that of women. For families with limited workforce, usually due to migration, maintaining a homegarden to Atiuan standards can be very hard work. In this case the family may hire a group of people. Members of a *tumunu*, village or sports team, for instance, will hire out their labour to fundraise for a community project, like the renovation of the village hall or the purchase of team sport uniforms.

Gardeners refer with pride to the beauty and tidiness of their homes and homegardens and emphasise the absence of *tītā* in their gardens. The term *tītā* (as mentioned above) has many connotations, but it broadly refers to 'things with no use' such as rubbish, dried leaves and even plants with no name and no known use. Trimming the hedges and cutting the grass is a common activity mainly carried out by young boys in the household. The dried leaves are called *tītā*, which refers to rubbish. Raking the 'rubbish' (*parako tītā*) is a daily activity assigned to all the younger children by their parents to impose a sense of discipline.

The *makatea* forest is referred to as *tītā* or *vaorākau* (the latter literally meaning 'outside plants'). The islanders emphasise the tidiness and order of the area where the villages and

homegardens are situated and frequently contrast it to the unruliness of the forest, the *tītā*. The forest vegetation is perceived as uncontrollable, impossible to tame and forest clearance is considered an activity against the forces of nature. The forest is considered the dwelling place of the spirits of the ancestors, the *tūpāpaku*, who were buried in the pre-contact era in numerous caves in the forest (Kura et al. 1984: 58). The area is avoided at night when the spirits are believed to be active. The association of cleared land with progress and the association of forest with uncivilised, uncontrollable and supernatural forces is not unique to the Cook Islands. Dove noted similar values attributed to cleared and forested lands in Indonesia, with direct ramifications on land use (Dove 1985: 19). These perceptions associated with the land also guided the division of labour: men were assigned to work in the 'dirty', 'uncontrollable' and 'supernatural' spaces and women were assigned to work in the 'clean' and 'orderly' spaces.

4.3 People and plants

In Atiu, perceptions of plants and their uses were highly complex. Alcorn argues that an understanding of the context of plant use is necessary to interpret plant use data, to study plant use management schemes, to investigate the impact of human activities on plant communities and to evaluate the adaptive functions of ethnobiological knowledge (Alcorn 1981: 221). Men and women were very knowledgeable about plant distribution and their uses. However, because of their daily engagement men had a deeper and wider knowledge of agricultural plants whereas women were primarily associated with medicinal and ornamental plants. Planting crops was considered primarily a male task whereas church decoration and healing were considered female tasks. Young children were always assisting adults in these tasks and learning from them. In the next section I will give a brief account of the cultural perceptions of plants.

4.3.1 Plant values and principles of onomastics

People in Atiu value highly plants with a good smell, locally referred to as *kakara manea*. Fragrant gardenia flowers are frequently worn as an ornament on the head. A schoolteacher mentioned to me that gardenia flowers are very important for the children and are referred to as the 'heart'. The fragrant pandanus fruits are sewn into 'ei for very important occasions. Furthermore, during birth rituals such as the burial of the placenta in the homegarden, strong smelling plants are planted on top.

Flower beauty is another value commonly ascribed to plants. The hibiscus flowers are one of the main plants found in the homegardens and hedges. The 5-petal flower with the projecting style is a characteristic and very desirable pattern for the shirt fabrics. A wide range of ornamental plants was grown in the homegardens to 'make the house look nice' and also decorate the church.

Usefulness was another frequently mentioned plant value and incentive for plant population maintenance. The Environment Officer mentioned that he considered the coconut tree to be *tapu* because of the extensive range of its uses. He explicitly protested against coconut trees being cut because he considers the coconut tree to be the tree of life in the Pacific. On the contrary, plants with no use were referred to as *tītā*, rubbish. These plant values were commonly mentioned when Atiuans referred to medicinal plants and in particular when they talked about their ecological distribution.

Plant values were associated with the way plants were named. Plant names are primarily attributed to the plants' use or appearance. Binomials used for plant names are composed by a generic term followed by a modifier. Table 2 shows some examples of plant names, their literal plant meaning and how that relates to the plants' cultural and biological attributes.

Table 2: Atiuan plant onomastics

Latin name	Maori name	Literal translation	Naming principle	Name reference
<i>Gardenia taitensis</i>	<i>Tiare Māori</i>	Flower Maori	Use salience	Out of all the flowers, the <i>tiare Māori</i> was the most heavily used flower, the term Maori here indicates salience of use
<i>Mirabilis jalapa</i>	<i>tiare moe</i>	Flower sleep	Flowering behaviour	Refers to flower petals opening in the evening
<i>Heliconia spp</i>	<i>tiare parataito</i>	Flower paradise	Flower colour	The bright colours of the flower resemble images from the flora of 'Paradise'
<i>Derris malaccensis</i>	<i>Rākau papua</i>	Plant papua	Country of origin	This plant is believed to have originated from Papua
<i>Mimosa pudica</i>	<i>Rākau avarevare</i>	Plant liar	Plant behaviour	The compound leaves fold inward and droop when touched, re-opening within minutes; leaf behaviour is equated to the behaviour of people who lie (see quote in beginning of chapter)
<i>Morinda myrtifolia</i>	<i>Pirita tūtae puaka</i>	Pirita faeces pig	No use	The plant is named in a derogatory way because it looks like the useful pirita, which is used to weave eel traps but it has no use
<i>Solanum melongena</i>	<i>Uā'rao puakanio</i>	Testicles goat	Fruit resemblance	The fruits of the aubergine look like the goats testicles
<i>Justicia betonica</i>	<i>Uru manu</i>	Tail bird	Flower resemblance	The flower looks like the tail of a bird
<i>Alocasia sinderiana</i>	<i>Upoko oro enua</i>	Head horse	Leaf resemblance	The leaves resemble a horse's head

As this table shows, plant names did not refer to a particular type of plant properties. They refer to a wide range of biological and social attributes. A particular characteristic of Atiuan plant classification is the attribution of gender categories to the appearance of certain plant parts.

On Atiu certain plant parts and particularly the fruit are considered female or male. Some medical recipes require fruit of a specific 'gender'. These categories are based on the shape or appearance of the fruit. The elongated and pointed fruit of *tiporo* (lime, *Citrus aurantifolia*) and noni are considered male and rounded ones are considered female. Similar characteristics are applied to taro tubers. In the case of *miro* (Pacific rosewood, *Thespesia populnea*), split calyx was considered a characteristic of female fruit and a united calyx a characteristic of male. These notions of fruit gender were shared in Rarotonga as well (Whistler 1992: 101). Gendered fruits were identified in generic fruit categories as well as variety types.

Local plant varieties are identified by the characteristics of the fruit, tubers and flowers. The names given to the different varieties represent the colour, smell, shape and taste of the plants. Variety names were always expressed in binomials, the generic term representing the plant and the modifier the variety. Even though there was a correlation between generic terms with species, and modifiers with varieties; these associations were not always made with agronomically-recognised varieties but rather with culturally-recognised varieties ie landraces. I conducted casual 'on the spot' free list interviews on variety types for six of the most salient plants: banana, mango, taro, coconut, breadfruit and hibiscus. I asked twenty people to name as many plant variety names as they could for one of these six plants. Collectively, the respondents recognised five banana varieties, fifteen mango varieties, four taro varieties, five coconut varieties, two breadfruit varieties and two hibiscus varieties. Variety names were frequently associated with cultural uses and/or morphological characteristics. For example *nū* is the generic term used for coconut, *nū teatea* refers to the white coconut variety, *nū oroa* refers to a variety that produces large coconuts used for communion in the Protestant church and so on.

Varieties that are commonly used in healing are the *kaute 'enua* variety of *kaute* (*Hibiscus rosa sinensis*); and *nū uri* and *nū pokura*, varieties of *nū* (*Cocos nucifera*). It was commonly acknowledged that certain medical recipes required these specific varieties of hibiscus and coconut. Specifically, only the water from the fresh green coconuts of the *nū uri* variety was used as a liquid medium in Maori medical recipes. I enquired what was so special about this variety. Most people did not disclose a particular reason. One of the traditional chiefs mentioned: 'Don't know why, maybe it was the first coconut on Atiu.' A local healer distinguished between two further sub-varieties: 'There is *nū uri tou* which the dark one and *nū uri maratea* which is the light green one. The old *pāpās* and *māmās* use the *nū uri tou* for the medicine.' The school principle contributed a different insight:

'*Uri* means to turn, change². *Nū uri* is called like that because it may turn into something else. For example if you plant a *nū uri uto* when it grows it may transform into a *nū kura*.'

The maintenance of different coconut varieties required replanting a germinating coconut, the *uto*. Neglect to do so meant that some varieties were more rare than others and that was the case of the *nū pokura*, the only variety that was used to treat babies' skin illnesses. A senior planter recounted:

'There are not many *nū pokura*. *Pokura* means the colour of the sunset. Only those that have the medicine bother to replant the *nū pokura*. On the top the husk is red. It is these red fibres that you use for the medicine and the juice too.'

Medicinal uses of plants encouraged their active management. This was also the case of the *kaute 'enua* variety of *kaute* (*Hibiscus rosa sinensis*), which I further discuss in chapter 5. Another factor affecting plant management was their association with the spirits of the ancestors.

4.3.2 Plants and spirits

Plant scent is strongly associated with the spirits of the ancestors in varying ways: the strong scent of the *tiare moe* (*Mirabilis jalapa*) is believed to attract the spirits and therefore never planted near the main doors of the house (the link between belief systems and plant management is further discussed in chapter 5). On the contrary, the strong scent of the basil is believed to repel the spirits. Strong smelling plants are commonly applied throughout Polynesia as spirit repellents (Whistler 1992). There are three plant species that are directly associated with the spirits: the '*utu* (*Barringtonia asiatica*), *ava* (*Ficus prolixa*) and *tiare moe* (*Mirabilis jalapa*). '*Utu* is planted near the *marae*, the ceremonial sites. *Ava* grows in the *makatea* and its longevity and use is associated with the ancestors.

² For example *uri te pae taro* means to turn the soil in the taro patch.

Spirits can make their presence felt by taking the form of animals like the centipede, *viritara*. During medicinal plant harvest, healers avoid collecting plants with centipedes on them or near them. Graves are almost exclusively decorated with fresh flower garlands, which are considered a sign of respect that also appeases the spirits. However, plants are also associated not only with the spirits of the ancestors but with the Christian God as well.

Many devoted Christians view plants as God's creations and believe that with God's will and God's instruments (i.e. the plants) they can heal. The primary distinction that people made when asked to differentiate between Maori medicine and western medicine is that Maori medicine uses plants that are God's creations. Supernatural elements of efficacy are further discussed in chapter 7. Plants are also heavily used in decorating the church. Most of the ornamental plants that women used for church decoration were collected from their homegardens. Plants on Atiu have multiple uses and 'medicinal plants' did not form an exclusive category of plants. In the next section I will provide an overview of the major plant use categories in order to later situate medicinal uses within the wider context of plant utilisation.

4.4 Plant uses

Plants have a very central role in Cook Islands society and are employed in a multitude of ways. They support the material and aesthetic needs of the island population and provide materials for medicine, food, crafts, decoration and adornment. Out of the 491 plant-like species (including ferns, algae and fungi) present in Atiu (McCormack 2004), I recorded 164 terrestrial plants with medicinal, alimentary, craft/technical and ornamental/aromatic uses (figure 13).

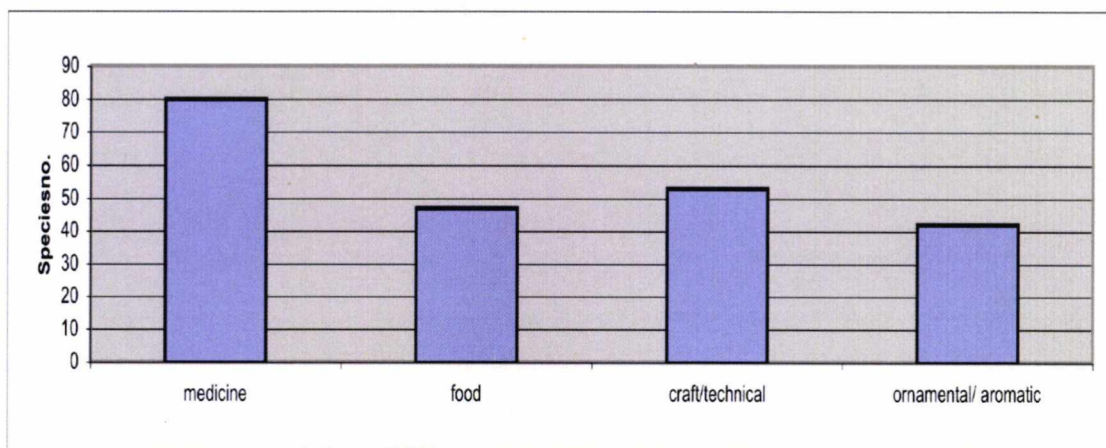


Figure 13: Number of plant species per use category

Specifically, for medicinal purposes eighty plant species were used, a percentage of 49 % of the total number of recorded useful plants. There is no local term exclusively for medicinal plants. Most plants have other salient uses too. Out of the 80 medicinal plant species, only 33 plant species are used exclusively in traditional medicine. Therefore, only 41% of the recorded medicinal flora was used and consequently managed exclusively for medicinal purposes (figure 14). The remaining 58% of the ‘medicinal flora’ was used and managed for their alimentary, technical, ornamental and aromatic uses as well.

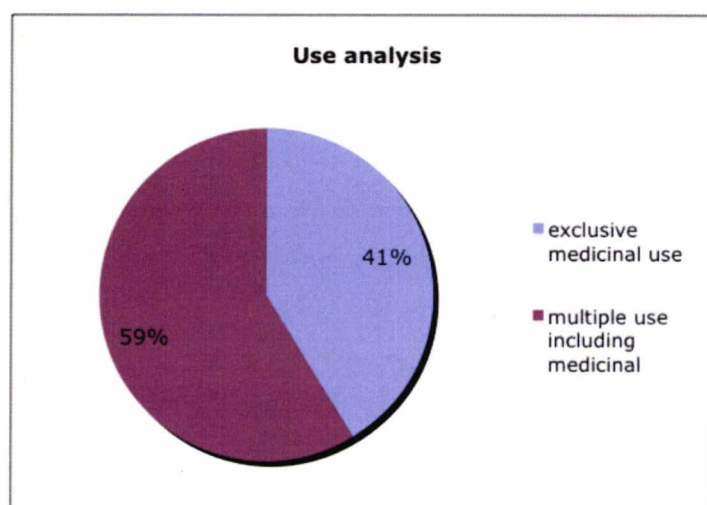


Figure 14: Percentage of medicinal plant species with exclusive medicinal uses and multiple uses (including medicine)

This renders the category 'medicinal plants' rather problematic. There is no local term denoting medicinal plants and there is a significant amount of use overlap. This classification problem has further ramifications in the assessment of the conservation status of medicinal plants and the quantification of the biological and cultural impact of their loss. Ellen astutely notes that studies of knowledge transmission and erosion have tended to focus on a transmitted or eroded element as a member of just one domain and that such an approach ignores the relevance to transmission of simultaneous occurrence of that element in several domains (Ellen 2007a: 6). This raises some important questions for the domain of TEK studies relating to ethnomedicine: can the erosion of medicinal plant knowledge and/or medicinal plant management be separated from the erosion of agricultural and craft knowledge and/or associated plants in the cases where plants belong in more than one domains? In the case of Atiu, some medicinal plants also belonged in the category of food plants and/or ornamental plants and/or technical plants. I dealt with this problem by assigning plants to more than one category. Bearing in mind, the prevalence of category overlap, I will further discuss in brief, which plants, and which uses each category entails.

4.4.1 Medicinal plants

Ethnomedical knowledge was clearly divided in the generalist (open access) and specialist (family-owned) domain. Plants with medicinal uses that were widely known in the community were planted in the homegardens to provide easy access to the healers. As the healers are mainly the older women of the community, they want in the event of an illness to be able to collect the required medicinal plants with minimum effort. The most commonly used species were the coconut, noni and aloe vera. Even though, the fermented juice of the noni fruit is the most well-known medicine, Atiuans used the roots, bark and leaves in different recipes. 'Aroe or *cactus (Aloe vera)* is commonly applied on cuts. A wide variety of medicinal coconut oils are made on the island for skin treatments. The oil preparation involves cooking various leaves and flowers in coconut cream. Added leaves include 'ava'ava (*Nicotianum tobaccum*), pi (*Talinum paniculatum*) and tiare

Māori. Specialised medicinal uses of plants will be discussed in more detail in the next chapter.

4.4.2 Ornamental and aromatic plants

Ornamental and aromatic plants such as *roti* (*Rosa chinensis*), *'ara* (*Pandanus spurius* and *Pandanus whitmeeanus*), *tiare Māori* (gardenia, *Gardenia taitensis*) and *miri* (basil, *Ocimum basilicum*) proliferate in the homegardens, which are the main source of ornamental plants. A total of forty-two ornamental and aromatic plant species were cultivated, usually in the front part of the garden. Out of these 42 plant species, ten species were also used in medicine, a percentage of 23.8%. Apart from their high aesthetic value, ornamental and aromatic plants are also frequently used in decorating the church and making *'ei*, the famous Pacific flower garlands. The *'ei* are made for people visiting or leaving the island and for important social events. *'Ei* are very important in Atiuan culture. *'Ei* made with the fragrant, bright red pandanus fruit are made for special occasions and are a sign of respect from the family who made them towards the person who wears them. Pandanus fruits are also used in Maori medicine.

For Atiuans, the goodwill of the spirit world was regarded as necessary for ensuring the health and vitality of the living and the productivity of the environment. Goodwill could be achieved and maintained by the maintenance of the houses of the spirits, namely the church and the graves of the ancestors. Ancestral graves are cleaned and decorated with fresh *'ei* that are (ideally) frequently replaced. The decoration of the churches was a weekly duty of a different family assigned by a rota system. Ornamental plants for these types of decorations were mainly collected from the homegardens, the mainly ornamental and aromatic plant repository. Since the rest of the congregation would informally inspect the results, having the church beautifully decorated for that week was a source of pride for the responsible family. The homegardens provide the regular stock of ornamental plants that are required for the elaborate church decoration.

4.4.3 Food plants

Taro, the main staple crop is planted in the taro swamp. Cassava and sweet potatoes are planted in the fertile lowlands. A total of forty-seven plant species were cultivated for food on the island out of which nineteen were also used in medicine, a percentage of 40%. Fruit trees, like banana, papaya, mango and guava, were common. With the exception of mango, all of the aforementioned 'food plants' also have medicinal properties. Mainly children eat the fruits as snacks. The act of planting 'food trees' is considered to be a duty of care towards future generations and ancestors are frequently praised for their provident ethos. New plants make their way into Atiuan food plant variety as well. *Pota viti* (spinach hibiscus, *Abelmoscus manihot*) is a recently introduced green leafy vegetable that is eaten instead of taro leaves. It propagates vegetatively and is commonly shared between households. As a green leafy vegetable, it does not have a high status as food but as it is a 'new' plant, it is more eagerly consumed.

4.4.4 Craft and technical plants

Handicrafts are still produced on Atiu but their production is limited due to lack of popularity with the younger generation. Fifty-three plant species were used in crafts and other daily activities, out of which 22 species were also used in medicine, a percentage of 41.5%. I use the term 'technical' to refer to plants that play a supportive role in everyday activities and provide materials for food preparations, tools, housing, fencing, firewood, insect-repellent and other similar uses. *Rau ara* (weaving pandanus, *Pandanus spurius*) is the main plant used in weaving baskets, mats and hats on Atiu. Weavers who find it difficult to get hold of pandanus fibres told me that in the past, every family had their own pandanus plantation. During my fieldwork *P.spurius* was rare on Atiu due to a mealy bug infestation which was reported to be associated with the pineapple industry (Vougioukalou 2006). *Rauti* (cordyline, *Cordyline fruticosa*) leaves are used to make dance costumes. Dancing is a major form of entertainment on the island and disposable

dance costumes made from cordyline leaves are frequently made. *Au* (tree hibiscus, *Hibiscus tiliaceus*) leaves are used in covering the *umu*, the earth oven.

The percentages of use overlap demonstrate that the category 'medicinal plants' is not an exclusive subgroup of the local flora and raises some questions about the definition of medicinal plants and concerns about their management, as the way they are managed is not determined exclusively by their medicinal uses. The Atiuan ecosystem of people and plants is further enriched by the presence of animals and spirits and in the next section. I will illustrate the role of animals not only as consumable resources but also their role as disease causing agents and their associations with the spirits.

4.5 People and animals

4.5.1 Terrestrial animal diversity

Terrestrial animal diversity on Atiu is very limited. Mammal diversity consists of *puaka* (pig, *Sus scrofa*), *puakanio*-literally pig with horns (goat, *Capra hircus*), *puakatoro*- lit. pig with big stomach (cow, *Bos taurus*), *kuri* (dog, *Canis familiaris*), *ngiao* (cat, *Felix catus*) and *oro* 'enua³- lit. the one that runs on the land (horse, *Equus caballus*).

Pigs are the most important of all animals on Atiu and they are seen as the embodiment of the ancestors that could cause accidents if angry. Until recently, human labour was paid in pigs rather than money. Some people expressed nostalgia for the days where money did not have to be the medium of service provisions:

'In my dad's time you would ask a carpenter to come and build your home and you wouldn't pay him. To the chief carpenter you would give the *nio piki*-the pig with

³ There used to be many horses on Atiu before, now there is only one.

the big teeth, to the carpenter assistant a smaller pig and so on.'

Nowadays, on Atiu you rarely see people feeding the *nio piki*. However, during feasting time, *nio piki* were in great demand as they were the greatest meat contribution a family of high status could make. Purchasing a *nio piki* cost around NZ\$ 450 (GB £150) which was a very high amount for local standards. In the island of Mitiaro adult boars were in abundance. In the past, in Atiu, aspiring husbands offered a *nio piki* to the bride's family as part of a formal marriage proposal. Offering a *nio piki* was considered a proof that the aspiring husband was a good animal keeper and that he would be able to feed his family in times of hardship. Acceptance or decline of the *nio piki* was a symbolic act of accepting the marriage. However, things didn't always go to plan. A 41-year-old woman narrated her husband's marriage proposal in the mid-nineties:

'He came with all his family and a *nio piki* at the back of the truck to ask for me from my dad. My dad did not want me to marry him because he was a Catholic. They brought presents and everything. My dad threw the pig back to them without saying a word. As they loaded the truck and were ready to leave, I jumped on the truck and left with them.'

In formal feasts, the head of the pig is always offered to officials and the chief customarily has to bite the ear of the pig. When the roof of the Protestant church hall was completed (and the building was half way through) they asked every household to provide a pig. All the pigs were brought to the meeting houses of each village and slaughtered there. The pigs were then distributed to the people that offered their labour voluntarily in the building of the hall.

Goats are kept near the taro swamps and were sacrificed only for feasting occasions. Goats are only used for their meat, which is considered a delicacy. Goat meat is boiled three times and then the meat pieces are boiled in coconut cream with turmeric. This dish is highly valued in feasts.

There are ten cows on the island, which are rarely killed. I only witnessed a cow being killed on the event of the death of a member of parliament, to provide meat for the funeral rite meals. The cows are used only for meat and are not milked. Beef is a valued meat but it is not consumed on Atiu, except in the form of corned beef.

Cats and dogs are common on the island and are kept as pets. Dog meat is occasionally eaten as a snack for *tumunu* goers-the people that attend the bush beer schools. Dog meat is cooked in the *umu*, the earth oven by men who like drinking. The rest of the community however frowns upon this activity.

All chickens are practically feral on Atiu. They roam during the day, lay their eggs under the foliage and sleep on the trees at night. People are entitled to collect their eggs as long as they are laid on their land. Collecting eggs in a 'treasure hunt' mode was a favourite children's activity. Hens were rarely trapped and eaten as most people opted for purchasing imported frozen chickens from the shop, referred to as *moa papa'ā*, western chicken. However when a local chicken, *moa Maori* was on offer, people readily preferred it.

4.5.2 Animals and ghosts

Pigs, cows, cats and horses appear in a wide range of ghost stories. The idea of spirits in animal form is deeply rooted in Polynesian culture history, yet as Clerk points out the notion of a cow as a suitable spirit vehicle is clearly one that can only have developed since the introduction of such animals in the last century (Clerk 1995: 162). Even though ghost stories are rooted in tradition, new experiences are being woven in.

In Atiu, each tribe is associated with a particular set of ghosts or symbols. The 'flagship' symbol of the tribe of *Rongomatane Ariki* is the shark. According to a legend, a grandmother and her grand daughter were drowning when their canoe capsized outside the reef and a shark brought them back in land. As they approached the beach, the shark

transformed into a woman and as she was leaving them on shore to return to the water, she transformed back into a shark and entered the water. It is also said that on some full moon nights outside the *marae* of *Ada Rongomatane Ariki* one can see the ghost of that woman emerging from a gardenia shrub. I was told by a visiting teacher from New Zealand that young people on Atiu are very superstitious and believe in the literal existence of features appearing in legends. People also mentioned that sometimes they see a ghost of a cow under the *barringtonia* tree outside the chiefly house of *Ngamaru Ariki* or a cat sitting on the fence. They know it is a ghost because the animal does not have material substance. This area is considered a very sacred place because that is where the elders sat and recited genealogies in the past. The *Ngati Nurau* tribe is associated with the rainbow and Atiuans mentioned that every time that the tribe will meet, it will rain and there will be a rainbow afterwards.

Ghosts can be passive agents, messengers for the ancestors or embodiments of aggressive spirits. People reported seeing ghosts at night and especially during full moon nights. Reported sightings were usually associated spatially with a *marae*, an ancestral ceremonial ground. I was told that on a full moon night if you go on the road near the *Arae-te-Tonga marae* you can sometimes see ghost horses on the road. The aforementioned ghostly sightings in Atiu were also associated with full moon nights. These type of ghosts were not threatening to the living. Wild pigs have a more active role in ghost stories. They can cause accidents to happen particularly at night and are seen as ancestral embodiments that roam on the land. Furthermore, unusual cockerel or centipede behaviour is perceived as a warning sign from the ancestors. In these circumstances, the ghosts lived in the body of an animal. Similarly, Oliver notes that in Tahiti ghosts (*atua*) were believed to possess *mana* and some *atua* were conceived of as existing 'naturally' in some visible and usually zoomorphic form like a shark, a giant eel, a large octopus (Oliver 1974: 58). The role of animals as ancestral spirit carriers and disease causing agents will be further discussed in chapter 7 where I analyse in detail spirit-induced causes of illness.

4.6 Conclusion

This chapter provided the environmental and ecological background of life in Atiu where plants and animals are managed as biological and cultural objects. Local people recognise six distinct habitats of the island. Each habitat is associated with a different degree of disturbance, land use and vegetation type. Medicinal plants are harvested from all island habitats. Plants have multiple uses that are grouped in four main categories: medicinal, ornamental, food and technical. I found that understanding use overlap was important to further understanding plant management and harvesting, as medicinal plants are not managed exclusively for their medicinal purposes.

Tending pigs is central in Atiuan life. Animals were associated with spirits. They were perceived as the embodiment of a spirit or a vehicle for spirit activities, which usually was associated with causing accidents or a messenger for bad news. Understanding the role of plants, animals and spirits in the human lifecycle provided the basis for the construction of a model that as the consequent chapters will show unites beliefs of illness causation to medicinal plant use, demonstrating the relevance of cosmological theories to environmental management. Having provided a background on the social and 'natural' environment of Atiu, I will proceed in the next chapter to discuss medicinal plant use and management.

5 Medicinal plants: use and conservation



Figure 15: Boy Kea with his sons Breamt and Charlie and nephew Teokotai harvesting meika ve'i in the makatea

'This plant? I don't know if you can find it in the forest. All I know is that you can find it in the garden of that māmā over there, she is using it for the Maori medicine.'

'Oh, I don't make this medicine very often. I need a special variety that grows in the makatea and it is hard to find. When my boys are not here to help me, who will go and get the plants for me?'

'It was getting hard to find this plant down the land. If a patient came to visit me at night I had to go down the land and get it. So I took some plants and planted them in the garden, here behind the water tank so it grows nicely.'

'Why do I plant this one? We use it for the Maori medicine. I don't use it myself but I keep it for when other people need it, to come and take the leaves.'

What were the principles that guided Atiuan medicinal plant use? Evidently, plants were not used as mere biological objects as frequently portrayed by botanists; neither were they used as mere cultural objects as portrayed by anthropologists. There were strong cultural restrictions associated with their uses but also their distribution and abundance provided additional restrictions to the prevalence of these uses. Having read a plethora of reports on medicinal plant overharvesting, all I could anticipate was a group of determined locals harvesting plants from wherever they could; however that was not what I encountered. On Atiu there was no 'wild forest' where anybody could go to and collect whatever they wanted. The forest, like the villages and the plantations; like all land on Atiu including the reef, was owned by different families. And whatever 'biological objects' grew on these pieces of land, they belonged to these families; and they were used according to the family-owned traditions that belonged to particular family members. It is this complex relationship between the cultural and the biological attributes of medicinal plants that I will seek to disentangle in this chapter.

5.1 Introduction

This chapter explores the sustainability of medicinal plant use on Atiu by looking at medicinal plant management and the ecological status of medicinal plants. So far I have discussed local livelihoods, island habitats and the role of plants and animals in the social and 'natural' environment of Atiu. In this chapter I would like to bring medicinal plants into the picture and assess how does the distribution and abundance of the medicinal plant populations relate to health-seeking behaviour. Besides, if the plants are not available, how would the healers be able to treat their patients? In order to determine the sustainability of medicinal plant use, I first need to define what the term entails. The most widely used definition is provided by Article 2 of the Convention on Biological Diversity, which states that:

'Sustainable use means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations' (cited in Jenkins & Edwards 2000: 2)

In this definition the availability of resources for the next generation to use is central. The conservation of medicinal plants in particular is viewed as an issue of critical ecological, cultural and economical importance (Hamilton 2003; On et al. 2001). Most conservation focus on non-timber forest products (NTFPs) has been given to individual, economically significant overexploited medicinal plant species (Tictin 2004). Nowhere else are these issues more acute as in tropical and sub-tropical regions where people still rely on natural resources (Sumner 2000: 185). In small island populations, plant species are prone to extinction due to the islands' isolation and size as well as vulnerability to environmental change (Woodward et al. 2000). In the rapidly modernising islands of the South Pacific, medicinal plants comprise the most diverse category of coastal plants used (Thaman 1994). However, the mode of medicinal plant use in Polynesia seems to be non-threatening to medicinal plant populations. In Tahiti, plants used in medicines were of no commercial value and were usually considered as weeds (Hooper 1985: 70). Voeks has

explicitly highlighted the role of weeds and secondary growth in ethnomedicine in what he refers to as 'disturbance pharmacopoeias'. Specifically, he argues that disturbance pharmacopoeias combine 'optimal foraging features with the natural distribution of promising plant-derived compounds' (Voeks 2004: 869).

Taking into consideration the prominent role of homegardens in Atiuan livelihoods, the questions I will be exploring in this chapter are the following: What is the status of wild and cultivated medicinal plants? Are the medicinal plant populations being lost? And finally, is their use sustainable?

5.2 *Ethnomedical practice: rules and taboos of behaviour and plant use*

In this section I provide a snapshot of a typical procedure on the treatment of an illness using Maori medicine and briefly overview the processes of illness diagnosis, medicinal plant harvest, preparation and administration. The treatment process begins when the patients or their carers diagnose the illness. Then the family approaches a suitable healer. The healer diagnoses the ailment and its cause, harvests the necessary plants from the wild or from the homegarden, prepares the remedy and administers it. The healers worked very closely with the carers of the patients and instructed them to assist in the healing process. Each healer is very aware of the distribution and abundance of the plants that are needed for the particular specialised recipes. Predominantly fresh plants are being used, a common feature of Polynesian ethnopharmacopoeias (Whistler 1992). The requirement for fresh plants necessitates their actual growth in the local environment so healers ensured that viable medicinal plant populations are looked after in the wild or in their homegardens. Atiuans strongly believe that the efficacy of Maori medicine is due to the fact that it is natural and all the ingredients being used need to be fresh. Fresh plants are the ones that contain the potent *vai rākau*, the 'water of the plants'.

5.2.1 Illness diagnosis

Those initially involved in diagnosing an illness are the sick person in consultation with other family members. Diagnosis is not a separate process from treatment, rather it is being progressively carried out throughout the course of treatment. The healer observes the symptoms, assesses the situation of the patient and proceeds with the preparation and administration of the remedy. The process of the preparation and administration of the remedy are integral parts of the diagnosis as the healer becomes receptive to cues for the causation of the illness. Also the patients' reaction to the remedy is used as a cue to diagnose the nature of the illness. If the health of the patient does not improve after the course of the treatment, the healer may conclude that either the cause of the illness is different, like for example caused by a spirit or that the patient is suffering from a different illness and suggest that a different practitioner is visited.

Illnesses are initially diagnosed at home, usually by a knowledgeable older female and then by a specialised healer. The healer will look carefully not only into the symptoms of the illness but also the patient's habits, activities as well as patient's family situation. These procedures are common in other traditional medical systems as well, where healers may address the patient's diet, daily routines and other habits that may be associated with the illness (Nordstrom 1989).

Diagnosis in Polynesian herbal medicine has been criticised by health authorities for being weak in that emphasis is put on cure rather than the illness itself. In Tonga if the herbal treatment administered is not effective then the disease is attributed to the spirits and western medicine may be suggested. Similarly, in Tahiti diagnosis is often made after healing (Whistler, 1992: 84). Healing is a highly spiritual activity during which the healer is in close communication with God and highly perceptive to signs of a metaphysical nature. These signs appear throughout the course of the treatment starting with the harvest of medicinal plants.

5.2.2 Plant harvest

The process always begins with a prayer and the healer proceeds with or without an apprentice to collect the required plants. Healers harvest the required plants from the wild or cultivated areas that are owned by the extended family of the healer. Healers are aware of where 'their' medicinal plants grow and usually go to specific places to collect them. The requirement of certain medicinal plants for individual recipes encourages the active stewardship of plant populations in the wild and also in homegardens. This is due to the fact that plant harvest is very strongly linked with the family ownership of the remedy and the transfer of the *mana* from older generations to younger ones.

There are some particular restrictions associated with plant harvesting. Most recipes cannot be made on rainy days, while others are linked with the phases of the moon, the *arapo*. Rainy days are always avoided for plant collection because plants are considered to be watery and weak. People mentioned that there are signs on the medicinal plants that encourage or deter picking. When it comes to selecting leaves, fruits or flowers the healers pick 'only the nice ones', healthy-looking plant parts. The presence of insects on medicinal plants during harvest is considered as a bad omen and these plants are not collected. It is also believed that if birds are 'crying' when the healer goes to pick medicinal plants, it is a sign that plants shouldn't be picked because something is preventing the healer from accessing them.

Plant parts used in the recorded recipes are the outer bark (*pakiri*), fruit (*ua*), young leaves (*rau*), root (*aka*) and more rarely the flowers (*tiare*). The category of leaves was the most diverse category as a total of fifty-nine plant species were medicinally used for their leaves (figure 16). Young leaves are always preferred to mature foliage because they are considered to have the *roro*, the juice of the plant, otherwise referred to as the 'water of the plant'. The category root includes root tubers (*kiko*) and root tips (*mata o te aka*). Concerning flower use, only *tiare* Māori flowers are used medicinally. Different flowering stages are important for different recipes; some required closed flowers-*matapuku* and others open-*puera*. The bark is grated and other materials pounded.

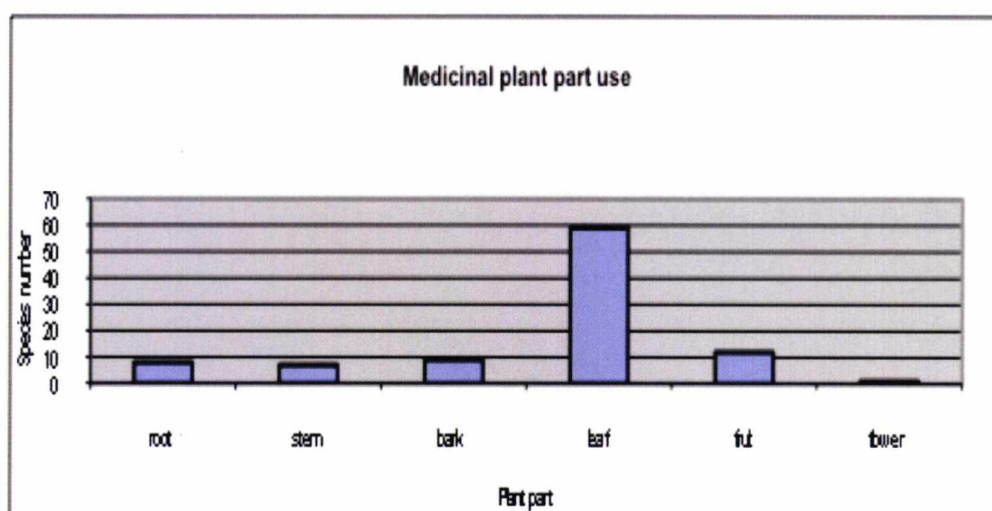


Figure 16: Medicinal plant species diversity of plant parts used

These plant parts form the basis of other Western Polynesian ethnopharmacopoeias such as those of Tahiti and Hawai'i (Krauss 1993; Whistler 1992). As already discussed in chapter 4, certain recipes require 'female' or 'male' plant parts. Another characteristic is the equal use of green and yellow leaves as well as the equal number of green and ripe fruits in the preparation of a medicine. Other ingredients in traditional medicine are minerals such as coral lime (*ngaika*) and black soil (*onu kere kere*) and animal parts like the brain of the hermit crab (*roro o te papaka*) and the skin of the sea cucumber (*pakiri o te rori*). The remedies are usually very specific. The numbers used are multiples of three. If herbs are being used, then they are measured in handfuls (*kukumu*). If sugarcane is used then it is measured in number of nodes.

5.2.3 Recipe preparation

The preparations of medicinal plants vary according to each recipe. The leaves and bark of the medicinal plants are mainly used in infusions. As a liquid medium coconut water or fresh water is used. The green coconut variety, *nu uri* (*Cocos nucifera*) is primarily used. Fruit and roots are also crushed and used in infusions. The medicine is administered either as a potion to be taken internally, applied to the skin or used in a bath.

Essential for the preparation of the Maori medicine is a *kumete*, an elongated wooden bowl; a *reru*, pestle and a white cloth. The pestle is made from stalactites - the *pooki keo* that are carved into a white and shiny smooth stone. Plant matter is pounded in the *kumete* and then the crushed materials are placed into the white cloth and squeezed until all the liquids have been extracted. It is this fresh juice, coming directly from the pounded plant materials, that is considered the most efficacious substance in Maori medicine.

Only medicinal oils require boiling. Nowadays, a stove is used to cook the medicinal oils. In the past they were cooked in the open fire. Once the preparation is finished, the remaining plant materials are carefully disposed of since they are considered potent. They must not be burned or trod upon. They are usually wrapped in a leaf and buried.

The treatment for *maki tūpāpaku* can be either ceremonial or herbal. It usually employs strong smelling plants like basil because it is believed that the smell repels the spirits. These plants are usually administered in drops in the area of the eyes or the mouth. The healer may call a family meeting to identify any conflicts that may be the cause of the illness or try to contact the spirit. I did not personally witness anybody being possessed by a spirit but my informants very frequently talked about it.

The preparation of the remedy is considered an important procedure and specific events occurring during the preparation are considered signs revealing the origin of the illness. For example if the medicine mixture is frothy then it means that the patient is very sick. The most prominent case is the treatment for the baby's illness *ira*. During this illness the babies cry for a very long time and their eyes 'turn blue' (further discussed in chapter 7). This illness is usually attributed to unhappy ancestral spirits. It is treated by massaging the baby with a particular coconut oil, '*akari ira*'. One of the '*akari ira*' specialists explained:

'*Ira* can be caused by the *tūpāpaku* or not. It is hard to know what is happening from the beginning. But I am watching the signs. Sometimes when I cook the oil the bubbles that come on the surface are big, very big. That is a sign that the cause

of the illness is the *tūpāpaku*. It may be that the baby is given the wrong name or that its parents are fighting and a grandma who is now dead is unhappy. So if I see the bubbles, I go to the family and ask them what is going on.'

There are good signs too such as the colour of the mixture. When I was treated for a burn on my leg, the healer said that the water in which she rubbed the medicinal leaves was very green which was a good sign.

Healers have a role in maintaining social harmony and negotiating social relations. Through their ability to mediate in the spheres of the natural and the supernatural they are able to apply their specialised knowledge in two levels: curing the symptoms and the causes of illness as well.

5.2.4 Medicine administration

Once the preparation of the remedy is completed the healer advises patients and their families on administration. Medicine can be taken internally or externally. The main external applications are bathing and soaking. Soaking fractured limbs in medicinal baths is a common remedy that is believed to work because 'it makes the body very cold'. Massage is used for fractures and body aches. A specialised practice that is rare nowadays is the use of volcanic stones, *pooki Māori*. The stones are heated up on the fire and placed in a basin of water to make a steam bath. Alternatively, they are rubbed on grated coconut and used for massaging. Baths are usually given to women who have just given birth. Some remedies for headache consist of smelling gardenia flowers. The main internal applications exist in the form of potions that are administered by mouth. The remedy is given once or twice a day for three days. On the fourth day, a laxative is given to help the body get rid of disease residuals.

In Maori medicine, plants are mainly administered as potions (infusions of the bark or the leaves, leaf juice), massages, ointments and steam baths. The length of the treatment is

usually three days and the remedy is taken once, twice or three times a day. In the cases where internal medicine is taken then a purgative is administered on the fourth day. The purgative is administered in order to enable the body to get rid of the illness and medicine residues. The accumulation of *repo kino*, literally meaning the 'bad dirt' is considered the cause of many internal ailments and its removal by purging is necessary for the patient's recovery and general well-being. Purging is frequently used in traditional pre-natal care of pregnant women. It is perceived to be very beneficial in keeping the woman's body clean and helping the baby to grow healthy. Administering emetics and purgatives to pregnant women receives a lot of hostility from medical practitioners. In the Polynesian system as in many other systems, the expectations of treatment include perceptible evidence that disease entities or substances leave the body (Etkin 1986). For example, in Ayurveda the use of purgatives and oil massages are the two most common therapeutic measures because they help soften the body and assist the fluid movement (Trawick 1992).

During the administration procedure, the patient enters a state of *tapu* where certain *ture*, dietary or behavioural prohibitions apply. Weiner notes that in Polynesia, the highest cosmological authentication occurs through the authority of famous ancestors or gods and their *mana*. In order to become infused with *mana* a person must enter a state of *tapu*, where social taboos and ritual prerogatives are in effect (Weiner 1992). In the Cook Islands, failure to adhere to the prohibitions is believed to result in failure of the treatment. The healer instructs the patient on the set of required prohibitions, as they are particular to each treatment. Some examples of common prohibitions are smoking, drinking alcohol and eating red foods like corned beef, pork or ketchup. Red substances are believed to interfere with the medicine.

As I have described, medicinal plants are used for a wide range of ailments using this prototype of procedures. In the next section, I profile these medicinal plant populations, discuss their distribution and abundance and the intensity of their use.

5.3 Medicinal plant populations on Atiu

In order to look at the overall interactions between the medicinal plant uses and the distribution of medicinal plant populations with a bird's eye view, information on plant ecology and ethnobotanical uses was collectively analysed for all medicinal plant species. Data on medicinal plants was sorted according to medicinal plant life forms, abundance, distribution and finally medicinal use frequency.

5.3.1 Plant origin

Non-native flora contributed significantly to medicinal plant use and transition. Twenty-three species were native to the Cook Islands (29%), 20 species were introduced by Polynesian settlers (25%) and thirty-seven were introduced post- European contact (46%) (figure 17).

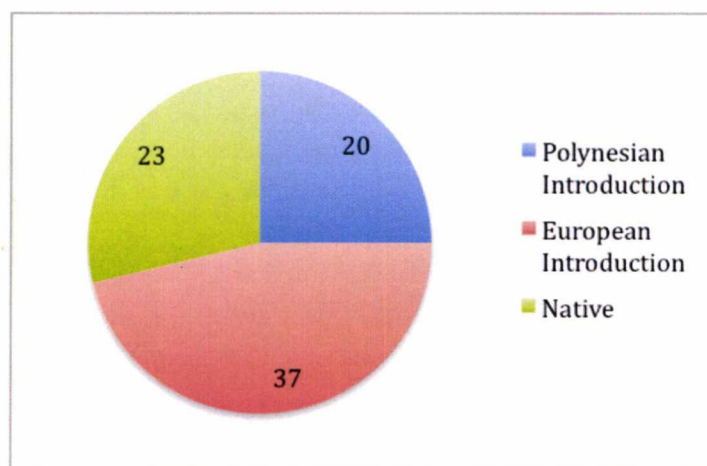


Figure 17: Medicinal plant species' origin

Whistler also noted that non-native flora contributed significantly to medicinal uses. Specifically he noted that out of the 51 medicinal plants listed 35% are native, 37% are Polynesian introductions, and 28% are recent or European introductions (Whistler 1992: 99). The higher percentage of recent or European introductions in my sample (37% compared to 28%) could be attributed to a higher number of plant introductions that have taken place since the eighties when Whistler collected his data.

5.3.2 Plant life forms

All plant forms (herbs, shrubs, vines, trees, ferns) are employed medicinally; however trees form the larger group, followed by the herbs (figure 18). Plant parts were harvested upon illness events. Typical quantities were one handful of leaves, 20cm x 10cm of bark, three root tubers and three flowers. The leaves of the trees were pounded and added to the recipes and the bark was scraped using a small knife.

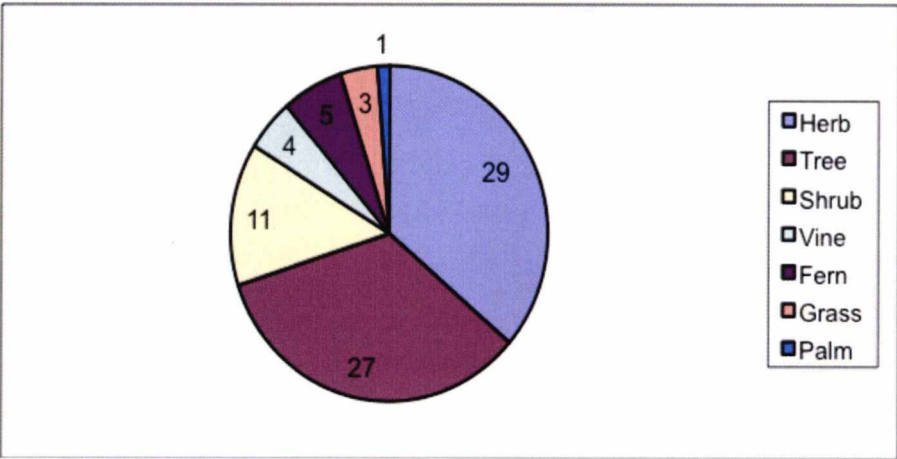


Figure 18 : Number of medicinal plant species per life form

The most common medicinal plant life forms that are propagated for their use in medicine are typically herbs and shrubs.

5.3.3 Medicinal plant abundance

Medicinal plant abundance was estimated by population counts in each habitat. The four-point abundance coding system (1-Rare, 2-Uncommon, 3-Common, 4 Very common) was adopted to contribute to existing entries in the CIBD and refers to the following population counts: for herbs, ferns, vines and grasses (1: 1-40, 2: 41-80, 3:81-100, 4: >100); for shrubs (1: 1-20, 2: 21-40, 3: 41-75, 4: >75); and for palms and trees (1: 1-5, 2: 6-20, 3: 21-50, 4: >50). Habitat-specific population counts were then aggregated to produce an abundance estimate for the whole island. Twenty-one medicinal plant species

populations were uncommon and could be found in a wide range of habitats (figure 19). Atiu has been going through a period of rigorous social and environmental changes. Invasive plants are colonising fallow lands. The relative abundance of medicinal plants varied. Sixteen plant species were classified as rare, mainly due to habitat requirements.

There were no clear indications of medicinal plant decline due to over-harvesting for two reasons: firstly, there was no commercial value in traditional medical recipes as no plants apart from the *noni* were traded; secondly only fresh plants are used for Maori medicine and therefore plants were harvested following illness events. As a consequence, harvesting was never done in bulk. The only medicinal plant that was commercially harvested was the *noni*, which was exported. Only ripe fruit were collected that posed no threat to the *noni* population, which was very common. Rarity didn't give any special value to the medicinal value of the plants. Atiuans preferred not to use rare plants that grew in the *makatea* because their harvest was very labour intensive.

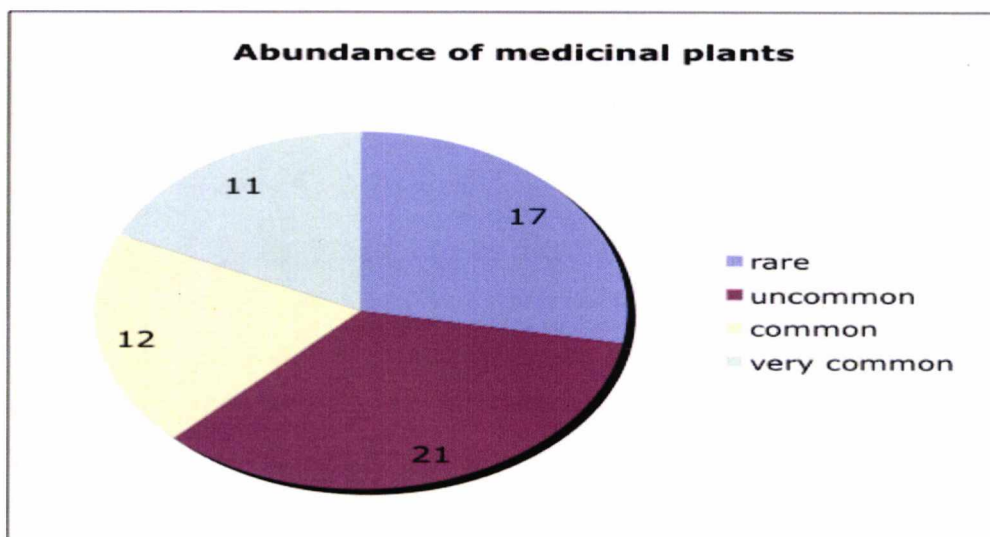


Figure 19: Abundance of medicinal plant species' island populations

It is acknowledged that in many traditional societies medicinal plant populations and other important resources were protected from over-exploitation by strict rules and cultural practices (Swiss Biodiversity Forum 2002: 13; Tavana 2001), and by protected areas such as sacred groves (Byers et al. 2001: 187). However, as most traditional

controls have been eliminated, problems of over-harvesting become prominent (Leaman 2001: 8). The case of Atiu is a case where strict rules and practices are still being adhered to and therefore facilitated the conservation ethos in the use of medicinal plants.

5.3.4 Medicinal plant distribution

In Atiu, land ownership determined the location of medicinal plant harvest. As described in chapter 3 the whole island area from the villages to the reef is divided in five segments, according to the boundaries of the five villages. Each village is further divided in small land pieces that belong to different extended families. The resources of each land piece belong to the owners and particularly to the family that 'owns' it by usufruct. All healers reported that when they harvest medicinal plants from the wild or the *makatea* forest, they collected their resources predominantly from land pieces that belong to their extended family. The spirits of the ancestors are believed to dwell in the land that belongs to their family and particularly in the *makatea*. It is the same land that they used to dwell when they were alive. Angry ancestral spirits are believed to cause 'accidents' when people trespass or collect plant and other resources unauthorised from other peoples land (further discussed in chapter 6).

The acquisition of medicinal plants was a significant point of communication between local people. The healers and their assistants were usually the ones who collected the plants required for the recipe. They would go and collect the required plants either from the wild or from the homegardens; either their own or of other members of their extended families. Medicinal plants were distributed across all six habitats of the island (figure 20).

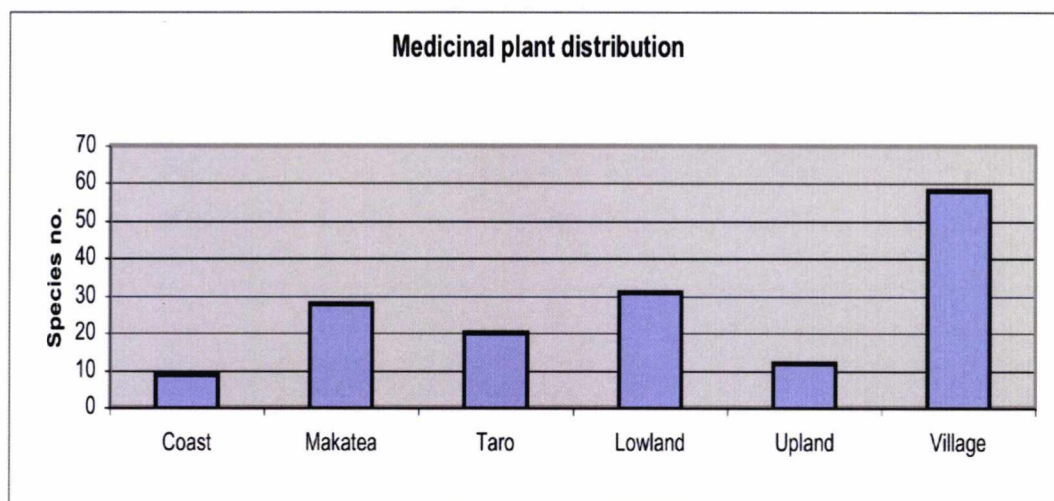


Figure 20: Medicinal plant distribution per habitat

However, some species were limited to particular habitats due to growth limitations. For example the root tips of the '*au* (*Hibiscus tiliaceus*) were only harvested from the Lake Teroto, as they only grow aurally near water sources. Few plants grew exclusively in a particular habitat. One example is the fern *tuenue* (*Dicranopteris linearis*) that is typically found in the inland uplands. The seeds of the banyan *ava* (*Ficus prolixa*) need to land on tall and large trees in order to germinate and start growing as epiphytes. The category 'village' has the highest number of medicinal plant species as homegardens served as prominent sites for medicinal plant management.

5.3.5 Use frequency

A factor determining the impact of medicinal plant use on medicinal plant populations is the frequency of use. I coded quantitative and qualitative information on plants using a 3-point use intensity coding system whereby 1-*Low* refers to infrequent use on an annual basis reported by less than 10 informants (ie. specialised uses for not very prevalent illnesses), 2-*Moderate* refers to regular use on a monthly basis reported by 10-20 informants and 3-*Heavy* refers to frequent use on a weekly basis reported by more than

20 informants. In Atiu, medicinal plants are harvested and used only when illnesses occur. Even for one illness there were many alternative local recipes that are owned and practised by different families. As a result the frequency of use for the majority of the medicinal plants was quite low (figure 21). The only plants that were heavily used were plants with large populations such as the noni, coconut, gardenia and cordyline species that were commonly used by a large number of people. The knowledge of their uses belonged to the common knowledge domain.

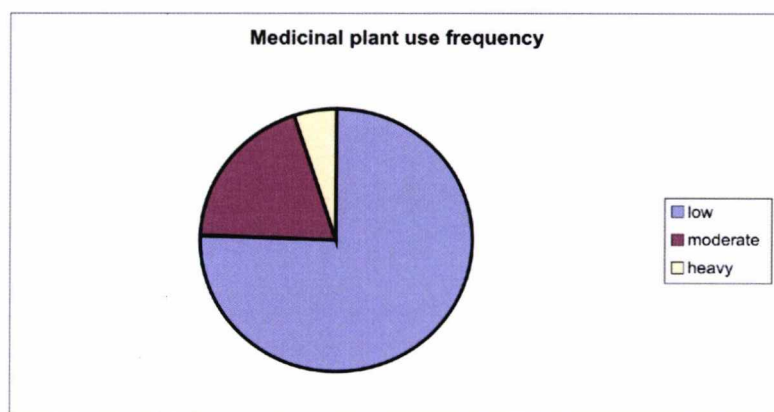


Figure 21: Use frequency of medicinal plants

The distribution of the plant populations as well as knowledge for their use determined plant management by individual healers. The personal duty of the healers' families to maintain the plant populations that they used, was the incentive that drove active efforts for their conservation. The village homegardens in particular were a site where local conservation was at its peak.

5.4 Homegardens and plant conservation

Homegardens are old and well-established land use systems across the world. They are diverse and have multiple social and ecological functions. Even though the agricultural role of homegardens is well documented (Brownrigg 1985; Kumar & Nair 2004; Mitchell & Hanstad 2004a) their importance as a cultural space where family traditions and

specialist plants are conserved is not. The greater part of published homegarden studies refer to South-East Asia and South/Central America (Benjamin et al. 2001; Landauer & Brazil 1990; Zaldivar et al. 2002), while very few refer to the Pacific Islands (Thaman, 1990). Due to the small size and isolation of the landmasses, the tropical ecosystems of the Pacific Islands have different dynamics than the tropical forests of other geographic regions (van Royen & Davis 1995).

5.4.1 Medicinal plants in the homegardens

In Atiu a total of 58 different plant species in the homegardens were reported to have medicinal properties. Medicinal plants commonly maintained in the homegardens were: the *nono* (*Morinda citrifolia*) whose roots, leaves and fruit are used for a variety of ailments; the *āroe* or *cactus* (*Aloe vera*) which is commonly applied to cuts, the *tiare Māori* (gardenia, *Gardenia taitensis*) which is used in treatments for headaches and babies' illnesses and *rauti* (cordyline, *Cordyline fruticosa*) used in treatments for burns and stiff neck. A wide range of homegarden medicinals is used in the preparation of medicinal oils for skin ailments. These plants are the *‘ava ‘ava* (*Nicotianum tobaccum*), *pi* (*Talinum paniculatum*), *tiare Māori* and *miri* (basil, *Ocimum basilicum*). The latter is also used for in treatments for spirit-induced illness, *maki tūpāpaku*.

The plant with the highest distribution and abundance, which also has the highest number of uses is the multi-purpose coconut palm. Coconut palms were found in all homegardens. Fifteen uses of coconut palm parts were reported ranging from using the bark as insect repellent, the roots for medicine, the wood for housing, the leaves for making baskets and covering taro patches, the nuts for drinking, eating, making oil and many more.

Household residents were readily able to describe the medicinal uses of plant species in their homegardens, even though they did not personally use them. Some plants with general medicinal uses that were widely known in the community were planted in the

homegardens to provide easy access for the healers. As the healers are mainly the older women of the community, they want to be able to collect the required medicinal plants with minimum effort upon an illness event. However, many medicinal plants, were not purposively planted. Some grew spontaneously and others were planted for their alimentary, ornamental or technical use.

Even though there has been evidence arguing for the importance of homegardens as medicinal plant repositories (Agelet et al. 2000; Rao et al. 2004), global attention is still focused on the declining tropical forests as sources of medicinal plants. That is probably because of the immediate need for the conservation of tropical forests, which renders the implicit contribution of small fragmented homegardens to biodiversity conservation easily overlooked. Furthermore, the uses of plants change over time relative to social and environmental changes and the values that people attribute to plants change accordingly. However, plants strongly associated with specialised family traditions and family histories were actively conserved in the homegarden despite their utility.

5.4.2 Family-owned medical traditions and homegardens

Homegardens are an important source of medicinal plants for most families on Atiu. As it has already been mentioned the ability to heal is considered a gift from God and is always practiced without payment. Each family on Atiu specialises in the preparation of remedies for two to five illnesses and these remedies are passed on from generation to generation. Thus, patients need to be aware of which family to approach to obtain the appropriate remedy for their illness. Healers are required to serve their patients with all their heart and without any payment.

Healers and gardeners reported that the primary reason for planting medicinal plants in their homegarden is easy access to plant populations at any time that patients may visit the family for help. Medicinal plants found in each homegarden are particular to each

household because they relate to family-owned recipes. Therefore, even though there is a core group of plants that are common in most homegardens, there is significant inter-garden medicinal plant diversity. People that are closely related tend to live near to each other. Medicinal plants in gardens of adjacent houses were frequently very similar because they belonged to people of the same *kōpū tangata* who specialised in the same remedies, such as the case of *tiare moe* (see section 5.5.1)

Homegardens provide a suitable location for experimentation to grow newly introduced plants with newly discovered properties. They are a confined space, close to the house where plants are safe from the wild pigs. That was the case with the cultivation of a 'new' plant, the 'ava'ava (*Nicotiana tabacum*) that was found almost exclusively in the homegardens of only one out of the five villages, Areora (see section 5.5.5).

Furthermore, in many gardens there were some 'unused' plants that were planted by previous generations for medicinal purposes but no longer used. These plants were proudly maintained not only as a sign of respect for the person that planted them but also for other people to use (see section 5.5.7).

These examples clearly illustrate that apart from their utility and symbolic significance, plants are actively maintained in the homegarden in order to be used by the wider social network of the *kōpū tangata*.

5.4.3 Homegardens and social networks

Even though homegardens are owned and managed by residents of the household they are not entirely private or bounded entities and neither do they guarantee the self-sufficiency of the household. Plant resources are used as exchangeable items within the extensive social network. Plants may be absent from people's gardens but are frequently used as they are obtained from other households. For instance, *kaika* leaves (*Syzygium malaccensis*) are commonly used to treat mouth thrush in babies, *kea*. Mouth thrush is a

frequent illness of babies and younger children. This particular recipe belongs in the domain of collective folk knowledge and is not owned by any particular family. I recorded the presence of *S. malaccensis* in only three homegardens. The carers of children sick with *kea* freely go and help themselves to *S. malaccensis* foliage when in need. People are aware of the distribution of plants in other people's gardens as homegardens mediate between the private and public sphere. They frequently take plants from other people's gardens to use them or replant them in their own garden. People are happy to help someone that makes the local medicine by providing plant material (see section 3.6 & 3.7). Thus families' medicinal needs are met through a combination of their own homegarden produce and that of other households. Finerman and Sackett present a very similar case for an Andean community, arguing that homegardens need not to be viewed as independent entities. They note that families do not grow some medicinals, in which case they can borrow them from other families (Finerman & Sackett 2003: 459).

In Atiu, homegarden produce formed an important source of exchangeable plant material. In the Cook Islands giving '*ei* is an important ritual in welcoming or bidding farewell to guests. The abundance of suitable flowers as well as the time and technique to weave beautiful '*ei* are considered important resources. If someone does not possess time or know-how, he or she can ask a member of the extended family for assistance and will reciprocate by providing flowers, food or other specialist services in exchange.

Since many plants in the tropics propagate vegetatively, people can take a piece or a shoot from a neighbour's plant and replant it in their garden. On Atiu, this takes place when people visit other people's homegardens and they see plants they desire. Aromatic plants such as *Gardenia taitensis*, medicinal plants such as *Aloe vera* and alimentary plants such as *Abelmoschus manihot*, are some examples of plants that were commonly exchanged. When I enquired about the origin of the plant stock in the homegardens, the gardeners were very well aware from whom they obtained the plant material and also to whom had they given shoots for transplantation. However, open access to homegardens allows for plant parts to be removed without the awareness or consent of the owner, which sometimes causes tension between the households.

5.4.4 Homegardens as sites for experimentation and innovation

Homegardeners have been described as perpetual experimenters as they are constantly trying out and testing new species and varieties and their management (Ninez 1987). Furthermore, the homegarden gives an area under constant supervision where these experiments can be monitored several times a day (Heckler 2004: 215). In Atiu, the homegarden landscape provides a controlled environment for experimentation. Atiuans are interested in new plants with new uses whether these are medicinal, ornamental, food or craft plants. An example is the case of the tobacco plant. After Atiuans women found out that tobacco-infused coconut oil (*'akari 'ava 'ava*), was better for treating skin ailments than pink flameflower-infused oil (*'akari pi*), they took an interest in preparing the new oil. As a tobacco grower explained, in the beginning only a few families were planting the tobacco, which caused some problems:

'I planted the *'ava 'ava* for my wife to use when she wants to make the oil. I used to have the plants growing in the front garden, but then everybody was coming to get their leaves from my plant. One day the plant would be growing fine and the next morning it had no leaves left, so I took it and planted it in the back of the house. Now that people know the plant is good they plant it too.'

Therefore, the homegarden provided a location not only for the experimentation with new medicinal plants but also for the transmission of new ethnomedical knowledge.

5.4.5 The socio-cultural role of homegardens

The homegardens in Atiu are dynamic systems whose use and floristic diversity reflects the social status of their owners and their relationships with their community. It is the utility and social values of plants that drive their conservation in the homegarden. Homegarden plants support the material and spiritual needs of the family and their social network; they are the product of a particular sociocultural order, which adapts and

changes. Cultural beliefs, customs and taboos influence the diversity and composition of homegardens. As in Bangladesh, some plants or animals may be retained or excluded depending on the above considerations (Millat-e-Mustafa et al. 1996: 259). Homegardens enrich not only the livelihoods of their stewards but also their social networks.

Sharing plant resources and agricultural products is common in Pacific island communities (Thaman 1990). Sharing plants generated in abundance in one's garden with the extended family is a valued act, which is reciprocated accordingly. By generating crucial exchange materials and by providing a space in which certain resources are freely available to neighbours and kin, homegardens are a central feature in the medicinal plant and other resource exchange networks that are so important for South Pacific sociality. The value of plants in exchange between households as well as their specialist medicinal value for individual households drive their conservation in the homegardens.

The homegardens of Atiu play a very important cultural and environmental role in the practice of Maori medicine and the continuation of family-owned ethnomedical traditions. Furthermore, the homegardens are dynamic systems shaped not only by the current needs of the household members but also by family history and cultural identity. Homegardens provide a setting for family life and social networks and their plants serve as markers of family-owned ethnomedical traditions. They cater for the needs of the household and other households with whom they have links. Homegardens, as living plant repositories, are an important source of both plants and knowledge for the household members. This knowledge is required for the plant resources to be used in ritual, food, craft and traditional medicine and is passed on from older generations to younger ones. Plants also serve as mnemonic devices reminding new family members of the departed and connecting old and new ways of life.

Some plants in Atiuan homegardens are also used to mark life stages of the family members that dwell in the household (as discussed in chapter 3). Even after their physical departure to another household, another island or even death; the associated plants remain on the family land as a marker of the members' presence and status within the family,

their healing knowledge and healing status being one of them. These plants have the dual role of reminding consequent dwellers not only of their spiritual family heritage such as specialised family traditions but also their material heritage such as land claims. A study of homegardens in the Ecuadorian Andes revealed a similar pattern: the natural history of the homegardens mirrored transformations within the family (Finerman and Sackett, 2003: 473). On a larger scale, homegardens and their produce contribute to the maintenance of social networks and exchange systems that facilitate the exchange of the island's limited resources.

5.5 Case studies where medicinal use facilitated conservation

Managing, using and harvesting plants on Atiu are activities that are bounded by a wide range of social and environmental parameters. From a social perspective differential access to plant knowledge and use influenced significantly plant management. From an environmental perspective, plant ecology and habitat requirements influenced where plants could grow and under what circumstances. Overall, medicinal plant uses were controlled by a small number of users. This system of specialised family-owned medical traditions positively affected the distribution of medicinal plant populations. Only 18 species were collected exclusively from the wild. Twenty-two species were collected from the homegardens and thirty-eight species were collected from both locations (figure 22).

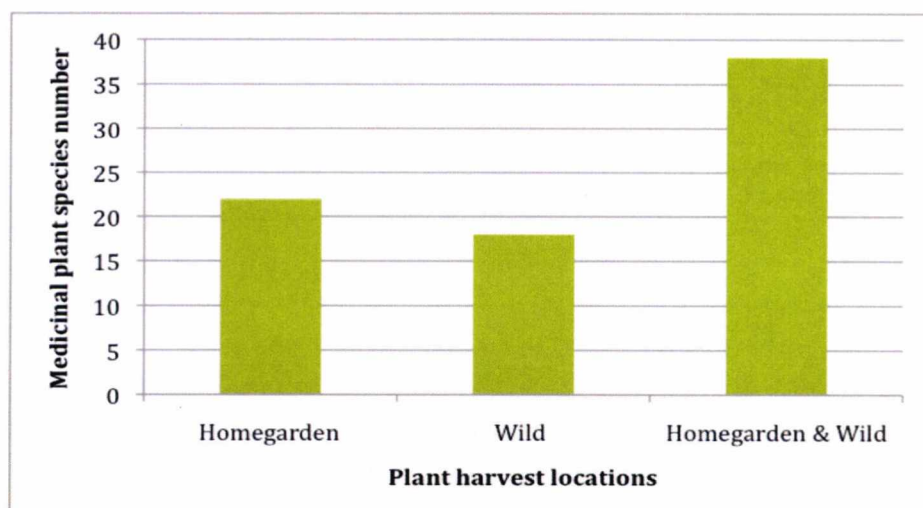


Figure 22: Medicinal plant harvest location types

Before I conclude on the principles of medicinal plant management, I describe briefly some case studies that are indicative of the interplay of social and environmental factors affecting medicinal plant management.

5.5.1 Specialised use and cultivation in the homegardens

The case of *tiare moe* (*Mirabilis jalapa*) & *poroporo* (*Solanum viride*)

The case of *M. jalapa* management is an example where the medicinal use of a relatively abundant plant encouraged its cultivation in the homegardens and the cultural beliefs associated with it determined its spatial position in the homegarden. *Mirabilis jalapa* (Nyctaginaceae family) is a quick growing shrub that grows up to one metre. Its leaves are ovate-lanceolate and its characteristic yellow and purple fragrant flowers are funnel-shaped and open late in the afternoon (Wilder 1931: 49).

The root tubers of *M. jalapa* are used medicinally for one of the many different types of family-owned '*akari ira* recipes. '*Akari ira* is a medicinal oil that is applied on babies to treat the spirit induced baby illness *ira* (see chapter 6). In the village of Mapumai *M.*

jalapa was present in four homegardens. Four related families, who owned the recipe for 'akari ira that required the root tubers of *M. jalapa*, managed these homegardens. These families maintained the plant populations in order to have easy and secure access to the plants in the cases where they would be asked to make the oil. *M. jalapa* was always planted on the side of the houses. At dusk they open their flowers and produce a very strong smell that is believed to attract the spirits. Four homeowners stressed that *tiare moe* were never planted near the house entrance in order to avoid attracting malevolent spirits.

An example of a plant that is rare in the wild as well as the homegardens is *poroporo*, (*Solanum viride*). *Solanum viride* (Solanaceae family) is a shrub that grows up to two metres high. Its leaves are alternate with an ovate blade which is typically 8-18 cm long (Whistler 1992: 200). The name *poroporo* is attributed to the plant's glossy red ellipsoid berries that resemble balls, *poro*. This plant is extremely rare on Atiu. I recorded its presence in only three homegardens of families that used it for medicinal or ornamental purposes. A specialist healer cultivated a population of eight plants at the back of her house. She was the only woman on the island that owned the medicinal recipe for *maki opu*, a type of food poisoning, which required *S. viride* leaves. The healer explained that she cultivated the plants in her homegarden in order to be able to obtain the materials she needed for the preparation of the recipe. I also recorded one plant in the homegarden of an elderly lady who specialised in making flower garlands. She maintained, *S. viride* in her garden because she used its red fleshy fruit for making specialist flower garlands offered as a sign of respect to honoured members of her family.

5.5.2 Rare wild plant populations transplanted in the homegarden

The case of *vavai tara* (*Abelmoschus moschatus*)

The case of the *vavai tara* is a case where a rare wild plant was transplanted in the homegarden for easy access. *Abelmoschus moschatus* (Malvaceae family) is an

introduced shrub, which is uncommon as a weed of disturbed places and marshes (Whistler 1990: 412). In Atiu, it grows near the taro plantation and the inland lowlands. One healer uses its leaves to treat people that have a bone obstructing their oesophagus, *ivi (raoa)*. The healer noticed that the plant population near the taro swamp was decreasing and that he consequently found it increasingly difficult to find the plant when he needed it. So he transplanted it at the back of his homegarden, near the water tank. He explained:

‘It was getting hard to find the plant down the land. If someone came at night with a bone stuck to his or her throat we had to go down the land and get it. So I took some plants and planted it in the garden, here behind the water tank so it grows nicely.’

His wife tended this population as the homegarden belonged in her sphere of duties. Women usually tended the homegarden, and tended medicinal plant populations that were used by other members of their extended social network.

5.5.3 Wild populations harvested sustainably

The case of *ava (Ficus prolixa)*

Ficus prolixa (Moraceae) is a strangler tree that grows in the *makatea*. Young banyans grow initially as epiphytes. Their seeds germinate when the droppings of fig-eating birds land on suitable trees. Aerial roots develop and become thicker when they reach the ground eventually becoming accessory trunks that strangle the host tree. Fully-grown trees have immense growth that extends over a large area that could range up to 50 square metres. Furthermore, the fruits of the *ava* support a wide range of fauna such as birds, crabs, chickens and rats (Vougioukalou 2000). *F. prolixa* is a tree strongly associated with the spirits of the ancestors. The bark is used for making *tapa*, barkcloth and the root tips are used in Maori medicine. Atiuans harvest the bark and the root tips with great care

and respect for the tree and the elders who passed on specialised knowledge to their respective apprentices. I accompanied a 42-year-old woman and her nephews in a casual trip in the forest to harvest *ava* bark for making *tapa*. She specialised in making *tapa* out of the outer bark of *Ficus prolixa*, also used the young roots of the *ava* for treating an illness of the eyes. While the younger boys were climbing on *Ficus prolixa* cutting wooded verticals, she told me:

‘I also use this tree to make Maori medicine. It is made with the root tips. My grandma taught me how to make it. I always come to this tree because that is where my grandma came to get the parts for the medicine. I never tell others from where I get my materials. I keep the location a secret so no one comes and cuts from this tree. For me this is a *tapu* and I always cut only what I need, never more. This is what my grandma told me.’

The root tips of the aerial roots were used medicinally for a specialised recipe for *maki mata*. Each potion requires one handful of root tips. The infrequency of *maki mata*, coupled with the small amount of plant material required and the abundance of banyans on Atiu did not constitute a threat to the trees’ survival. Wild plants were harvested not only from the forest but from homegardens too.

5.5.4 Tending spontaneous growth

The case of *pi* (*Talinum paniculatum*)

Talinum paniculatum (Portulacaceae family) is an erect herb that grows up to 80cm. Its leaves are alternate, fleshy and oval to 11x5cm. It bears minute flowers on a slender much-branched structure. Its fruits are small, reddish, round of 3mm in diameter (McCormack 2004). *T. paniculatum* is one of the medicinal plants that were not consciously cultivated in the homegardens. When it grew spontaneously, gardeners did not uproot it because of its use. *T. paniculatum* leaves are used in the preparation of a

particular type of coconut oil, the '*akari pi*. This oil is commonly used for skin care and the treatment of minor skin ailments. During a garden survey, the gardener pointed at the *T. paniculatum* in her garden and explained:

'See this plant here? I use it for the Maori medicine. We didn't plant it here, it just grew but because I like it, I look after it and now it has grown nicely. I use it for my coconut oil but I haven't made some for a long time, that is why you see so much of this plant here.'

Medicinal oils such as the '*akari pi* are considered health care 'staples' and bottles with infused coconut oils are found in every household. There was an established list of plants used in the different oils and new plants were added to this list as well.

5.5.5 Experimenting with new plants

The case of '*ava'ava* (*Nicotiana tabacum*)

Homegardens are frequently used to experiment growing newly introduced plants with newly discovered properties. They are preferred because they are a confined space, close to the house. That was the case with the cultivation of a 'new' plant, the '*ava'ava* (tobacco, *Nicotiana tabacum*, Solanaceae family) that was found almost exclusively in the homegardens of Areora, one of the five villages. This introduced tobacco plant is known on all the islands but it is rarely cultivated (Whistler 1990: 359). The gardeners explained to me that three years ago a specialist healer from Rarotonga was invited to do a workshop and teach local women some new recipes. The workshop took place in the Areora village hall. The healer taught the Catholic women of Areora how to make tobacco-leaf infused coconut oil, '*akari'ava'ava* to treat minor skin ailments. Some women started experimenting with growing tobacco plants in their gardens and making this 'new' oil, which is now considered a village speciality. A resident of that village explained:

‘The ‘*akari* ‘*ava*‘*ava* is being used recently. Before we didn't use the ‘*akari* ‘*ava* ‘*ava*, we used the ‘*akari* *pi*. They say the ‘*ava*‘*ava* is better. There are not many ‘*ava* ‘*ava* plants. People grow them at home. All the families know how to cook the ‘*akari* ‘*ava*‘*ava* but not all of them have the plant. You can go and ask for the leaves.’

The case of *N. tabacum* forms a typical case where new knowledge fits in existing structures of ethnomedical practices such as the use of coconut oils and their properties. It is also incorporated in existing plant management schemes such as the homegardens and further contributes to their role in exchange of plant material.

5.5.6 Using and exchanging plants

The case of *cactus* (*Aloe vera* & *Aloe arborescens*)

Medicinal plants were maintained in the homegardens for the use of the resident family and their extended network. This was the case of the Aloe species *Aloe vera* & *Aloe arborescens* of the Liliaceae family. The common aloe, *Aloe vera* is a low shrub with a basal rosette of fleshy, tapering leaves. The leaves, which are used medicinally, are green, coated, and spiny on the sides and grow up to 60cm. It produces one long stalk with a densely flowered terminal. The flowers are yellow-orange with a protruding stigma. Octopus Aloe (*Aloe arborescens*) is a sprawling shrub with much narrower leaves and red flowers (McCormack 2004). Both species are commonly used for treating cuts, lesions and burns. I recorded these species only in the homegardens of two families. Both gardeners mentioned that many people would come to them and ask for a few leaves. Some medicinal plants like the *Aloe* species were purposively maintained for the needs not only of the resident family but others as well. Interestingly, two homegardeners mentioned that they maintained plant populations exclusively for the use of others.

5.5.7 Maintaining plant populations for the use of others

The case of *kaute* 'enua (*Hibiscus rosa-sinensis*) & *nūroa* (*Leucas decemdentata*)

Kaute 'enua (a variety of *Hibiscus rosa-sinensis*, Malvaceae family) was considered the only medicinal type of *kaute*. It is a much-branched woody scrub, which grows up to 4 metres in height. The leaves, which are used medicinally, are alternate, the blade is broadly ovate with toothed margins. They are 6-15 cm long. The characteristic flowers grow solitary in the leaf axils. Their corolla is showy red, 5- or 10-parted, mostly 8-10 cm in diameter (Whistler 1992: 156). In a homegarden surveys, when I asked a gardener why did she plant the *kaute* 'enua she mentioned:

'We use it for the Maori medicine. I don't use it myself but I keep it for when other people need it, to come and take the leaves.'

This was statement people regularly mentioned when I enquired about the distribution of *H. rosa-sinensis* in people's homegardens. Despite its ornamental value, people consciously maintained *H. rosa-sinensis* in their gardens for others to use, even though they did not use the plants themselves.

Furthermore, in many gardens there were some 'unused' plants that were planted by previous generations for medicinal purposes but no longer used. These plants were proudly maintained not only as a sign of respect for the person that planted them but also for other people to use. One such example is *Leucas demcedentata* of the Lamiaceae family. It is a decumbent to ascending, square stemmed herb up to 40 cm or more in height. Its leaves which are used in medicine are opposite with an elliptic to ovate blade, mostly 2-4 cm long on a petiole less than half as long. The flowers consist of a 2-lipped, white corolla, 7-9 mm long, in axillary whorls of 3-10 or more (Whistler 1992: 166). It grows spontaneously in gardens or on the walls between cracks. A 41-year-old middle-aged schoolteacher explained about a disused *nūroa* (*Leucas decemdentata*) population growing in her garden:

‘My mum used this plant as a medicine for diabetes. Everyday she would cut one handful, add it in boiled water and drink it. I have never used it but I keep it. Other people come and ask for it. They know it’s here.’

This example illustrates that apart from their utility and symbolic significance plants are actively maintained in the homegarden in order to be used by the wider social network of the *kōpū tangata*.

5.5.8 Use of rare wild plants

The case of *pia rautai* (*Nervilia aragoana*) and *meika vē ĭ* (*Musa troglodytarum*)

Some medicinal plants had small populations that were only distributed in the *makatea*. That was the case of *pia rautai* (*Nervilia aragoana*) and *meika vē ĭ* (*Musa troglodytarum*). *Nervilia aragoana* (Orchidaceae family) is a ground orchid that is classified as nationally endangered. It produces a flower stalk up to 40 cm with 5-15 pendulous pale green leaves. The 2cm x 1cm ovoid, white root tubers are the plant part which is used medicinally (McCormack 2004). *N. aragoana* is very hard to detect because it is a very inconspicuous plant and it is also rare. I did not record it in any of my habitat surveys or transects. When I enquired about its distribution, no one knew if this plant was still growing on Atiu. One day, I happened to interview a healer who used this plant in one of his recipes. He knew where to find it and explained the difficulties. He recounted:

‘ The *pia rautai* is hard to find because it is too short. I use the *kikoo* [tuber]. It grows alongside the road from Taunganui to Oravaru, you can find it there. It has only one leaf, a round one. You have to pull stem and follow root underground, it is four to five inches away from the stem, you have to be very careful.’

The healers who needed rare wild plants for their recipes kept an eye on their populations in the wild. *Musa troglodytarus* (Musaceae) is considered the 'king of the bananas' because of its distinct biology and rare distribution. It is the only banana variety with erect fruit that are occasionally seeded. The tree-like herb grows up to 10m. The 'trunk' consists of a pseudostem of clasping leaf-stalk sheaths, which are shiny purple-black in colour towards base and green towards the top. They exude a distinctive dark purple sap. The flowers are positioned on the terminal erect stalk, which can grow up to 60cm. The distinctive fruit are straight to slightly curved, stout with a tough skin. When the fruit ripen, the skin turns orange to red-orange. Black seeds can be absent to a few. They are usually eaten cooked like plantains. *M. troglodytarus* needs 24 months to develop from sucker to a flowering plant. After this period it needs 4 months to produce ripe fruit (McCormack 2004). Due to its life cycle, *M. troglodytarus* needs a level of management otherwise it is prone to extinction.

The leaf-stalk sheaths are used for ringworm, *muna*. However this treatment was not frequently used because it was very hard to get hold of them. One local planter knew of the presence of three mountain bananas in the *makatea*. The stem sheets are also dried and used as weaving fibres for specialist patterns because of their dark colour. I followed the planter and his sons in the *makatea* to harvest the banana stems and fruits (see cover photo, this chapter). After cutting down the bananas he replanted the young shoots so that new plants would grow. This trip to the *makatea* coincided with the Harvest festival of the CICC church where plants are placed near the altar of the church, decorated with 'ei and blessed by the pastor. Instead of keeping the two bunches of *M. troglodytarus* fruit, he placed them anonymously along with the other crops by the altar (see chapter cover photo). He later told me that everybody wanted to know where they came from. Shortly after our trip he also mentioned to me that he enquired about the historical distribution of *M. troglodytarus* on the island to some elder planters in his *tumunu* and they were very surprised that this plant still existed on Atiu.

As the above examples demonstrate that the medicinal use of the plants positively affected the plants' management in the wild as well as in the homegardens. Furthermore,

what these examples also demonstrate is that plants are utilised not only as biological objects but as cultural objects as well; and a deeper understanding of their cultural role is necessary to situate their role in Atiuan pharmacopoeia.

5.6 Conclusion

This chapter looked at the environmental parameters of medicinal plant use and sought to assess the sustainability of these uses. The medicinal plant survey showed that 64 out of the 80 medicinal plant species used were not threatened (uncommon, common and very common), which contributes to a percentage of 80% of the medicinal flora (Figure 20 & Appendix 11.7). There are thirteen species of medicinal plants that are rare in the wild and are also cultivated in the homegardens because of their use. Three species are both rare in the wild and inexistent in the homegardens. Local healers who are using the specific medicinal plants knew the location of well-established wild plant populations. Finally and most importantly, since medicinal plant knowledge is distributed between specific families, these families reported active engagement in ensuring that the population of the most rare plants that they used medicinally, are maintained and managed in a sustainable manner either in the wild and the homegardens.

Medicinal plants on Atiu are harvested according to social and environmental parameters: the illness that they were collected for and land ownership respectively. These two principles prevented overharvesting but also encouraged plant stewardship. Healers preferred to collect plants from homegardens or semi-disturbed habitats with easy access. Even though many medicinal plants were present in the primary forest, they were not considered more potent. The *makatea* was avoided due to difficulty of access. As a result in Atiu, medicinal plants were not prone to extinction and rare populations were either transplanted in the homegardens or looked after in the wild by the specific families of healers that needed to use them.

There has been considerable and growing attention in recent years in *in situ* conservation and ecologically- and economically-based sustainable use of wild populations of non-timber forest products, and especially medicinal plants (Akerele et al. 1991). Medicinal plants are frequently used as flagship species for biodiversity conservation projects because their extinction has direct effects on three important sectors: the disturbance of ecological balance, the lack of natural resources used by local people and finally to the lack of local health security. As this study shows, homegardens can be used as suitable locations for *in situ* conservation initiatives.

However, homegardens are not solely important sources of medicinal plants that provide families with essential plant resources for household and community duties. They are important spaces that support the social life of the resident families, where plants serve as mnemonic devices for departed family members and family-owned ethnomedical traditions. These findings contribute to the emerging body of interdisciplinary homegarden research by demonstrating how homegardens are determined by social relations, particularly of the family's status, history and specialised skill traditions (Finerman & Sackett 2003; Heckler 2004).

Atiuans were not explicitly interested in the abundance of the plants in the wild but about their abundance *per se*. In this era of social change, where people refrain from forest-dwelling activities, many people were only aware of the existence of medicinal plants existence in the homegardens. Some plants that were rare in the wild were abundant in the homegardens (e.g. *S.viride*). Other plants that appeared rare in the wild, such as *pia rautai* and *meika vei*, had patchy distributions and were difficult to detect using standard habitat surveying techniques. For example, a local healer who used specific medicinal plants, would know the location of established plant populations such as the cases of *N.aragoana* and *M.troglodytarus*. When these techniques were supplemented with ethnobotanical enquiries, then more plant populations were pointed out. Finally and most importantly, since medicinal plant knowledge is distributed between specific families, these families would ensure the population of the most rare plants that they use medicinally is managed in a sustainable manner.

The family ownership of traditional medical recipes plays a major role in the way plant resources are managed and exchanged. This is particularly the case for medicinal plant management and exchange because specific individuals within different families have the authorisation to prepare particular medical recipes. The healers and their families monitored the medicinal plant populations in the wild and replanted rare plants in the homegardens. Also, they maintained medicinal plant population in their homegardens for other healers to use. Consequently, they served as custodians of both knowledge and plants. The sense of obligation to the community's well-being and divine guidance that accompanied the practice of traditional medicine resulted in the operation of a moral and spiritual driving force behind this form of biological conservation. This chapter therefore highlights the importance of knowledge distribution and ownership in medicinal plant management, which is a factor frequently ignored in biological assessments of biodiversity use.

Medicinal plants are not under threat in Atiu because of the absence of markets and international trading. This highlights the importance of exogenous political and economic factors in the sustainability of local people's medicinal plant use. Fifteen years ago, Dove stressed that the impact of international trading markets upon local plant management schemes cannot be overlooked and urged scientists and policy-makers to ask 'what have we taken away from tropical forest peoples?' rather than 'what do we need to give them' when thinking about development (Dove 1993: 22). What has happened to research in medicinal plant use since then? Even though, medicinal plant overharvesting is primarily linked with trading (Kuipers 1997; Salick et al. 1999; Shinwari & Gilani 2003), it is still local people's practices that are being assessed for their sustainability, rather than those of governments, traders and international aid agencies. In the next chapter I will discuss the knowledge transmission mechanisms that hold this apparently sustainable system in place.

6 Traditional medicine: principles and knowledge transmission

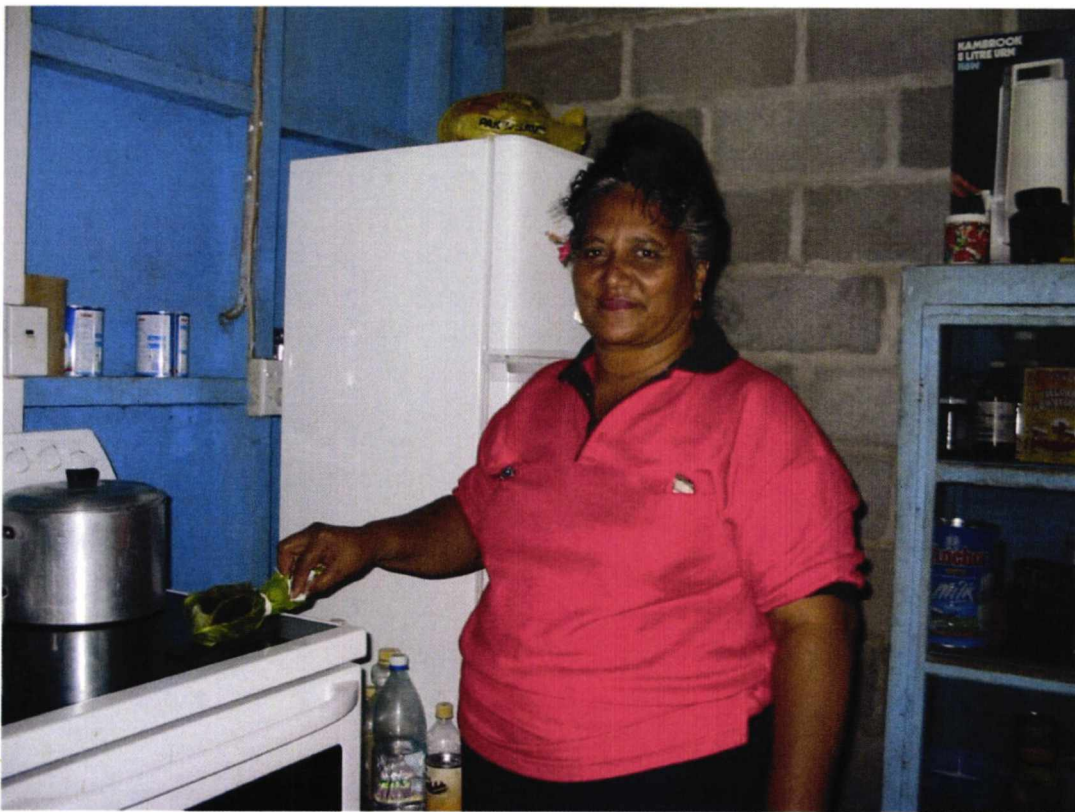


Figure 23: Local healer, Ake Pati Kaiaruna warming up macerated plants enclosed in a leaf bundle over an electric stove

'No one will tell you about the Maori medicine because it is a family secret. The families do not want others to know about the medicines they know how to make.'

'For the medicine to work you need authorisation from the healer who owns the medicine. If you do not have his authorisation, you do not have the mana to heal. If you try and make it anyway, the medicine will make the ill person even worse.'

'We call the Maori medicine vairākau Maori. It means the water from the plants. When you collect the plant, you have to pick the nice ones. It is the youngest ones on the top that are better, they have the roro, the juice of the plants. We do not collect plants on rainy days because their juice is watery.'

'I never receive anything for making the Maori medicine. Healing is a gift from God. I do not accept any payment...otherwise people will say I am doing it for the money.'

When I first arrived in the Cook Islands the practice of Maori medicine, the knowledge associated with it and the prevalence of its practice seemed almost incomprehensible. Why are the recipes such a big secret carefully guarded even from one's own relatives? And why do so many people heal so eagerly for no money? All Maori medicine is provided free of charge and the knowledge is considered the property of its owner. The family ownership of individual recipes resulted in a highly varied distribution of ethnomedical knowledge throughout the community. There was no special group of people that operated as medicine men or women. Different families possessed small parts of this complex body of knowledge. However, only few people within each family had the right to use it. Presumably secret knowledge had an important place in this small island community, but how were secrets kept in a place where everybody knew everything about everybody else?

6.1 Introduction

Discourse on traditional medicine in the South Pacific has progressively moved from missionary accounts depicting a medical system based on ancestral spirits and sorcery (Crocombe 2001; Eeuwijk 1992: 20; Hiroa 1971 [1934]) to a more systematic account of sophisticated medicinal plant use (Cambie & Brewis 1997; Morrison et al. 1994). Studies of Polynesian ethnomedicine describe a health care delivery system based on a collection of traditional Polynesian and Judeo-Christian cosmological beliefs as well as an elaborate medicinal plant use system (Cox 1991; Whistler 1992).

In the Cook Islands in particular the limited literature portrays a system of family-owned medical recipes that aim not only to treat illness but also restore social harmony (Baddeley 1985; Whistler 1992). However, none of these studies have researched the role of knowledge transmission in ethnomedicine and the impact it has on plant management.

In order to address the practice of traditional medicine and the knowledge transmission process, I conducted interviews with healers, patients and schoolteachers and distributed questionnaires to schoolchildren. Specifically, I interviewed healers in order to determine knowledge acquisition, frequency of visitation and sites of medicinal plant harvest. I also interviewed school personnel involved in education programmes on traditional uses of plants in order to establish the role of the school and school initiatives in the transmission of traditional knowledge. These interviews were also conducted with healers and the schoolmistress during a visit to the island of Mitiaro. The purpose of these comparative interviews was to look at illness and plants in a proxy community and identify inter-island knowledge transfer patterns. Finally, at the end of my fieldwork I handed out questionnaires to school children in schools in Atiu and Rarotonga to quantify the knowledge transmission process concerning making not only Maori medicine but also eel traps, fans and baskets (see chapter 2 for details). Information on ethnomedicine and knowledge transmission was also collected during homegarden surveys, plant transects and participant observation of countless day-to-day activities. The information presented

in this chapter draws particularly on the data concerning the knowledge and practice of a total of 128 ethnomedical recipes that are used to treat 88 different illnesses on the island using a combination of 80 medicinal plants with additional minerals or animal products.

I found that the Polynesian concepts of *mana* and *tapu* are still very influential in the operation of the ethnomedical system and safeguard the family ownership of the recipes and prevent unauthorised use. Other key elements contributing to the system's sustainability are that the healers do not charge for any part of the healing. If they charge it is believed that their gift of healing would be removed from them. As a result medicinal plant trade is absent as there are no financial incentives associated with selling plants. Furthermore, healers have to be constantly available to offer their services to the community. Consequently, they acquire an elevated social status, which leads to an elevated social capital and favourable position in the pervasive operating exchange network. However, these forms of immaterial systems do not appeal to the young generation and even though they highly value traditional medicine as part of their culture, they do not wish to become healers themselves.

These findings contribute to broader ethnomedical studies of indigenous knowledge and plant use (Berlin & Berlin 1996; Waldstein & Adams 2006) by demonstrating the role of knowledge ownership in the process of transmission and consequent practice.

6.2 Maori medicine in the Cook Islands

6.2.1 Maori medicine as an institution

Traditional medicine is an important but not formally recognised social and therapeutic institution in the Cook Islands (Whistler 1985: 89). It is locally referred to as Maori medicine or *vairākau Maori*. *Vairākau* literally means water from the plants. The name

comes from the principle component of all traditional recipes which is the juice of the plants that is being extracted by pounding (Baddeley 1985: 136).

The term *vairākau* extends to all medicines including imported items like pills, lice shampoo and even pesticides. *Vairākau Māori* specifically refers to local medicines. All nouns with the adjective Maori refer to local items or concepts, opposed to nouns with *papa'ā* as their adjective, which refer to concepts or things originating in the western world i.e. *vairākau papa'ā*, western medicine. Therefore, when referring to Maori medicine, the term Maori does not have any ethnic connotations but rather is colloquially used to signify a local practice of varying origin.

Maori medicine is prepared by the healers free of charge and it is used to treat a wide range of ailments including stomachache, vomiting, diarrhea, worms, cuts, burns, boils, toothache and many more. Also, there is a wide range of pre- and postnatal treatments that are treated exclusively by Maori medicine. The local pharmacopoeia has adapted to treat new illnesses as well like diabetes. Nowadays, traditional medicine is practised in parallel to the western health system as western medicine is very well established and accepted by the population. Hospital staff and official health authorities actively discourage Maori medicine. However, along the side of hospital services Maori medicine is frequently used by people of all social strata, both in the Cook Islands and in the diaspora. Cook Islanders who have migrated to urban centres of New Zealand and Australia still communicate with relatives in the homeland and ask for remedies to be sent over. The prevalence of the use of Maori medicine across social and geographical boundaries is remarkable considering the long history of suppression by missionaries as well as the health authorities in more contemporary times.

In 1879 the missionary-influenced council outlawed traditional medicine as it was practised by the *ta'unga*, who were the priests of the old religion (Whistler 1992: 243). The first among the mission-inspired Laws of Rarotonga, was a ban on the consultation of 'sorcerers' to discover the cause of sickness or find a thief (Clerk 1995: 163). The *ta'unga* who were the original healers, lost all their power after Christianity. The term

ta'unga is commonly used to refer to a healer that apart from specialised knowledge and skills also has the *mana* to heal. The *mana* is described as the supernatural power of efficacy or 'force of nature' that is unequally distributed among people, plants, animals, spirits and sometimes even stones (Makirere 2003:113). Another associated term is *tapu*, which is the supernatural concept of sacred that is regulated by the anger of the spirits of the ancestors, the *tūpāpaku*. If someone does something bad to a member of the extended family or in general to society, then he or she is considered to break the *tapu*. Consequently their *mana* is taken away from them, leading to sickness or misfortune (Beaglehole & Beaglehole 1971 [1938]; Hecht 1985). The belief that moral transgressions and duty omissions anger the ancestral spirits, which consequently cause the offenders to get sick is common throughout the Polynesian region (Hogbin 1961). However nowadays, even though these concepts are still commonly shared among Atiuans, they are intertwined with theories of natural causation of illness. The old gods have been replaced with the Christian God but the spirits of the ancestors still have a very active role governing the lives of the living.

In the Cook Islands, medicinal remedies are 'owned' by different families and will not work without permission. The same practice can be found in Tahiti where along with the permission, the family gives the *mana* as well (Whistler, 1992: 75). Another way to discover treatments is through dreaming. Dreams can reveal where to find medicinal plants and how to prepare them. The particular ingredients and dosage of family-owned recipes is kept secret from other members of the community.

6.2.2 Becoming an expert- *ta'unga*

The term *ta'unga* referred in the past to the priests of the old religions. *Ta'unga* and its cognates (*taula* in Tonga, *taulaaitu* in Samoa, *tahu'a* in Tahiti and *kahuna* in Hawai'i) is a common Polynesian term denoting a priest or an expert (Whistler 1992). For New Zealand Maoris, the *tohunga*, were considered a personal embodiment of acquired *mana* (Weiner 1992: 29). Nowadays in the Cook Islands, the term *ta'unga* refers to a specialist

of a particular practice. It is closely related with specialist healers and particularly healers that can communicate with the spirits and diagnose the social cause of the illness.

Specialists in Maori medicine are referred to as *ta'unga vairākau Māori*, meaning specialist in Maori medicine. In Atiu, the healers rarely identified themselves as *ta'unga*. That term was feared and was usually associated with people who could cure spirit induced illnesses and communicate with the spirits. The activities associated with the spirits, the *tūpāpaku*, were not formally recognised and were frequently seen as mutually exclusive with the Christian faith. However, most of the informants were convinced of the active presence of the spirits and had witnessed associated events that they were very willing to recollect and discuss. People enjoyed talking about incidents in the past when the cause of an illness or a fit was a discontented ghost/ ancestral spirit.

However, the term *ta'unga* is not restricted to the practitioners of traditional medicine. People usually became specialists by picking up skills from their parents, grandparents or an elder in the extended family with who they were close. Specialisation in a particular activity or 'craftsmanship' was very established. These activities could be a type of planting, fishing, making instruments, weaving, healing etc. Specialists were renowned for their skills and people would approach them to ask for their services. Their fame extended through the social network to other islands and even other countries where the Cook Islanders resided⁴.

Becoming a specialist involved a long apprenticeship procedure and specialists were few in number. For example, on the island of Atiu there was only one specialist that made canoes and twenty specialists that made baskets. Specialisations were usually gender specific and had a strong genealogical link. Other types of specialisation for men included making reef shoes, spearing octopus, planting by the phases of the moon,

⁴ For example when I visited the island of Mitiaro, the wife of the Catholic priest mentioned during an informal conversation: 'You know your *māmā* in Atiu, she is a *ta'unga tui kakau* [specialist in sewing clothes]. This is her speciality and she has been to Mitiaro to teach the women how to sew some patterns.'

carving wood and making instruments. Types of specialisation for women included weaving baskets and mats, sowing, cutting *tivaevae* patterns and making barkcloth, *tapa*.

The Christian God is referred to as *ta'unga nui* (literally meaning great specialist) referring to his abilities to create 'specialised' creatures. This distribution of specialist knowledge and its use within the exchange network of goods and services is a form of 'mental economy' to borrow the terminology coined by Balée. Mental economies are operating where oral transmission is the only way for certain kinds of knowledge to be transmitted (Balée 1994: 88). This is the case for all kinds of traditional knowledge on Atiu that are being practised within the small community. However, doing favours and sharing freely the fruits of specialised knowledge are proving to be increasingly difficult as economic payment increasingly substitutes reciprocity and exchange.

6.2.3 Knowledge distribution within the community

In societies with oral traditions like those of the Cook Islands,⁵ the transmission of ethnobotanical knowledge relies exclusively on the willingness of certain knowledgeable individuals to share their knowledge with others. As a result, in Atiu there is a complex pattern of ethnomedical knowledge distribution that depends not only on the potency of certain remedies but also on the ownership rights of different families. Whistler noted that traditional medicine in the Cook Islands is structured in three levels: folk medicine, healers and the *ta'unga* (Whistler 1992: 246); a tri-partite structural pattern typical of traditional medical systems (Kleinman 1978a).

In Atiu these levels are not socially segregated, as one person can possess knowledge that belongs to more than one level. Folk medicine is considered the use of commonly shared knowledge on herbal medicine for minor accidents and illnesses. These are simple recipes involving few plants for which no formal authorisation is required. On the second level, healers perform family-owned recipes for which they have received authorisation.

⁵ The Cook Islands language was first transcribed by the missionaries in 1830. The first book written in Rarotongan Maori was the Bible. There is no written record from the pre-contact era.

They specialise in setting bones, performing the traditional Polynesian massage (*māoro*) and herbal medicines. On the third level are the psychic healers that can heal illnesses that have supernatural components. These illnesses usually have no apparent cause.

Atiuans do not explicitly make the distinction between these three levels of knowledge. Even though they are aware of ownership patterns and restrictions, they recognise all treatments as *vairākau Māori*. Similarly, in Tonga, there is no definite boundary between folk medicine and specialist knowledge since there is usually a specialist in each extended family (Whistler 1992: 42). Furthermore, Oliver notes that in Tahiti every man or woman was a kind of practitioner, having their own stock of remedies and skills (Oliver 1974: 476). Therefore, when I use the term 'healers' in the context of Atiu, I do not refer to a particular section of the society with a particular status. I refer to ordinary community members who know how to perform a healing practice.

Most healers are women and they treat both men's and women's illnesses. This gender bias is based on two principles. Preparing the Maori medicine is considered a very laborious activity and men are not asked to participate or help out of 'respect'. An elderly healer remarked:

' I am the only one left on Atiu. My brothers know how to collect the plants but they don't know how to make it; my sons don't want to learn and I don't want to teach them because I respect them and they do not have the patience. I will probably teach my grandchildren.'

Even though male healers were actively engaged in healing, they were not as numerous as female healers. I formally interviewed six male healers and thirty female healers. Two of the six male healers specialised in massage and bone setting. In cases where the healer had to treat a patient of the opposite sex, the patient's spouse or carer was present and assisted in the treatment process.

Another determinant in knowledge transmission was birth order. First-born children, like men, were 'respected' and therefore not asked to partake in the laborious task of preparing Maori medicine. This can be attributed to two elements of traditional leadership in the Cook Islands: that most forms of leadership were the responsibility of men, and that first-born children were considered superior to later born (Crocombe 2003: 15). While looking for knowledgeable informants, I asked one of my informants whether his elderly mother knew how to make any medicines. He replied:

'My mother? She doesn't know how to do anything. She was the first born of the family so she was never asked to do anything.'

That task of healing was assigned to the younger female children of the household (further discussed in section 6.4.3).

6.2.4 Healing knowledge and power

Healing is considered a gift from God and healers have a positive status in the community. Asking for money would cause the healer to lose his or her *mana*. Atiuans do not consider healing abilities and ancestral divination contradictory to Christian beliefs. On the contrary, devout Christians are perceived to be very effective healers as they are considered to be closer to God. A local legend recounts the achievements of *Tamatonarahi*, a healer from Manihiki who healed a very sick chief while taking religious training to become a priest (Kauraka 1982). None of the healers engage full-time in healing. They heal their patients while carrying on with their paid or unpaid employment and familial obligations. Healing is practiced as a service to the community. For this reason no money is taken but sometimes food is accepted. Most recipes are 'owned' by the healers that developed them and they are considered to be ineffective if someone prepares them without their consent. Medicinal plant knowledge is mainly transmitted from older relatives to younger people in the same family.

Through becoming a healer, individuals acquired an elevated social status within the community. This is expressed in terms of good reputation, increased *mana* and an advantageous position in the exchange network. When knowledge becomes power in small communities like those of the Cook Islands, secret knowledge is a valuable commodity. Being a healer requires a lot of personal qualities apart from the strict 'know how'. Such qualities are considered the commitment to the welfare of the community, selflessness (the healer may be required to make the medicine every time someone asks, at any time of day or night), patience (to collect and prepare the plants) and lack of self-interest (never to accept payment for your services). These qualities are associated with healers across many cultures of the Pacific (Parsons 1985a). The role of healers is not limited to treating particular illnesses; their role extends to diagnosing the cause of the illness, which can be physical or metaphysical and restoring social harmony between the living and the dead.

6.2.5 The self in Polynesian culture

In Polynesian culture, an individual is part of a highly structured and all-encompassing social context and there is a very precise hierarchical structure upon which social life and customs are based (as described in chapter 3). Neglect of familial responsibilities and interpersonal hostility may result in illness. The ailments are rarely caused by the vengeance of other individuals. In Polynesia, the cause of illness is commonly attributed to strain in social relations or violating *tapu* (Cox, 1991: 150). Examples of *tapu* violations are considered giving the baby a name not suited to its rank and family position, using the family-owned land without the consent of the extended family, mistreating others and not respecting the social hierarchy. These violations are thought to upset the ancestral spirits of the lineage who have the ability to inflict sickness on the offenders.

The specialist healers are usually visited for a particular ailment or to treat *maki tūpāpaku*, diseases that are thought to be supernaturally caused. *Maki tūpāpaku* is widely thought to be caused by the unhappy spirits of the deceased ancestors. In the past the healers have been known to call family meetings, talk to the patients, their family and their close relatives to identify any conflicts (Baddeley 1985: 140). Nowadays, healers engage in these practices in a less formal setting. Together with preparing their family-owned recipes, specialist healers are actively involved in the restoration of social harmony, which contributes to the patients' recuperation.

6.3 Key concepts

6.3.1 Mana and tapu

The Polynesian concept of *mana* has been historically associated with the power of the chiefs and their links to the Polynesian gods and the spirits of the ancestors. It has been argued that primal *mana* was not perceived merely as power or energy, but procreative power derived from the universe (Handy 1978 [1927]: 27). These powers extended to the realm of healing where the chiefs with their *mana* alone could heal people who were sick (Firth 1941). Nowadays, this power is still associated with the supernatural and the ancestors but the divine power is associated with the Christian God and his powers. As a consequence of the overall disempowerment of the chiefs through the colonial and missionary period, Atiuan chiefs are not considered 'exclusively' powerful and the healing power is distributed among the population.

In the context of traditional medicine, the term *mana* refers to the power of the healer to heal. The process of authorisation from the healer to the apprentice corresponds not only to the transmission of technical knowledge of the actual recipe preparation but most importantly the transmission of the ability to heal. This power is restricted to the particular recipe that the apprentice 'inherits'. Therefore, healers can cure only specific

illnesses using specific recipes that they have been authorised to perform, because it is for these illnesses that they have received the *mana* to heal. For the *mana* to work, the patient needs to enter a state of *tapu* where particular dietary and behavioural restrictions apply.

Tapu is another Polynesian concept associated with Maori medicine. Makirere offers the following definition:

‘*Tapu* referred to that which was physically dangerous and therefore restricted, forbidden, set apart, to be avoided, because (a) it was either divine and therefore needed to be isolated for its own sake from both the common (human beings and things) and the corrupt; or (b) it was corrupt and therefore dangerous to the common and the divine, needing isolation from both’ (Makirere 2003: 113).

In the context of Maori medicine it refers to rules that are associated with the recipe and the patient. It does not refer to prohibitions in the strict sense but ‘sacred’ preconditions or rules associated with an act. The word for prohibitions is *ture*, which literally means law. In my interviews with healers I would always ask ‘Is there any *ture* for this medicine?’ Then the healers would start recounting: ‘while taking the medicine one shouldn’t smoke, eat red meat, have sex..’

The *tapu* is what safeguards that *ture*, the protocol to be followed. However, there were few exceptions to the rule. Some people claimed that the *tapu* were mere superstitions and that the efficacy of the medicine had nothing to do with authorisation. A 38-year-old female healer described during our interview:

‘When a *māmā* makes the medicine I go on her side and see how she makes it. Then I go home and make it for my children. I never ask for permission. Everytime I make it, it works! I don’t believe in these things.’

These claims were never publicly admitted and existed in the women’s private realm. *Tapu* can be found in acts ranging from the mundane to the sacred. It is associated with

activities of chiefs and their tribe or activities of high cultural importance such as canoe making, fishing and healing. Traditionally the chief had the *mana* and certain parts of his body like his head in particular were *tapu* (Steiner 1999: 129). Nowadays, chiefs do not have the same powers but a lot of the *tapu* are associated with their *marae* where the investiture ceremonies for new chiefs take place.

Atiuans enjoy recollecting stories where *tapu* violations led to punishment or misfortune and see the upkeep of *tapu* prohibitions as inherently linked to their culture. Respect for the customs is considered an essential element of community well-being and affects all areas of social life. For example, a *tapu* that is frequently recollected in Atiuan stories is that when a man goes out fishing his wife should stay at home and not go out; otherwise he will not catch fish or will have an accident at sea. Another example is that when a canoe is launched in the sea, a woman should not be swimming in these waters otherwise the canoe will not be safe and may capsize. Small catches or rough seas are often attributed to *tapu* violations. The system of *tapu* is considered to have controlling influence over all phases of the life of the individual and the community across Polynesia (Handy 1978 [1927]: 43).

Specifically, in the context of traditional medicine, it is believed that if an unauthorised person prepares a recipe, then the treatment will be insufficient to cure the illness. Furthermore, a *tapu* violation may make the patient even more ill because that person 'was not supposed' to do it. One informant, very keen to persuade me on the potency of the *tapu*, described his attempt to sidetrack the authorisation process and treat his friend's *toe tupu* (polyp or haemorrhoids) without seeking permission from a healer:

'I am telling you if you do not have permission to make the medicine, the medicine won't work. My friend had *toe tupu* in his bottom and he was really hurting. I had seen someone else make the medicine and I recorded it in my mind. He wasn't around to ask for his permission and I don't believe in these things anyway so I made the medicine myself. When he put the medicine on, his bottom

got itchy and very sore! He couldn't even sit. I am telling you it became worse. It is because I did not have permission to make the medicine, that is why. '

A 45-year-old healer who was 'given a medicine' (which means that she was authorised to perform a recipe) from a relative in Rarotonga explained during her interview:

'The medicine was given to me by my husband's cousin to make it for my children. I do not teach other people because maybe there is a *tapu* in it and when they will try to make it, it will make the ill person worse.'

Each recipe comes with context specific restrictions and most ethnomedical knowledge is passed on based on these restrictions. These restrictions are primarily based on who is entitled to make the recipe and be held responsible for the upkeep of their family-owned secret ethnomedical tradition.

6.3.2 Family ownership of recipes and secrecy

Knowledge of healing and permission to heal are two very different processes in Maori medicine. Knowledge of different healing techniques is shared among many individuals whereas rights in performing recipes are specialised and most times personalised. Specialised healing practices are owned as family traditions and only selected people possess the strict know how. Herbal recipes are passed on from generation to generation. Similar processes were described by missionaries regarding the transmission of knowledge associated with black magic in Mangaia, where male sorcerers only taught their nearest male relatives, either their son or nephew (Hiroa 1971 [1934]: 188). The healers and their families safeguard the medicinal plant populations that are required for each healer's family-owned recipe. Consequently, even if the knowledge remained inactive (like for example by the absence of that illness) it was still being preserved in the memory of a specific group of people. Individual healers serve as the custodians of both

specialised knowledge and plant associated with specific recipes. Cox notes that in Polynesia the choice of medicinal plants is dependent on the following three factors (Cox 1991: 154):

- a. local flora and the familiarity of the healer with the species
- b. the family of the healer since the knowledge systems concerning medicinal plants are strongly family based and frequently matrilineal
- c. ownership of herbal recipes

Even though these factors highly influence plant choice on Atiu as well, there is one significant difference between the size of the landmasses of the islands of the Cook Islands and those of other Polynesian nations; that the former are very small. The island of Atiu is 20km in circumference and is inhabited by a small and tight knit community of 500 people. Secrets are not easily kept in a small tight knit community. In Atiu, there were various levels of secrecy surrounding each family's medical recipes. I have grouped these levels of secrecy in four broad categories starting with no secrecy and then increasing (the number of times information on recipe secrecy was mentioned by informants is included within brackets):

- 1) people know the exact particulars of another healer's recipe but have no permission to make it (10)
- 2) people know of certain healers who can perform ethnomedical recipes and which plants they use but they have neither knowledge of the doses nor permission to make it (44)
- 3) people know of certain healers who can perform certain recipes but do not know any recipe details (87)
- 4) total secrecy: nobody outside the household knows about the recipe (2)

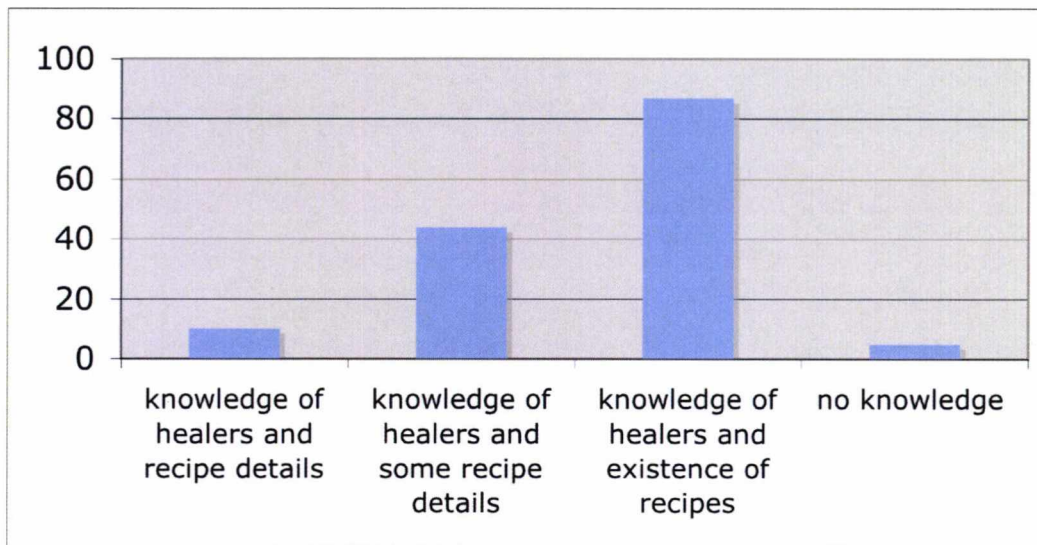


Figure 24: Number of reports of secrecy levels associated with ethnomedical recipes

These varying secrecy levels creates a broad spectrum between generalised and specialised knowledge throughout which community members navigate. These differential rights to knowledge and treatment have very important implications in the practical preservation of individual recipes and plants.

Secrecy and family ownership of specific practices are not limited to traditional medicine. Secret knowledge is evident (but not so structurally prominent) in other activities such as planting according to the phases of the moon (*arapo*), *tivaevae* designs, choreography, homebrew recipes, dress patterns, food recipes and many more. A study on secret planting knowledge in Rarotonga showed that in the Cook Islands as long as knowledge has a high potential for success it is not shared openly (Hartan 2002). People were keen to exhibit their special skills but not to disclose their specialist techniques. The strict know-how and the craftsmanship tricks were carefully guarded from the public eye. Persistent secrecy maintained a level of differentiation in the way things were done. However, according to many Atiuans, fellow islanders tend to always copy innovative practices and as soon as something new arrives on the island, everybody instantly tries to copy it and consequently appropriate it. Sunday church services in particular provide

unique opportunities for the whole community to display their skills and assets. A competent dress-maker commented:

‘If you make a dress with a new pattern and wear it to church on Sunday all the *māmās* will be looking at your dress to figure out how it is made. Then when they go home they will try to make it for their daughters. Next week, you will see all the girls wearing your design. But in order to be able to copy you need to have an eye for this.’

A local cake-maker who had a small home-based business making cakes described a similar case:

‘I never tell anybody what exactly I put in my cakes. If I did the next day the bakery would be selling them.’

It seems that secrecy assisted the maintenance of some level of diversity within this small island community. Difference and innovation were very desirable traits of many local practices and exclusivity facilitated the transmission of specialised knowledge. Therefore secrecy added not only to the value of the recipe but also safeguarded the plant populations from being over-harvested. Secrecy has been reported to be associated with traditional medical recipes in other ethnomedical systems as well. In the Samoan ethnomedical system, a system very similar to that in the Cook Islands, secret knowledge is associated only with *vai aitu*, treatments for spirit possession (Macpherson 1985: 13). For Yoruba herbalists, the greater the potency of the recipe, the greater the secrecy surrounding it (Buckley 1976: 415). Secrecy was also linked to potency in the Wag Wamra region of Ethiopia where healers are interested in advertising not only their recipes but the secrecy surrounding them as well (McKee 2005: 157). For Thai healers, secrecy and healers’ rivalries promoted the diversity of treatments available (Golomb 1988: 90). However, in all the systems mentioned above patients pay for their treatments whereas Atiuans receive Maori medicine for free. Ethnomedical recipes had to be

provided eagerly and free of charge as well, otherwise it was considered that they would be ineffective.

6.3.3 Payment for Maori medicine- *tūtaki*

Healers do not receive any payment for 'making the Maori medicine'. This absence of payment is considered a fundamental part of the efficacy of their recipes across the Cook Islands (Baddeley 1985: 132) and the wider Polynesian region (Parsons 1985a). For example in Tahiti, medicines are never bought or sold and the healers who use them maintain an ideology of completely free services (Hooper 1985: 170). In Rarotonga, Atiu and Mitiaro healers repeatedly stressed that they were not healing patients 'for the money'. This was a comment made by all the healers that I interviewed. By not accepting payment, healers achieve an elevated social status, similar to that of chiefs. Sahlins notes on Melanesian chiefs:

'A big man's career sustains its upward climb by calculated generosities, by placing others in gratitude and obligation through helping them in some way.'
(Sahlins 1963: 208)

These characteristics were also attributed to people of high social capital on Atiu. In order to cancel this unpaid debt patients' families provided different forms of indirect payment to the family of the healer within the context of the reciprocity and gift exchange that is governing social norms in the Cook Islands society. The Atiuan word for payment, *tūtaki*, also means exchange. The word *tūtaki* is also present in the Tikopian language. Tikopian and Cook Islands Maori both belong in the Nuclear Polynesian group of the Malayo-Polynesian languages. Firth translates *tūtaki* as joining (Firth 1941: 200). The difference of meaning ascribed to the two identical lexemes could indicate a semantic extension due to the introduction of new concepts of money. In Atiu there was a wide variation in what constituted a payment that was acceptable by the healer.

Payment or direct acceptance of goods is rejected because it is thought to interfere with the *mana* and diminish the status of the healer. Older people in Atiu were much more adamant in refusing payment. A healer in her 70s emphasised:

' I never ask for payment when I make Maori medicine. Sometimes people come and bring me some corned beef but I do not accept. People will say that I am doing it for the money'

Even though not requested, food was a frequently accepted form of payment for some healers. Local food was preferred for this kind of exchange, as it does not have a direct monetary value. For example, accepting a tin of corned beef that cost NZ\$5 was considered equivalent to accepting five dollars. The acceptance of direct payment was considered contradictory to the Maori medicine ethos.

I recorded a total of six different acceptable methods of direct reciprocity. They are listed according to order of increasing value (the number of times payment for Maori medical treatment was mentioned by informants is included within brackets):

- 1) local food like taro, sweet potatoes, fish or meat (10)
- 2) raw materials especially in the cases where the preparation of the recipes is labour intensive. That was the case for the coconut oil where a large number of grated coconuts were required (2)
- 3) imported food like corned beef (3)
- 4) cigarettes if the healer was a smoker (4)
- 5) motorbike rental if it is required to collect the plants and healer does not have access to a motorbike (1)
- 6) money for petrol if healer owns bike but has to go far way to search for plants (this case was only reported once in Rarotonga)

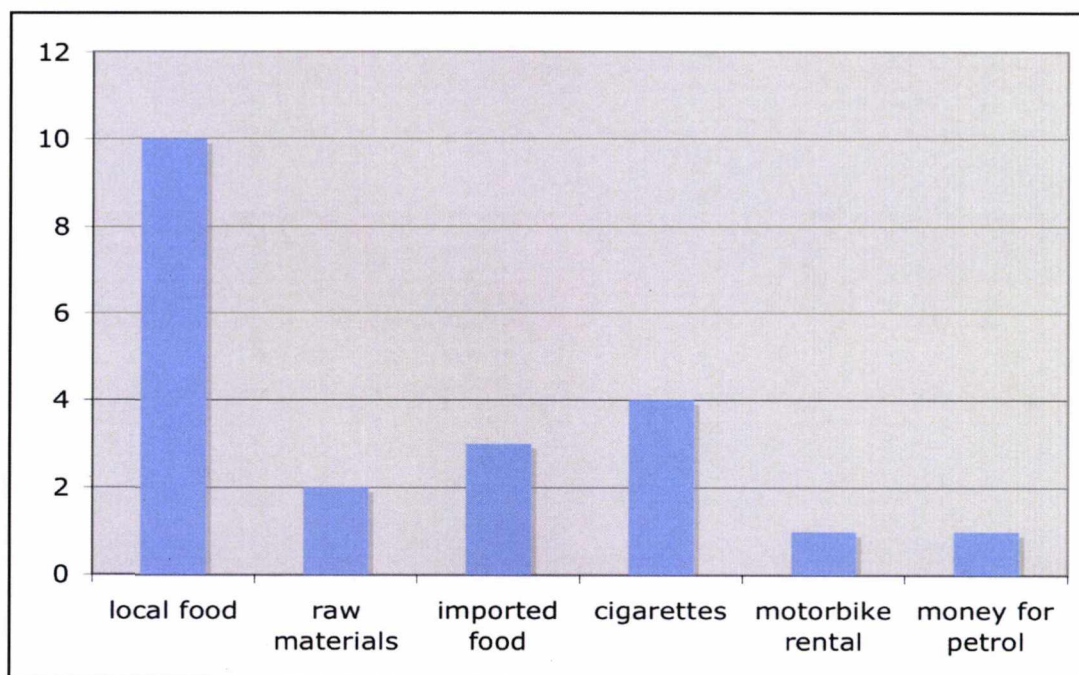


Figure 25: Recording frequency of different levels of payment associated with ethnomedical recipes

In *Primitive Polynesian Economy*, Firth noted the elaborate processes through which services were reciprocated in terms of food or other goods or services within long and often inter-generational timeframes (Firth 1936). Some of these exchange patterns are still associated with traditional healing systems across the Pacific (Morrison et al. 1994). In Atiu, indirect provision of different kinds of specialist services over a long period of time was more commonly used as a subtle way to reciprocate. The healers maintain their *mana* by providing a constant service to the community, available for patients at all hours and performing the task ‘with all their heart’.

6.3.4 Healing with ‘all your heart’

On Atiu the efficacy of healers’ recipes is not permanently guaranteed. For a recipe to be efficacious, it needs to be suited not only to the illness but to the person who is preparing

it as well. Healers commonly pointed out: 'If you don't make the medicine with all your heart, it won't work'. The efficacy of a traditional recipe is believed to be based on the faith of both the healer and the patient in the efficacy of the medicine. Healing was always conducted with the assistance of God and all the healers emphasised that before they prepare their recipes they always pray to God to help them. Csordas argues that these primordial experiences of efficacy can serve as a prototype of experiencing the divine power (Csordas 1996: 108). For the Atiuans, the efficacy of the traditional medical recipes was considered as proof for the existence and agency of God.

The children are carefully selected as heirs of a traditional recipe according to their personality. They need to be willing to listen to their parents and assist in the time-consuming plant collection and medicine preparation process. The healer's personality is considered a very important aspect of healing. The association of the efficacy of the traditional medicine with the personality of the healer is not a concept unique to the Cook Islands. Similarly, the Sinhalese claim that if the same medicine is given to a patient by two different healers, one with the 'gift' and one without, the medicine will answer more successfully to the former (Nordstrom 1989: 51). It has also been noted that the balm healers in Jamaica make the patients feel that they genuinely care for them and they can confide in them (Wedenoja 1989: 88). Metzger and Williams noted that in Mexico, practitioners are distinguished by their ability to 'pulse', a skill that comes to the curer only as a 'gift of God' (Metzger and Williams 1963 cited in Lieban 1977: 23). Knowledge transmission was associated with the transmission of the divine power to heal and ultimately determined the way medicinal plants were used. In the traditional medical system of the Cook Islands one's illness and health is a product of complex relationships between the individual, the natural environment, the living relatives and the departed ancestors. To provide an insight to this system I will analyse in detail some of the key concepts associated with medical efficacy.

6.3.5 Perceptions of efficacy

What constitutes efficacy in medical treatment is highly contested. Etkin argues that efficacy of treatments can only be evaluated by taking into account the processual nature of healing and the different criteria of emic and etic definitions of efficacy (Etkin 1988a). In Atiu, efficacy is related to the identified cause of illness. Illness causation is expressed in dualistic terms: it is either caused by natural elements or via the agency of a punitive spirit. This can be progressively revealed throughout the course of treatment. However the treatment itself is not dualistic but fused. It incorporates the power of God, the *mana* of the recipe and the power of the plants. All these three elements are important in healing any type of illness irrespective of the cause. When I asked informants why particular plants or remedies were efficacious I received mixed responses. Most people mentioned that they inherited the recipe from their forefathers and didn't know of any specific reasons. However, some informants referred to physical attributes of efficacy such as particular properties of the remedy and others referred to spiritual attributes of efficacy such as chasing away evil spirits. I have grouped their responses under two categories: physical and spiritual (the number of times information on recipe efficacy was mentioned by informants is included within brackets).

Physical elements of efficacy:

- 1) 'It is bitter' (25)
- 2) 'It cleans the dirt from the body' (43)
- 3) 'It is clean' (5)
- 4) 'It is fresh' (35)
- 5) 'It puts the organs back in place' (12)
- 6) 'It makes the body cold' (24)

Spiritual elements of efficacy:

- 1) 'Plants are created by God' (13)
- 2) 'It happens with God's will' (24)

3) 'It chases the spirit out of the body' (7)

Informants explained the efficacy of medicinal plants by referring to both physical qualities of plants themselves and also offering spiritual explanations. Twenty-five informants explained the efficacy of a medicine by saying that it was bitter. The bitter and unpleasant taste of many Maori medical recipes is considered to be good in treating illness. Bitterness is associated with efficacy in many medical systems across the world (Etkin 1986). Others (43) explained efficacy in terms of 'cleaning the dirt from the body'. Removing the *repo kino* is an important and exclusive function of Maori medicine, which is aimed at cleaning the body from 'internal dirt' and medicine residues. It is particularly associated with the efficacy of internal medicines used to treat internal ailments. The perception that illness is caused by the accumulation of dirt occurs in other traditional medical systems such as the Indian Ayurvedic system (Trawick 1992). Others (5) mentioned that Maori medicine was clean medicine and that is why it worked.

Maori medicines, as opposed to western medicines are viewed as clean because they use plants that are clean. Western medicines are viewed with suspicion because patients are unaware of their manufacturing procedures and associated sanitary conditions. The freshness of the ingredients was another reason commonly ascribed to efficacy. Only fresh plants are used in Maori medicine and the fresh juice that is extracted from the plants is considered the most active ingredient.

The presence of *mana* in raw plants, as opposed to cooked ones is a concept shared throughout Polynesia (Sahlins 1985:113). In the Polynesian nation of Tuvalu where leaves are key ingredients of all ethnomedical recipes, local healers conceptualised medicines as coming from two contrasting sources of fresh ingredients: *lau* 'leaves' and *hua* 'liquid or juice made by squeezing things' (Chambers and Chambers 1985). Concerning massage in particular, twelve informants mentioned that certain illnesses are cured because massage 'puts the organs back in place'. This statement refers particularly to effects of massage that is performed when illness is caused by internal organ dislocation. A schoolteacher described the treatment of her son for *ua oro*:

‘*Ua oro* happened to my son, he was crying all the time. I took him to a lady that is doing the massage. She massaged him on his back, and then on the front starting from near the head, going down, the baby was crying all the time, then as she massaged near the stomach and the baby cried more, she felt his testicles and massaged them, then the baby went to sleep.’

Finally, another element of efficacy that informants mentioned (24) was the ability of the medicine to ‘make the body cold’. That was particularly the case of *vairākau ati*, the recipes for muscle sprains and broken bones. The afflicted limb was immersed in the medicinal bath and the patients felt unusually cold. Similarly, in the island of Puka Puka cooling medicines like massage were perceived to be efficacious because they prevented bad blood from flowing to the afflicted part (Beaglehole & Beaglehole 1971 [1938]: 338).

Spiritual elements of efficacy were usually associated with Christianity. Thirteen informants explicitly stated that Maori medicine works because ‘plants are created by God’. The therapeutic value of plants is considered a gift from God and the efficacy of the traditional medicine is attributed to divine powers. As God’s creations, plants share his divine power and have healing potentials. Furthermore, twenty-four informants mentioned that Maori medicines work ‘with God’s will’. God is believed to be an active agent in the efficacy of the Maori medicine in treating illness. All of the healers explicitly mentioned saying a prayer before harvesting medicinal plants, preparing the recipe and administering it. God was asked for his help to make the patient better. Similar patterns have been reported for Papua New Guinea where Christianity has had a major influence on Maisin thinking about health and disease. Like in the Cook Islands, some missionaries in the past spoke out against indigenous healers, seeing them as the representatives of the heathen religion, but many national priests today give cautious support and claim that the Maisin healers and their work demonstrate God’s power over evil (Barker 1989: 82). The cause of some types of illnesses is believed to be the intrusion of an ancestral spirit into

the human body. Where this is the cause, according to seven informants Maori medicine restores health because 'it chases the spirit out of the body'.

Evil spirits are believed to be the cause of some illness and in these cases Maori medicine and massage are viewed as efficient in removing spiritual disease causing agents. That is particularly the case for massaging the joints where spirits are believed to be hiding. The removal of spirits out of the body as a means of therapy has been reported in other Polynesian societies as well and it is viewed as part of Polynesian cosmology. Ingredients that had a particularly unpleasant smell and taste were believed to be particularly efficacious in chasing spirits away. In the Marquesas, people used the ripe noni juice; in Tonga they employed strong smelling leaves and in Tahiti they used heat, emetics and washing for this purpose (Handy 1978 [1927]: 245).

These categories alternated throughout the course of the illness treatment. Delivering the specialist service of healing was not a mere mixture of substances, specialist healers had to be particularly sensitive to matching their medicines to the patient's symptoms, monitoring efficacy and addressing the causes of illness.

6.3.6 Delivering specialist services: mana, money and time

Most of the time, healers did indeed prepare the medicines without payment and with all their hearts as requested. They also frequently complained of being asked to do too much. The majority of healers were mothers working in some kind of paid employment or occupied in community duties besides looking after their children. After their daily jobs they would frequently escort their husbands to the plantations. These activities had to be interrupted if they were asked for help by a patient. Some of the medicines like the coconut oil '*akari ira*' that is used to treat spirit-induced baby illnesses, is particularly labour-intensive to produce. Healers who were holding paid employment found it very difficult to find time to collect the coconuts, grate them, collect the rest of plants and then cook the oil which required an additional two hours. A 42-year-old healer explained:

‘ When people come and ask me to make the oil I always make it and never ask for payment like my auntie told me. I only ask that they provide the grated coconuts because it is too much work for me, a woman on my own, to sit and grate twenty coconuts, that’s how many are required.’

Therefore on some occasions the effort required to make the traditional medicine coupled with the lack of payment acted as a motivation to keep the recipes that each healer knows secret. This is not a new phenomenon. A healer described why her grandmother purposely kept her knowledge secret:

‘My grandma taught me how to make the medicine but only for the family. She didn't want other people to know that she has the medicine because it very hard to make and she felt sorry for me.’

Another healer who specialised in a kind of pressure point massage, *māoro*, for back aches raised similar concerns:

‘I was very close with my mother and I learned from her how to do the massage. I do not let many people know that I know how to do it. One afternoon someone came to me with a backache. I massaged him and then three more members of his family came and wanted a massage that evening. And I had to do it, properly and with all my heart but I have pigs to feed and dinner to cook and I was really feeling pressed for time.’

Massage holds a liminal place between medicine and a service because it is based on the possession of a specialised technique rather than specialised ingredients. The origins of Polynesian massage lie in bonesetting that used to be a common practice for people with dislocated bones. Bonesetters across Polynesia are usually men (Whistler, 1985). Nowadays, in the Cook Islands, some foreigners are charged for the newly branded ‘Polynesian massage’ that resembles an intensive pressure point massage. Entrepreneurs

who have acted as agents for poor massage specialists have instigated small businesses offering Polynesian massage. That was the case both in Rarotonga and Atiu. One of the 'agents', a local pastor was explaining to me how his encouragement of the massage specialist in Rarotonga to charge tourists for his services lifted him out of acute poverty:

' I first met him when he joined our church. I was asked to help because he lived in very poor conditions. He had five children at the time, was kicked out of his home because he had no money for the rent and was squatting. He was very good in making the massage and all sorts of Maori medicines but he refused to be paid even though he was in this terrible condition. I told him many times, with this gift of yours you can make loads of money. But he insisted that this gift was a gift from God and that if he charged people then God would take away that gift from him. So we settled that he would charge only tourists as God wouldn't mind and continue to treat the locals for free. His massages were very successful. He lives in a nice home with his family has grown to ten children-the tenth is a new born. His wife helps in the business too. Now he can afford things he never dreamed of but he still remains a devoted Christian even though he has changed church.'

Massage specialists called or visited for a service not related to curing an illness, referred to their practice as providing a service and therefore receiving money would not interfere with their *mana*. Even though knowledge of traditional medicine or massage was a source of easy money, Atiuans are very hesitant to come forward and use these skills commercially. In the previous sections I described the basic principles of the practice of Maori medicine. Now, I will proceed to contextualise these principles within the process of ethnomedical knowledge transmission.

6.4 Knowledge transmission

6.4.1 General patterns of knowledge transmission

Knowledge transmission in the Cook Islands occurs in the context of specific activities that involve both adults and children (Borofsky 1987: 79). A senior healer on Atiu explained how she inherited recipes from her mother and how she plans on choosing her apprentice:

'I inherited a lot of my medicines from my mother. I enjoyed being by her side all the time and she taught me everything I need to know. Now, I am asking my girls to help me when I have to go and collect the plants when someone is sick but only the oldest one is doing it with all her heart. The younger one is complaining when I ask her to help me: "Why do we have to go again down the land to collect the plants?" When the time is right I will teach the oldest one how to make it so she can do it for the people when they are sick.'

This type of knowledge transmission follows classic patterns of inheritance where a nominated heir inherits secret ritual knowledge (Hiroa 1971 [1934]; Levi 1988). However, even though only a small number of people are formally allowed to use this knowledge for healing, a much larger number is aware of it, creating a very varied patchwork of partial knowledge distribution within the community.

Firstly, children, as long as they do not disrupt the proceedings, are taken to adult events and allowed to play and observe the adults from the sidelines. When women make Maori medicine their grandchildren frequently play around them, observing the procedure. The word *kite* means both 'to see' and 'to know'. Knowledge is seen to be something that is grasped visually and children are encouraged to observe and not to ask many questions. Secondly, children actively assist with most daily adult activities.

When not at school, they participate in household chores. Tasks are often gender, age and location specific. Nevertheless, even though some tasks are mainly performed by women, such as making traditional medicines, weaving baskets and preparing food, the collection of plants for these tasks is a family affair. It is common for young boys to help women collect medicinal plants, particularly if it requires climbing trees or some other physically demanding tasks. Through this assistance, younger members of the household become familiar with local plants and their uses. The pool of potential teachers is further enriched because children are not bound to one household. As described in the previous chapter, they may assist or stay in other households of the extended family as feeding children, *tamariki 'angai*, and learn from different people.

Children gain knowledge and consequently the respect of adults through copying adults and managing tasks on their own. These forms of learning occur in an unstructured manner within a structured hierarchy. Young people are expected to work very hard within the house, on the plantations and feeding the animals. Nevertheless, young people have started to demand compensation for their labour in the form of food, sweets or money. Importantly, although children begin to learn about plants and their associated techniques and activities by doing chores and assisting elders, a more complete and nuanced knowledge of plants only occurs once the young people have demonstrated a willingness to help, a commitment to household duties and an interest in the plants and activities.

6.4.2 Knowledge transmission within and between families

What is termed as family in the Cook Islands, as I described in chapter 3, is not a fixed unit but rather refers to the extended family, the *kōpū tangata* whose membership depends on both residence and descent. Even though the term *kōpū tangata* is a very loose concept, after careful examination of what Atiuans mean when they refer to family when they talk about ownership of a traditional medical recipe, I was able to establish that they refer to a subset of the extended family that is associated with an up to third

degree of relation consanguinally, affinally or by adoption who also share some household responsibilities. This broad range of people constitutes the pool of potential apprentices.

The distribution of ethnomedical knowledge within and between families is a particular characteristic of this type of knowledge. The importance of family ownership of individual recipes was intensely stressed by all the informants that I spoke with. I was very frequently warned that should I desire to record the ingredients of particular recipes I would not be able to. People, especially in Rarotonga were very suspicious and frequently commented: 'You will not find out because it is the secret of each family'. As it was later explicitly explained to me, each family specialised in making particular recipes to treat different illnesses. These recipes were the property of the healers and only these healers and the appointed members of their families (if any) were able to do the treatments in order for them to work. For example, one family specialised in the treatment of asthma and boils whereas another in the treatment of broken bones. There were many different treatments for one illness and different families specialised in one of them.

Baddeley who conducted fieldwork in Rarotonga in 1985 noted that:

'a person cannot become a healer simply because of a wish to practice Maori medicine. He must be recognised by an established healer as having the dedication not only to learn the various techniques but also be available to patients all hours of day and night.' (Baddeley 1985: 132)

Almost 20 years later, during my fieldwork I noted the prevalence of exactly the same process. To qualify as a healer, apprentices must acquire and learn how to employ ethnomedical and ethnobotanical knowledge from an authorised healer. That knowledge includes expertise in diverse areas such as pulsing, pharmacology, preparing herbal remedies, massaging, faith healing, exorcism, psychotherapy and family counselling. Healers who have demonstrated capabilities in any one or a combination of these

specialities are believed to have a personal command of the generalised supernatural power, the *mana*. No person or thing possessed intrinsic *mana*, but beings or objects of all kinds were capable of becoming mediums for the divine psychic potency (Handy 1978 [1927]: 27). In order to acquire knowledge to heal and *mana* through the permission to heal, the apprentice must demonstrate selfless commitment to the task of healing.

The new apprentices are usually the children of the household (especially the daughters) who help the mothers/grandmothers/aunties who live in the household. Men are generally excluded from the process of the healing apprenticeship because they are 'respected' or because they usually engage in activities outside the home. A healer described her selection process as an apprentice:

‘When my mother wanted someone to help her collect the plants she would usually ask one of us girls. She would not ask my brother because she respected him and did not want to ask him to do jobs like that. I was more keen to learn so she passed on the medicine to me.’

The notion of respect was very frequently mentioned and dominated the code of Atiuan social behaviour, particularly that which had to do with asking for favours. Showing respect was shown by certain avoidance rules, like for example not kissing someone on the face or not eating on the same table, which was the custom when feeding guests. Showing respect also meant not asking for favours or other services from respected people. First-born children and particularly the first-born male were considered to have the *mana* of the ancestors (Makirere 2003: 13). As a result in Atiu, the oldest children of a family rarely know how to make the family recipes. Most of the healers that I interviewed were among the younger members of their families and mentioned being forced to do chores such as helping aunties by their older siblings.

This trend raises some questions concerning birth order and healing: if healers are people with an elevated social status why are first-born children excluded from this role? The first-born and adopted children were more respected than the younger ones. The role of

older siblings is to act as deputy family heads and provide for the welfare of all family members at a higher level. It would therefore be deemed inappropriate for family members to ask them to collect plants and prepare medicinal recipes.

The medicinal recipe was taught to a selected member of the family, which had shown obedience, willingness to learn and commitment to the welfare of others. I use the term 'medicinal recipe' as a subset of Maori medicine to refer explicitly to the body of knowledge that includes diagnosis, plant harvest, preparation and administration. The prototype of a medicinal recipe is a concoction of fresh plant materials, occasionally combined with minerals and animal parts, prepared using a mortar and pestle and administered over three days, followed by a day of purging, during which dietary and behavioural prohibitions apply. New apprentices are taught how to diagnose the illness, select suitable plants, prepare the mixtures and administer them to patients. This labour intensive procedure requires an ethos of selflessness and commitment to social welfare. These personal qualities are associated with the selection of healers' apprentices in ethnomedical systems of the wider Pacific region. For New Zealand Maoris, accuracy of memory, extensive knowledge and keenness of mind were considered evidence of the apprentice's *mana* (Weiner 1995: 29). In Samoa, the person to whom the knowledge could potentially be transmitted had to be someone of good character who has demonstrated a desire to learn and an aptitude for medicine (Macpherson 1985: 10). Similarly for the Chomorro people of Guam, becoming a healer required charisma, as healers are believed to be connected to the ancestral spirits to which many diseases are attributed (Workman et al. 1994: 204). In Atiu, it was usually the youngest female of the family who was assigned the duty of looking after the ageing parents or grandparents. That was particularly the case for healers over 40 years of age. These healers grew up in very different conditions than the young people I observed growing up during the time of my fieldwork.

Most adults repeatedly stressed the hardship of their childhood years. As children they had to work very hard within the household and did not have many rights or freedom of choice of leisure activities like children have nowadays. This meant that for these senior

healers the 'privilege' of inheriting this special knowledge and divine charisma of healing was in the majority (even though there are some exceptions) not a desired choice but an enforced option to the women left behind while men sought paid employment in the urban centres to support the household. One of the most reknown of the few remaining spirit healers in Rarotonga, explained how she received the gift of healing and ability to communicate with the spirits:

'I was the youngest of eight children so I was left to look after grandma. My grandma came from Tahiti and she knew all different medicines and how to treat the *maki tūpāpaku*. She was a *ta'unga*. When I was growing up she was very old, at her last years. So when it came down to who would stay at home to look after grandma my older brothers and sisters would leave me behind. I didn't go out to play like all the other children did. When it was down to who will take grandma to the outside toilet at night, it was down to me again. And it was scary...it was full of cockroaches! So by being on her side I learned everything from her, everything I know is from her.'

Newly married women frequently mentioned being taught new recipes from their mothers in law shortly after getting married. These recipes were associated with infant health care. The main objective of the transmission of ethnomedical knowledge at an older age was childcare for the new members of the family, so that the new mother would be able to look after her children when they got ill. A 52-year-old mother of five children described how she was instructed in the art of healing from her mother-in-law when she started having children:

'I moved in with my husband and mother-in-law when I got married. She knew many medicines. But she didn't teach me until I got my first child. Then she taught me everything she knew so that I could look after my family when they got sick.'

The above examples are typical examples of knowledge transmission within a kin group. The apprentices were chosen by a senior family member to inherit the family tradition. This is what Atiuans refer to as 'the medicine staying within the family'. There were also some occasions where the recipes were taught to people outside the family and that was particularly the case with mothers of sick children.

Knowledge transmission to new healers outside the family occurred in particular contexts. These were usually the cases when a child got ill and the healer decided to teach the child's mother how to prepare the recipe. That was how one of the specialists for *vairākau ati*, medicine for fractures acquired her knowledge:

'I only learned that medicine ten years ago when my son had an accident. He had an accident while he was playing rugby. I didn't know what to do. They told me that a girl in the next village knows how to make the medicine for the broken bones. She was the only one at the time who knew how to make it so she showed me so that I could make it for my son or anybody else. She is not here any more. She moved to New Zealand some years ago so I make it now.'

Cases of serious illness events where patient care is limited served as triggers for knowledge transmission barriers to be lifted for the scope of human welfare.

6.4.3 The instantiation of knowledge transmission

The differential distribution of ethnomedical knowledge within the Cook Island population is perpetuated via a specialised knowledge transmission mechanism. The primary events during which the major corpus of knowledge transmission between the healer and the apprentice would take place revolved around actual illness events, where an ill patient approached the healer for treatment and the healer had to prepare a medicine. During these events, the apprentice would slowly transform from an active observer to a participant in the preparation process. Through the process of assisting,

young people learned about the ecology of the plants, their uses and their families' particular associations with them.

Ethnomedical knowledge was not taught 'encyclopaedically' like other kinds of traditional knowledge such as genealogies, legends or the history of the tribe. It rather belonged in the applied kind of traditional knowledge like fishing, planting, weaving etc. These types of knowledge were tied to certain acts that had a certain function. Ethnomedical knowledge was taught with the purpose of its practical application, which was the amelioration of the patients' health and their re-introduction in the community.

This pattern of learning is common in other systems of local expert knowledge. An example is canoe carving. I asked an expert canoe carver whether young boys were interested in learning from him how to carve a canoe. He explained that when he is called to make a canoe, together with a group of men they start by cutting some big trees from the forest and transport them to the garden of the future canoe owner where the lengthy process of carving takes place. Young people frequently pass by but rarely take a serious interest in the process. Most of them are discouraged by the amount of patience and labour that is required. However, if some take an interest, he lets them observe him, fetch tools and progressively assist.

This pattern of 'learning as you go along' emerged from my interviews with healers and also from personal experience of falling ill where I was instructed how to make recipes so I could treat myself. Many healers became specialists in a particular remedy when a member of their family had fallen ill and needed treatment. In a similar fashion, when I experienced illness episodes many healers became instantly keen not only to treat me but also to teach me how to make their medicines so that I could treat myself in the future. On the whole, actual illness events were the biggest incentives for the ethnomedical knowledge to be transmitted and the occasions where knowledge transmission barriers were lifted between as well as within kin groups. As a result, illness events became triggers for the renewal of social networks through the use of traditional medicine.

6.4.4 The eight types of ethnomedical knowledge transmission

The preparation of a traditional medical recipe is seen as the exclusive right of an authorised family member. New healers can be authorised in other ways than the strict linear way described by Cook Islanders. In the numerous interviews and participant observation that I conducted, I recorded a total of eight different ways of asking or receiving permission to perform a medical recipe (the number of times information on knowledge transmission was mentioned by informants is included within brackets):

Vertical

- 1) A younger person asks for permission from an elder within the extended family group (10)
- 2) An elder healer authorises a younger person within the extended family group (20)

Horizontal

- 3) A person asks for permission from a healer outside the family group (10)
- 4) A healer gives authorisation to a person outside the family group (3)
- 5) Children are taught by a teacher who is also healer in school (2)
- 6) Women are taught in a workshop by an invited healer (6)

Independently

- 7) Someone innovates and uses new ingredients (3)
- 8) Someone dreams of a recipe (3)

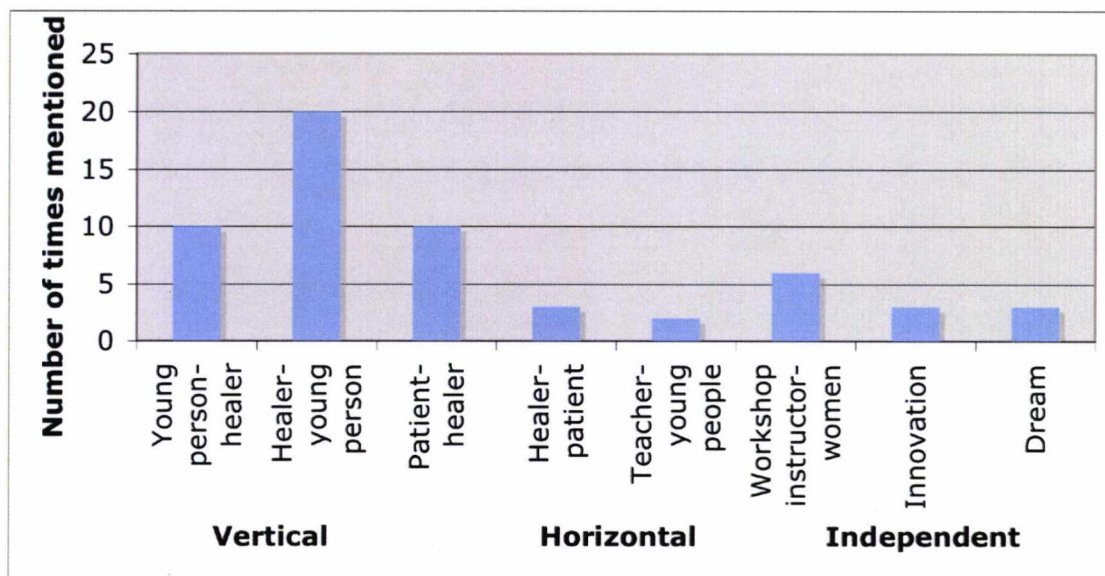


Figure 26: Reportage frequency of ethnomedical knowledge transmission types

These eight ways will be described more analytically as they vary in frequency and mode of knowledge transmission.

The most prominent and most frequent mode of ethnomedical knowledge transmission was the lineal or vertical. Knowledge could be transmitted lineally (meaning within family groups from an older person to a younger one) if someone is close to their mother, father, aunt, mother-in-law or other senior family member, has a helpful personality and not complain when asked to help. This person is taught and given the recipe details by external but voluntary agreement. Ethnomedical knowledge can be also transmitted vertically when someone is the last-born of the family and assigned to look after a grandparent and do all the jobs by an external involuntary appointment.

However, knowledge can be also acquired later on in a person's life when transmitted horizontally to unrelated people. That was particularly the case for knowledge transmission during meetings that regularly took place between the resident population and the diaspora. Knowledge could be transmitted laterally, meaning between family groups if a person (usually a woman) approached a healer to ask permission to make the medicine because there is no healer on the island, or because she needs to make it

frequently. An Atiuan healer mentioned learning her recipe for fractures from another woman from Mangaia. They were both nurses and they met in a workshop in Rarotonga. When the Mangaian nurse disclosed that she had a very good recipe for fractures the Atiuan nurse asked for her permission to authorise her to make the recipe on Atiu as she was not aware of anybody else making a recipe for fractures.

Ethnomedical knowledge was also transmitted horizontally when a healer made a recipe for a patient and consequently taught and authorised the patients' carer to make it. More specifically healers chose to authorise unrelated people when the medicine is very labour intensive or when they want to help other people, or because they prefer not being asked repeatedly. That is usually the case for mothers of sick children, who are being authorised to make the recipes for their children. A 40-year-old mother of two children mentioned learning her recipes from some distant cousins of her husband when she was in Rarotonga. Consequently, she got authorised to make the recipe and therefore own it but she is not allowed to teach others because those were the rules of the authorisation process.

More rarely children are taught at school informally how to make some medicines. This mode of knowledge transmission usually occurred during the Maori class in Mitiaro and Atiu. The pupils were taught how to make coconut oil in the school in Mitiaro and a medicine for sore eyes in Atiu.

On one occasion women were taught in a workshop by an expert in healing. I recorded only one such workshop where a healer from Rarotonga was invited to give a workshop in Atiu. Six women from the village of Areora reported to own the recipe of a medicinal oil for skin ailments that they learnt in the workshop. As this workshop was hosted by this village and paid the expenses of the 'trainer', the attendants had the right to own the recipes they were taught.

I use the term 'independent' to denote circumstances where the acquisition of ethnomedical knowledge (meaning with no family group association) occurred when

someone innovated and used new ingredients. An interesting example of innovations was the case of a purple coconut oil that was invented in New Zealand. Based on an Atiuan recipe, the migrants replaced the missing plants with plants they could find in their gardens. The purple colour allegedly came from the aloe vera that was added to the oil. The oil was considered very good for minor skin ailments (further discussed in chapter 8).

Finally, ethnomedical knowledge could be acquired through dreaming. I recorded only three cases where medicines were dreamt. Interestingly, one case occurred in New Zealand when an Atiuan dreamt a medicine for his sick son. The next day, he prepared it and it worked so he authorised his cousin who was visiting from Atiu to make it. On return to Atiu, his cousin taught his wife so she could make it for their children.

The commonly acclaimed strict vertical mode of knowledge transmission was only one of the many modes that ethnomedical knowledge was transmitted. What then motivated this mode of horizontal and almost egalitarian knowledge transmission? It has been argued that in Polynesia, the transmission of traditional knowledge occurs within the all-pervasive context of status rivalry. On the island of Puka Puka in the Cook Islands, status issues of relevance to the transmission of traditional environmental knowledge are primarily social hierarchy, dependency and defense to superiors; and secondly autonomy and peer equality (Ruddle 1993: 23). Therefore, ownership of secret knowledge, gives people not only the power to heal but also the power to decide whether to transmit this knowledge.

Ethnomedical knowledge is transmitted on a local, national as well as international level between resident and migrant Cook Islanders thus allowing for knowledge transmission across geographical boundaries (chapter 8). In this context of demographic change, Maori medicine resumes an increasingly social, rather than therapeutic role. This social role emphasises the caring role of the individual, strengthens family group links and defines the Maori identity, all of which have been devalued in the context of globalisation. Hewlett and Cavalli-Sforza's model of knowledge transmission considered vertical

knowledge transmission more conservative in comparison to horizontal knowledge transmission (Hewlett & Cavalli-Sforza 1986). In the case of Atiu, horizontal knowledge transmission was the way new ideas and new recipes were introduced into the Atiuan ethnopharmacopoeia. These 'new' recipes were then vertically transmitted to the younger members of the family, thus maintaining high levels of intra-cultural variation.

As these transmission patterns indicate, Atiuan ethnomedical knowledge is not a body of knowledge that can be classified as exclusively Atiuan. Furthermore, knowledge about specific recipes is transmitted with varying degrees of details in a multitude of ways throughout the busy social life of Atiuans. Cook Islanders can operate as transmitters or receivers of ethnomedical knowledge irrespective of location.

6.4.5 Knowledge acquisition through dreaming

Apart from learning from specialists, a few people acquired their ethnomedical knowledge through a dream, *moemoea*. The dreaming process occurred at night which is the time that the spirits of the ancestors are perceived to be active. The ancestors, *tupuna*, are often referred to as *te po* meaning 'of the night'. During a 'typical' healing dream, the person would see oneself going in the forest, collecting medicinal plants and then preparing them to cure a specific illness. I did not interview directly people who had seen these dreams but many of my informants had relatives who had revelatory dreams of this kind. In the Eastern Caroline Islands, in Micronesia, the most efficacious medicines were considered the ones that were dreamed (Bourdy & Walter 1994: 36). In Atiu dreamed recipes, even though few in number are considered of a similar potency as the others.

I have recorded three instances where people dreamed of medical recipes. Dreaming was seen as a way of communication between the living and the dead and strengthened the belief that there is spirit life after death. The intention of the living to care for their elderly relatives is to receive their spiritual 'protection' once the elderly have passed

away. It was believed that the treatment of the elderly people would influence accordingly the life of their relatives after their death.

The first case was the case of the '*akari pi*' in the island of Mauke where a young girl dreamt picking the leaves and cooking a medicinal oil. When she told her mother what she dreamt of, it was considered an omen for the treatment of the girl's grand-father who was suffering from skin sepsis. They followed the recipe, administered it to the heavily inflamed legs of the grand-father and his wounds healed. This case was the most widely acknowledged because the '*akari pi*', the coconut oil cooked with the *pi* leaves (*Talinum paniculatum*) was on sale in Rarotonga (Whistler 1992: 91). This oil was commonly used for treating minor skin illnesses. The shopkeeper who was selling the oil was from Mauke herself and she told me that she had permission from the girl to make the oil. She recounted how the girl saw herself in one of her dreams walking into a field and collecting the plants guided by the spirit of her deceased relative. The next day she made the oil and it worked.

The second case was the case of the Atiuan man in New Zealand who dreamt the medicine for the illness of his son and it worked. This case is of particular interest because it is an example where 'traditional knowledge' was both new and created in a foreign country and later arrived on Atiu. A healer from Atiu explained how his cousin had acquired the ethnomedical knowledge that he later passed on to him:

'The son of my cousin in New Zealand was ill. They had taken him to the doctor but he was not getting any better. One night my cousin in his sleep saw himself making a recipe using the leaves from the tree in his garden and some other plants. The next day he made the medicine and gave it to his son and it worked. So when I was visiting he taught me how to make it and gave me permission to bring it to Atiu and teach my wife so she can make it when any of our children get ill.'

The last case was that of a man who learned two recipes from his grandfather one of which the grandfather had dreamt of. The acquisition of ethnomedical knowledge through dreaming was more rarely reported than the direct transmission from another healer. Agency was indirect in the dreaming process as the spirit was seen guiding the process. Dreaming is very important in the Cook Islands and has multiple functions. Firstly it provides a link with the ancestors: people saw their ancestors in their dreams at particular moments. The ancestors could speak to the living through their dreams and give advice or express their discontent. It also provides a link with living elders: especially where there is a strong personal bond and physical separation occurs. People who had migrated to urban centres particularly mentioned seeing their grandparents who still lived in the outer islands. Secondly it can reveal who holds a medical recipe. That was a unique case described from a shopkeeper in Atiu:

‘One year I had a very bad eye infection, we call it *maki mata*. I didn’t know what to do. I called my sister in Rarotonga to see if she knew someone who could do the Maori medicine for me, she didn’t know anyone who had the medicine for *maki mata*. One day she calls me to tell me that she saw in her dream that a *māmā* in Atiu was making the medicine for *maki mata*. I didn’t know anything about that so I went and asked her. I said: *Māmā* do you know how to make the medicine for *maki mata*? She asked: How do you know? I told her my sister saw it in her dream. She told me: your sister is right, I do make this medicine and she made it for me and my eyes got better.’

Finally three healers mentioned that they could usually see in their dream whether a patient would be visiting the following day. Being able to predict patient visitation incidents was mentioned quite frequently especially from the older healers. All the healers associated with spiritual work mentioned that they knew that someone would come and visit them on that day. One healer mentioned that unusual animal behaviour such as a cockerel standing at the door of the house that would be considered as a sign to inform the healer that a patient would be arriving like.

Dreaming became a link between people who were linked by intimacy. This link transcended physical separation and even death. In this respect, healers had special sensitive powers, which were not limited by genealogical and physical boundaries. As ethnographic examples have shown special links between people were created by active engagement and offering practical assistance in daily life. This was particularly the way young people gained favourable treatment from adults.

6.5 *The new generation*

6.5.1 The role of traditional knowledge in the lives of young people

People commonly talked about changes happening in Cook Islands society and fears about Maori medical knowledge being lost because young people are not interested in learning. On the role of children as recipients of ethnobiological knowledge, Ruddle argues that this body of knowledge is transmitted to the next generation as a body of truth during socialisation, which is then internalised as subjective reality (Ruddle 1993: 20). I found that young people did not find this body of knowledge obsolete and quite the contrary had a deep respect for it. I am quoting the full text that a pupil of Enuā Manu High school wrote about Maori medicine, as I believe it summarises all the issues I have been trying to address:

‘As Cook Islanders we ought to preserve our traditional medicine. Knowing that we use nature materials for we need their juice. Many people are still using this medicine and believe that this is better than powder medicine/liquid from doctors. This is one important event to us Pacifics. We live with it, conserving this from our long time ancient four fathers. Ever since then we still carrying on to use this. Well, people believed in this medicine that this has powers from the spirits of our four fathers. Traditional medicine reminds us of our ancestors, people who invented the medicine, an event that had happened, our custom and culture. This is passed on

from generation to generation but modernised people are not saving or catching the knowledge our passed parents had for making the medicine. Once again, traditional medicine is really our ancestors relying medical healer. As a culture, we keep this knowledge according to some rules that abides with the type of medicine. An easy making makes it cheaper for all of us.'

This text highlights the cultural values associated with Maori medicine. Maori medicine is not viewed as a mere therapeutic tool but as a way of life that connects the young generations with old ones, the living with the departed. Similar views were expressed in a questionnaire that I handed out to 109 high school children (58 in Atiu and 51 in Rarotonga) about children's involvement in making Maori medicine and other traditional crafts. The questionnaires were distributed in both islands to document the effects of social change in the engagement of young people in traditional activities.

In both islands, young people referred very fondly to Maori medicine: they referred to it as part of their culture, as a therapeutic tool ensuring health security and even as a source of money. I quote some actual extracts from the questionnaires. Next to each quote, I attach a bracket with the gender of the respondent (M-male, F-female) and his/hers age.

The majority of the comments referred to therapeutic significance. It was considered very important to treat illnesses, particularly in areas where western medicine failed.

'I want to learn about the *vairākau* Māori. When some kids or my sister get a sick in our family. It is easy to get this *vairākau*.' (F 13)

'Because it helps us humans to get our life better in terms of sick and because its important to us human nature Maori.' (F 14)

'If there is no *papa'ā* medicine on the island we can use our *vairākau* Māori.' (F 15)

‘Because it is what makes people live.’ (F 15)

‘It helps me to get well or survive.’ (M 13)

‘Very important because some *papa* ‘ā medicine is not as effective’ (M 15)

Pupils also commented on its cultural significance: that making Maori medicine is part of being Maori.

‘This is important to my culture because it help to cure the sick of our people. Back in the days they use Maori medicine there was no panadols, those day so our people would not want to forget our culture, and so I would like to become a witchdoctor.’ (M 14)

‘Vairākau Māori is very important to Atiu. Because it is our original medical. (F 16)

‘It is the only method that out forefathers used long ago and it has been passed on from one generation to a generation.’ (F 16)

‘It is important because only Cook Island people know it.’ (M 15)

‘So that people know I am a Cook Islander’ (F 15)

Maori medicine was also praised for its free provision. Healing for free was considered the only way to heal according to the Maori ethos where the welfare of members of the community was of paramount importance.

‘Because it does not cost a single money to buy it.’ (F16)

‘So people won’t waste money on man made medicine. We can make our own and get popular.’ (F17)

‘The vairākau has no costs only *papa* ‘ā medicine’ (F16)

Interestingly on Atiu, two pupils commented on its potential economic value:

‘Because, could make money and even help others and spread knowledge.’ (M16)

‘Because you can earn money’ (F 14)

In the end of the questionnaire I asked the children to rank in order of importance the practices of making Maori medicine, eel traps, fans and baskets. In both islands Maori medicine came first in the majority of the questionnaires (figure 27).

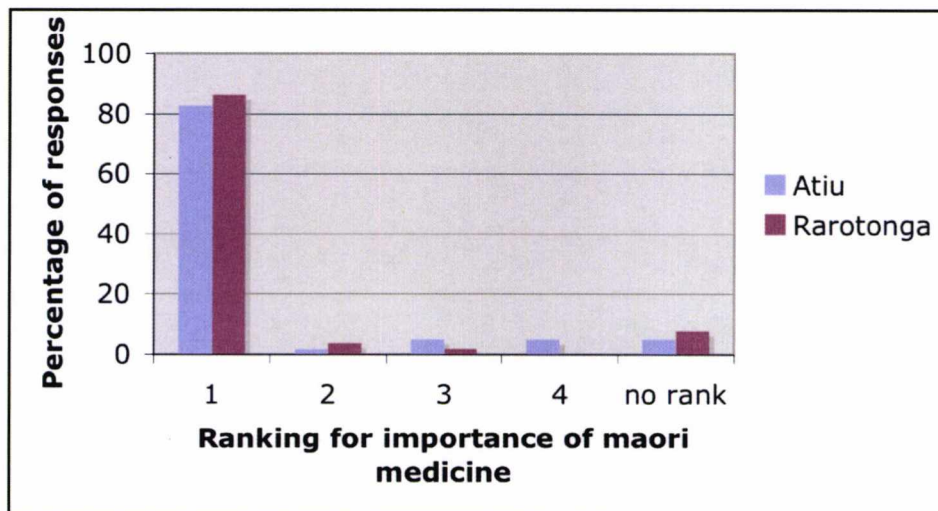


Figure 27: Ranking exercise on the importance of Maori medicine in school children questionnaires in Atiu and Rarotonga

There are stunning similarities between the responses of pupils from the two islands despite the great difference of livelihoods that they lead. After a closer examination of the questionnaires I realised that many of the students attending the Rarotonga high schools did actually come from the outer islands, as next to the 'Island' space they put more than one island. When I looked more closely at the students' questionnaires 39% of Rarotongan participants added an extra outer island next to the 'island' space, namely: Atiu, Mauke, Mitiaro, Mangaia and Puka Puka. This data indicates that a significant proportion of the 'Rarotongan' pupils that answered the questionnaire have spent their childhood in the outer islands before relocating to Rarotonga to attend secondary education. However, as this information was collected *ad hoc* it would not be valid to make any more comparisons between these samples.

6.5.2 Children's involvement in traditional activities

Apart from their respect for their own medical traditions and traditional crafts, young people were practically engaging on a regular basis in helping out the elders in their households to collect plants and prepare them. Despite the economic differences between Rarotonga and Atiu, the proportion of children having engaged in the preparation of traditional plant uses was not significantly different on the two islands. Specifically, 84% of the Rarotongan pupils and 86% of the Atiuan pupils had been actively involved in assisting members of their extended family in collecting medicinal plants or assisting household members make the Maori medicine (figure 28).

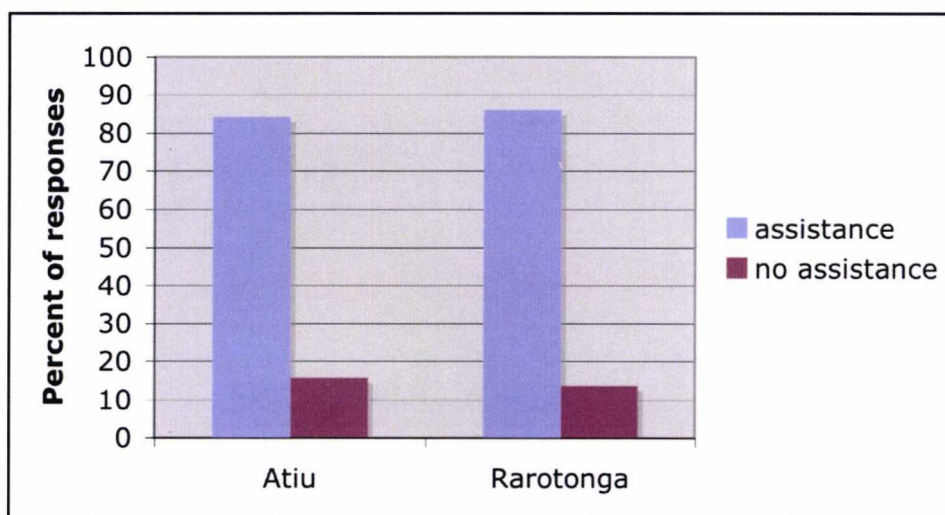


Figure 28: Percent of school children in Atiu and Rarotonga assisting their elders in making Maori medicine

Again, a possible explanation for the similarity of results is the high percentage of Rarotongan pupils that come from the outer islands of Atiu, Mauke, Mitiaro, Mangaia and Puka Puka. Post-relocation they continue some of the activities they learnt in their island of origin. The lifestyle in Rarotonga is very different to that of the outer islands. Whereas in Atiu, they harvest the necessary material from the forest, the marsh and the old plantation, in Rarotonga, they buy their supplies where possible.

This observation helps to explain some differences found in the survey. In the question ‘Where do these plants grow?’ in Rarotonga, 31.37 % of the children identified the homegardens as a habitat where medicinal plants grow, whereas in Atiu only 20.69% of the sample reported the homegardens (figure 29). The students from Atiu predominantly reported collecting plants from the wild (the forest, the beach or ‘down the land’ which generically refers to the inland lowlands). In the category ‘homegardens & wild’ I have grouped generic answers such as ‘everywhere’.

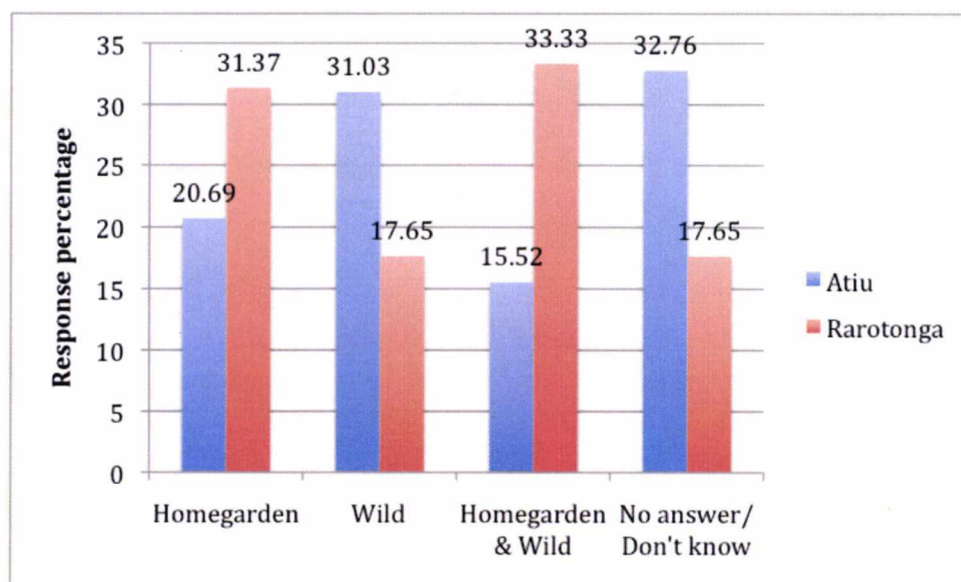


Figure 29: Identified locations of medicinal plant presence from school children in Atiu and Rarotonga

So, in both places, demographic and economic changes affect children's involvement and interest in traditional tasks. Although they continue to assist with household chores, the degree to which they are curious about and wish to engage fully in these activities is variable and perhaps decreasing. Nevertheless, homegardens provide an increasingly unique site for introducing children to these activities, encouraging them to pursue these activities, certainly giving them the opportunity to learn and engage with techniques that are identified as being valuable aspects of their own culture.

Nevertheless, even though young people did appreciate Maori medicine (as figure 27 shows) and were actively involved in helping members of their household to collect plants (as figure 28 shows), they did have some hesitations in becoming healers themselves. The daughter of a healer in Atiu repeatedly emphasised to me:

'I do not want to learn the medicine from my mother. Even if she wants to teach me, I do not want to learn it. Why? Because I do not want people to depend on me. If people are sick and they come to you in the middle of the night you have to

go and get these plants and make the medicine for them. I do not want that responsibility.'

It was the constant sense of duty and dependence that deterred many young people. The lifestyle of the close knit community where people share resources and depend on each other for the provision of resources and skills was not a desired model of living for young people. Individual economic power through wage labour gave individuals powers of independent actions that were unheard of before, and very desirable.

6.6 Conclusion

The practice of traditional medicine in the Cook Islands entails complex dynamics between local beliefs about cosmology, social relations, illness and plants. The efficacy of traditional medical recipes is largely dependent on the *mana* of the healer and the use of natural ingredients. The concepts of *mana* and *tapu* facilitated the family ownership of the traditional medical recipes by deterring unauthorised people from performing 'stolen' recipes. The indigenous theoretical operating principle is that an ethnomedical recipe will be efficacious only if an authorised person makes it. Efficacy was attributed to the belief of the healer and the belief of the patient in the power of the medicine. This case study supports Hahn and Kleinman's 'ethnomedicogenic thesis' (Hahn & Kleinman 1983: 18) as the Atiuan ethnomedical system of belief and expectation causally effects the reality of sickness and health, with efficacy perceptually reinforcing the referring ethnomedical system.

As a result of this dynamic process between illness and the remedy, ethnomedical recipes obtain a commodity value because they can be traded or exchanged as well as a ritual value as they are linked with an ancestor. However, no direct payment was received but food or other services within local exchange norms were accepted.

Even though the transmission of traditional medical knowledge exhibits a rigid structure associated with many restrictions, there are also adapting mechanisms in place that allow for knowledge to be transmitted among highly fragmented populations. Transmission of ethnomedical knowledge can occur lineally as well as horizontally in a local, national and international setting. Traditional medicine encourages social cohesion not only within but between family groups as well, as people need to personally communicate to acquire or gain authorisation to prepare a recipe.

The family ownership of the recipes did not necessitate strict vertical knowledge transmission. In examples of more flexible horizontal ways of knowledge transmission the ownership rights of the recipe were transferred to an individual of a different family group, particularly upon the onset of serious illness events. The sense of obligation to the community's well-being and the godly charisma that accompanied the practice of traditional medicine resulted in the existence of a 'moral' and 'spiritual' driving force behind this form of knowledge transmission and practice.

Young people in Atiu and Rarotonga appreciate Maori medicine and consider it an important part of their culture. However, even though they were actively involved in assisting elders in their family to collect medicinal plants, they expressed resentment in becoming healers. Payment in elevated social status was not an adequate incentive for the young generation to take up this vocation and become available to heal others upon illness events anytime of day or night for no payment. Further research in the effect of migration experiences on young people would be necessary to assess the viability of ethnomedical knowledge transmission to the younger generations. Since it is the illness events that trigger the operation of the medical system as a whole, I proceed in the next chapter with a detailed investigation of the role of illness on the island.

7 Medical pluralism and health-seeking behaviour



Figure 30: The staff of Atiu hospital, Teariki Boaza, Ake Takaiti, Ina Tangaroa and Dawn Ngatokorua in the hospital's garden after an interview

'The medicine is not right for the illness, that is why it is not working.'

'I fell from my bike because a pig ran across the road. I didn't see it coming. It was a tūpāpaku. Maybe it didn't like that I was in his land without having asked for permission. My mum made the Maori medicine, to chase the spirit away.'

'I was treated so badly by my mum. She never gave me right. So I went to my grandma's grave and I cried to her for help. The next day my mum was so ill, she nearly died and nobody knew what was the cause.'

'There is no papa'ā medicine for this illness, everybody comes to me. Even people in Rarotonga pay my airfare to go and treat them.'

A nurse on the same illness: 'The Maori medicine does not work. They may try it for a few days but then they always come to us when they are even more sick.'

The illness and the diagnosis of its cause determined the type of medicine used. The interplay between Maori and western medicine and the different paradigms that were associated with these two systems made their study imperative for the understanding of traditional healing on Atiu. After all, plants were harvested and used only upon the treatment of illness episodes that were not treated in the hospital. Therefore the frequency and intensity of ethnomedical practice (and associated plant use) was a mere function of health-seeking behaviour in a medically pluralistic environment.

7.1 Introduction

In 1988, van der Geest and Whyte edited a collection of articles titled *The Context of Medicines in Developing Countries*, subtitled *Pharmaceutical Anthropology*. In their introduction, the editors noted the necessity to move away from an 'exotic bias' in research, more graphically described as 'overlooking the use of aspirin for headache while noticing the use of elephant dung for dizziness' (cf inTan & Etkin 1994: 1). This 'exotic bias' is common in studies of medical ethnobotany where an indigenous pharmacopoeia is portrayed as an enclosed entity without references to the additional employment of biomedical means in treating illness. Frankel and Lewis argue that when we readily think of a 'health service' and a 'medical system'; we isolate it in our minds as an institutional system and give it a singular identity and coherence as a system (Frankel & Lewis 1989b: 2). However, nowadays very few societies rely solely on one type of medical service or one type of medical system. Studies in Asia, Africa and Latin America have shown that families utilise both indigenous and cosmopolitan health care resources, sometimes serially and other times simultaneously (Pelto & Pelto 1997: 151). Medical pluralism is now the norm for most societies around the world (Nichter 2003) and social relations between doctors, healers and patients have been identified as determining factors in the healing process (Kleinman 1980).

Studies of health-seeking behaviour in medically pluralistic environments have shown that the choice of medical treatment reflects class, racial/ethnic, and gender relations (Baer 1989; Mello Amorozo 2004). In Atiu, despite socioeconomic changes and the decline of traditional practices as a whole, traditional medicine continues to be used across social and geographical boundaries, alongside western medicine. The question I ask is why are Cook Islanders continuing to employ Maori medicine when they have free access to western medicines? In order to answer this question and avoid the aforementioned 'exotic bias' I sought to contextualise the practice of traditional medicine within the medical universe of Atiu by investigating the prevalence of illness on the

island of Atiu, the hospital and indigenous treatment alternatives and the way local people navigate between these alternatives.

Atiuan patient health-seeking behaviour shows that patients frequently consult a wide range of traditional doctors and hospital personnel, throughout the course of one illness treatment. If a treatment, either allopathic or Maori failed to succeed, then it was considered not suitable for the illness and different treatment was sought. Hospital personnel, openly dismiss Maori medicine, but privately engage with it. Overall, I found that Maori medicine is employed because apart from its therapeutic role, it plays a very important social role: it supports the caring role of the individual, strengthens the links between groups and assists the formation of a cultural identity. These very important social functions have been threatened by globalisation and the rapid social and demographic changes that the islands have experienced in the last decade.

These findings situate medical ethnobotany within wider studies of medical pluralism (Lock & Nichter 2003) and primary health care (Helman 2001) by demonstrating the social value of ethnomedicine and the dynamic relationship between indigenous and biomedical pharmacopoeias.

7.2 *Illness and health*

7.2.1 Medical pluralism in South Pacific

Medical pluralism on Atiu is typical of health settings in South Pacific island communities that have undergone similar colonisation processes. South Pacific island communities, stretching from Melanesia to Polynesia have a long history of conflict between the imposed colonial culture and local culture, which is still being expressed through the antagonism between western and traditional medicine (Frankel & Lewis 1989a; Morrison et al. 1994). There are similarities as well as fundamental differences between the two types of medical systems, both in terms of structure and operation.

Finau, a Pacific public health scholar, launches a polemic against 'western medicine' in support of Pacific island medical systems. He argues that the western medicinal system is characterised by a highly bureaucratic structure and professionalisation. Its main emphasis is on disease treatment, similar to a disease repair service. Its professionalisation means that the type of services received depends solely on providers. Furthermore, western medicine has a philosophy of mastery over nature since its main applications are the prescription of medicine and surgery, which is manifested in the use of chemicals to correct errors and the removal of disease agents (Finau 1994: 52-58). However, Parsons argues that this dichotomy is not that clear-cut and we can no longer juxtapose 'traditional' Pacific medical systems against 'scientific' western medical systems as she argues that Pacific ethnomedical systems should be seen, for the most part, as being adaptive and relevant to contemporary living. Pacific medicines did not become redundant with the introduction of Christianity but developed concurrently with the introduction of western medicine (Parsons 1985b: xi).

In the quest for oppositions, Cox argues that Polynesian ethnomedicines treat a wider range of issues other than the symptoms as the illness is attributed to the disturbance of relationships with the gods, society or land (Cox 1991: 149). This disturbance makes people less efficient in meeting society's or their own expectations and therefore is unhealthy. Health is considered a primary notion that is related to a good life and happiness and disease its derivatives.

In western medicine the notion of health has been reduced to non-illness, a notion that is very different from that of the Pacific Islanders. In order to compare *generic* concepts of 'health', 'illness' and 'disease' in Pacific and European societies I used the definitions of these concepts as presented by Finau (1994: 54) and the Oxford English Dictionary respectively. These definitions indicate that in European societies, health matters are viewed with respect to the physical condition whereas in the Pacific health is approached in a more composite way where the individual is interlinked with its community (table 3).

Table 2: Comparison of definitions of health, illness and disease

	Pacific societies	European society
Health	A state of physical, mental, social and spiritual well-being	Soundness of body, that condition in which its functions are duly and efficiently discharged
Illness	A physical, social, mental and spiritual state that society and the individual agree will adversely affect relationships and performance of duties	Bad or unhealthy condition of the body (or formerly, of some part of it), disease, ailment, sickness
Disease	Response to illness used to inform the patient of the presence of pathology, as a means of deciding on treatment and a basis for comparing the outcome of that treatment	Absence of ease, discomfort, distress, a condition of the body, or of some part or organ of the body in which its functions are disturbed or deranged, a departure of the state of health especially caused by structural change.

However, the role of social factors in patterning illness and health has long been recognised and is evident in the World Health Organisation's definition of health which is 'a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity' (cited in Levin & Browner 2005: 745). Furthermore medical anthropologists have distinguished between 'disease' as abnormalities in the structure and/or function of organs and organ systems; pathological states whether or not they are culturally recognized; and 'illness' as a term that refers to a person's perceptions and experiences of certain socially disvalued states including but not limited to disease (Kleinman 1977 in Young 1982: 265). As I am not trained to identify 'disease' I have adopted the term 'illness' to refer to physical states described by Atiuans.

There is another fundamental difference in the service delivery of the two systems. In traditional systems, healers seek to resolve difficulties in the family or social environment of the patient and reintroduce the patient into his normal social context whereas in western medicine patients are placed in a hospital where they are isolated and introduced into an alienated environment (Cox 1991). Finau notes that traditional medicine is mainly criticised for three reasons: for not giving accurate pathological diagnosis- it relies only on the symptoms, not having accurate dosology- which could affect children that require

a smaller dosage and finally for being performed unhygienically. He argues that in the Pacific nowadays much illness is primarily due to smoking, heavy alcohol consumption, drug abuse, careless driving and excessive eating, all of which are western influences and not unhygienic conditions that traditional medicine is accused of (Finau 1994: 51).

The oppositions of traditional/ modern, ethnomedicine/ biomedicine infuse most healing system studies around the world (Sheperd Mc Clain 1989a). The healers are not formally recognised by the government in many cultures (Nordstrom 1989) and the medical doctors do not acknowledge the efficacy of traditional remedies. Currently most health systems in the Pacific are pluralistic. Traditional medical systems co-exist with hospitals in urban centres and clinics in the rural areas and local people amalgamate the two systems when choosing medical treatment. I examined the point where these oppositions fuse, which is illness treatment in a medically pluralistic system. Frankel and Lewis problematised the term 'system' and consider it rather misleading to speak of a 'system' when referring to local modes of treatment for the sick. They argue that local forms should not be matched against western medicine as one system against another, as biomedicine does account social relations, emotions and moral codes of conduct as causes of illness (Frankel & Lewis 1989b: 30). Pluralism like modernism brings increased possibilities for individual agency (Nichter 2003) and Cook Islanders during illness events fuse a wide range of remedies and health practices.

7.2.2 Maori medicine versus western medicine

With the arrival of the colonial rule, the practice of traditional medicine was prosecuted as a 'heathen practice' and the western medicine was introduced and dispensed by the missionaries of the Protestant church. During the same era in New Zealand, the Tohunga Suppression Act of 1907 was enforced to eradicate what they saw as charlatanism in Maori folk medicine and undercut the *mana* of prophets (King 1983: 162). However nowadays the practice of the Maori medicine is seen in accordance of the Christian ethos and a proof of the divine power of the Christian God. During a casual chat, a shopkeeper

told me how all the church leaders earlier in the year blessed the plants and prayed for their power to heal.

‘There are many illnesses on Atiu at the moment. Illnesses that we have never seen before. Our old people are falling ill and we do not know what to do. That is why all the church ministers got together and they blessed all the plants and prayed for their power to heal.’

This viewpoint was later re-affirmed by the pastor of the CICC, the Protestant church. The church authorities had nothing against the practice of the Maori medicine, they were only against the works of the *tūpāpaku*, the ghosts or malevolent spirits of the ancestors, that they re-named as Satan to match the Bible parables. Maori medicine, associated with the work of God was helping to fight against the work of the spirits/Devil that were causing illness on the island. Similarly, in a Maisin community in Papua New Guinea some priests perceived that healers and their work was a demonstration of God's power over evil (Barker 1989: 82). In the Cook Islands, divinity was associated with the power of healing and most of the healers who were middle-aged women were also devoted Christians. In one of the interviews I enquired about the difference between Maori and western medicine. The healer, a middle-aged woman and frequent churchgoer, explained:

‘The difference is that the Maori medicine is natural. Plants are God’s creations and have the Gods *mana*. That is why our Maori medicine is better than the *papa’a*. What power can these pills and powders have when they are made in the factories? But before I make my medicine I always say my prayer to god for the medicine to work’.

All health providers from hospital doctor to spirit medium had a strong belief in God. Nevertheless some health personnel expressed fierce objections to the practice of Maori medicine.

7.2.3 The concept of illness & health in the Cook Islands

In the Cook Islands the concept of health, *ora* is very similar to that of life *ora'anga*; to be healthy is considered close to being alive. However the term *ora* is not a direct correspondence to the term health as it has a multitude of meanings that relate to a wide range of concepts. According to the Cook Islands Maori dictionary the term *ora* as a verb, noun or adjective has ten different meanings such as: to live, become free, get better from an illness, be safe, lively and vigorous, live wire, having sensation and not being numb, life, safety and means of existence or sustenance (Buse & Taringa 1995: 289). This multitude of meaning reflects the Cook Islanders' concepts of what it means to be healthy.

Furthermore, people's health is linked with the health of their extended family and the well-being of their ancestors. Illness is referred to as *maki*, which also denotes bad. As it will be discussed later in the chapter, the causes of illness are perceived to be natural or supernatural and their classification depends upon a wide range of social and environmental factors. Atiuans attribute illness causation to the social status of the patients, their habits, their relationships with their living as well as departed relatives who continue to influence the lives of the living in the form of spirits.

A state of physical, social, mental and spiritual well-being is dependent upon a delicate balance of a multitude of relations. Starting from the self and extending to the community: physical conditioning, adornment, employment, adherence to social norms, providing for the extended family, contribution to community life, care for elders and tribute to deceased ancestors are some of the dominant factors perceived to affect one's health and illness.

7.2.4 Mental health

The concept that illness or lack of health arises from an unhealthy relationship between the individual and his/her community extends to the realm of mental health. The Welfare Officer mentioned that there are 15 people with diagnosed mental illness which accounts for 2.7% of the island's population. This figure appears disproportionately large, but considering the large number of people that have emigrated overseas, the mentally ill are the ones for whom this option is limited. The Welfare Officer's responsibility is to look after mentally and physically handicapped people and coordinate their claims to social security benefits. Each mentally disabled person was entitled to social benefits of NZ\$ 120 per month and that sum is usually managed by their carers. Mentally disabled people are referred to as *auouo*, which also means stupid, or *pakepaketae*, which refers to physically and mentally disabled people. They are usually kept at home and assist the family with the household duties. Because of the association of disability with shame, mentally disabled people are occasionally discriminated against. A relative of a disabled girl explained to me:

'The girl doesn't go out very much. Her mother doesn't even send her to the shop because she is afraid that the other children will make fun of her. One day her mother sent her to the shop to get some things and some children started throwing stones at her. When I saw that I stopped them and shouted at them. Later I called their parents and told them what their children were up to. Not good, huh?'

Mental illness did not have any divination connotations on Atiu. When I enquired about the causes of mental illness, I did not receive very clear answers. A few people mentioned that children were born *pakepaketae* because their mothers had tried to induce an abortion, *titiri potiki* while they were pregnant but failed. In fewer cases, mental illness was attributed to the doctor's negligence when the child was young. In the Cook Islands, it is believed that the sound of thunder signifies that someone is having an abortion. Unsuccessful abortion efforts may lead to a child being mentally retarded. Similarly, for the Senang, the sound of thunder is the sign of God Karei and gives

warning that someone has sinned (cf Murdock, 1980). There are a few traditional medicine recipes for abortion that were used together with massaging the abdomen but they are not openly talked about because abortion is considered a sin in Christian belief and also children are considered as a blessing from God.

7.2.5 Depression and suicide

In Atiu, and the rest of Cook Islands incidents of teenage suicide, particularly among boys, were on the increase. This raises a lot of issues concerning health and wellbeing in these communities. Teenage suicide is not a phenomenon affecting only the Cook Islands, the rates of Pacific Island youth suicide are among the highest in world (Booth 1999). Within the last three years five young people hanged themselves in Atiu and one such incident took place during my fieldwork. Other outer islands had similar but not so acute outbreaks. A middle-aged woman explained:

‘In Atiu the children are obliged to do what their parents tell them to do. I think that the reason we have so many suicides is because there is no communication any more between the parents and the children. If the child has a problem, where can it go? Nowhere! Here the nurse is the wife of the priest and she thinks that sex before marriage is a sin.’

This situation led to a specialist group from New Zealand coming and holding workshops in every village meeting house (November 2003). I attended the meeting in the village where I was staying. Women mainly attended the meeting for adults and there was a special meeting for children and young people. The instructors were New Zealand Maoris and they were commissioned by the government to visit the outer islands and raise awareness on suicide and mental health. They acknowledged the fact that in Pacific cultures ‘keeping things inside’ is promoted as a sign of respect. For example, it is considered a sign of good upbringing when children are not answering back to their parents.

The workshop facilitators proceeded to encourage the participants to identify the main causes of depression on the island. The participants identified social pressure and favouritism as primary causes. The few young adults who attended the meeting pointed out passionately:

‘ Usually the oldest child of the family gets favourable treatment and is not asked to do chores. The youngest one is like the pet of the family that everybody likes to play with. What about the rest in the middle? Why should we be treated like the slaves of the house?’ ⁶

This comment was greeted with the silence of the older women. Silent acknowledgement was a common response to issues that had to do with the social order. The meeting facilitators were very aware of that and clearly pointed in the beginning that the scope of the meeting was not condemning social norms but raising awareness on issues that may cause acute discomfort. Other motives suggested for attempting suicide on Atiu were impulse, stupidity *auouo*, neglect, abandonment, alcohol, abuse, money/debts, anger, peer pressure, communication, lack of jobs, not a enough food in the house, pity, loneliness, curse, bullying, reputation ‘the Atiuan warrior’ and the spirits, the *tūpāpaku*. These were the causes that made a person unwell and not able to function properly as a member of the community. There is no clear explanation for the prevalence of teenage suicide incidents on Atiu but it could be speculated that they are associated with social change and the dwindling economy and abandonment of the once prosperous island community. A further investigation into illness nomenclature shows some of the principles of illness classification.

⁶ This links to the mechanism of who inherits the medical recipes. It is not the oldest child of the family, it is rather the members of the household that have a chore-doing status

7.2.6 Perception of illness

It is not only traditional medicine but also illness classification and naming that shows similarities across Polynesia. Cox identified four general patterns of Polynesian disease categories (Cox 1991: 152):

- 1) Polynesian diseases are usually labelled by a binomial composed of a generic term with a specific modifier
- 2) Classification rules uniting genera are unknown to informants
- 3) Disease categories above the generic level are not used
- 4) Polynesian disease taxonomies consist of unrelated generic terms of different degrees of articulation

Illness classification in the Cook Islands follows a similar pattern. Illnesses are loosely grouped primarily according to the region of the body afflicted and secondarily on the type of affliction. This is reflected in the illness nomenclature as well (for full list of illnesses and their names see Appendix 2). Major groupings are illnesses associated with babies, women's reproduction, skin, head, body, abdomen, urogenital and fractures or sprains. The illnesses are labelled predominantly with a binomial that is composed of a generic term that refers to the part of the body afflicted and a specific modifier that describes what is happening to the part of the body afflicted. The following examples of illness nomenclature demonstrate these principles:

Illnesses of the eyes: blindness and conjunctivitis

Blindness and conjunctivitis are both considered illnesses of the eyes. Blindness is called *mata pō* and conjunctivitis *mata pīrau*. *Mata* means eye and *pō* means darkness. It is used as a modifier because the blind person is believed to live in darkness. Similarly, for *mata pīrau*, *pīrau* is used because it means pus, which is considered the main symptom of infected eyes.

Illnesses of the blood: diabetes and high blood pressure

The same naming principles are also applied to new illnesses like diabetes and high blood pressure, which are named *toto vene* and *toto kake* respectively. Diabetes and high blood pressure are perceived to be illnesses of the blood that are caused by the overconsumption of imported foods. Atiuans are very well aware about the exact foods that cause these illnesses because of the very vocal campaigns of the health authorities. Consequently, diabetes is called *toto vene* because it is caused by consuming too much sugar. *Toto* literally means blood and *vene* means sweet. High blood pressure is called *toto kake*, *kake* meaning high.

7.3 The health providers

Health providers on Atiu range from 'official' health personnel such as nurses and the island doctor to informal healers, specialist healers and spirit mediums. Even though the 'official' health personnel is publicly considered to be linked with development and the local healers with 'tradition', this dichotomy was not so clear in patient health-seeking behaviour.

7.3.1 Western medicine: the doctor, the nurses, the hospital

There is a small clinic that serves as a hospital. Four nurses and a head nurse, who is also a trained midwife, staff it permanently. The hospital is open from Monday to Saturday from seven in the morning to three in the afternoon. They receive patients from seven to twelve and after twelve they are open for emergencies. They hardly ever get inpatients staying over, as most patients are treated at home. The concept of patients being kept away from their homes is not very popular. The hospital is called *are maki*, literally meaning house of the sick. The Ministry of Health is called *Marae Ora*, which literally means temple of health. The doctor is called *taote* and the nurse *neti*, both cognates from the English terms.

The doctor's residence mound is situated next to the hospital. The building used to be the old hospital and it is built on a mound. It is commonly acknowledged that in the pre-colonial era, the area was used as a burial mound where 'in the olden days' Atiuans left the dead bodies to rot in the open air. Interestingly, the colonial administration chose this site of high ritual value to build the first hospital. Interestingly though, the past uses of this area are very well remembered. As it was a burial mound, the area is associated with ancestral spirit interference and is avoided. People are still afraid of the ghosts around the hospital. A retired nurse explained the situation:

'The hospital was built there because it was the only available location. The land was provided by *Ngamaru Ariki*. The first hospital, where is the doctor's residence used to be a burial ground and altar for king Akaina -relative of *Ngamaru Ariki*. Akaina was killed in Mauke because he was after a young princess⁷. His body was brought over and an altar was built. The body was left to rot in the open and the flesh was collected underneath in a basin⁸.'

The locality of the hospital together with the beliefs about ghosts, made the hospital a place to be feared. When there is no permanent doctor on the island, the clinic receives a visiting doctor from Rarotonga for a few weeks at a time. Alternatively, the head nurse covers the doctor's duties as well as conducts home visits. Towards the end of my stay, a retired Cook Islander doctor, originally from Atiu who had been living in New Zealand, settled in as the resident doctor.

Adjacent to the hospital is the dental clinic. The dentist is an Atiuan who has been living permanently on Atiu for a few years. He commented that he felt obliged to remain on the island because otherwise there would be no resident dentist. There is no pharmacist on the island and the medication is dispensed by the hospital. The medication used to be free but in April 2004 a fee of \$5 was introduced per visit to the doctor and medication.

⁷ The word princess here refers to the daughter of a chief or a young woman with a higher title in her tribe.

⁸ Vini (1976) mentions that leaving corpses to rot in the open air was a common Cook Islands practice that the missionaries recorded.

Elderly people commented that this fee is very high, especially in comparison with the Maori medicine, which is free.

For serious illnesses, which the hospital staff are insufficiently qualified, patients are sent to the hospital in Rarotonga and their flight expenses are paid by the Ministry of Health. As a result very few births take place on Atiu. The hospital also administers tablets every 6 months for *toke* (worms) & *mariri* (elephantiasis). A general call for the dispensing of tablets is announced on the radio and Atiuans willingly visit the hospital to receive their medication.

During the interviews, the nurses mentioned that the main health problems in the Cook Islands are hypertension, diabetes for people over forty years of age and asthma for children. The main illnesses that they treat are cuts, scabies and skin sepsis. Hospital visitation rates varied throughout the year. Monthly consultation rates ranged between 188 and 290 between the months of January 2003 and November 2003. In the hospital reports that I consulted, the major ailments for which the hospital was visited were acute respiratory diseases, asthma and bronchitis, all ailments of the respiratory tract (figure 22).

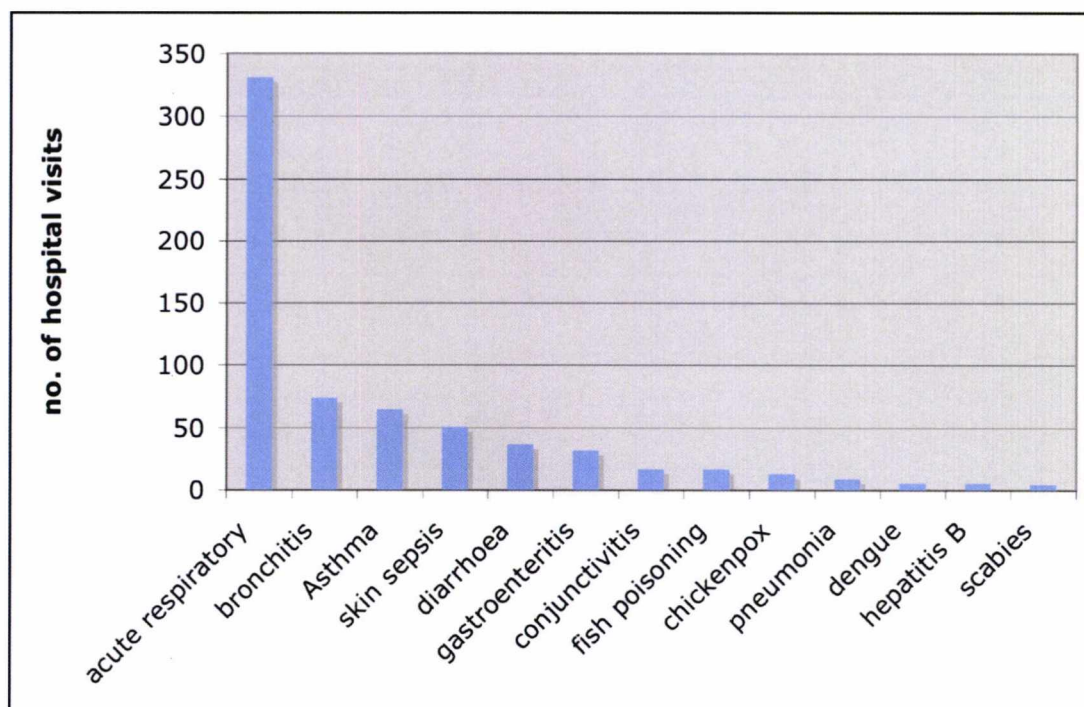


Figure 31: Hospital consultation frequency per disease from January 2003 to November 2003

Hospital staff mentioned that they always asked patients if they have received any Maori medicine prior to their visit. For some illnesses some people come to the hospital and if it doesn't work for two to three days, they proceed to use Maori medicine.

Atiuans frequently mentioned that Maori medicine works if you believe in it with all your heart, otherwise it won't work. However, some proclaimed that for people that use both types of treatment, Maori medicine wouldn't work either. The actual or fictitious contribution of faith to healing has always been a controversial issue in medical literature. However, Kleinman has pioneered in support for the pervasive power of belief, whose effects can act biomedically on the human body by stimulating the nervous system. He argues that in a western biomedical context evidence for this argument can be found in the frequently stigmatised process of 'the placebo effect', which he uses as evidence in favour of faith healing (Hahn & Kleinman 1983: 17).

The role of belief in healing has traditionally been discarded by western medicine. The Atiuan nurses are caught in between a biomedical training that excludes the agency of the spirits and the impact of social relationships on health, a Maori tradition that claims the opposite and a religious system that blends in Maori and western concepts of the supernatural. A hospital nurse mentioned an incident where her daughter was cured by faith healing:

‘My daughter’s illness was caused because of her name, someone cursed her name. I am not sure about the curse because *Pāpā* Orometua [CICC pastor] says that it exists. My daughter had to be delivered spiritually twice. When they put their hands on you, you may be knocked out and then you wake up. My husband said that our girl had been cursed by her grandmother because she wanted her name to be on the child, and we gave her another name.’

Furthermore, three of the nurses also administered and used Maori medicine, without seeing the two types of treatment as contradictory.

7.3.2 Maori medicine: common, specialist and spirit healers and massage specialists

In the ethnoepidemiological survey, patients reported that they sought the consultation of a wide range of therapists. Apart from a visit to the hospital, the patients consulted common, specialist or spirit healers, who provided different sets of services. As already mentioned in chapter 6, men as well as women of all ages can potentially become healers if they become authorised by another healer in the Cook Islands. However, female healers including spirit mediums outnumbered men on Atiu by a factor of 10: 1. This pattern is common in Polynesian nations (Whistler 1992) but not in Papua New Guinea where male shamans outnumber women (Herdt 1989). In Polynesia, the majority of the

healers are middle-aged women and they treat the numerous accidents and illnesses that babies and children experience. Healing is seen to embody cultural images of femaleness and nurturing or as mediating between realms of existence like nature/culture, the living/ancestors and purity/pollution (Sheperd Mc Clain, 1989: 2).

'Common healers' are people who use common knowledge in order to heal common ailments. These are usually the first people that the patient comes in contact with and they are members of the patient's household. These treatments, like simple plant recipes and simple massaging techniques are part of baseline healthcare that is provided at a household level. Common healing knowledge does not involve any formal knowledge transmission mechanism, it is shared by many people. It serves as a local 'first aid'. I recorded a total of 41 common recipes and examples include treatments for cuts, bee stings, headaches, mouth thrush and massage for leg and backaches.

'Specialist healers' are people who are authorised to perform family-owned recipes. The herbalists who recognise and treat natural illnesses still solicit the curative support of the Christian God. The healers explicitly mentioned they always used prayer before performing a treatment and asked for God's help. I recorded 88 recipes owned by specialist healers that treated conjunctivitis, skin burns, boils, sprains and other mild to serious ailments.

Spirit healers are healers more frequently referred to as *ta'unga* or *witchdoctors*. They are healers that have the special charisma of communicating with the spirit world. I recorded the operation of two such healers in Atiu and one in Rarotonga, however people frequently mentioned there used to be more spirit mediums in the past. These healers are numerically very few and are consulted for illnesses with no apparent cause.

The generalist and specialist domain of ethnomedical knowledge can be found in many ethnomedical systems. The ownership of the medicine by the healer is a very important part of the Cook Islands ethnomedical system. Similarly, in Samoa the sick are treated with the greatest consideration. The physicians are often older women, each with their

own secret lore, which they impart only to their chosen successor. The therapeutic methods employed include emetics, ointments, massage and bleeding. Fractured bones are set with considerable skill (Murdock, 1980). In a similar fashion in Sri Lanka, some local level healers specialise in treatments for particular illnesses or conditions such as hepatitis, snakebites or bone problems whereas others are generalists (Nordstrom, 1989: 50).

The perspectives of the different healers varied significantly, particularly concerning allegations of recipe efficacy. When I had a small accident and slightly burned my leg on a motorbike exhaust pipe, many people I knew insisted that I use their medicine and stop using any other treatment. As a result I used a total of seven different recipes in the course of one month as every healer swore at the potency of their recipe and its efficacy in not leaving a scar.

Some specialist healers boast about the efficacy of their medicines, how frequently sought after they are or how their recipe is the only efficacious cure on the island. An example is *maki opi*, a type of gastrointestinal illness caused by the consumption of the 'wrong part' of the crayfish (*Panulirus* spp.). The specialist healer I visited explicitly mentioned:

'My medicine is the only medicine on the island. There is no *papa 'ā* medicine for this illness. People come to me all the time, in the middle of the night asking me to help them. Even people in Rarotonga ask for my help and they pay my airfare to go to the hospital and make the Maori medicine because the *papa 'ā* medicine is no good and no one in Rarotonga knows how to make my medicine.'

A few months later, when I had compiled an inventory representative of the different illnesses recognised on the island, I visited the doctor and the nurses to cross-reference their opinions on the illnesses, their causes and the frequency of occurrence. Concerning *maki opi* the head nurse explicitly mentioned:

‘The Maori medicine does not work. They may try it for a few days but then they always come to us when they are even more sick they to ask for the medicine [..] Maybe you think I am making it up because I have something against the Maori medicine. Look here, it is in the hospital records that patients come and see us.’

Furthermore, it was not only healers who had different perspectives on effectiveness of local medicines; patients presented varying perspectives as well.

7.4 The patients

Patients navigate between treatments available at home, in other households and in the hospital. Throughout the course of one illness episode, patients reported using up to five different treatments. As the illness develops so do the theories of illness causation and symptom explanation. The following example illustrates a typical pattern of pluralistic health-seeking behaviour on Atiu. A school-teacher described the process of treating her ear infection:

‘I had a pimple in my ear. I didn’t know what it was. I went to the doctor, he gave me some medicine and nothing happened. They told me that there was a *māmā* who knew a Maori medicine that was good for the ear. I went to her, took her medicine but nothing happened. Then one day one of my pupils at school told me: Miss my grandma knows how to make the Maori medicine for your ear. I called his grandma and she invited me over. She checked my ear and made me the medicine, and it worked!’

Alternation between western and Maori medicine is not always employed in a linear fashion following a clear-cut sequence of treatments. Similar patterns of health-seeking behaviour have been described for many societies in Papua New Guinea where if someone gets sick and the people in the village cannot make them better they send them

to the doctors. Consequently, if the doctors cannot make them better either they return to the local healers (Barker 1989). In the following example treatments from both systems are used in a simultaneous fashion:

‘My son was in hospital. He had a car crash, he was very bad. I visited him every day and gave him the Maori medicine. Of course secretly from the doctor because he does not allow these sort of things. Every time I make the medicine I say my prayer and every time I give it to him I say my prayer again, to help him get better. One day the doctor caught me and he shouted at me. He said if he ever saw me doing it again he would send my son home.’

In a study of health-seeking behaviour in Australia, Connor argues that from the perspective of users who are often pluralistic and pragmatic in their orientation to healing modalities 'mixed therapy regimens' is a less dichotomised and more appropriate conceptualisation of the process of seeking health care from diverse sources of expertise (Connor 2004: 1695). MacDonald notes that there is a strong tendency in Tikopia for people to try several remedies at once (MacDonald 1985: 80). Similarly, even though Atiuans clearly distinguished Maori medicine from biomedicine, they did not find any contradiction in using both systems in a linear or simultaneous fashion.

Besides, accessing Maori medical treatment was not entirely based on pathology. Choosing a health provider also related to who people felt at ease with. Many people mentioned being shy of the examination process in the doctor's clinic. Even in the case of visiting a Maori healer, the patients' family had to be in good terms with that of the healers to be able to ask for treatment. In cases where people are unaware of someone specialising in a particular illness they visited the hospital instead. Patients mentioned that an incentive of going to the hospital was because it was easier:

‘ The difference between Maori medicine and western medicine is that is that western medicine is easy to get. Maori medicine is difficult, if the weather is wet you can't go.’

The main determinants of health-seeking behaviour on Atiu are severity of illness, the identification of the cause and treatment options available. The concept of severity of illness signs and symptoms is a panhuman concept (Pelto & Pelto 1997). In the case of Atiu people pick and choose among alternative actions through a process based on the use of their available knowledge.

Information collected from all methods employed throughout the fieldwork was compiled in the Illness directory (Appendix 2). A total of 89 illnesses were analysed, for which a total of 129 medical recipes were documented. My research on illness was initially guided by a survey of illnesses, their Maori names and symptoms that were compiled by Gerald McCormack and a medical doctor during the National Biodiversity Strategy Action Plan community meetings that were held in 2001. Throughout my research, I did not identify a contrasting local illness classification model and therefore I used the categories of this inventory as a starting point and expanded it. Cox concludes that Polynesians do not use disease categories above the generic level and that Polynesian disease taxonomies consist of unrelated generic terms of differing degrees of articulation (Cox 1991: 152). Atiuans loosely organise illness categories per body part with the exception of illnesses of women and babies, which form distinct categories.

Each 'illness category' consisted of 2-36 identified illnesses. Furthermore, for each recognised illness within these categories there was a wide range of remedies (figure 32).

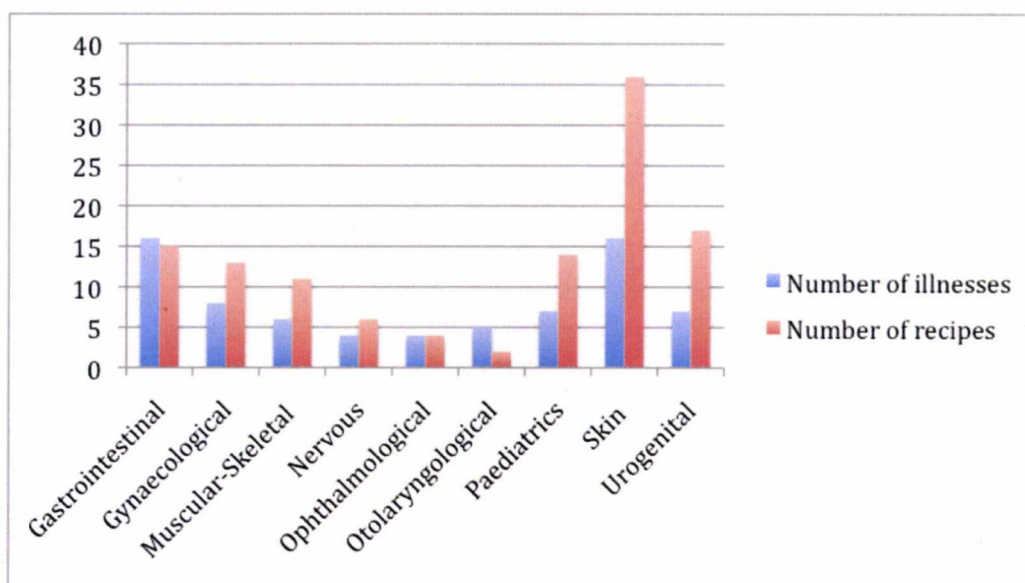


Figure 32: Number of illnesses and recipes per system

This figure is showing the distribution of medical recipes per illness category. Each family specialised in a particular illness type and for some illnesses there was a wide variety of traditional treatment alternatives-skin, urogenital and gastrointestinal conditions scoring the highest. Skin ailments had the highest number of Maori medicine recipes ranging from simple skin care to specialised recipes for advanced burns and boils.

Patients were aware of the existence of different specialist healers but their choice depended not only on therapeutic efficacy but also on other social, cultural and economic considerations as well between the family of the patient and the family of the healer. Weighing and negotiating economic, material resources is part of that cultural decision-making process, as are judgements of the social and cultural approachability of the service providers (Pelto & Pelto, 1997). The harmonic relations with the social network ensure not only good working relations and the exchange of material goods and labour but also the exchange of health services and plant material. Knowledge of a potent medical recipe is a valuable commodity for the healer. Access to this form of commodity requires that the patients and their families have good social relations with the families of the healers.

In the event of an illness, Atiuans followed one of the following three options: they used a family known recipe, they went to the hospital or they approached a healer known to treat the particular illness. Anthropologists have traditionally seen the treatment of illness as a way of 'reintegrating' patients into social groups and increasing social cohesiveness (Sheperd Mc Clain, 1989: 7). In Atiu seeking treatment was described in terms of asking for a favour. The patient or the patient's carer needs to know and be on friendly terms with a healer in order to ask for treatment. This familiarity becomes a criterion for choosing medical treatment and for this reason some patients expressed a preference to visit the hospital and receive this impersonal and unreciprocated treatment.

The gender of patients and practitioners also affects patient behaviour. That was particularly the case when the illness occurs in 'sensitive' areas such as the reproductive organs or the anus and the traditional healer is of the opposite sex. In these occasions the spouse of the patient resumes a very active role in the treatment. For example, a middle-aged mother of four children mentioned that when her husband had *toe tupu* (polyp) in his anus, she visited the female healer, received instructions on how to apply the medicine and administered it herself in her husband's anus. It is male healers, who specialise in massaging, usually treat women for *vairanga tapa* an extremely painful ailment caused by a 'displaced uterus'. They prefer if the woman's husband is around or alternatively they massage her over the clothes.

An illness can be considered as a reflexive experience because it challenges the order in one's world and the integrity of social relations. Efforts extended as well as withheld lead to a re-evaluation of one's social capital and safety nets. In such contexts cultural values and reciprocal relations are challenged (Nichter, 2003). As I have already described in the previous chapter, to reciprocate a Maori medical treatment can be quite complicated. Some people accept cigarettes and tinned food whereas others reject any form of payment that has a direct monetary value. Others may accept only food from the land whereas others nothing at all. Local family care requires a greater investment of time than going to the hospital. Home treatments necessitate the cultivation, collection and preservation of medicinal plants, processing and administering herbal remedies and continuous attention

to sick family members (Finerman 1989: 39) which sometimes deter patients and healers alike from engaging in Maori medicine due to the labour involved.

7.5 *Illness treatment*

In the Cook Islands at the moment, apart from the highly prevalent lifestyle illnesses, there are no acute illnesses or widespread epidemics. The most common ailments on Atiu are skin ailments that proliferate under the warm, tropical climate of the Cook Islands.

It has been argued that the Rarotongan attitude to treatment is essentially pragmatic and eclectic, as people try a treatment recommended by friends even while undergoing a different course of treatment. Furthermore, the treatment of illness is a process of experimentation and people are generally very open in trying different cures, both European and Maori (Baddeley 1985: 135). The different illness categories, key illnesses and their treatment are described below.

7.5.1 Paediatric conditions

Babies are perceived to have a different set of illnesses to adults, as they are considered to be more susceptible to the work of the spirits. A total of seven babies' illnesses were recorded that were treated with 14 different Maori recipes (figure 33).

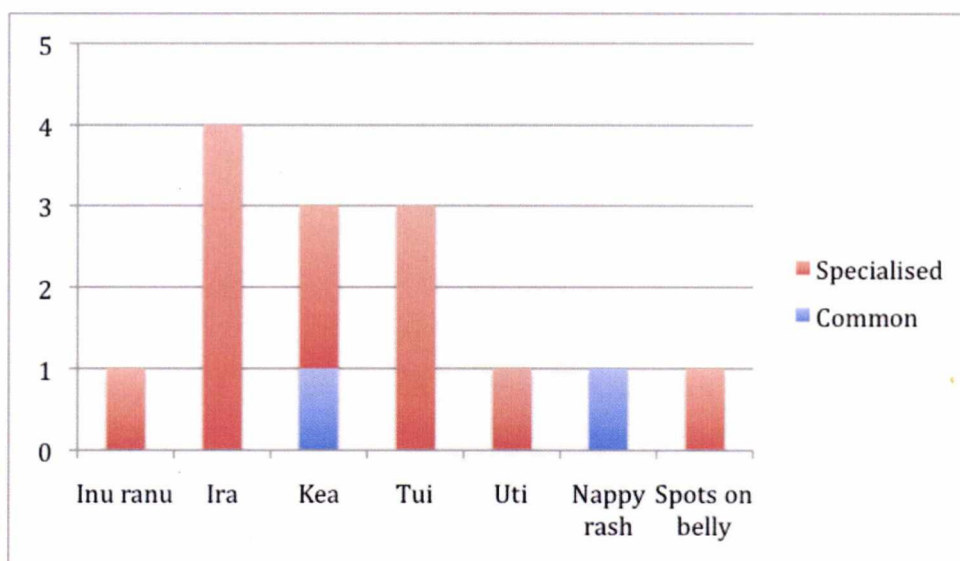


Figure 33: Recipes for paediatric conditions

For babies and young children one of the most common illness is mouth thrush, *kea*. A white filmy patch develops on the tongue of the baby making it very painful to chew. Krauss notes that '*ea* (a cognate of *kea*) commonly called thrush was a common children's illness in Hawai'i due to malnutrition. It is caused by lesions or raised white patches to form on the tongue and lining of the mouth. The causative agent has been identified as the fungus *Candida albicans* (Krauss 1993: 101). In Atiu most women use a simple single-plant preparation with the *S.malaccensis* leaves. The juice of the pounded leaves is squeezed through a white cloth onto the babies tongue. This remedy, called *vairākau kea* (medicine for the *kea*) is not owned by a particular healer and belongs to the sphere of common knowledge. There is second recipe for *vairākau kea* that is owned by a specialist healer, which is based on sugarcane. The sweet taste of the sugarcane-based medicine is much more enjoyed by babies and young children than the bitter taste of the juice extracted from *S.malaccensis* leaves. However, using *S.malaccensis* was the most common method of *kea* treatment due to the easy access to the *kaika* trees and the simplicity of the preparation.

Ira, as well as *uti* are the two baby illnesses that are frequently attributed to dissatisfied spirits of deceased ancestors. The symptoms of *ira*, are described as the 'the white of the

eyes going blue and the child crying for no reason'. *Ira* or its cognate *ila* followed by a modifier is used throughout Polynesia and refers to various babies illnesses which could indicate the presence of a proto-Polynesian disease classification system (Cox 1991: 153). *Uti*, refers to baby convulsions. *Tui* is another illness category that refers to babies having pimples in the back of their heads, which can be very serious. Usually they are treated with '*akari ira*, a special coconut oil prepared by a few specialist healers. The oil is used to massage the baby. I interviewed three different healers who 'owned' recipes for '*akari ira*. They mentioned that preparing the remedy is a process of diagnosing the cause of the illness. If while they are cooking the oil, they see big bubbles emerging on the surface of the mixture, then this is considered a sign that the cause of the illness is spirit-induced. They will then enquire whether the babies' parents have been arguing or whether there was conflict over the baby's name. After the conflict is solved or the baby's name changed, the baby is massaged for three days with '*akari ira*.

7.5.2 Gynaecological conditions

Most women's conditions are related to pre- and post-natal treatment. There is a wide range of local medications and body care techniques for pregnant women and new mothers (figure 34).

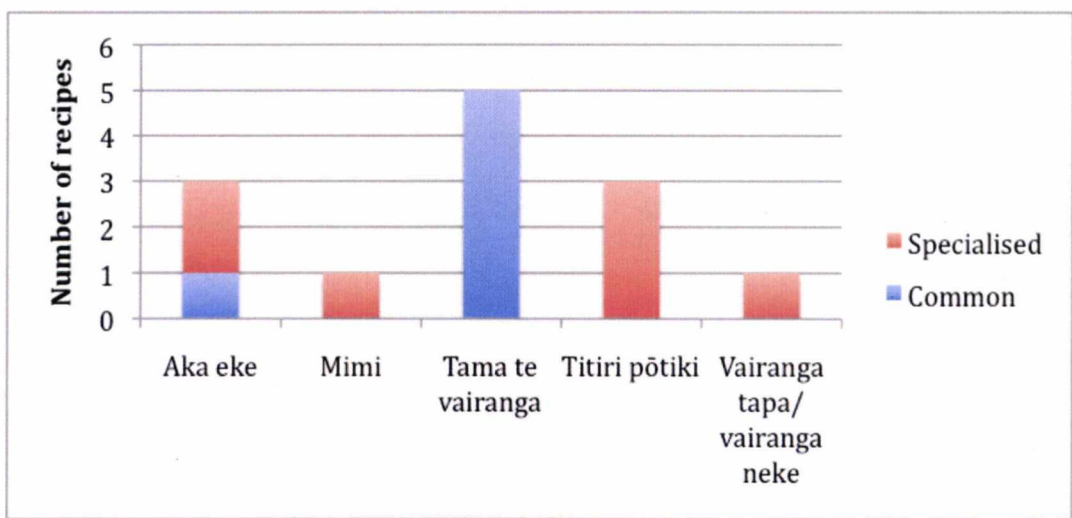


Figure 34: Recipes for gynaecological conditions

Local women take pride in the benefits of the use of diuretics and purgatives in maintaining the expectant mother and her baby healthy and strong. Pre-natal treatments were very much favoured by local women who strongly believed that the purging process helps ‘to clean the body of the woman’ (*tama te kopapa o te vaine*). However, these treatments are considered controversial by health authorities because they involve purgatives, emetics and intense massage. Doctors and nurses were concerned that these treatments were putting the health of the mother and the baby at risk. Home deliveries in Atiu stopped since the new hospital was built in the seventies. The head nurse on duty is a trained midwife and qualified to deliver babies. Expectant mothers also have the option to fly to Rarotonga and give birth in a fully equipped hospital, with expenses paid by the Ministry of Health. Most of the women take that option because they are afraid of complications.

I recorded five types of medicinal baths for post-natal treatment of new mothers. All recipes for the baths belong in the common knowledge domain. For post-partum cleansing, *tama te vairanga*, literally meaning to clean the womb, most women use warm baths with guava (*Psidium guajava*) and medicinal vitex (*Vitex trifolia*) infusions. These baths are considered very potent in healing and tightening the woman’s vaginal area and

getting rid of the ‘bad blood’. Abortion, *titiri potiki* is a subject rarely talked about. There are known abortifacient remedies and massage techniques but these are rarely used as contraceptive pills and injections are freely available in the clinic and were the most popular form of contraception.

7.5.3 Skin ailments

Skin ailments were very common in Atiu and were treated predominantly with simple recipes that belonged in the common sphere of knowledge (figure 35).

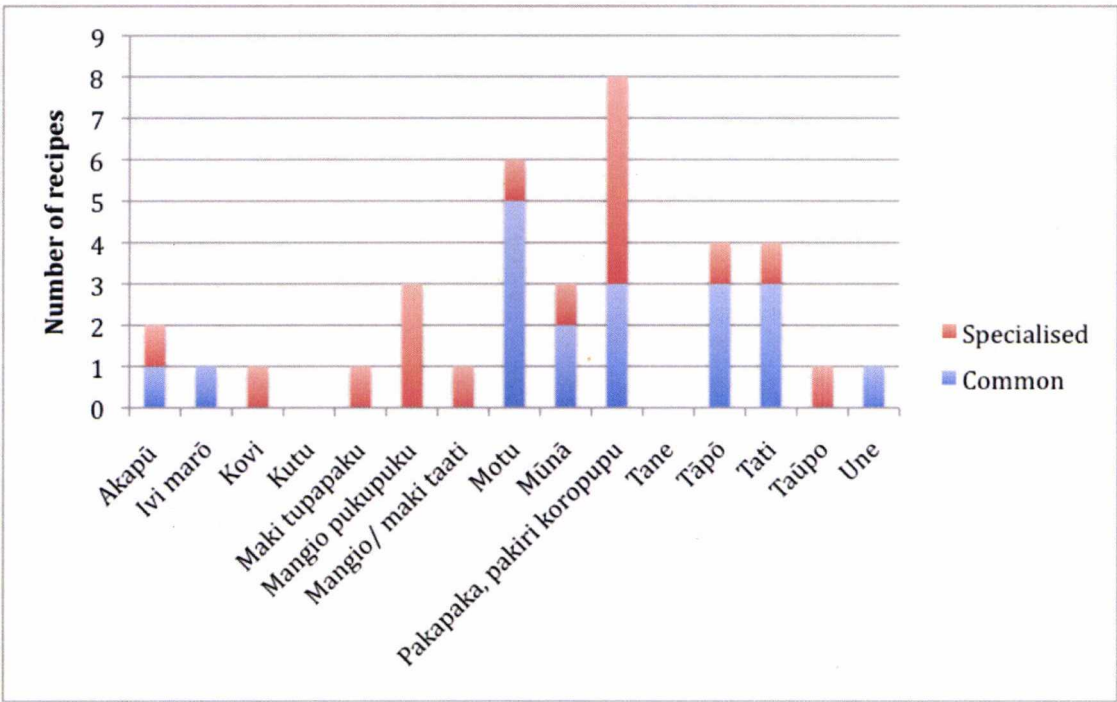


Figure 35: Recipes for skin ailments

The skin, *pakiri*⁹ is looked after very well and people take pride in healthy glowing skins. Daily skincare involves washing with soap and massaging with coconut oil. Neglect of personal hygiene is considered a cause of illness. Skin ailments, and boils in particular,

⁹ *Pakiri* is also the term used for the bark of the tree

are very common in Atiu because of the warm and humid weather. Two kinds of boils are recognised: *akapu* and *taūpo*, the second one being more serious and painful. They can be treated with traditional medicine, or opened up in the hospital. *Kovi*, is a type of eczema, which is rarely treated traditionally, and most mothers take their children to the hospital. Cuts, *motu*, are usually treated at home as well as burns, *pakapaka*. Burns from the exhaust pipe of the motorbike are very common and are ironically referred to as ‘the Atiu tattoo’. I recorded eight different local treatments, which are considered not to leave a scar. Pale spots on the skin caused by *Tinea versicolor*, *tane* can be seen on some of the children, which are usually taken to the hospital.

Hospital reports showed that between January and November 2003 a total of 53 incidents of skin diseases were treated, 51 of which were for skin sepsis (figure 36).

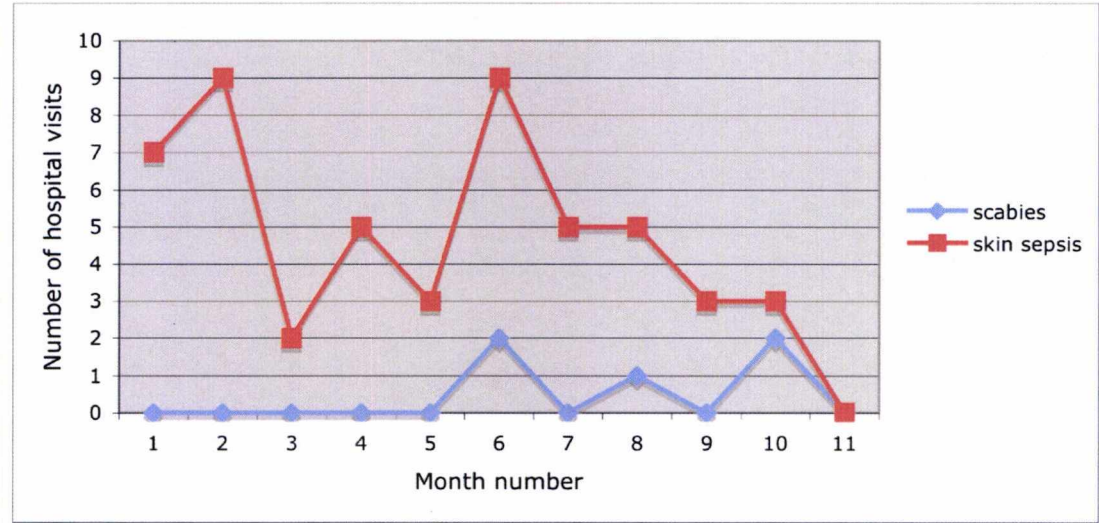


Figure 36: Hospital visitation rates for skin ailments

Skin conditions were initially treated at home and if local remedies did not prove efficacious, then patients visited the hospital. On the issue of skin sepsis, which is a very advanced form of skin infection, the head nurse commented with despair that Atiuans leave skin ailments to aggravate by treating them by Maori medicine and only visit the hospital when the skin is very heavily infected.

7.5.4 Ophthalmological and otolaryngological ailments

In the category ophthalmological and otolaryngological I have grouped ailments of the eyes, nose, mouth, neck and head. It is a very diverse category that includes six ailments (figure 37).

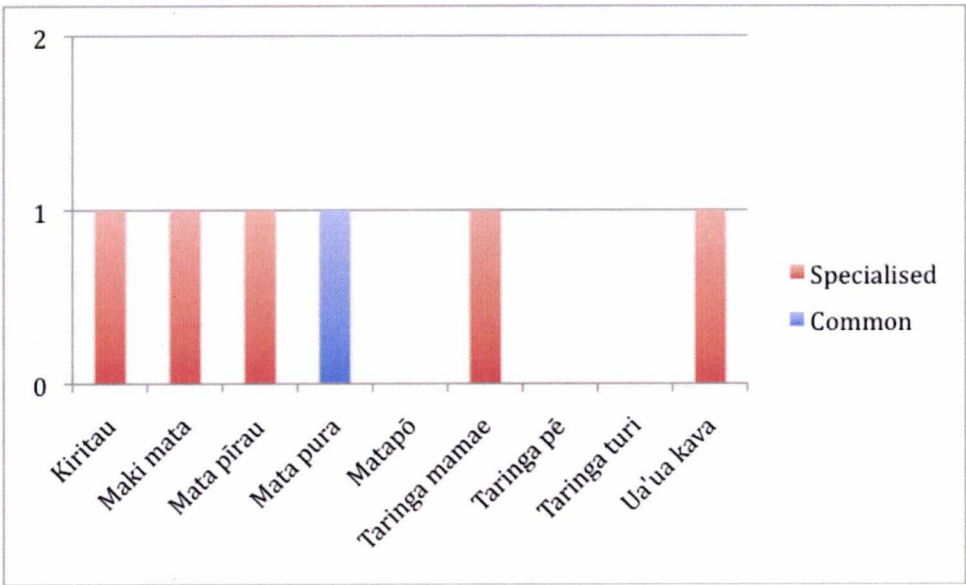


Figure 37: Recipes for ophthalmological and otolaryngological ailments

The head, *upoko*, is a body part of special significance in the Cook Islands and Polynesian cultures in general. The *mana* of the individual was believed to be concentrated in the head which according to Polynesian philosophy was associated with the superior, divine aspect of nature (Handy 1978 [1927]: 30). There are many restrictions associated with touching and tampering with the head some of which are expressed in hair cutting and grooming rituals (Loomis 1983). During my fieldwork I was once reprimanded by a young Atiuan brought up in New Zealand for walking close to his head when he was lying down on the lawn. He said from his supine position in an authoritarian voice:

‘Sonia next time you have to go to the kitchen you walk on this side, past my legs, not the other side past my head. You know, for us the head is very important and you must never walk behind someone’s head.’

Hair, especially in young people was very meticulously groomed, not only for beauty but also to prevent lice infestation. Head lice, *kutu*, are very common in school children especially since most of the children; boys and girls have very long hair. For girls, long hair is an essential part of their beauty, explicitly displayed in dance performances. Young girls sought permission from their father before cutting their hair. Boys have long hair until they have their hair cutting ceremony between the ages five and twelve, which is a very big social event. The most frequently reported illnesses are associated with the eye, ear and mouth infections. A form of conjunctivitis is identified as *maki mata*. People treated *maki mata* using a combination of local recipes and western medicine. *Mata pirau* is considered an acute form *maki mata* where the eyes had pus.

7.5.5 Gastrointestinal ailments

Gastrointestinal ailments include 15 ailments such as stomach pains, food poisoning and , illnesses caused by the perceived displacement of internal organs and ancestral interference. I recorded 15 recipes that treat gastrointestinal ailments, all of which were owned by specialist healers (figure 38).

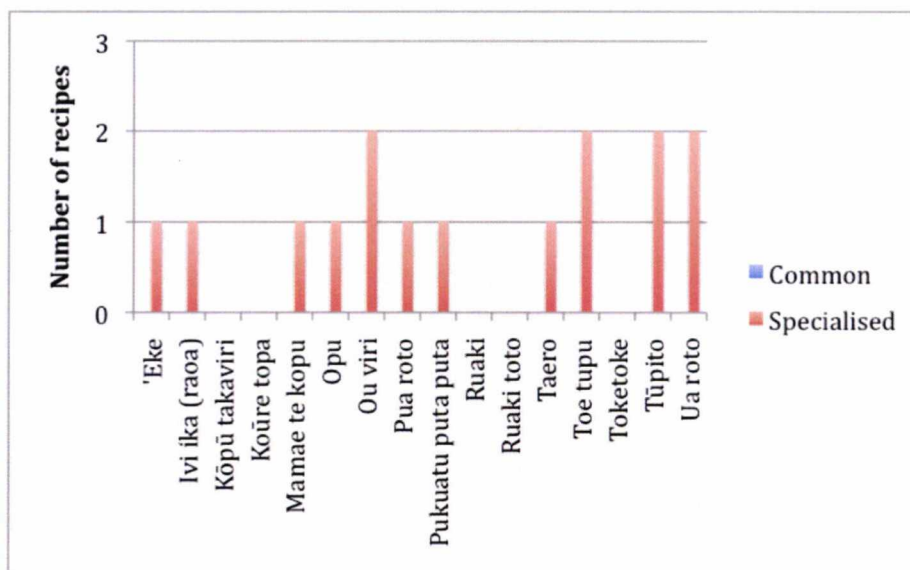


Figure 38: Recipes for gastrointestinal ailments

The general area of the abdomen is referred to as *kopu*, which also denotes stomach. The knowledge of and naming of the internal organs is quite generalised. All internal organs are referred to as *ngakau* and the major organs such as the liver, lungs and kidneys are referred to as *ate*¹⁰. In *vairanga tapa*, which literally means fallen uterus the womb is believed to fall. Atiuans mentioned that the only cure for these ailments is to visit a massage specialist who can put the organs back in their place. It is believed that if the cause of these illnesses is supernatural the healer will be able to tell because he or she will be able to feel when touching the afflicted areas ‘something like an electric current that throws you away from the patient’. This belief was reported from patients and healers alike.

People frequently complained of stomach pain, *mamae te kopu*. A particular form of stomach pain *tūpito* was believed to be spirit induced and specialist healer had to be visited. The healer can diagnose if it is simple stomach pain or *tūpito* by placing his or her finger on the belly button, and checking for ‘pulse’. If it is *tūpito*, the healers

¹⁰ Similar terms are used for the pigs’ internal organs. Atiuans are very familiar with pig anatomy. Slaughtering and preparing pig meat for consumption is an activity that the whole family gets involved in.

mentioned that they felt a very strong pulse coming from the belly button. The conceptualisation of the symptoms of *tūpito* is similar to notions of sorcery and spirit-possession in Tuvalu, a neighbouring Polynesian nation where sorcery-induced ailments involve an invisible power residing in the body. Massage specialists can find the actual place where the magic power resides and then apply pressure or massage to keep it in one place. Once the power is prevented from jumping around the person's pain stops and the power departs (Chambers & Chambers 1985: 38). This notion of an invisible power taking over the body and moving within different parts of the body was also evident in other ailments apart from *tūpito* such as *vairanga tapa* (mentioned above) and some types of *maki tūpāpaku*, where the foreign force is massaged out of the joints where 'it likes to hide'.

Cancer is very rare in the Cook Islands. The term 'cancer' in the Cook Islands refers to a serious undiagnosed illness where 'the inside of the body is very bad' or 'the organs have changed place'. One of the most common local remedies for cancer is the consumption of the outer black skin of the sea cucumber, *rori* (*Holothuria atra*). The treatment for 'cancer' is family-owned and it reported to be very effective. Sea cucumbers are harvested from the reef where they can be found in abundance.

The hospital was also frequently visited for the treatment of diarrhoea, fish poisoning and gastroenteritis (figure 39). Fish poisoning which was absent in the months of January to May is caused by the consumption of fish that have been feeding on what is believed to be 'infected coral reefs'.

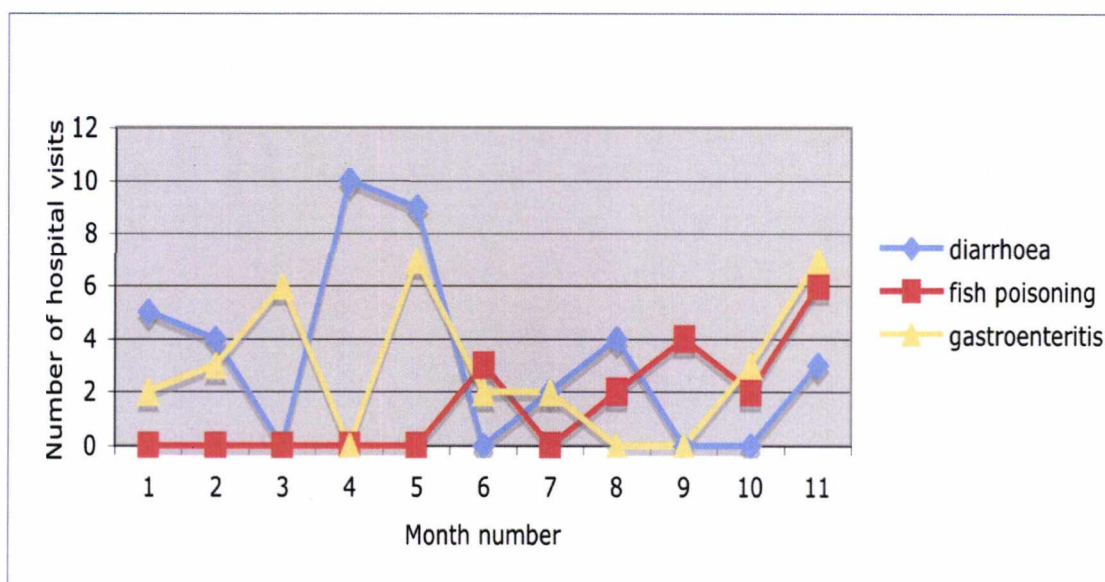


Figure 39: Hospital visitation rates for gastrointestinal diseases between January and November 2003

7.5.6 Respiratory ailments

Asthma (*potopoto au*) and coughs (*kooma pe*) were ailments rarely treated by Maori medicine. Most Atiuans preferred to visit the hospital. Between January 2003 and November 2003 the hospital treated a total of 479 respiratory diseases. Acute respiratory diseases particularly peaked in the month of August, which is the middle of the dry period (figure 40).

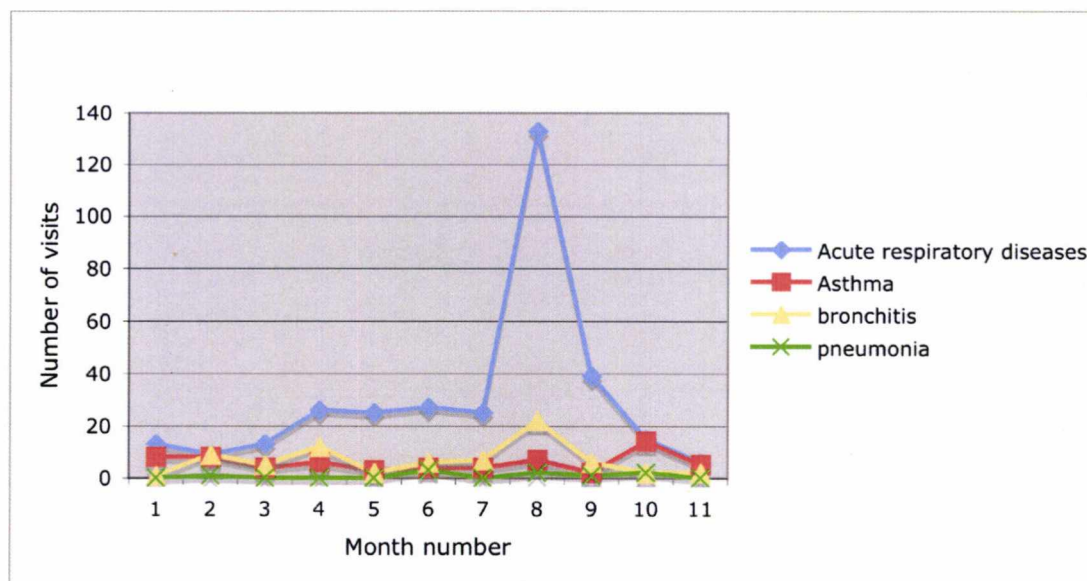


Figure 40: Hospital visitation rates for respiratory diseases between January and November 2003

7.5.7 Urogenital ailments

This category includes the general sub-category of *maki mimi*, that is caused by the accumulation of ‘bad dirt’ in the body and male illnesses associated with erectile dysfunctions (figure 41). *Vairākau mimi*, the medicine for *maki mimi* had the highest number of local recipes available. *Maki mimi*, literally illness of the urine is the major grouping of urogenital diseases. There was a very wide range of popular traditional recipes for *vairākau mimi* and they were used to treat particular internal ailments that were considered urine-related or simply as a tonic. It involved an internal diuretic medicine taken over three days followed by a purgative. The cause of *maki mimi* was considered to be the accumulation of the *repo kino*, the ‘bad dirt’ that accumulated in the body and the *vairākau mimi* helped to ‘clean the body’.

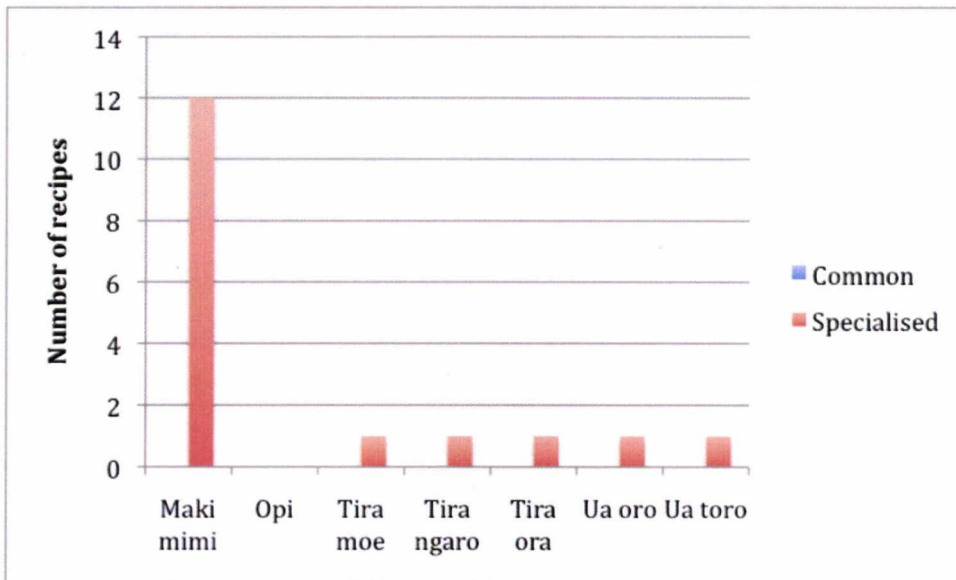


Figure 41: Recipes per urogenital ailments

Certain illnesses are thought to be caused by organ displacement such as the case of *ua oro* and *vairanga tapa*. They are both perceived to be caused by excessive physical activity and lifting heavy weights. In *ua oro*, which literally means running balls, the testicles are believed to enter the main body and settle on the inner thigh.

7.5.8 Myoskeletal ailments

This category includes predominantly different types of fractures and sprains that are treated with medicinal baths that ‘make the body cold’ and specialist massage (figure 42).

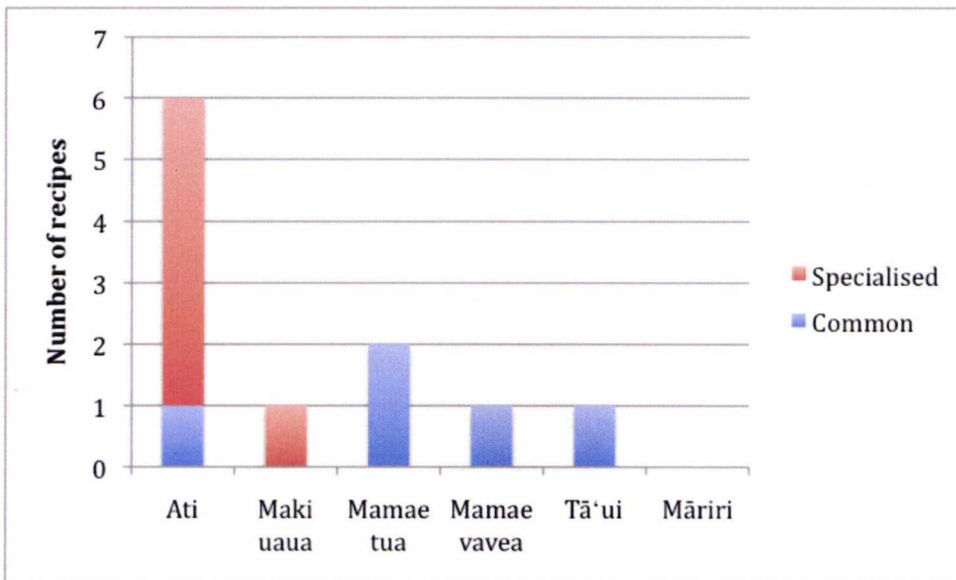


Figure 42: Recipes for myoskeletal ailments

Sprains, frequently referred to as *ati*, 'broken bones' are common incidents on Atiu. They occur when people trip and fall, have a minor motorbike accident or during sports like football and rugby. A popular effective local treatment is *vairākau ati*, which involves a bath that makes the afflicted part 'very cold'. In more acute cases of bone dislocation a specialist massage healer is visited who can set the bones. This was usually a male specialisation. Even though falling over or having an 'accident' is a physical event, the cause of the event can be attributed to the spirits. For these cases Maori medicine has to be used to ensure the removal of the spirit. The administration of *vairākau ati* is not viewed as conflicting with the adherence to a treatment prescribed by the hospital doctor. Another treatment, which was commonly acknowledged, was the application of breadfruit sap on the afflicted region. The rationale for this application was that as the breadfruit sap is sticky, when it would be absorbed by the body and get close to the bone, it would help the bones to stick back together. This concept of efficacy denotes that the physical properties of the substance would remain unaltered in conditions internal or external to the human body. Similarly, in Tahiti broken bones are set and then breadfruit sap is being applied on the area (Hooper 1985: 167).

Tā 'ui is a common form of muscular neck pain, which is treated at home with a simple remedy. A warm *rauti* leaf (*Cordyline* spp) is tied around the neck and that is believed to relieve the pain.

This account of the major illnesses on the island and their treatment shows that treatment is a highly complex social process through which the relations of the patient and his or her family with the living and deceased members of the Atiuan community are affirmed or negotiated. The body and its condition serves as a physical manifestation of these relations, an argument proposed for other Pacific Island societies as well (Becker 1994). However, what these examples show is that there is a high level of intra-cultural diversity. This diversity poses additional challenges to health-seeking behaviour. Ellen argues that many descriptions of ethnobiological knowledge present the knowledge of a few individuals as if it were the knowledge of the entire population and that commonly applied knowledge shared by all members of the community needs to be distinguished from more specialised knowledge shared by only one category of users (Ellen 2003: 52). In Atiu, the types of treatment that were commonly known differed significantly from specialised knowledge and accessing these types of treatment, necessitated a certain level of social relations, and rupture in these relations could become a cause of illness.

7.6 Causes of illness

Health in the Cook Islands is not always an individual's command. Illness can be naturally caused, like for example tripping and falling over out of carelessness. The same health condition can be caused by a dissatisfied ancestral spirit that acts on its own or is summoned by an angry relative, upon the wrongdoing of the individual. The belief that illness is a punishment for wrongdoing in human society is very widespread. Where it occurs, the social order is identified with a moral order of a universe where health depends on virtue (Lieban 1977: 24). In traditional medical systems sickness, sorcery and social events associated with healing processes are embedded in a cultural matrix that has a logical structure comparable to western scientific theory (Cox, 1991: 149). It is

according to this structure that decisions concerning the health-seeking process are taken.

The majority of internal ailments are believed to be caused by an increase of the *repo kino*, the ‘bad dirt’ that accumulates inside the body. In a similar fashion, internal ailments are always treated with internal medicines. Diuretics and purgatives are considered particularly effective because they remove the *repo kino* from the body. In a similar fashion, external ailments are treated with external applications. Hard work could cause the ‘organs to change place’ and that was considered another cause of illness. Specialist massage was applied for the organs to ‘return to their place’. Furthermore, the cause of the internal ailment or the organ displacement can be physically caused (i.e. bad dirt accumulation or hard work) or spirit induced and depending on the case different treatment is being used (table 3).

Table 3: Model of Atiuan notions of illness causation and medical efficacy

External cause	Internal cause	Illness	Symptom	Treatment	Effect
Consumption of food and drink OR spirit	<i>repo kino</i> accumulation	Internal ailments	Feeling unwell	Internal medicine eg diuretics, purgatives	Get rid of <i>repo kino</i>
Hard work OR spirit	Organs change place	Prolapsed uterus, testicle dislocation	Pulsating pain	External application eg massage	Put organ back in place
Environment OR spirit		External ailments eg skin problems	Sores, spots	External application eg poultice, oil	Get rid of symptoms
Accident OR spirit		Spraint, leg dislocation	Pain, feels hot	External application eg bath	Makes body cold

Patterns abstracted from conversation, interview sessions, and observed behaviour suggest some of the factors shaping the Atiuan perceptions of natural and spirit-induced causes of illness. By the term ‘natural causes’ I refer to illnesses that are caused by physical means as a result of human action. By the term ‘spirit-induced causes’ I refer to illnesses that are reported to be caused by supernatural beings like the spirits of the ancestors. There is still a physical causal agent in the illness but it has been triggered by something immaterial rather than material. I analysed the reported causes for 110 illness

treatment episodes and I identified five physical and six spiritual causes:

Physical causes (reported in 74 out of 110 illness episodes)

1. Excessive consumption, for example too much drinking, smoking, eating sweets (cause for gout, diabetes, hypertension)
2. External cause eg accident, falling (cause for fractures, sprains and burns)
3. Too much hard work and lifting heavy weights (cause for *ua oro* and *vairanga tapa*)
4. External agents eg too much dust in the air (causes for asthma, conjunctivitis)
5. The *repo kino*, bad dirt that accumulates inside the body (cause for internal ailments like urinary tract infections *maki mimi*)

Spirit-induced causes (reported in 36 out of 110 illness episodes)

1. Spirits acting directly on person causing fits, *uru tūpāpaku*
2. Spirits acting directly on person causing internal illness after breaking of *tapu*
3. Spirits acting directly on a child that was given the wrong name, *ingoa*: wrong naming usually resulted in the children's illness of *ira*
4. Spirits taking the form of a pig and cause an accident
5. Spirits causing an accident by provoking a fall
6. Spirits acting in response to someone making a curse- *tauma 'a*: angry ancestral spirit called by someone to cause illness to someone who had been bad

In the natural explanation of illness cause there is a linear relationship between the cause and the illness. In the supernatural explanation of illness cause the agency of the spirits takes many forms. The course of treatment is often pluralistic. Western medicine and Maori remedies are used depending on their efficacy. However, western medicine is considered ineffective in treating illnesses with a supernatural cause. The identification of the cause of illness is a 'stepping stone' in the health-seeking process. The diagnosis of the illness and its cause changes throughout the treatment. The efficacy of the treatment

validates the diagnosis of the illness. Because of this crucial role that illness causation plays in the treatment of illnesses in Atiu and consequent choices for different herbal remedies I will describe more analytically these causes in respect of observed illness episodes.

7.6.1 Natural causes

Patients and healers alike frequently attributed ailments to natural causes particularly in the cases where the cause was obvious and the direct effect of a human action or external agent. In ten illness episodes, causation was attributed directly to excessive consumption like too much drinking, smoking, eating sweets. Diabetes, *toto vene* and high blood pressure, *toto kake* are very widespread in the Cook Islands because of lifestyle and dietary changes. Atiuans are very aware of that and attribute the cause of the 'new' illnesses directly to food intake and drinking. However, they are puzzled at the same time because the consumption of imported food is still linked with progress. A 41-year-old female teacher who got recently diagnosed with high blood pressure mentioned with astonishment:

'I don't understand...the doctor told me not to eat corned beef, no butter, no cream crackers...all the good food is not allowed. What will I eat now?

Atiuans found it hard to adjust to messages from the health authorities that urged them to eat more local foods and reduce the consumption of meat, as they were brought up thinking that these were the 'good foods'.

In twenty-five illness episodes, external ailments, fractures and burns that are caused directly by human action were recognised as directly caused by physical action. However, this action on some occasions is attributed to the work of the spirits.

Eight episodes where illness was caused by ‘organ dislocation’ were attributed to too much hard work and lifting heavy weights. This cause was attributed to men who are engaged in heavy physical work in the plantations. Physical strain could cause *ua oro* in men where the testicles were believed to disappear inside the thigh. In a similar fashion for women, ‘the womb could fall’, *vairanga tapa*, if she lifted something heavy. In both cases the physical work caused a perceived organ displacement, which consequently caused immense pain. However, sometimes *vairanga tapa* was believed to be caused by an ancestral spirit that disapproves the heavy workload that a woman has to do. In these cases the metaphysical explanation of illness causation has a normative effect on gender workload allocation.

External agents present in the environment were referred to as causes of four illnesses. For example dust was commonly identified as the cause of asthma and conjunctivitis. In Hawai’i, respiratory illnesses are attributed to the two distinctive seasons: the wet and the dry (Krauss 1993: 101). Even though, the climate in the Cook Islands is characterised by a wet and a dry season as well, seasonality was not perceived as a cause of respiratory illness. However, this could very well be the case because as figure 33 shows, hospital visitation rates for acute respiratory illnesses peaked in August, which is in the peak of the dry season.

In the case of local categories for internal disease causing agents, the *repo kino*, dirt accumulating in the body was recognised as a major contributor to ill health. It literally means ‘bad dirt’, which accumulates inside the body and causes internal ailments. Internal ailments are treated with diuretics, *vairākau mimi* (meaning medicine for the urine). Most internal medicines are followed by a day of purging, *aka eke*, where a laxative concoction or coconut oil is consumed to cause vomiting and diarrhea. This series of treatments was perceived to cure the internal ailments by ‘cleaning the inside of the body’.

7.6.2 Spirit-induced causes of illness

The main spirit-induced cause of illness was attributed directly or indirectly to the mediation of some offended and punitive ancestral spirit. Murdock categorised supernatural causation in three fields: mystical, animistic or magical causation (Murdock, 1980). In Atiu, the divide between mystical and animistic causation is not clear-cut as the spirits acted on their own initiative upon the breeching of a taboo relating to social norms or land issues (causes 1-5). Illness episodes were rarely attributed to magical causation. It was only in the case of the curse, the *tauma'a* that they acted on another human's initiative (cause 6). More explicitly four people mentioned that spirit aggression could act directly on a person causing a fit, *uru tūpāpaku*. During the fit the person would fall on the floor and shake. Sometimes the afflicted person would speak with another voice. A spirit doctor would be called in and try and talk to the spirit to find out the cause of its anger. Basil and massage is used to chase away the spirit. During my research, I did not witness a person being possessed by spirits and having the symptoms of a fit. However, many people mentioned the symptoms of a fit as a direct cause of spirit possession.

In three occasions, spirits were reported to act directly on person causing internal illness after break of *tapu*. Acute internal illnesses with no apparent cause that no treatment can be attributed to the spirits 'protesting' for the break of *tapu*. For example, a senior man bulldozed some graves in his property because they were near his new accommodation units and soon after that he had a heart attack. Some people confided that he angered the spirits who were buried in the land he was planning to develop and they caused his heart attack.

More commonly, spirits were perceived to act directly on a child that was given the wrong name, *ingoa*: like for example the name of a higher rank or the name an ancestor that it was not supposed to. Wrong naming usually resulted in the children's illness of *ira*. Illness following the baby being given the wrong name was a common explanation for babies' illness where no treatment was efficient. These illnesses were mainly attributed to the work of a dissatisfied ancestral spirit that was complaining for the baby

not being named after him/her.

After accompanying a family to feed the pigs, the mother recalled casually as we sat on two coconuts waiting for the pigs to finish eating their coconuts:

‘My brother, our first-born, died when he was five. They say it was because he was given the wrong name. The auntie that named him gave him the name of a *mataiapo* (lower chief). Now people don’t believe very much that a wrong name can be the cause of an illness but still they never give title names to the children’.

The naming complications extended to the realm of land inheritance. During a casual chat on naming, a 32 year-old woman emphatically stated:

‘Naming in the Cook Islands is very important. If a family gives a name from another family to the baby, then this boy may later on claim land from the family that he got his name from.’

Therefore, choosing the right name for a child required carefully adherence to genealogical, tribal and other societal hierarchies.

In five episodes, spirits were reported to take the form of a pig and cause an accident. These kind of accidents were reported to happen at night. A young school-teacher explained to me how she had an accident that was caused by a wandering pig:

‘It was Saturday night and we went to get bread from the oven with my cousins. [The bread is ready around midnight on Saturdays because the bakers are Seventh Day Adventists and Saturday is their holy day of rest] The bread was not ready so my cousin said lets go for a ride to the wharf! On our way down the hill is when I crashed on a wild pig. Maybe a *tūpāpaku* put the pig there or the *tūpāpaku* was a pig. There is no other explanation, the light of my bike did not show a pig. The pig hit the front wheel of the bike and run into the bushes. After the side of the road

there is a big drop, the *kauvai*, and the pig did not fall by running at that speed. We didn't do anything bad but maybe that pig was a *tūpāpaku* for that side of the island for the people that own the land there.'

In order to understand better the agency of the spirits in the cause of the accident, I later asked one of her cousins who was present during the accident and observed that incident from his bike. He was convinced too that the cause was a *tūpāpaku* because of the unusual behaviour of the pig:

'It was *tūpāpaku* because the pig wanted the accident to happen. I was it coming out of the bush and walking in the road. Wild pigs usually run when they see people, they don't walk. That pig I am telling you walked to the middle of the road and then stopped. It just stood there looking at us.'

Alternatively, spirits could cause an accident by provoking a fall. Accidents with no apparent cause were commonly attributed to the spirits. Interestingly the same schoolteacher (as mentioned above) had another accident on her motorbike that was attributed to the work of the spirits. This time the spirit did not embody or manipulate another animal but acted straight on the person. The following accident happened at broad daylight after the workers from the Ministry of Works trimmed heavily a tall *kaika* tree (*Syzygium malaccensis*) that was next to the school. Trimming the tall trees that are located near buildings is a routine operation to prevent damage during a hurricane. As the schoolteacher was riding her bike to school, following a route that she was taking daily, she fell over while crossing the school grounds. She recalled:

'That accident happened during the day. I fell from my bike because of the *tūpāpaku* from the *kaika* tree. It was the first time that the tree was cut. The *tūpāpaku* live on trees, most of the times on houses that no one lives or on the road at night. There was no cause for the accident to happen. Nothing in front of the bike, no other bikes round. It felt like the bike was lifted on the air from the back wheel.'

The spirits could express their discontent for a wide range of issues such as lifestyle choices of the living. In the following case, the spirits were thought to have provoked an accident to express their discontent for the relocation of a new bride to her husband's family home:

‘A long time ago we had an accident with my husband on the motorbike, we hit the lamp post. We were living in my husband's village when my father was still alive. I wanted to go back to my home in Mapumai. After we had the crash my family took us in our home and put us in the Maori medicine bath. The spirits wanted to take my husband away and that is why we had the accident, they were not happy that she wasn't living in my birth home. Every time I had to go outside the Cook Islands something happened and I couldn't go.’

The crucial issue here is the notion of 'accident'. Accidents happen unprovoked, directly provoked by spirits in various forms or indirectly provoked and the boundary between these categories is not clear-cut. In the neighbouring Polynesian nation of Tahiti, which bears many cultural and ethnomedical similarities with the Cook Islands, Hooper notes that Tahitians have similar notions of accidents. Some accidents are believed to happen simply by chance, and some injuries may be caused simply by misadventure and lack of adequate care. However Tahitians are also very ready to try and discern that behind the fortuitous circumstances of an injury, there could be some underlying meaning or cause like the actions of a spirit (Hooper 1985: 162). The most obtrusive fact about spirit aggression theories is their virtual universality. There is a very strong correlation between societies that depend on animal husbandry and theories of spirit aggression as illness causation (Murdock 1980). In the Cook Islands people engage heavily in keeping pigs, which is the main source of animal protein (together, now, with imported foods). As I already explained in chapter 3, pigs were used in the past as a form of currency and still nowadays play a very central role in village feasts. Even though, many animals can act as spirit mediums such as the pig, centipede, the cockerel and the shark, only wild pigs, especially at night, were reported to cause accidents.

Theories of spirit aggression are reported for all societies in the Insular Pacific. Murdock noted that among sorcery techniques, those of verbal spells and exuvial magic have their strongest representation (Murdock, 1980). This is the case for *tauma'a*, the curse in the Cook Islands, which was the only cause of illness attributed to magic.

In nine episodes of *tauma'a* angry ancestral spirits were summoned to cause illness to someone who has 'sinned'. The curse uttered by someone who was angry or hurt by someone else's wrongdoing and sought to re-establish the social order or his or her own authority or even seek revenge. The mistreated person would 'cry to the ancestors' and the spirits with which the claimant is closely associated with had the power to inflict illness on the wrongdoer as a means of punishment. Nowadays, the power of the ancestors is fused to the power of God. The illness is not chosen or directed from the person making the curse. The resulting illness is very difficult to treat because the cause is supernatural. This illness cannot be treated particularly by western medicine. A spirit doctor who will advise the patient can only identify the cause of illness. After the patients repent and change of behaviour the illness will go away. This is illustrated in the following example:

'When I was younger I used to live with my auntie in Rarotonga, together with my sister and some other boys, all 'feeding children'. Auntie was extremely strict with us, the children had to work very hard and the food was very little. One day I cried and wished that God would give something to them for being so mean. Later on my uncle fell ill and he was taken to hospital. No one knew what is happening and he was not getting better with the hospital medicine. One day an auntie from Atiu, who was a witchdoctor came to visit my uncle in the hospital. The moment that she stepped on the door she told my aunt that it was a *maki tūpāpaku*. She asked who was living in the house. When she mentioned my name, the witchdoctor asked who was my father and then she knew that it was I. They went home and they asked me to come in the room. When I stepped in the room the witch doctor knew it was I. I didn't admit that I made a curse. For my uncle to get better I had to make the

medicine myself with all her heart. I explained to the auntie what was my pain but agreed to make the medicine. After I made it the uncle started to become better.'

Cursing was never explicitly identified as a cause of illness and was rarely talked about. I first became aware of the term in a prayer meeting of the protestant CICC church. The pastor believed that the island was cursed and claimed that it was for this reason there was drought, many infertile couples and problems with the wild pigs damaging the plantations. He attributed that to a weak belief in God that led to strong activity of the malevolent spirits on the island. The work of the spirits was equated with Satan's work and believers could be liberated from the influence of Satan/ancestral spirit through faith healing.

When I enquired about the curse a religious believer explicitly mentioned to me: 'I don't believe in the curse because I have a strong belief in God.' In order to gain an insight in its prevalence in the Atiuan medical universe I started consciously mentioning it in my interviews. During an interview on illness episodes I asked my informant, a middle-aged woman who had returned to live permanently on the island, whether she was aware of the concept of the *tauma'a*. The woman explained to me:

'I have heard that *tauma'a* can cause sickness. I don't believe it but it happens. For example if the parents love their daughter too much and they don't like the husband they may say that they will not have any kids, or if you hate someone for doing something bad like stealing and you say one day it will happen to you. The reason why the *tauma'a* happens is because the old people catch your voice, we say *opu iamai e te po to kureo*. The spirit of the old people, the *tūpāpaku* is doing that.'

Similarly, Oliver reported that Tahitians shared the idea that spirits travel on winds and used vigorous fanning as a method to deter spiritual interference (Oliver 1974: 77). The ancestral spirits can cause very serious illnesses that hospital doctors cannot diagnose or treat. The sick person can go to a spiritual healer, *ta'unga* and the healer will diagnose

that it is a spirit-caused illness and that the patient needs to address what has he/she done wrong and change it. When illness is interpreted as a sanction, medical diagnosis is frequently a diagnosis of social relations of the patient and therefore illness treatment is a form of social repair (Lieban 1977: 25). Very frequently, in traditional systems, the healers seek to resolve difficulties in the family or social environment of the patient and reintroduce the patient into his normal social context whereas in western medicine the patient is put in a hospital where the patient is isolated and introduced into an alienated environment (Cox, 1991: 151). One of the major areas of social control mediated through medical theory comes from the belief that the breach of some culturally defined regulation will lead to disease or death (Alland 1970).

However, what Atiuans did not see themselves as mere victims of the temperament of the spirits. They keep graves clean and decorated with fresh *'ei* to appease their ancestors. Furthermore, they can warn them to 'keep quiet' in case they are restless:

'One night *pāpā* came home drunk, he went to sleep and his covered him with a blanket, he threw the blanket and it spun in the air in the room. His wife thought it is the spirit of the uncle. They dug four holes next to the uncles grave, poured kerosene and burned it, that was to tell the uncle to keep quiet.'

Nowadays, belief in spirits is becoming less popular and the spirit doctors are frequently referred to as witch doctors. The church does not disregard the malevolent power of the ancestors but refers to it as the work of the Satan. That is particularly the case for the Protestant faith.

Illnesses could also serve as omens predicting future events. It was believed that having *maki akapou*, a serious type of boil, was considered a sign. A 52-year-old woman explained to me:

'If you get a bruise on your arms or legs it means that someone in the *kōpū tangata* will die, if you get it on your body it means that someone very close to

you that you love will die. Before my father died I would wake up and have bruises on my arms like someone was punching me and after my father died I never had them again.

Another woman, one day showed me a bruise on her arm. She told me that she just woke up and had a bruise, and that it was a sign that someone would die. It was also believed that deaths went in a sequence of three and then a birth. People were very concerned when someone died about who would be next.

The identification of the cause of illness determined the type of treatment received and the choice of medicinal plants used. Efficacious treatments worked because they addressed not only the symptoms of the illness but most importantly its causes.

7.7 Conclusion

Traditional medical knowledge encompasses not only knowledge of using plants but also most importantly knowledge on illness diagnosis and causation. The chosen treatment is primarily based on the classification of the cause rather than the classification of the illness. Illness is loosely classified using the body parts affected, a pattern common across Polynesia. The cause and type of the illness is established progressively throughout the course of treatment. Failed treatments are explained as 'not suited to the illness' and new treatments are pursued. The diagnosis of the illness and the diagnosis of its cause are negotiated throughout the treatment process. In this context, health-seeking behaviour on Atiu is an adaptive process. Wiley argues that adaptation is seen as a continuous health-seeking process which is based on compromise and not on an ideal deal (Wiley 1992).

As it was demonstrated in the previous chapter, traditional medical knowledge is activated and instantiated upon the event of the treatment of an illness. Therefore in this chapter I have sought to determine the domain of illness and then assess how patients and

their social network responded to an illness event. This provides a framework for a more systematic data analysis where illness treatment is assessed from a hospital staff, traditional healer and patient perspective. Anthropological research has been criticised for producing an abstracted 'medicocentric view' of the medical system that is not directly concerned with actual illness episodes and patient-practitioner transactions (Kleinman 1978b). These models fail to examine health and sickness beliefs as they are used and negotiated during actual illness episodes. Medical ethnobotanists argue that there is a need for more systematic data collection in order to provide some validity for ethnomedical conclusions, otherwise according to Moerman 'what appears to be a gold standard may be fools gold if not weighed carefully' (cited in Nichter 1992: 225).

The adaptability of the ethnomedical knowledge is what allows for the western medicine and the Maori medicine to co-exist and to continue to be meaningful as bodies of knowledge to the patients of all social backgrounds. Knowledge about illness and its cause directly affects health-seeking behaviour and consequently the use of medicinal plants in the case that the illness is treated by traditional means.

It is for these reasons that I have chosen in the last chapter of this thesis to situate the Atiuan case within the broader context of social and political change. I will finally demonstrate how due to recent demographic changes and the high outmigration rates, the Atiuan medical practices assume multiple sociopolitical roles, as social and environmental changes bring in new 'modern' and 'global' influences.

8 Traditional medicine and knowledge transmission in the context of socio-environmental change



Figure 43: The Catholic scout group from Atiu on the last day of their visit to Mitiaro

'I learned this recipe from my cousin in New Zealand when I went to visit him two years ago. His little boy was ill and the doctors could not cure him. He went to bed one day and dreamt a medicine using the leaves from the tree in the garden. The next morning he made it and it worked! So he told me how to make it so I could teach my wife when I returned to Atiu to make it for our children.'

'The ingredients of this recipe are steak, beer and [...]. It is good for cancer. I learnt this recipe from a man from Aitutaki when we were working in a car factory in Australia'

'This is a new coconut oil, it is good for the skin. Relatives in New Zealand make it. They put inside whatever they find in their gardens.'

'See this plant? It is new on the island. It grows everywhere, like a weed. The leaves are a medicine. They are good for diabetes.'

'I learnt this recipe from my grandma. She was a ta'unga. She could make all sorts of recipes and talk to the spirits to find out the causes of peoples' illnesses. She came from Tahiti.'

What is it that makes Maori medicine 'traditional', 'indigenous' or 'local'? This body of knowledge, perceived to be descending from the ancestors, with the strict taboos associated with its practice and knowledge transmission seemed to be evolving in a more dynamic fashion than any of the latest island trends. New knowledge and new plants get incorporated in old recipes, new recipes are invented to tackle new or existing illnesses and new ingredients get incorporated. This replenishment of the pool of 'traditional knowledge' would not have happened if the people of Atiu did not have an extremely diverse and well-articulated social network that extended to Rarotonga, New Zealand, Australia and Tahiti. And it was the importance of this network as a source of knowledge and plants that I did not anticipate.

8.1 Introduction

Questions have been raised about the validity of labels such as western, alternative and traditional as applied to medical systems. A review of sociohistorical factors that influence medical systems highlights important processes such as cultural interpretation and indigenisation that characterise what would be more appropriately described as *transitional systems* (Tan 1989: 301). Similarly Frankel and Lewis ask whether we should expect to find consistency at all as people are likely to pick and choose according to their past experience, their opportunities and the information available to them (Frankel & Lewis 1989b: 3). Referring to smallholder cultivation systems that are neither indigenous nor exogenous, Dove suggests that the term *hybrid systems* would be more appropriate (Dove 2002: 349), as it refers explicitly to the hybridisation process that the system undergoes when new knowledge is being incorporated into existing practices. Similarly, Milliken and Albert highlight the similarities between the pharmacopoeias of neighbouring Yanomami groups in the Amazonian region and associated knowledge transmission processes (Milliken and Albert 1997: 275-276), which consequently renders the ascription of specific ethnomedical knowledge domains to individual groups rather problematic.

This chapter examines the transmission of ethnomedical knowledge in the Cook Islands as a local process within the wider context of globalisation and demographic change. Maori medicine encompasses a dynamic body of knowledge and plant use system that adapts to social and environmental changes. Having already described in the three previous chapters the traditional medical system, the illnesses it tackles and the plants used; the scope of this chapter is to highlight the adaptive properties of this ethnomedical system and its ability to incorporate innovation. After all it was these resilient properties that have allowed this system to persist under 180 years of adversity; from the colonial era starting in the 1830's, where Maori medicine was outlawed as 'heathen' practice, to the present day where it is opposed by the health authorities as an unscientific and ineffective practice. This chapter deals with two major contemporary issues: the effect of

migration on the transmission of traditional knowledge and the incorporation of new medical knowledge in the traditional ethnopharmacopoeia.

8.2 *Traditional knowledge and change*

8.2.1 Demographic changes in the Cook Islands

In the last decade the population of the Cook Islands and particularly the outer islands have experienced a large out-migration towards the capital island Rarotonga, New Zealand and Australia. Migration of rural people to urban centres is a global phenomenon with some desired benefits and many unforeseen consequences.

Even though New Zealand was the main destination for migrants, many outer islanders migrated and settled in Rarotonga. Migrant communities in New Zealand and Australia were closely linked and operated as a distinct group, following traditional customs. The chiefs and priests dominated the operation of migrant social institutions. There was a very strong link between the migrant community and assistance with jobs, welfare and housing was being offered through kinship links. Help extended to the realm of healing where kinship ties facilitate health-seeking behaviour.

In a report on Australia's migrant situation it was argued that:

‘capitalist penetration, labour migration and remittances have served to block economic development by fossilising traditional economic structures and creating a ‘migrant’ syndrome in which households have come to rely on remittances to maintain consumption standards’ (Appleyard & Stahl 1995: 47).

Atiuan households are heavily reliant on remittances from family members working overseas. This money supports not only the needs of the household but also the

household's material contributions to the village, church or other community projects, that are considered an important obligation of individual households towards their community. Contributions are usually in the form of food for workers who work voluntarily on these projects and village feasts for guests and special occasions. Migrants also contribute financially to sponsor parts of a project or assist poor relatives with their travel fares. Atiu is considered among Cook Islanders to have a very active community life and hosts many church and village projects, community events and organised visits from the relatives who live overseas. As a result the Atiuan households are under constant pressure to contribute to these events and projects.

The Atiuan population is demographically very fragmented. Atiuans estimate that the non-resident population is considered to be at least four times bigger than the resident population, consisting of around 3,000 people. An exact figure is hard to obtain because claims to Atiuan ancestry are very varied and context-specific. However, this estimate is helpful in conceptualising the magnitude of external financial assistance provided to the small island community of 500 people. Money, resources, ethnomedical recipes and medicinal plants are exchanged within this transnational network.

The diasporic population, despite their physical separation, maintain a strong sense of cultural identity and kin allegiance and regularly visit their home island. Children frequently relocate temporarily to different households of the extended family network, much to the discontent of the Atiu schoolteachers who do not have a fixed group of pupils in every semester. It is not only the demographic constitution that is changing; society is changing as well and moving rapidly from subsistence farming to cash-economy. A lot of the 'old ways' are being abandoned as young people are striving to adopt 'western' ways in an effort to combat poverty and ensure financial security. This process is not unique to the Cook Islands; it is the reality for many Pacific Island states, where migrants from the outer islands aggregate in urban centres in search of a new and prosperous life and instead find themselves in acute poverty and marginalisation. Similarly in Samoa, deculturated poor, who tenuously hover on the periphery of both the western economic system, as well as on the edge of Samoan traditional cultural

institutions, are unable to access resources in either western or indigenous infrastructures (Tavana 2001: 11).

Within this context of change, is there a place for traditional knowledge and what is the effect of the disruption of its transmission both by the movement of people as well as the influx of new ideas? I explored this issue by investigating the transmission of traditional medical knowledge flow in two planes: space (locally, nationally and internationally) and kin groups (within and between nuclear and extended families).

8.2.2 Outmigration and the land

Atiu is passing through a period of vigorous social and environmental change. Most young people emigrate when they finish school, few are returning at a later age and, as a result of this exodus, the landscape is changing. The waves of overseas migration have significantly reduced the workforce of the island, leaving few people to tend family-owned land. As fewer young people live on the island, agricultural activity has been reduced resulting in large areas of untended fallow land. The tropical climate facilitates the rapid overgrowth of previously cultivated areas. As a result of the dense overgrowth harvesting secondary or slow growing crops becomes increasingly difficult. The economy is becoming less subsistence based and increasingly dependent on government jobs and remittances from overseas. Due to this economic shift people spend more time in the villages, around the homes and homegardens.

The effects of the purely pragmatic aspect of reduced access to land are coupled with recent lifestyle changes, which have rendered agriculture unappealing to young people. Young people prefer to seek paid employment rather than engage in planting. They are also discouraged from further agricultural development by the large number of wild pigs destroying the crops. The Protestant church minister talked about the island being cursed because of the large number of wild pigs destroying the crops and the prevalence of

couples that are not able to have children. He mentioned:

‘Many people believe that this island is cursed. When a plane flies over Lake Teroto it is like it gets sucked down. The pilot has told me that’

Tending pigs is very important on Atiu and as previously mentioned in chapter 3, pigs were used as a form of currency in the past. Now, with introduction of foreign foods and wage labour, tending pigs has become less important, resulting in the escape of hungry, unattended pigs to the plantations. Planting staple crops such as sweet potato and cassava has shifted towards the homegardens. As an ex-subsistence farmer explained:

‘I don’t plant down the land any more. My last crop was eaten by wild pigs. All the taro was dug up. It is like planting for the pigs not for my family. Eating rice from the store is cheaper and I don’t have to work that hard.’

In places of high out-migration to nearby, economically prosperous countries, remittances from abroad are a major component of local economies (Appleyard & Stahl 1995: 8). People nowadays can afford to buy products instead of having to grow them and therefore dependency on subsistence farming, hunting and gathering has decreased. No family depends directly, and on a daily basis on land produce to meet its basic needs for food, shelter and medicine. Nevertheless, the agricultural land and the homegardens are still important and their use has adapted to meet the current needs of the population which is to provide the household with supplementary rather than essential plant materials.

The young people of Atiu are in a state of transitional restraint: they see on the television an idealised version of the developed world; they hear from their relatives about the economic benefits of migration and the same time they cannot access this world. As a result young people depreciate island life customs as ‘backward’ and ‘boring’. Going ‘down the land’ is considered a chore imposed on them by their socio-economic state. I once asked my pupils at school what they thought was the main difference between

themselves and children in other countries and one pupil emphatically stated: 'after school we go down the land and they go to the disco.'

A job in a factory in Rarotonga or New Zealand and a leisure time of excessive drinking and eating fast food is seen as a progressive 'way forward'. In the midst of striving for economic development, young people find themselves disoriented and uninterested about their future as long as there is a contract for paid employment however 'short-term', 'negotiable pay' or 'flexible hours' it may be. It is being perceived that at least it is leading somewhere, towards a more secure future, contrary to the poverty and illiteracy that the 'olden ways' lead to.

One Atiuan in his early thirties, living in Rarotonga, who was struggling to make ends meet described leaving Atiu as a teenager:

'Don't think that I didn't think twice when I left Atiu. I thought very seriously about staying on the island, growing taro, feeding pigs and selling them on. But do you know how long it takes to feed a pig? One whole year, and you have to feed it every day. And how long it takes to grow the taro? Six months! And what do you do in the meantime? How do you live? And you are not even sure if you will end up getting any money for your pigs and your taro because the pigs get loose and the taro eaten by the wild pigs...and then you are left with nothing. Plus...it is boring, there is nothing to do there. '

Despite the slow rhythms of the island life, young people still maintain a very deep respect for their traditions and their elders.

8.2.3 Migrant life and social networks

Migrating to another island or country was not an easy decision for Atiuans. Specific household members, particularly the fittest of the males were chosen and supported

financially in their move. In return they had to send money home regularly. The first step in the migration 'ladder' was Rarotonga, then New Zealand and some people finally continued to Australia. It is estimated that in 1997 Pacific peoples comprised 6% of the New Zealand and 12% of Auckland population (Abel et al. 2001: 1138), and I anticipate that this percentage will be much higher nowadays. Due to the lack of industry and limited skilled employment in the Cook Islands, Cook Islanders seek employment as labourers in factories, farms or in building construction. While in New Zealand and Australia, the Cook Islanders form close knitted communities and mix mainly with other Pacific Islanders, as they tend to occupy the same neighbourhoods where cheap housing is available such as the areas near the airport.

When abroad Atiuans frequently marry other Cook Islanders, preferably Atiuans. Atiuans meet other Atiuans in the events organised by the 'Atiu committees', organised groupings in urban centres out of Atiu, in family reunions and fundraising events organised for community projects on Atiu. The migrant communities reproduce most of Atiuan social institutions such as women's, church, scout and village groups in the new relocation centres. Cook Islanders from the same island or even from the same village have meetings and organise fundraising events for projects in the homeland. Participation and organisation in all these groups is voluntary and strengthens the individual's position within their community. Participation in voluntary associations is considered to be a key aspect of social capital among marginalised people (Cattel 2001). For Atiuans participation in the voluntary associations facilitated not only access to social capital but also access to knowledge and information about urban survival and health care.

These patterns of migrant Atiuan social organisation are typical of Pacific Islanders' social grouping. In general, Pacific peoples in New Zealand and particularly the older age groups continue to have strong family and church networks that encourage the continuation of many 'traditional' beliefs and practices (Abel et al. 2001). Young people are frequently associated with 'Islander gangs', as they find it hard to adapt to the new urban lifestyle of the large cities.

After I finished an interview with the female household head, I spent some time leisurely talking to my informant's 17-year-old daughter who had just returned from New Zealand. She spoke with excitement about 'Islander gangs' operating in Auckland, how necessary they were and then she proudly elaborated on the involvement of Cook Islanders in these gangs. It seemed so odd to hear these words from a tranquil 'good daughter' in the peaceful village setting of Atiu. I enquired further on the reasons behind this necessity to join a gang:

'You have to join a gang. It is not a matter of choice because you need someone to protect you. If you don't join then you will start being bullied, asked to hand over your pocket money or even beaten up. The Samoans or the Tongans usually dominate the gangs. You will join the gang where the most of the Cook Islanders are.'

In the context of social exclusion networks can provide social support, self-esteem, identity and perceptions of control. Reciprocity and 'looking after your own' is a common expectation in 'traditional' patterns of social networks (Cattel 2001: 1510).

Even though there is a large Cook Islands population abroad, migrants return almost biannually to the home island for holidays. They refer to their homeland in an idealised way:

'For me Atiu will always be my paradise, however many years I spend in New Zealand I will never forget my island, where I come from' (visiting Cook Islander during Christmas holidays for his family reunion)

But very few visiting migrants desire to return to an island lifestyle:

'There is nothing to do here, we cook *tiopu kuru* [breadfruit soup], rake the rubbish [sweeping the leaves], just to pass the time. We are used to a different

lifestyle now' (visiting Cook Islander during Christmas holidays for their mothers unveiling).

This migration wave is an unavoidable product of modernisation. Two aspects of modernisation are progress and replacement of old and customary ideas (McElroy & Townsend 1989). A modernising society reorganises itself around consumerism and a cash economy. Economic migration to cities is a key aspect of modernisation, as in many cases it is the only way to provide money when other ways have failed. In the case of Atiu, failed agricultural development projects coupled by the major restructuring of the public sector left the island population in a desperate state of transition and unemployment.

8.2.4 Meeting points for the resident and diaspora population

Ethnomedical knowledge transmission is being replicated irrespective of space in Rarotonga, New Zealand or Australia. Even though the Atiuan population is very fragmented there are numerous occasions where different travelling groups of Cook Islanders, *tere*, meet and exchange knowledge. In the context of fluid migration migrants and residents are not clear-cut categories. For analytical reasons only, in this chapter I will refer to Atiuans as migrants or residents based on their status during the period of the fieldwork. However, many of the 'migrant episodes' were narrated to me by 'resident' Atiuans and referred to their past experiences and many of the 'resident episodes' were narrated to me by 'migrant' Atiuans and referred to incidents during their visits that lasted from one week to several months. I could almost argue that residents and migrants do not form separate groups. All people over forty that I interviewed on Atiu had either lived in New Zealand or Australia for a period of time or had visited their relatives there. Consequently direct or indirect experiences of migrant life formed an integral part of island life on Atiu.

News about family members, economic activities, health conditions and effective recipes were common topics of conversation between migrants and residents. Even though knowledge about medical recipes was transmitted, the level of information disclosed varied significantly: from simply acknowledging the existence of a good healer, to disclosing specific information on medicinal plant use. The wide range ethnomedical knowledge transmission patterns that was described in detail in chapter four, is replicated not only locally, nationally but also internationally as well. This indicates that the transmission of knowledge is principally not space-biased but rather kin-biased. There are numerous occasions all throughout the year where the Cook Islanders, either migrants or residents visit each other and exchange knowledge. Below are listed some of the occasions that Atiuans (and other outer islanders) travel.

Main reasons for international trips are:

- to visit family (New Zealand, Australia)
- to attend training courses (Fiji)
- *tere* party (travelling party)- formal group visit of the people of a group (women's group, church group, scouts etc)
- fundraising- usually involves a youth dance group or music group raising money for an island project (NZ, Australia)

Main reasons for national trips are:

- hospital treatment/ to give birth (Rarotonga hospital)
- sports / dance competitions (Manea Games, Constitution day)
- training courses for public servants (Rarotonga)
- for employment or school (Rarotonga)
- *tere* party (travelling party)- formal group visit of the people of a group (women's group, church group, scouts etc) from one island to another
- fundraising- usually involves a youth dance group, music group and/or cooking

local food from the island in order to raising money for an island project (see cover photo, this chapter)

These trips are always associated with family re-unions, feasts, gift exchange and formal social events. Atiuans frequently mentioned discussing about health issues and Maori medicine and taking the opportunity to exchange best practices with Cook Islanders from other islands. These events provide a meeting point for Cook Islanders from different islands who would not otherwise meet. Therefore even though the population is highly fragmented, these customary visiting trips and re-unions with the associated 'protocols' are helping rejuvenate existing extended family acquaintances and even raise awareness about new kin links.

8.2.5 The contemporary importance of traditional knowledge

Despite the aforementioned social changes and the devalorisation of traditional culture, traditional medicine is still widely valued and considered effective by the resident population of the Cook Islands as well as the diaspora. For Pacific people, traditional medicine is not a mere therapeutic tool; it has an important cultural role as well. This role consists of social exchange (rituals), economic exchange (gifts) and a pool of natural history knowledge (Finau 1994: 49). The social and economic exchange involved in asking for and receiving traditional medical treatment is interlinked with other systems of material and immaterial exchange that are central in shaping community cohesion (as discussed in chapter 3 and 4) not only of the resident population of Atiu but that of their migrant network as well.

Even though the practice of traditional medicine is still opposed to the modern health care system, Atiuans do not view the two health systems as mutually exclusive and they use them in a complementary fashion. The hospital in the main island of Rarotonga, is commonly visited by Atiuans for serious conditions. The doctors are very hostile towards people using traditional medicine even though some doctors have close family members

that practice traditional medicine. When I was in Rarotonga, I approached some doctors to interview them on their views on Maori medicine. One doctor in particular refused to see me and his secretary stated emphatically that the doctor does not approve of Maori medicine in any form. A few weeks later through snowball sampling some of my informants identified an elderly lady with the same surname as that doctor as a knowledgeable healer. I arranged for an interview with that woman and during our interview, after advocating the potency of her remedies, much to my surprise she mentioned with pride her son was a practising doctor on the island and that he used some these remedies too. This example clearly illustrates the social pressure under which medical personnel have to openly dismiss Maori medicine even though in practice they might use it. As discussed in the previous chapter, patients commonly reported visiting both the doctor and the local healer at the same time. In the thirteen inhabited outer islands where there is no hospital, traditional medicine resumes an increasingly important role in local health security, contributing directly to the self-sufficiency of the outer islands that do not have a resident doctor.

Furthermore, traditional medicine is very important for the health care of migrant Cook Islanders as well, as they are not very well integrated in the New Zealand and Australian society. Krishnan and his colleagues report that an issue of great concern is the rapid acceleration during the 1990's of trends that directly link race and economic status, and that a substantial Polynesian minority is becoming an 'entrenched underclass' (Krishnan et al. 1994: 83). In these communities of the 'entrenched underclass', engagement with the official employment and health sector is minimal. Migrant Atiuans reported a strong reliance on members of their community for the provision of housing, employment and illness treatment. Illnesses with no apparent causes were frequently attributed to the spirits of the ancestors from the homeland. For example, I documented a case where a baby was diagnosed with *ira* in New Zealand and its parents called their relatives in Atiu to ask them to prepare '*akari ira* and send it over with another Atiuan visiting New Zealand (discussed further in 3.3.1, this chapter).

There were two principles of Maori medicine that created additional challenges in the ethnomedical knowledge transmission across demographically distinct communities: the family ownership of recipes and the strict healer authorisation process. When the population fragments as a result of migration, migrants take the recipes they 'own' with them, leaving behind an apparently impoverished pool of local knowledge. However, migrants frequently paid the airfare for family members from Atiu to visit them. During visits to and from Atiu, Atiuans exchanged not only mats, microwaves and gossip but ethnomedical knowledge as well. However, ethnomedical knowledge does not remain static, as people move and migrate they become exposed to new ways of thinking about illness and new ways of treating it. Within this fluid system of population movement, it was traditional recipes that changed as well.

8.3 *New knowledge, new illnesses and new plants*

Siikala and Siikala consider inventiveness, synonymous to creativity, to be a classic hallmark of culture. They quite explicitly stress that, if cultural processes are governed by principles stretching over time, then the problem of continuity and change should be a central problem in the study of culture (Siikala & Siikala 2005: 18). When Atiuan ethnomedical traditions are examined under this lens, new knowledge and new practices resume a more prominent place.

8.3.1 Changing traditions at home and abroad

Knowledge and practice of Atiuan ethnomedicine is not restricted geographically to the island of Atiu but is shared and practiced among the diaspora as well. As a result of these frequent interactions between Atiu's resident and migrant population, Atiuans' knowledge about plant use is continuously impoverished and enriched. Impoverished by older recipes being forgotten and not learnt from elders. Enriched by new recipes being

acknowledged and adopted. Family members returning from urban migration centres often bring back seeds or knowledge of hitherto unknown medicinal plants.

It has been argued that traditions can either be actually invented or emerge in a less easily traceable way within a brief and dateable period (Hobsbawm & Ranger 1984). The latter is the case for the emergence of new recipes and the adoption of new practices in Atiuan pharmacopoeia. The practices that become adopted fit in the 'Maori medical prototype' which concerns not only strictly speaking the local recipes (taboos, dosage etc) but also the code of conduct of the traditional healers (willing administration, free of charge).

In New Zealand and Australia migrants continue to cultivate homegardens in their new residence and experiment with new plants that grow in that habitat, where the climate allows. Atiuans with short or long term migration experiences mentioned growing medicinal, alimentary and ornamental plants in their gardens and using them when they wanted to make food and medicine from the Cook Islands. A 55-year-old woman who had returned permanently to Atiu to open a store described her life in New Zealand:

'I was working in a car factory in New Zealand for eight years. We were making car parts [...] I used to grow the 'āroe [*Aloe vera*] in my garden and make the medicine when I was not feeling well and drink it. I used to grow all sorts of things, even pota [*Colocasia esculenta* var]. At the weekend I would boil the leaves in coconut cream and sell them in the market together with other island food. All the Cook Islanders would come and buy food from my stall. They were all drinking the night before, too lazy to cook! When I stopped running the stall the people continued to ask for me.'

In New Zealand too, Cook Islanders incorporate new plants in the traditional medical recipes that they attempt to recreate. In the absence of plants from the homeland, new plants are integrated into traditional uses and are often used in a similar fashion. A 42-year old school teacher who had recently returned from a visit to her relatives in New Zealand noted with surprise:

‘You see this purple coconut oil? It is a medicine. It’s a new recipe that the families in New Zealand have made. I asked them, what did you put in it and it’s like that? They said, whatever we can grow in the garden, we use. But it still works, its good for skin problems.’

Innovation and experimentation were not processes linked exclusively to migrants. As I showed in chapter 5 with the case of the new tobacco-leaf infused medicinal oil (*‘akari ‘ava ‘ava*), resident Atiuans had an active interest in enriching their practices too. The *‘akari ‘ava ‘ava* is a typical example of new knowledge being grafted on a similar local body of knowledge. The knowledge about the *‘akari ‘ava ‘ava* was taught to the women of Areora in a workshop given by a healer that they invited from Rarotonga. Three years later, I personally witnessed the women of Areora teaching the women of the island of Mitiaro how to prepare this oil. When I interviewed the Rarotongan healer who instructed the Atiuan women, she explained how she was taught this recipe from her grandmother who came from Tahiti and migrated to the Cook Islanders when she married a Cook Islander in the 1950’s (see figure 44). This particular case forms an interesting example of a ‘local traditional medical practice’ that when traced outwards in space and backwards in time does not appear to be local or traditional at all neither in origin nor in mode of transmission.

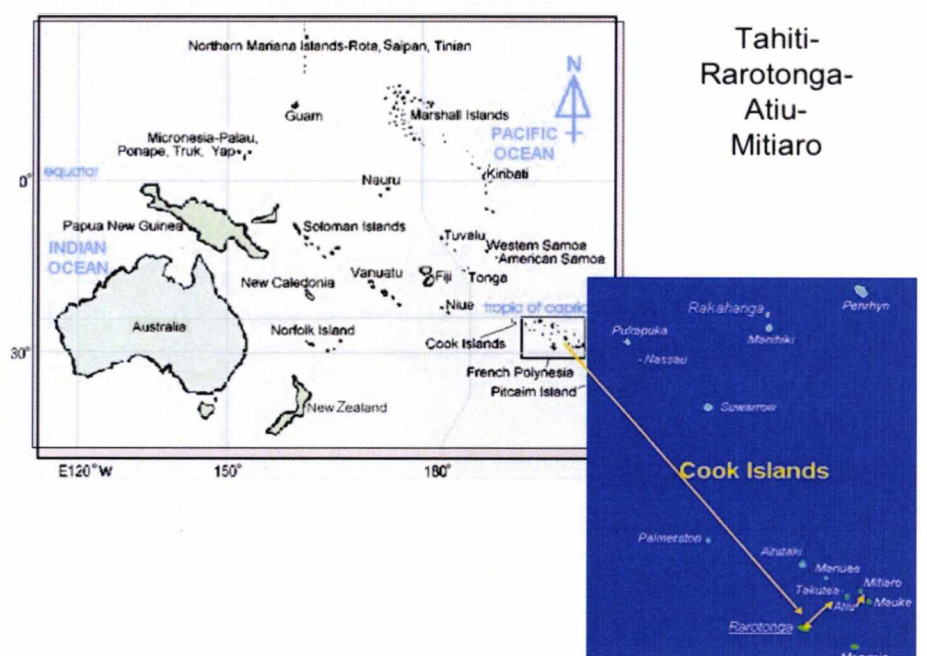


Figure 44: Graphical depiction of international knowledge transmission

Therefore if we explore this particular knowledge transmission event ‘backwards in time and outwards in space’ it would appear like this:

Table 4: Knowledge transmission of ‘akari ’ava’ava recipe in space and time

Time	Place	Transmitter	Receiver	Event
?	?	?	?	?
1900	Tahiti	?	Tahitian woman	She acquires knowledge from someone
1960	Rarotonga	Tahitian woman	Grand-daughter	She teaches her youngest grand-daughter
2000	Atiu	Grand-daughter	Atiuan women	She teaches the women in the village of Areora in Atiu during a workshop
2004	Mitiaro	Catholic Atiuan women	Catholic Mitiaro women	During a Catholic scout trip, they teach the women who are hosting them
?	?	?	?	?

This particular chain of events serves as an indicative example of the dynamic knowledge transmission patterns by which this 'secret' specialised knowledge is transmitted in time and space. I have added two rows with question-marks before and after the events for which I collected information in order to highlight the continuous journey of this recipe which must have been transmitted to this Tahitian woman sometime in the 1800's and will continue to be transmitted in the 2000's in near infinite modes.

8.3.2 Atiuan ethnomedicine in a transnational context

Maori medicine is widely practised by migrant Cook Islanders in New Zealand and Australia. While overseas the Cook Islanders tend to mix with other Pacific Islanders and not get integrated with the rest of the New Zealand community. Even though hospital treatment is widely available, Pacific caregivers mentioned the use of herbal remedies and other plant infusions to treat the illnesses of babies or skin ailments (Abel et al. 2001: 1146). The family was referred to as a prime source of help during illness, and offers support for the elderly and childcare. Children's well-being was the responsibility of the extended family. Female family members provided considerable practical, financial, and emotional support (Abel et al., 2001: 1141). In the context of deprivation, it has been argued that the more varied one's network, the greater the range of resources accessible and the greater the benefits of health (Cattel 2001). For Cook Islanders, varied networks enabled access to varied sources of family-owned medical recipes.

Accessing ethnomedical knowledge

Atiuans living in New Zealand face practical constraints in order to be able to receive ethnomedical treatment: they need to access ethnomedical knowledge and medicinal plants. Concerning acquiring knowledge, informants mentioned that they either made their own remedies, called their relatives on Atiu or asked another member of their community.

Maori medical recipes were considered as the properties of their owners, who were the healers who were formally authorised to prepare the recipes. Atiuans complained that when people emigrate they 'take their recipes with them', not necessarily leaving someone behind who can prepare them.

When in need of a Maori medical recipe, migrant Atiuans called home to ask for a recipe (and vice versa). Via overseas telephone communication resident Atiuans and migrants alike, either asked permission to be given the recipe details or become authorised as healers. During an ethnoepidemiological survey a middle-aged woman who was also a healer mentioned:

'My husband was ill last month. He had *toe tupu* [polyp]. The only person I knew who made the medicine for this illness had moved to New Zealand. So I called my auntie who lives in Auckland and asked her if she knew where that *māmā* lived. She gave me her phone number and I called her. I told her, my husband is ill and I don't have the medicine to make him better. Can you teach me? And she did.'

Alternatively, the family of the patient could ask the healer to prepare the medicine and send it over. I witnessed a case that illustrates this point very clearly. A healer I knew was asked to make '*akari ira*, the medicinal oil for the babies' illness *ira*, for her first cousin's niece's baby who resided in New Zealand. I was passing by her house and during our casual chat, she recounted with slight discontent:

'My cousin came round and told me her niece asked for my medicine because her baby is ill so I have to make it...and it takes so much time you know. Now, I have to go down the land get twenty coconuts, get all the plants and come home to prepare it. I will pack the medicine in some empty Sunlight [washing up liquid brand] bottles and give it to my other cousin who will be visiting New Zealand soon.'

Then I enquired whether she had to do it or whether she could opt out of the obligation. She explained:

‘No, I cannot refuse because I respect my cousin, I respect her mum, that is why I am doing it. Her mum and my mum were sisters. Her mum was the oldest so whatever she asked for, we had to provide it. In the past when we had family meetings, they were held in the house where my cousin lives now. You see why I cannot refuse?’

This example forms an interesting case study where birth order of deceased ancestors continues to influence in a pragmatic level the interactions between resident and migrant Atiuans.

However, the ‘Atiu network’ was not the only source of medical provision. Atiuans communicated with other Cook Islanders, exchanged recipes and if in their interest asked for authorisation to make the recipes themselves. I came across this pattern, when I interviewed an elderly man who knew how to make the medicine for *ua roto*, a form of internal ailment, freely translated as ‘cancer’. During the ‘healer interviews’ my two main objectives were to find who was the source of knowledge and where was the source of plants. As he was a man of 75 years of age, a traditional leader, an expert planter and a fisherman; I was expecting to discover a very old recipe, deeply rooted in Atiu tradition. I was pleasantly surprised:

‘I learned this medicine from a man from Aitutaki when we were working in the car factory in Australia. I worked there for twenty years. He told me I have this very good medicine for cancer. So asked him to teach me. He said you need steak, beer, lemonade [...]’

This example is a very interesting case study where Cook Islands ‘traditional’ knowledge from two different islands was probably produced (due to the nature of the ingredients) and exchanged in Australia, and then brought to Atiu where it was practiced as

traditionally family-owned recipe which was consequently passed down only to the healer's daughter (figure 45).

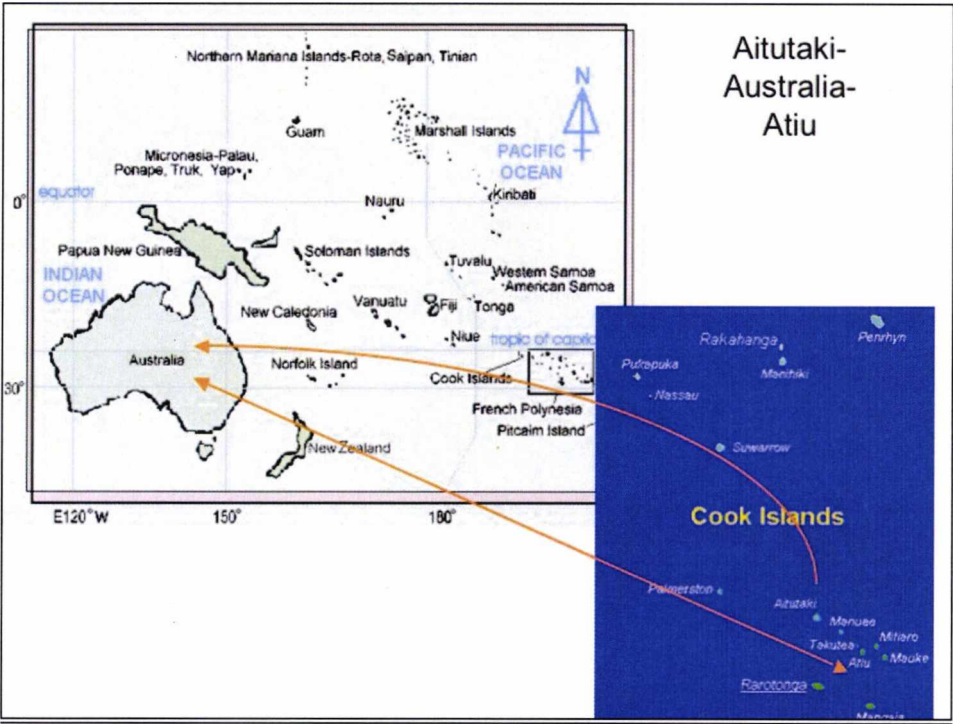


Figure 45: Graphical depiction of the transmission of new ethnomedical knowledge

Similar episodes indicated that considerable medicinal plant knowledge was being exchanged abroad. Cook Islanders feel the obligation to help each other in many ways and health related activities were considered issues of very high importance.

Accessing medicinal plants

Concerning acquiring plants to prepare a treatment three alternatives were reported: growing plants in the homegarden, asking for plants to be sent over from Atiu and replacing them with new ingredients.

For more specialised ingredients, I recorded five case studies where migrants rang their relatives back home and asked for plants to be sent over. This was not very commonly reported because only fresh plants, are employed in the Atiuan pharmacopoeia, and they easily wilt if cut and packaged for a long period of time. Furthermore, as New Zealand has strong quarantine laws prohibiting any unauthorised fresh plant material being taken into the country, plants are 'smuggled' in suitcases.

Atiuans replaced missing ingredients with new ingredients that were more easily accessible. One such example is the purple medicinal oil where basil, aloe and gardenia were infused into the coconut oil. In that case, fresh coconuts were bought from the market and grated; and fresh leaves were collected from the homegardens. This new recipe was owned by its inventor who then had the power to authorise other people to make it. This case is an interesting example where new recipes are being created and incorporated into existing practices.

Finally, Atiuans mentioned growing the following plants in their homegardens in New Zealand: *tiare taina* (*Gardenia augusta*), *pota* (*Colocasia esculenta* var.), *miri* (*Ocimum basilicum*) and 'āroe (*Aloe vera*). Alternatively, some fresh medicinals such as pumpkin tips, coconuts or arrowroot starch were purchased in the Polynesian open-air markets. Through these sources, migrant Atiuans assembled some basic medicinals.

The plants used in the medicinal coconut oils were cultivated or encouraged in the homegardens. The homegardens provided a source of plant material that was closer to home than the plantations or the taro swamps. They provided a safer and more convenient landscape. Where Cook Islander communities made less use of the landscape, homegardens take on a whole new significance, reflecting both their new aspirations and interests, but also a link with a 'traditional' lifestyle, a distant homeland and/or a self consciously asserted ethnic identity. As part of the dwelling space, homegardens are manipulated to fulfil complex needs and desires of the gardeners. As part of the public space, they are significant reflections of identity and status. Specifically, for Atiuans

living on Atiu or abroad their homegardens play an important role in identity formation and place making.

This role has become more pronounced as a localising strategy in the context of globalising pressure. Community fragmentation through large scale labour relocation and the devalorisation of traditional food and medicine leave both the resident community and the migrants alienated and resource-less. In a study on medicinal plant use in Mexico, it was speculated that though people will probably continue to use medicinal plants, these will be more restricted to cultivated and exotic species, as is already the case for rural areas in more industrialised regions of the country (Mello Amorozo 2004: 151). In Atiu, as people move away from a lifestyle based on subsistence, homegardens resume a different role as substitutes of forest plots and plantations.

8.3.3 The 'new' traditional knowledge

Like every other body of traditional knowledge, ethnomedical knowledge is subject to change since illnesses, beliefs and people change as well. Tradition provides parameters within which acceptable decisions can be made, and these parameters may widen or contract depending on the extent to which other constraints or opportunities gain priority (Wiley 1992).

Traditional medical systems may be past-oriented but they are also dynamic and capable of creative syntheses (Nichter 2003). This is particularly the case in the Cook Islands when new recipes include new ingredients and modes of preparation, maintaining at the same time features that allow their classification as 'Maori medicine'. These features are the property rights of the owner, the strict transmission of knowledge with the authorisation of new apprentices, a state of behavioural taboos and prohibitions for the patient during the course of treatment, the 3-day administration and consequent purging if the medicine is taken internally.

When I first arrived in Atiu, I had brought with me a stock of specialised products from Rarotonga, that I knew I could not find on Atiu. Being Greek, one of them was a bottle of olive oil. When I arrived at my host family's home, I took out the olive oil bottle and started explaining to my host mum, what was olive oil; its importance in Greek culture and where it came from. She exclaimed:

'I know olive oil. I have seen it in New Zealand. You know we have a medicine with olive oil. We call it *vairākau olivani*. You take half a glass of olive oil, squeeze the juice of one lemon and drink it. You do this three times a day. It is good to clean the inside, it gets rid of the *repo kino*.'

This recipe was clearly a new recipe that was created in New Zealand, as olive oil was a rare commodity in Rarotonga and absent from the shops of Atiu. However, it fitted an existing prototype: that of ingesting half a glass of oil for purgative purposes. In the Cook Islands, new recipes for new illnesses or for existing illnesses with new ingredients, follow a recipe prototype that makes their novelty pass almost unnoticed. Certain traits diffuse well, others poorly. Culturally based behavioural systems contain elements, which restrict randomness. New elements, no matter their origin, must be worked into existing theories (Alland 1970). In Atiu the existing protocol of the three-day administration, the associated food taboos and above all the healers' ownership of the recipe, are found in all the new recipes as well. Healers integrate diverse strands of experience into a knowledge framework that closely fits the needs and demands of people in their communities (Nordstrom 1989). For example, local medicines for diabetes and high blood pressure had come into place due to the high incidence of these diseases.

Since illnesses are changing and new concepts of illness and health are being introduced, the traditional medical system is bound to change as well. New recipes are being borrowed from other countries and other islands, existing recipes are modified and new recipes are invented. In India, the healers mediate new medical information with the old by translating it into terms compatible with existing Ayurvedic theory and with existing understandings shared throughout the community. Continuity of meaning is thus ensured,

but the specific content of medical knowledge is able to change (Nordstrom 1989: 53). In Atiu, this continuity of meaning is what enables new recipes to be part of the corpus of Maori medicine and not that of *papa'ā* medicine, which is a process that some would argue started in 1830 with the arrival of the missionaries.

Flexible ways of knowledge transmission and the incorporation of new knowledge have allowed the perpetuation of this body of knowledge to contemporary times. However, lifestyle changes and the rapid transition to cash economy endanger the transmission of ethnomedical knowledge as younger generations despite having a deep appreciation for the healing knowledge of their ancestors 'don't see the point' in becoming traditional healers.

Large-scale transnational migration of Cook Islanders has had a significant impact on the practice of traditional medicine and its transmission. With five times as many Cook Islanders living abroad, the vertical 'orthodox' transmission of ethnomedical knowledge has extended from the isolated Cook Islands to other islands and countries, still maintaining some strict taboos related to the efficacy of recipes. The traditional medical recipes are still believed to work only if the person making them has received permission from a member of the family that 'owns' that medicine. It is the mode that these permissions are given that has extended to the new places that Atiuans are relocating. There is significant transnational communication of Cook Islanders around illness events where recipes are discussed over the phone, indicating that the ownership of a traditional medical recipe reinforces not only intra-kin but also inter-kin relationships regardless of space. Furthermore, effective recipes invented or ascertained overseas can be communicated and practiced back in the Cook Islands, thus creating a 'new' 'traditional' knowledge that is independent from a place of origin. This inter-oceanic non- vertical mode of knowledge transmission is an adaptation to a fragmented island population that still maintains a strong notion of island kin identity. Young people growing up in this environment of change with fluid residence patterns become heirs of this dynamic knowledge. They still value its therapeutic and cultural role, but at the same time feel hesitant to take on the demanding role of the healer. Their daily experience of the

dichotomy between the Maori and *papa'ā* ways gives way to the negotiation of knowledge and values, and consequently their adaptation.

8.4 Socio-environmental change and health issues on Atiu

Diabetes and high blood pressure frequently referred to as lifestyle illnesses or non-communicable diseases (NCDs) are the biggest threat to the health of Cook Island people. The hospital records of Atiu hospital showed that between January 2003 and November 2003 the hospital was visited 429 times for hypetension, 95 times for diabetes and 31 times for gout (figure 46). For an adult population of around 350 people, these figures are quite high.

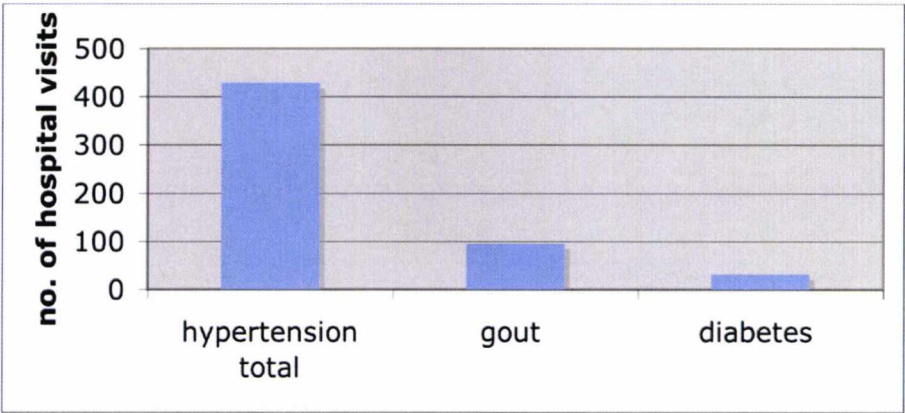


Figure 46: Hospital visitation rates for NCDs between January and November 2003

The nutritionist from the Ministry of Health mentioned that there is growing concern over diabetes, hypertension and obesity. Lifestyle illnesses started appearing in 1945. She also noted that the people of a lower socioeconomic status tend to be better off health wise because they rely more on their gardens and have less money to spend on imported junk food. In a biocultural study on modernisation and diet in Rarotonga consumption of imported foods was positively correlated with increased education levels and economic

status (Ulijaszek 2002). Where people could afford to, they purchased and consumed imported foods. In the Cook Islands, a large body mass is culturally accepted but obesity is criticised. Sick- leaves, doctors appointments, medication, flights from the outer islands to Rarotonga to go to the hospital are a constant financial drain, and the government to take measures to tackle the issue. The World Health Organisation together with the Ministry of Health launched a programme in 2003 in the Cook Islands to take biometric and behavioural data from all adult Cook Islanders and raise awareness of this issue.

The cause of the lifestyle illness outbreak is diet and lifestyle change. The imported foods, once unaffordable and associated with the affluent European culture are now part of the daily food consumption. The reasons behind the high incidences of diabetes and high blood pressure are very complex and deeply entangled with post-colonial ideals of progress and absence of work force.

High blood pressure

Hypertension or high blood pressure was the main lifestyle illness on Atiu. Male and female patients with high blood pressure visited the hospital throughout the year (figure 47).

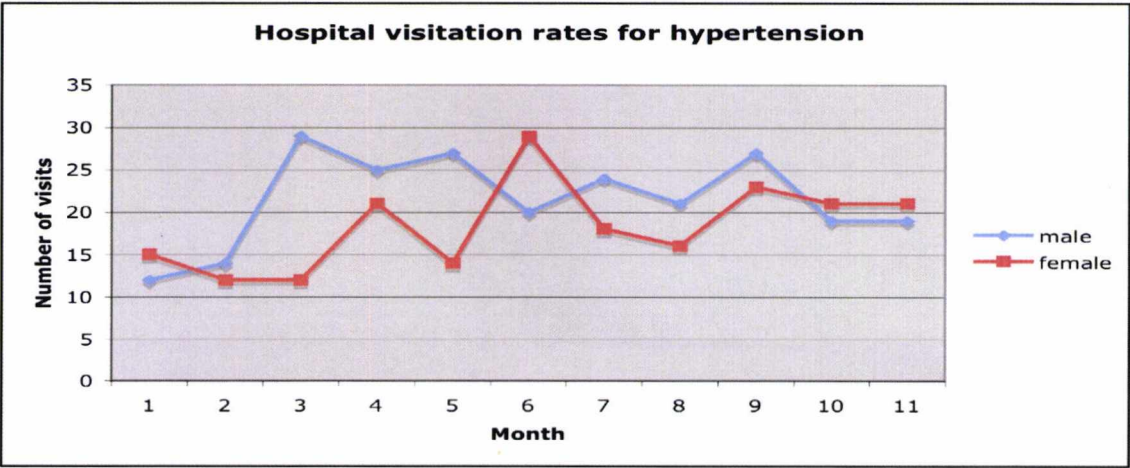


Figure 47: Monthly hospital visitation rates for high blood pressure

High blood pressure is locally referred to as *toto kake*, literally meaning high blood. It is attributed to smoking, bad diet and low levels of physical exercise. People were puzzled with the diagnosis as they considered being able to afford cigarettes, imported food and abstinence of physical labour, indicators of ‘quality of life’.

Diabetes

Another illness associated with lifestyle changes was diabetes, which also affected men and women (figure 48).

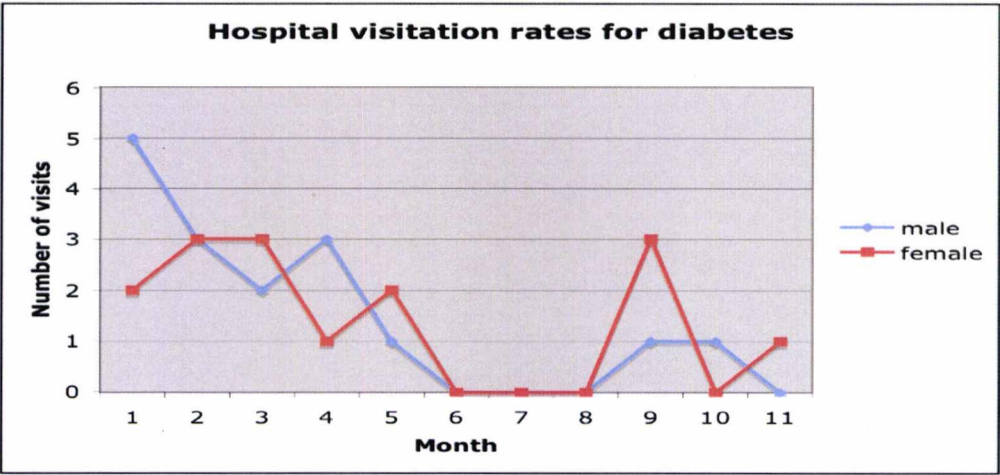


Figure 48: Monthly hospital visitation rate for diabetes

Diabetes was locally referred to as *toto vene*, literally meaning sweet blood. In men, the main causes of diabetes are attributed to a high consumption of homebrew at the *tumunu*. For women, it was attributed to a high consumption of imported sweets such as biscuits and sugar. Interestingly, but perhaps not surprisingly, there were three Maori medicines for diabetes. They were simple recipes involving leaf infusions. The recipes were family-owned and women were keen to employ them.

Gout

Gout is a disease created by excess of uric acid. It affects predominantly the male population of Atiu (figure 49) who consume homebrew on a daily basis.

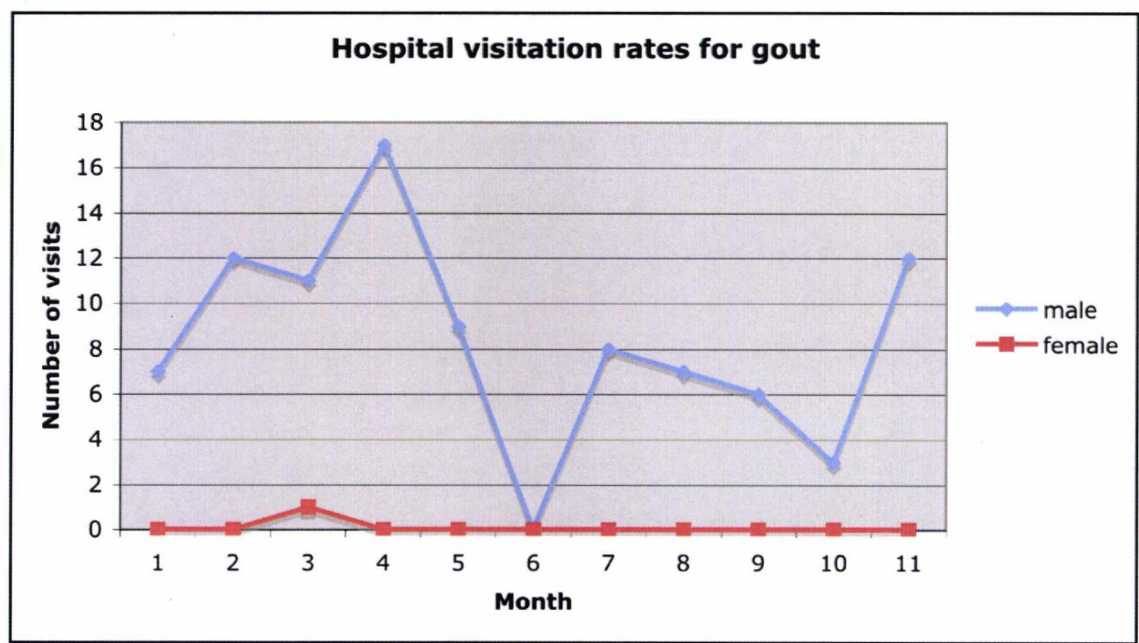


Figure 49: Monthly hospital visitation rates for gout

There was no local term for gout or any Maori medicines. Men who were diagnosed with gout did not report any willingness to change their drinking habits. The *tumunu* were areas that provided men with affordable alcohol and good company to discuss issues that concerned them.

Imported foods such as corned beef, tinned fish, cabin bread, margarine, noodles, rice, and biscuits are part of the daily diet of the Cook Islanders. Financial resources to purchase imported foods requires a surplus of wealth, which was provided either by wage labour or remittances from overseas. Even though this financial surplus drives the over-consumption of imported goods, the origins of this desire can be traced back to the arrival of the missionaries whose imported supplies were considered superior food to the locally produced one. Still people refer to imported food as ‘good food’. The particularity of

lifestyle illnesses is that they are a social product directly attributed to lifestyle choices. The lifestyle and economy in the Cook Islands has changed but the perceptions of food and wealth have not changed.

8.5 Conclusion

This chapter explored the notion that traditional knowledge is not impoverished by social changes and migration but rather transformed to adapt to the new health needs and population settlement. A methodology adapted towards tracing the origin and transmission mode of ethnomedical knowledge was employed, in order to clarify the links of tradition to time and space and the identification of 'new' traditions that dominate the current cultural order. Traditions which appear or claim to be old are often quite recent in origin and sometimes invented (Hobsbawm & Ranger 1984) and this is the case of some of the traditional medical recipes such as the recipes that used olive oil, steak, aloe vera .

Even though the transmission of traditional medical knowledge has a rigid structure associated with many restrictions, it contains adapting mechanisms that allow for knowledge to be transmitted among highly fragmented populations. Transmission of ethnomedical knowledge can occur lineally as well as horizontally in a local, national and international setting. Traditional medicine encourages social cohesion not only within but between family groups as well, as people need to personally communicate to acquire or gain authorisation to prepare a recipe. What appears on the surface to be a system in disarray (young people leaving the island, not interested in learning the 'old ways', science dominating over traditional knowledge) when investigated closely it appears to have a well-defined and orderly underlying structure (visiting groups, social networks).

Migration affects all aspects of social life on Atiu and the transnational flow of money, ideas and plants is shaping the way that Cook Islanders perceive and inherit their ethnomedical traditions. The personal and family networks that facilitate daily life on a small island are still maintained after migrants emigrate. Even though these networks

take on a new international role, notions of kin remain the same. Similarly in Tokelau, where the atolls have suffered from large outmigration, social change is very evident in the form of government jobs, education, imported outboard motors and food; and inevitably some erosion of traditional values (Wessen et al. 1992).

Fawcett identified three main functions of family and personal networks in migration: tangible such as remittances, regulatory such as consequent migrant flow and relational such as role modelling (Fawcett 1989: 674). Settled Atiuan emigrants have a regulatory role in the consequent migration of their family members. Culturally-based family obligations may dictate the priorities for sponsorship of new immigrants by former immigrants. As in the case of the Cook Islands, rules and even norms may change, but obligations among family members are of an abiding nature.

The issue of health is a very suitable 'window' to observe cultural adaptations to new ideas and environments. Adaptation involves changes and modifications that enable a group to survive in a given environment and therefore health can be considered as measure of environmental adaptation (McElroy and Townsend, 1989). As society and values change, new illnesses arise and populations become increasingly mobile. In this context of change, Atiuans adapt knowledge transmission and ethnomedical practice patterns to suit the changing context. New medicines can be recognized by the nature of the illness (e.g. if the illness is relatively new like diabetes, high blood pressure and gout). Innovation can also be detected by the nature of the ingredients (e.g. if the ingredients are not common in the Cook Islands like steak, lemonade and beer).

Concerning traditional medicine, adaptations occur within a framework that is claimed by Cook Islanders to be invariable with time and therefore linked unquestionably with the past. Adaptation and change is not admitted to be a desired or logical consequence of social change in the domain of traditional medicine. As a healer emphatically claimed: 'Some things are just the way they are. Just as the summer comes after winter year after year, the waves come in and then out again[..]'. When Atiuans cannot rationalise traditional practices, they attributed invariance to an unbroken chain of practices that link

the living to the ancestors. For example, when I enquired about the reasons that certain plants were efficient in treating particular illnesses, I frequently received the following reply: 'I don't know why [...] but that is what our forefathers did'. Traditions adapt and change but as in the case of traditional medicine, these changes do not occur randomly. Like elsewhere in the Pacific, custom restricts innovation but gives the desired change the sanction of the precedent, the link with the ancestors and social continuity (Glaskin 2005: 297).

Cultural renaissance in the context of global decentralisation can be seen as an interplay between the world market and cultural identity. The ever-increasing multinationalisation of world market products goes together with a drive for liberation and self-determination (Friedman 1994: 102). This is the role of Maori medicine for Atiuans. It is something that is perceived as uniquely theirs and something 'traditional' that links them to their homeland. Nevertheless, the idea of what is 'traditional' has undergone significant changes to become a self-conscious reaction to externally imposed conditions, such as integration, migration, and economic marginalisation. People bring to the solution problems of health and disease not only customary behaviours and beliefs. Atiuans actively adapt their health-seeking behaviour to new illnesses and new medical systems to optimise treatment. Similar processes have been associated with other Pacific Island peoples as well. MacDonald suggests similar conclusions for Tikopians whose long history of traveling to and from other islands is associated with a long history of introduction of new ideas, new diseases and new remedies (MacDonald 1985: 67). People are not only creatures and carriers, but creators of culture (Landy 1990). And in this way the Cook Islanders are creating operating networks and medical systems to suit their new lifestyle and new needs.

9 Conclusion



Figure 14: Tupuna Tuariki (centre) and family members outside the Catholic church hall after a church reading, wearing specially made clothes that indicate group membership

9.1 Summary of results

In this thesis, I examined the link between the traditional medical knowledge and medicinal plant use in Atiu, Cook Islands, an area not previously examined by literature of Polynesian ethnomedicine. An interdisciplinary perspective using anthropological and ethnobotanical methods was used to assess the effect of healing practices on ethnomedical knowledge transmission and medicinal plant conservation.

Overall, this study showed that despite socioeconomic changes and the decline of traditional practices in general, traditional medicine in the Cook Islands continues to be used across social and geographical boundaries without apparent threats to medicinal plant populations. This effect is attributed to the adaptive properties of the healing system that maintains some traditional elements such as the family ownership of medical recipes and the absence of monetary reward for healing while allowing for innovation such as the development of new recipes for new illnesses and flexible knowledge transmission patterns. The family ownership of the recipes facilitated the conservation of both ethnomedical knowledge and medicinal plants by rendering specific families custodians of specific knowledge and plants. The moral and pragmatic driving force behind this form of biocultural conservation was the obligation that Atiuans felt towards the community's well-being as well as the association of God with healing.

In short, this study shows that traditional medicine has a positive impact on the transmission of ethnomedical knowledge and the conservation of medicinal plants as Atiuans strive to conserve medicinal plants in order to acquire the elevated social status associated with traditional healing. Soule, a fierce critic of post-modernist discourse on the deconstruction of 'nature', suggests that current trends advocating the positive role of local people in forest conservation are based on myths of western moral inferiority and constructionism (Soule 1995: 144). Taking this critique in mind, I feel the need to clarify that the positive impact of Atiuan medicinal plant management on medicinal plant conservation is not a product of an advanced knowledge system that enlightened non-westerners possess but a coping mechanism given the limited resources that islands offer

coupled with low post-migration population pressure and absence of trading. This thesis contributes to the growing trend in ethnobiology that recognises the dynamic nature of social-environmental systems (Ellen 2006a; Maffi 2004) by providing evidence of an ethnomedical system that consists of a dynamic knowledge system that adapts to changing social and environmental parameters. Furthermore, it shows that this adaptability contributes to local plant conservation; which has been argued to be a pragmatic strategy when livelihoods depend on a multitude of products produced by biodiversity (Berkes & Davidson-Hunt 2006: 44).

These overall conclusions were deduced by smaller findings presented in the following thesis chapters:

Chapter 2 showed how social and natural science methods were co-joined to address cultural and ecological factors associated with ethnomedical practices on Atiu. The employed methodology was adapted to suit the local socio-cultural context and in particular family ownership of recipes, local taboos and the highly stratified social structure. Social science methods yielded key data on plant use and natural science methods yielded key data in knowledge transmission. Therefore, data was analysed thematically and not methodologically. Two databases on illness and plants were constructed and information collected from all the methods was entered under a plant species and/or an illness category. This method of data analysis, provided an efficient way to integrate a large amount of different types of data and allow for systematic analysis without disclosing sensitive information such as the particulars of medicinal recipes.

Chapter 3 provided a geographical, historical, and social background to the Cook Islands and the island community of Atiu. It accounted for the impact of the arrival of the missionaries in 1830's and its consequences. The missionaries outlawed the practice of traditional medicine and introduced new laws and codes of behaviour. Traditional medicine continued to be used, incorporating elements from the new religion. An insight into contemporary livelihoods and social institutions such as kinship, residence and land

tenure provides the social background for the consecutive chapters. Kinship determines who has access to the knowledge and land tenure determines the location from where plant harvest is allowed. Plants, animals and spirits form part of the ceremonies associated with the Atiuan lifecycle and the exchange processes that take place during these ceremonies allow us to better understand plant management and illness treatment in the context of local exchange.

Chapter 4 discussed how plants, animals, spirits and humans co-exist in the animated social and physical landscape of Atiu. Plants served multiple roles and Atiuans did not recognise an exclusive 'medicinal plant' category. Animal husbandry has a very central role in Atiu and animals were perceived to operate as vehicles for spiritual agency. Ancestral spirits influenced the life of the living in a multitude of ways. They could act directly on humans, take the form of pigs and cause accidents or take the form of centipedes and deliver 'warning' bites.

Chapter 5 looked at traditional medicine as a system of medicinal plant use. Medicinal plants were harvested across all habitats. Healers reported harvesting plants only from land that belonged to their extended family. There was no evidence of overharvesting medicinal plants as only fresh plants are being used and healers do not receive any payment for their services. Bought or sold medicinal plants are not considered to be efficacious. Homegardens were an important site of *in situ* medicinal plant conservation where healers tended medicinal plant populations and re-planted medicinal plants from the wild. Healers and their families act as stewards of medicinal plant populations used in their recipes and ensure their viability in the wild or in the homegardens.

Chapter 6 looked at traditional medicine as a knowledge system. It showed that the concepts of *mana* and *tapu* are very influential in the operation of the ethnomedical system as they safeguard the family ownership of recipes and prevent unauthorised use. Other key elements contributing to the system's sustainability are that the healers do not charge for any part of the healing. Accepting money for healing was considered a moral transgression that would result in the removal of the gift of healing. As a result medicinal

plant trade is absent as there were no financial incentives. Furthermore, healers have to be constantly available to offer their services to the community. Consequently, they acquire a high social capital, similar to that of chiefs, which leads to an elevated social status and favourable position in the pervasive exchange network. However, these forms of incorporeal knowledge do not appeal to the young generation and even though they highly value traditional medicine as part of their culture, they did not express willingness to become healers.

Chapter 7 looked at traditional medicine as a system of treating illness. Patient health-seeking behaviour shows that patients frequently consult a wide range of traditional doctors and hospital personnel throughout the course of one illness treatment. If a treatment, either western or Maori failed to succeed, then it was considered not suitable for the illness and different treatment was sought. Hospital personnel openly dismiss Maori medicine, but privately appear to be intimately engaged with it. Throughout the preparation, healers received cues concerning the cause of illness. Traditional remedies often addressed the cause of the illness and not the symptoms. These causes were attributed to physical and spirit-induced elements that included moral transgressions, family tensions, offences against ancestral spirits and the accumulation of 'dirt' in the body.

Chapter 8 looked at traditional medicine as a culture-affirming institution in the context of social change and modernisation. Patients and healers do not engage in Maori medicine solely for therapeutic reasons but also as a way of affirming their cultural identity. The operation of a large transnational Atiuan and Cook Islander community allowed resident and migrant populations to exchange money, goods, labour services, medical recipes and medicinal plants across geographical boundaries. Therefore, new knowledge and new plants were incorporated within the existing body of ethnomedical knowledge, creating a dynamic and resilient ethnopharmacopoeia that has potential to adapt to social and environmental changes.

This chapter overview provides a condensed insight in the main conclusions of this thesis. In the next section I will further contextualise these findings in the context of knowledge transmission, illness treatment, medicinal plant conservation and social change.

9.2 *Biocultural diversity in the Pacific*

The Pacific region has a unique and unrivalled combination of geographically located biological resources that are threatened by the novel all-encompassing waves of globalisation and medicinal plants are part of it. Plant diversity including medicinal flora in Polynesian nations is prone to population extinctions and alien species invasions due to the islands isolation and size. Research in Polynesian ethnobotany has shown that Polynesian peoples have developed practices that promote conservation precisely because they live in confined and remote island land masses (Balick & Cox 1996: 182). However, the impact of traditional medical systems on plant population abundance has been poorly addressed. Therefore, it is not clear whether medicinal plant use in other Polynesian and Pacific Island ethnopharmacopoeias has had similar positive impacts on medicinal plant populations.

This thesis contributes to the critical evaluation of anthropological and biological approaches to ethnomedicine. Despite research on traditional medical systems being carried out extensively by social and natural scientists an issue that remains unqualified is the effect of knowledge transmission on plant conservation. Concerns about the loss of ethnomedical knowledge and medicinal plants make this issue particularly relevant for contemporary study. The question is how do we measure adaptation or evolution in ethnomedical systems and what is the effect of this semantic process on the plant populations utilised?

9.3 *Assessing knowledge and plant loss*

In the anthropological literature there is considerable concern about the loss of traditional environmental knowledge and similarly in the biological literature there is considerable concern about the decline of plant populations. Underlying this divergence of opinions lays not only a disciplinary bias but also the way traditional environmental knowledge is being problematised. For example, anthropologists problematise ethnomedical knowledge as a knowledge system that treats illnesses whereas biologists problematise it as a practice that uses plants; and therefore research is accordingly conducted. In order to explore new avenues on this trend, ethnomedical knowledge was problematised as a system that treats illnesses and a practice that uses plants as well. I sought to answer the following questions:

- 1) Is traditional knowledge being lost due to outmigration from rural areas or lack of interest from the new generation?
- 2) Are medicinal plants being lost due to land use management or overharvesting?
- 3) What is the link between the loss of ethnomedical knowledge and the loss of medicinal plants?

The ethnomedical system of the Cook Islands is an example of a resilient complex system that manages to adapt to socio-environmental change without changing its core structure. Where its practical value diminishes, it obtains a symbolic value that facilitates its transmission and reproduction. Furthermore, Maori medicine appears to be a sustainable system: there is limited plant over-harvesting and there is an active and well-articulated knowledge transmission mechanism that continues to operate even after large out-migration waves. Furthermore, when investigating the origin of knowledge and plants used medicinally, it was shown that a significant amount of traditional knowledge and plants are borrowed from other cultures in a historical or contemporary context. Social and economic exchange involved in asking for and receiving traditional medical treatment is interlinked with other systems of material and immaterial exchange that are

central in shaping the community cohesion, not only for the resident population of Atiu but that of their migrant network as well.

Knowledge loss was identified in a few treatments for illnesses that:

- i) were no longer present,
- ii) the recipe owners had died and did not pass on the knowledge
- iii) the recipe owners had migrated overseas

Knowledge about illnesses that were no longer present was being lost because it was not longer used. Also, some elderly healers either did not wish to pass on their knowledge or their younger relatives did not want to learn from them. As a result upon their death their knowledge is lost. Other, recipes were reported to be lost when Atiuans migrated overseas and 'took their knowledge with them', leaving no authorised healer to administer the treatment on the island. However, this knowledge could be later retrieved over the phone. Medicinal plant loss was identified paradoxically as a result of lack of habitat management and not increased land development. The link between loss of knowledge and plants cannot be addressed in a linear fashion because plants have many functions apart from their medicinal role. In Atiu, plants used for medicine are also used for food, decoration and crafts. Therefore, the loss of their medicinal function does not necessitate a loss of function *per se*. On the whole, ethnomedical knowledge and medicinal plants were not under significant threat. On the contrary, the pool of both knowledge and plants was constantly being enriched by new recipes and new plants that Atiuans learned from friends and relatives from other islands and other Polynesian nations. In this context, I would argue that cultural evolution is a more appropriate term than cultural loss.

An issue that requires further investigation is the way by which changes in knowledge systems affect plant use and vice versa. There is a growing trend in the representation of ethnomedical systems as dynamic knowledge systems that incorporate innovation and adapt to socio-environmental change. This study contributes to this trend by showing that

new knowledge and new plant management techniques are part of the 'traditional parcel'.

9.4 *Issues in plant conservation*

In our era of rapid social and environmental change, sustainable use of natural resources is seen as the only way to prevent plant extinctions from environmental degradation and over-harvesting. Underlying the project design for this interdisciplinary research was the active interest of the Cook Islands in defending their ethnomedical cultural heritage and conserving their medicinal plants.

The way ethnomedicine is practised on Atiu is an example of a traditional medical practice that incorporates conservation. The capacity of indigenous ethnomedical practices to incorporate conservation has been reported in other parts of the world as well (Balick & Cox 1996; Byers et al. 2001; Etkin 1998). What threatens medicinal plant conservation is not traditional practices but commercialisation and land development. Ethnobiological research has shown that unsustainable use is often linked to exogenous sources such as migration and rapid social and economic change (Maffi 2004: 11). The science of ethnobiology as well as historical and cultural ecology has a lot to offer to biological studies that record the dynamics of wild plant populations, because it can provide information to minimise sampling-error biases in population counts. Rare plant species suffer a low jeopardy because they tend to have both low local populations and restricted ranges (Lawton 1993). Consulting the local population on the distribution and abundance of rare medicinal plants can provide a very good guide for visiting scientists to develop efficient plant sampling strategies.

In Atiu, medicinal plants were present in all island habitats, disturbed and undisturbed. The forest was not considered a more valuable source of plants than managed habitats. On the contrary, where possible medicinal plants were transplanted in the homegardens. Homegardens have an increasingly important role as Atiuan society changes from subsistence to cash economy or rather remittance economy due to outmigration. People

aspire to minimize their visits to the forest and the plantations and spend more time around the villages, the church and the shops. Consequently, Atiuans were more familiar with medicinal plant distribution in the homegardens and than in the wild.

Concerning the human impact on the harvest of medicinal plants, population numbers of Atiu are decreasing due to emigration to the main island of Rarotonga, New Zealand and Australia and therefore there is limited human population pressure on natural resources. Also, Atiuans very frequently visit the hospital and illness is rarely treated solely by traditional medicine, easing the direct dependence on medicinal plants for treating illnesses.

Family ownership of recipes in Maori medicine acts as a mechanism preventing overharvesting medicinal plants as plants are only a small number of people have the right to use these plants medicinally. Furthermore, this system encourages the maintenance of 'useful' plant diversity because the families of the healers act as stewards for the plant populations that they were using. Medicinal plant harvest is bound by the land tenure system and as a result most healers harvest plants from their family-owned lands. Fresh plants form the basis of traditional medicine in many Pacific ethnopharmacopoeias (Johannes 1986: 204; Whistler 1992). Therefore, as it is leaves that are being harvested, rather than roots, plant reproduction is not threatened by the process of harvesting. Atiuans mentioned that it was the 'juice of the plants' that had the power to heal but could not explain the reasons behind the particular potency of fresh plants. The Atiuan term for juice is *roro*. When this term is used to denote an animal part, it refers to the brain. Sahlins noted that in Polynesia raw plants were believed to have the *mana* of the Gods and therefore could be consumed only after they were being cooked (Sahlins 1985: 113). He mentions:

'to make root crops accessible to man by cooking is precisely to destroy what is divine in them: their ability to reproduce, hence the ritual value of the raw-cooked distinction in Hawai'i and elsewhere is Polynesia'

I would argue that the emphasis on the medical potency of fresh plants on Atiu could be attributed to a semantic extension of what Sahlins noted concerning root crop use among Hawaiians. Fresh plants are considered potent because they have *mana*. Cooked, dried or processed plants do not have *mana* and cannot be used for healing purposes. The use of exclusively fresh plants allowed a kind of *in situ* conservation of medicinal populations as the absence of processing procedures like for example drying and storing in alcohol prevented overharvesting.

In Atiu, like the rest of the Cook Islands, land is not bought or sold and owned by different family groups. This pattern of land tenure, in combination with the pattern of ethnomedical knowledge transmission renders the process of medicinal plant harvest very specific. Specific people harvest specific plants from specific pieces of land and there are strict taboos prohibiting transgressions. The fear of wilderness and high values placed on cultivation led to an increased dependence on homegardens as medicinal plant repositories.

Homegardens are used to maintain plant stocks, knowledge flow, social networks and biodiversity. People maintain medicinal plants for themselves or others to use and neighbours frequently exchange plant materials. Atiuans plant medicinal plants in the homegardens because healers require easy and quick access to them upon the visit of a patient. For the same reasons of proximity and easy access, Atiuans replanted rare wild medicinal plants in the homegardens. Since medicinal plant knowledge is distributed across specific families, these families needed to ensure that the populations of the medicinal plants that they required were managed sustainably.

Homegardens are old and well-established land use systems across the world. They are diverse and have multiple social and ecological functions. Even though the agricultural role of homegardens is well documented (Brownrigg 1985; Kumar & Nair 2004; Mendez et al. 2001), their importance as a cultural space where family traditions and specialist plants are conserved is not. The majority of the published works on tropical home gardens have described their agro-ecological system, making inventories of plant species

and summarising their uses. It is increasingly recognised that to fully understand how homegardens function, and what benefits they provide to their users, socioeconomic as well as biophysical data need to become integrated and analysed (Das & Das 2005; Del Angel-Perez & Mendoza 2004). However it remains open to discussion how much socioeconomic analysis will suffice to understand the development, maintenance and function of homegardens.

9.5 Ethnomedicine and knowledge transmission

The ethnomedical system of the island of Atiu involves 500 people and 80 medicinal plants which are used to treat 89 locally recognised illnesses on the island of Atiu. When ethnobotanical knowledge and its transmission is investigated as well, then an extra thirteen islands and three additional countries come into the picture; that is the rest of the Cook Islands, Tahiti, New Zealand and Australia. Researching knowledge transmission reveals that knowledge about ethnomedical uses of plants as practiced on the island of Atiu have been taught to Atiuans from Cook Islanders from other islands, Tahitian women marrying Atiuan men and emigrated Cook Islanders who reside in New Zealand and Australia. The methodology employed focused on both illness and plants, and looked at the ways the distribution of knowledge and plants affect the practice of traditional medicine in the context of socio-environmental change.

Knowledge transmission played a key role in the operation and sustainability of the ethnomedical system. Illness events served as catalysts of ethnomedical knowledge transmission where the healer's status in the community was affirmed and new healers were appointed. There are three important concepts accompanying ethnomedical recipes in Atiu: that they are family-owned, that they are secret and that they are practiced free of charge. It is these factors that prevent the loss of knowledge and plants.

Mana and *tapu*, two concepts common in the region of Polynesia are strongly associated with ethnomedical knowledge on Atiu. *Mana* refers to the power of healing that is

transmitted through the authorisation process. *Tapu* refers to the prohibitions that if broken will lead to punishment or illness. The two main meanings of *tapu* are prohibited and sacred; however there is no distinction between prohibition and sacredness in Polynesian terms (Steiner 1999: 118). These two concepts safeguard the intellectual property rights of the owners of the recipes and prevent the unauthorised practice of the recipes. On a plant conservation level, they ensure the sustainable use of medicinal plants. The use of *tapu* as a conservation measure has also been argued for the Polynesian nation of Samoa as an adaptation to the limited resources that island landmasses offer. Cox refers to *tapu* as 'a religious system' (Balick & Cox 1996: 182) whereas in the case of Atiu it is an indigenous concept that operates within different religious and other social systems.

Weiner argued that in Polynesia, for a person to become infused with *mana* he or she must enter a state of *tapu*, where social taboos and ritual prerogatives are in effect (Weiner 1992). Similarly, in Atiu the treatment process involved the consumption or application of the medicine for three days, followed by a day of purging. Throughout the course of the treatment the patient entered a state of *tapu* and had to adhere to a set of dietary and behavioural prohibitions. Adherence to these prohibitions was an essential pre-requisite for the treatment to be efficacious. Treatments use fresh plants that are administered in the form of ointments, medicinal baths, purgatives and emetics. Internal ailments are usually treated with internal recipes that 'clean the body' whereas external ailments are treated with external applications. Internal ailments are reported to taste very bitter.

Ethnomedical knowledge in Atiu is not evenly distributed within the population. There are simple recipes known to everybody and specialised recipes owned by individual healers. Different families specialise in treating different illnesses. This pattern of ethnomedical knowledge differentiation has been reported in other Polynesian nations as well. Family ownership of recipes, not in such an elaborate form, has been described in Samoa, Tonga, Tahiti and Hawai'i (Whistler 1982). In Atiu, recipes are considered family secrets and only authorised people can use them, otherwise they are perceived to

be inefficient. Secrecy surrounding ethnomedical recipes added value to the recipes that were symbolically traded. Healers who possess specialised ethnomedical knowledge are able to authorise other people or exchange recipes with other healers.

Traditional healers usually receive payment for their services. Such examples have been reported in Africa, India and China (Bodeker et al. 1997). In Atiu and rest of the Cook Islands healing services are provided free of charge. Accepting money or goods is considered to go against the healing ethos. Healers reported that if they accepted payment then God would take away their ability to heal. Examples of commercialisation occur only in the cases of the *noni* juice and the coconut oil. The recipes for the noni juice and coconut oils (excluding the coconut oil for the children's illness *ira*) belong in the sphere of common knowledge and are not considered 'medicines' in the therapeutic sense.

Knowledge of specialised recipes was considered secret knowledge that was treated as the property of its owner. Secret knowledge was not exclusively associated with specialised ethnomedical knowledge. It was also associated with a wide range of practices such as weaving, planting, fishing, sowing and canoe making (Hartan 2002). Secrecy, as a component of an expert system, helps maintain heterogeneity in knowledge distribution, which consequently leads to heterogeneity in plant use. This was evidenced in the plethora of recipes used for the treatment of illnesses on the island. Linguistic and ethnographic evidence signify that secrecy is strongly associated with specialised knowledge in Atiu and has ramifications on knowledge transmission patterns. Therefore secrecy added not only to the value of the recipe but also safeguarded the plant populations from being over-harvested, as only a limited number of people were aware of medicinal plants' uses. Secrecy has been reported to be associated with traditional medical recipes in other ethnomedical systems as well (Buckley 1976; Golomb 1988; McKee 2005). However, in all these systems the patients paid for their treatments whereas Atiuans received Maori medical treatments for free. So why were the healers and other specialists in other trades so keen to keep their knowledge secret?

I argue that the traditional medical system of the Cook Islands is a type of exchange system where immaterial and/or material goods are being exchanged through the concept of *tūtaki*, reciprocity/paying back. Polynesian cultures historically were oral cultures where money was not used. In this context, doing favours and asking for help can be considered as acts of economic relationships (Firth 1936). Reciprocity is very strictly monitored and favours are registered by the extended family and paid back in varying time frameworks. Therefore, even though direct payment is not received for ethnomedical services, healers eventually receive an equivalent amount of services and/or goods 'in exchange'.

Even though the majority of the healers are middle-aged and older women, men are not precluded from the vocation. The association of women with healing is common in a very wide range of ethnomedical systems (Sheperd Mc Clain 1989b), including the other systems of the Polynesian region (Whistler 1992). Feminist literature argues that for women, the status of the healer gives them responsibilities beyond the confines of the household, the workplace and the outside boundaries of kinship roles. In doing so they gain degrees of freedom, prestige and influence denied to them by the more routine dimensions of their lives (Sheperd Mc Clain 1989a: 17). In the case of Atiu, female healers gained access to labour services, assistance in the much needed agricultural work and indirect material compensation, all of which are in limited supply in the context of outmigration and labour shortage.

Atiuans describe the transmission of knowledge of secret recipes as a very rigidly structured vertical process where a knowledgeable healer appoints a selected heir. This type of selective and exclusive ethnomedical knowledge transmission has been also reported in Samoa, Tonga and Hawai'i (Krauss 1993; Macpherson 1985; Parsons 1985c). However, Atiuan ethnomedical knowledge is transmitted in a much wider, more flexible and opportunistic way. I documented eight different ways via which healers acquired their knowledge. The commonly acclaimed strict vertical mode of knowledge transmission was only one of the many modes that ethnomedical knowledge was transmitted. What then motivated this mode of horizontal and almost egalitarian

knowledge transmission? It has been argued that in Polynesia, the transmission of traditional knowledge occurs within the all-pervasive context of status rivalry (Borofsky 1987). Within this context, ownership of secret knowledge, gives people not only the power to heal but also the power to choose whether to transmit this knowledge.

Ethnomedical knowledge is transmitted on a local, national as well as international level between resident and migrant Cook Islanders thus allowing for knowledge transmission across geographical boundaries. In this context of demographic change, Maori medicine resumes an increasingly social, rather than therapeutic role. This social role emphasises the caring role of the individual, strengthens family group links and defines the Maori identity, all of which have been devalued in the context of globalisation. Hewlett and Cavalli-Sforza's model of knowledge transmission considered vertical knowledge transmission more conservative in comparison to horizontal knowledge transmission (Hewlett & Cavalli-Sforza 1986). In the case of Atiu, horizontal knowledge transmission was the way new ideas and new recipes were introduced into the Atiuan ethnopharmacopoeia. These 'new' recipes were then horizontally transmitted to the younger members of the family, thus maintaining high levels of intra-cultural variation.

Young people in Rarotonga and Atiu highly valued traditional medicine and considered it an important part of their culture. Specifically, 84% of the Rarotonga children and 86% of the Atiu children that responded to my questionnaire had been actively involved in assisting members of their extended family in collecting medicinal plants or assisting household members make Maori medicine. However, they were reluctant in being authorised to become healers because of the level of commitment it entailed.

9.6 *Ethnomedicine and medical pluralism*

As traditional medicine operates in response to illness events, a more detailed analysis of the types of illnesses on the island and health-seeking behaviour was carried out. Illnesses are treated with a combination of traditional medicine and hospital treatment.

The term 'hospital' is a local term used to refer to a small clinic mainly staffed by local nurses. Data from the hospital visitation rates showed that the Atiuans visited the hospital much more than they openly talked about, especially when they advocated the potency of Maori medicine. These findings also highlight the importance of using different methods to obtain information on the same subject.

The role of women and particularly mothers as primary health providers is very common across cultures (Finerman 1989). In Atiu, the first source of health provision is the mother of the household. They are the ones who identify the illness and its cause and make the decisions concerning the type of treatment to be sought.

Medical pluralism, the co-existence of many medical systems, is common in many cultures, however the level of competition between the different medical systems varies greatly (Lock & Nichter 2003). Frequently, Atiuans reported using traditional medicine together with biomedicine in the course of the treatment for one illness, much to the fury of the doctors. Maori medicine was perceived to work faster than biomedicine, to be cleaner and more potent due to the divine creation of plants. Furthermore, western and Maori medicines are considered particularly efficient for a different set of illnesses even though for many illnesses they largely overlap. Biomedicine is thought to be efficient in curing lifestyle illnesses and respiratory diseases. On the contrary, Maori medicine was considered particularly efficient for pre- and post- natal ailments, baby illnesses and skin conditions.

For any one illness there is often more than one ethnomedical treatment. For example, on Atiu there are six different treatments for burns and twelve different diuretic potions. Different healers know how to make different recipes. Patients visited more than one healer in the course of one illness and/or the hospital serially or simultaneously. Doctors and nurses advocated a disapproval of the practice of Maori medicine and advised their patients against its use. However, as Maori medicine is so deeply integrated in all levels the society, many of the health officials turned a blind eye or secretly approved of it.

Pluralism like modernism brings increased possibilities for individual agency. Nichter argues that illness events challenge the order in one's world and the integrity of social relations. Offers or withdrawal of assistance lead to a re-evaluation of one's social capital and safety nets. In such contexts cultural values and reciprocal relations are challenged and re-ordered (Nichter 2003). Personal contacts facilitated significantly health-seeking behaviour on Atiu. Knowledge and good rapport with specialised healers with secret knowledge mediated access to their services. Lack of personal contacts or unwillingness to engage with the social network led to a preference for hospital treatments.

In Atiu and the rest of the Cook Islands, the extended family and the village control much of the social life (Borofsky 1987; Stephenson 1976). Social harmony and peace with the ancestral spirits was considered very important for health and their disruption led to illness. Supernatural causation of illness was much more prevalent in the past. Nowadays, it is only the baby illness *ira* that is considered by most people to be exclusively induced by spirits. Healers treating *ira* take an active role in family dispute resolution as well as preparing the medicine.

The belief that ancestral spirits can cause illness is found all over the Pacific (Eeuwijk 1992: 93; Krauss 1993). In the Insular Pacific theories of spirit aggression are reported for all its societies. Furthermore, there is a very strong correlation between societies that depend on animal husbandry and theories of spirit aggression as illness causation (Murdock 1980). In Atiu, pigs were the main animals that were raised and also they were the main animals that were considered to operate as a vehicle for spirit aggression. The most common reasons behind spirit-induced illness are failure in duty towards members of the joint family and neglect of the poor relatives outside it. Therefore, most cases of sickness are believed to be caused by these sins, which may be regarded as 'sins of omission' (Hogbin 1961: 52). Atiuans attribute illness to trespassing, appropriating property without consulting the extended family and mistreating their children. Similarly, in the highlands of Papua New Guinea the ghosts of kin, the caprice of spirits and the breach of social sanctions are held responsible for some illnesses, and most sickness is attributed to enemy sorcery (Johannes 1986: 189). In Atiu, despite the dominant role of

ancestral spirits in illness causation, the only form of sorcery, the curse *tauma* 'a, is attributed as the cause of very few illnesses.

Children were generally considered more susceptible to the malevolent work of the spirits and being given a 'wrong name' was considered a very frequent cause of illness. A name change can bring the illness to an end. Naming is a procedure of high symbolic significance in the Cook Islands during which genealogical ties are being affirmed. Inappropriate naming could cause the anger of a deceased ancestor. When illness is interpreted as a sanction, medical diagnosis is frequently a diagnosis of social relations of the patient and therefore illness treatment is a form of social repair (Lieban 1977: 25). This was certainly the case in Atiu where illness causation and treatment is seen to operate as a form of legal system. An understanding of illness causation led to an investigation of efficacy, as treatments were not only addressing symptoms but causes as well.

The Atiuan ethnomedicine is a system that conceals failure. Atiuans explain the lack of medical efficacy to the unsuitability of the recipe to the illness and consequently another recipe is sought. This explanation applies both to local and hospital treatments. A society's ethnomedicine constructs medical reality (Hahn & Kleinman 1983: 16) and treatments are sought according to this reality. In Atiu, medical reality consists of knowledge inherited from the ancestors, knowledge provided by doctors who sporadically visit the island and nurses trained in Rarotonga. Another pervasive element of efficacy is belief. This knowledge system is a fusion of indigenous and biomedical beliefs that are constantly negotiated in the course of illness treatment. Atiuans frequently attributed efficacy on belief by claiming that 'if you believe in it, it will work.' Kleinman has been a keen advocate of the physical effects of hope and belief such as a heightened activity of the autonomous nervous systems (Hahn & Kleinman 1983: 18).

Adherence to the healing 'protocol' ensured the healer had the *mana* to heal particular illnesses using particular plants. The healers always mentioned saying prayers throughout the procedure and asking God for help. The knowledge and norms were coming from the

ancestors but it was the Christian God who was enabling it to work. Efficacy is seen as evidence for the power and influence of God in human affairs. Primordial experiences of efficacy are preserved as a prototype of experiencing the divine power (Csordas 1996: 108). In the case of Atiu, healing is inherently linked with religious experience where people and plants operate as vehicles for supernatural powers. However, despite the prevalent ideational element in Atiuan ethnomedicine, there were some pragmatic constraints as well. These were the abundance and distribution of fresh medicinal plants in the natural environment, as without them none of the aforementioned cultural behaviour could take place.

9.7 *Traditional medicine and socio-environmental change*

The Cook Islands diaspora maintains close links with the home island and like other diasporic networks exchange goods, knowledge and facilitate the migration and employment of family network members (Fawcett 1989). There is significant transnational communication of Cook Islanders around illness events where recipes are discussed over the phone or during family re-unions. This transnational knowledge exchange pattern indicates that the ownership of a traditional medical recipe reinforces not only intra-kin but also inter-kin relationships regardless of space. If someone on Atiu needs a recipe that migrants have 'taken with them' abroad, then they could approach a resident relative of the migrant healer's family or phone the healer to inquire about the recipe. Atiuans who needed to use this recipe to treat an illness can ask the healer to authorise them and explain the recipe over the phone.

Atiuans discuss health matters and recipes when they meet other Cook Islanders abroad. This type of 'new knowledge' is later incorporated into the island pharmacopoeia, as it fits the prototype of the Maori medical recipe. New recipes are also being invented abroad and then transmitted back to Atiu, which demonstrates that this kind of knowledge is not tied to space or time. Why do Atiuans continue to maintain their ethnomedical traditions and practice Maori medicine? Atiuans are still interested in becoming 'unpaid'

healers because it adds to their social capital, it asserts the caring role of the individual within the community, it strengthens the links between family groups and contributes to the creation of a national identity; all of which have been threatened by globalisation. These attributes are very important in places where deprivation and marginalisation prevail (Cattel 2001).

Community fragmentation through the large-scale labour relocation and the devalorisation of traditional food and medicine has left both the resident community and the migrants alienated. The free association with New Zealand allows Cook Islanders to go back and forth to New Zealand without visa restrictions and also to have access to New Zealand state benefits and health care, which accentuates population movement and consequent transmission of knowledge between countries.

When in New Zealand, Atiuans find themselves alienated and marginalised occupying lowly- paid jobs and living in deprived neighbourhoods. For these migrants, the use of traditional medicine and cures from home is much more than a therapeutic tool; it is an affirmation of their identity. In more traditional societies, like that of Atiu, the self is defined external to the body, it resides in the larger social network and its representations, and personhood is stabilised by the social network and its cosmology. In modern individualistic societies, the self is totally alone in the quest for identity and recognition, perturbations and crises in the social world imply total crisis for the individual as well (Friedman 1994: 248).

Transmission of traditional medical knowledge occurs through a system of apprenticeship within the extended family group. However, the extended family is very loose concept that consists of actual groupings of people as well as a general notion of relativeness and is used differently in different concepts. As most young people leave the island after they finish school, knowledge is transmitted more flexibly in a horizontal mode, rather than a strict vertical mode due to the lack of potential recipients within the extended family group. This (re)-distribution of expertise is an example of the resilient properties of this system where existing practices operate within new population distributions.

In the past decade, social anthropologists have turned their attention to the challenge that many people face in maintaining a sense of identity in a world where boundaries are breaking down and societies are changing rapidly. Globalisation has led to insecurity and disadvantage for many people and they have reacted by seeking to establish or maintain a sense of continuity, which is often called 'tradition'. In many ways, however, this tradition is a self-conscious construct, which selects certain elements of a past lifestyle to recombine them in a new manner that is both pleasing and useful for contemporary societies. Atiuan ethnomedicine has adapted not only to cater for new illnesses on the island but also new concepts of social status and cultural identity.

A key part of tradition and identity for most people is a sense of place, or having 'roots' in a particular locality, region or country and for Cook Islanders using traditional medicine is one way of achieving this goal. This sense of place is not a simply an abstract concept. It is an exceptionally powerful and complex concept that is embedded in identity. Engaging in Maori medicine is not an isolated therapeutic act; it is a process that involves the transactional history between the family of the healer and the patient, as well as the current working relationships between the healer and the patient. The manner in which people engage with their cultural heritage, which elements they consider to be most significant, what they can do with it are all affected by socio-cultural expectations and norms. For example, the school children in Atiu and Rarotonga who completed the questionnaires accounted for Maori medicine as a much more important part of their culture than weaving crafts. However, how 'traditional' are the practices labelled as Maori medicine is subject to interpretation and calls for the re-examination of operational definitions. Pacific scholars commonly advocate that 'traditional medicines' in the Pacific are not closed entities and have incorporated European practices through the missionaries as well as other Pacific island elements through extensive migration (Hooper 1985; Macpherson 1985; Whistler 1992).

The status of tradition in the South Pacific (*kastom* in Melanesia) has come under serious scrutiny and deconstruction (Demian 2006; Linnekin 1992). There is a disjuncture

between continuity with past practices and beliefs and the contemporary 'invention' of the past and adaptation to the present. The past is honoured but few wish to live there. Therefore, in the contemporary context traditions can serve as specifications for identifying, reasoning about and solving situational problems in a social context (Fischer 1996). In the realm of health-seeking behaviour tradition provides parameters within which acceptable decisions can be made, and these parameters may widen or contract depending on the extent to which other constraints or opportunities gain priority (Wiley 1992).

There is a general tendency toward cultural revivalism, which is due to the security and even salvation provided by a traditionalist identity in time of crisis. It is fixed and ascribed, provides a medium for engagement in a larger collectivity and provides a set of standards, values and rules for living. In such periods traditionalism is expressed in the desire for roots, the ethnification of the world, the return to religion and stable values (Friedman 1994: 243). In the context of outmigration and unstable residence patterns the inclusive ethos of the *kōpū tangata* and the willingness of the healers to harvest and administer local remedies free of charge provide fixed values and commonly accepted codes of behaviour that are not easily found elsewhere.

9.8 Recommendations for further ethnobiological research

Adding a spatial and temporal dimension in the documentation of ethnobotanical practices can allow ethnobotanists to situate the value and place of traditional plant use in the context of change. The knowledge and plants employed in ethnomedicine are not tied to a historical past neither to a specific location like that of the 'wild forest'. Adaptation and exchange are integral parts of the evolution of ethnobiological practices. In Atiu, new knowledge and new plants are incorporated in seemingly 'local' practices following the prototype of 'Maori medicine'. I would therefore recommend that the acknowledgement and identification of the source and types of changes become part of basic analyses of ethnomedical systems. However, if we take constant change as the norm, what would be

an appropriate way to reference research published in varying chronological orders? Can we say for example the Samoan ethnomedical system entails x,y and z referring to an account written two decades ago? Should we assume that it would have certainly changed by the time we refer to it and if so how will we be able to identify, let alone reference what elements change and which stay the same?

Accounting for change is particularly challenging in an interdisciplinary field such as ethnobotany where changes occur in social as well as environmental realms. Ethnobiological methodologies can be further enriched by anthropological methodology as well as ecological methodology in order to enhance further research in the dynamic relationship between ethnomedical systems and medicinal plant populations. As discussed previously, the two diverse realms of inquiry; namely that of illness and that of plants are typically being selected as focal points of investigation by social and natural scientists respectively. The event where these two lines of enquiry converge is the use of medicinal plants for the treatment of an illness. When these events are studied ethnobotanically, a dual enquiry on the nature of treated illness and the used plants is paramount to understand the articulation of these events. The challenge lies in the incorporation of ethnomedical research into broader research. The methods employed need to allow for the documentation of the varied role of ethnomedical systems, not only as ecological but as social systems (Berkes & Folke 2001)

A surprising number of agricultural studies are limited to 'doorway' interviews (Finerman & Sackett 2003) and their responses are moulded into standardised data analysis units, including labour hours, productivity and plant uses. The need to move medical ethnobiological research from species inventories and descriptions to establishing underlying concepts and general principles has been repeatedly expressed over the last two decades (Carlson & Maffi 2004a; Ellen 1996; Etkin 1988b). A plant inventory or a table of time allocation does not explain *why* these plants are used. The cultural beliefs, customs and taboos of the households *do* explain the diversity and rationale of ethnobotanical uses.

Does the analysis need to extend to the realm of anthropological research and incorporate issues of kinship and land tenure? Systems of land tenure, which are frequently overlooked, are important determinants of ethnomedical systems. The existence of ownership or similar rights determines whether the family has the right to improve the land, expand the plot and/or receive any long-term benefits such as harvesting plant parts (Mitchell & Hanstad 2004b; Soini 2005). In a similar fashion, kinship is closely linked with material and immaterial inheritance patterns (Parkin & Stone 2004). Who is related to who physically or symbolically determines their potential in acquiring material wealth such as land and/or its resources? Similar principles apply to the inheritance of immaterial wealth such as social capital and specialised techniques of natural resource use. Certainly, in the case of Cook Islands, kinship and land tenure determine access to ethnomedical knowledge as well as access to plant resources; therefore rendering them crucial factors in ethnobotanical study.

So how can we study a dynamic practice like that of medicinal plant use that is bound by social and environmental conditions and is constantly changing? First of all diachronically, investigating past functions of ethnomedicine, documenting their present state and asking young people about their future aspirations. Secondly, looking at practices geographically, tracing back where the knowledge and the plants come from. The methods employed need to be able to incorporate spatial and temporal dimension of medicinal plant use. Furthermore, social norms and social relations with the land bind medicinal plant harvest. Therefore key aspects of social organisation such as kinship, land tenure and residence patterns become pivotal in understanding how people gain the right to dwell in the land and harvest resources. A way forward is for ecological data to be coupled with ethnographic research and progressively contextualised quantitative data analysis within the socio-economic profile of the area studied.

The 21st century has seen a continual movement of peoples from rural regions to cities, both locally and across borders. Future ethnobotanical research should be geared towards researching the relation between plants, health and identity in a local as well as global context. This way ethnobotanical research can contribute towards the re-

conceptualisation of theories of rural/urban migration, and 'traditional' 'local' knowledge by highlighting the ways in which urban/rural connections are maintained, transmitted and transformed, and the dynamic nature of traditional practices in the context of global cities and rural sources of outmigration. In such processes of migration, local knowledge, including plant use, takes on new meanings, such as negotiating cultural identities. Only then future medical ethnobiological research will be able to highlight the dynamic role of traditional medical systems in the conservation of ethnomedical knowledge and medicinal plants. Could we finally re-conceptualise traditional knowledge as new, situate local knowledge internationally or even possibly talk about 'rural cities' and 'urban villages'?

9.9 Policy recommendations

The Convention of Biological Diversity is the first legal international instrument to address biological diversity conservation and medicinal plants have been acknowledged as an important component of biological diversity. In the Red Data Book of Threatened species, the IUCN uses measures of rarity, rates of decline and population fragmentation to categorise species according to their risk of extinction. Kunin and Hartley argue that most quantitative measures of these three concepts are linked to scale and particularly area-of-occupancy ratio. In their study of rarity estimates for two British plants they demonstrate a 200-fold reversal in their relative rarity when measured at different scales (Hartley & Kunin 2003: 1559).

This study highlights the need for conservation indices such as the IUCN Red Data Book on Threatened Species plant categories not only to be reassessed ecologically but also anthropologically, as anthropological research into plant management can shed light into the very important issues of rarity, rates of decline and population fragmentation of medicinal plant populations. This is because social, political and economic considerations also have a spatial component that can influence the interplay between distribution patterns and extinction risks (Hartley & Kunin 2003: 1567). And unless these social,

political, economic *and cultural* considerations remain in the fringes of conservation policies, the future of medicinal plants will remain uncertain.

One way scientists can deal with complex and heterogeneous datasets in order to inform policy-making is through the use of databases. The creation of searchable databases for dissemination via the web was identified by the Royal Society as a key step towards the conservation of plant diversity (The Royal Society 2003: 30). Furthermore, databases that incorporate scientific and socio-economic data can be used to efficiently address key macroquestions in social and environmental change. An example of such a database is the Cook Islands Biodiversity Database that was used extensively for this research. This database contains taxonomic, ecological, social and historical information on an extensive number of biologically identified species of plants and animals. The wealth and contemporary relevance of this data base is attributed to the efforts of Gerald McCormack and the Cook Islands Natural Heritage project that have been cataloguing information and acting as a focal point for visiting researchers for the last 20 years. Furthermore, the wealth of catalogued information is attributed to the high level of public participation in providing information not only on the species ecological distribution but also on their cultural significance. The importance of long-term monitoring and public involvement were highlighted by Parr and his colleagues as necessary elements in understanding the factors determining the vulnerability and resilience of the nature-society system to change (Parr et al. 2003: 1).

The contribution of social sciences to biodiversity conservation is finally being recognised. Alan Thornhill, the Executive Director of the Society for Conservation Biology stated triumphantly:

‘In a world increasingly dominated by humans and influenced by human interactions with each other and the environment, conservation biology must meet complex challenges with our social science colleagues as close allies; their expertise and experience should inform all conservation actions. We thank our

colleagues in the social sciences for reminding us of the importance of a holistic approach to conserving biodiversity.’ (Thornhill 2003: 1476)

Let’s hope that in the years to come we will see this recognition and gratitude expressed in further research development and practice; and not just courteous expressions of civility.

This research aims to be a positive contribution in the interdisciplinary efforts that have been mounted to curb the erosion of biodiversity and ameliorate human welfare. At present, the rate and extent at which genetic resources are being depleted worldwide threatens species extinction to an extent never before experienced in human history. Closer attention to the social and cultural matrix in which those plants are embedded, including the various contexts of their use, is needed to identify culturally and ecologically informed ‘best practice’ for dealing with these problems.

The application of ethnopharmacologic data to the resolution of health and wider social problems worldwide has been very poorly discussed. Whereas some envision the improvement of welfare only in terms of more efficient manufacture, distribution and administration of biomedicine, I would like to advocate the central role not only of indigenous healers but also non-western medicines in local health security and community well-being. As already argued by Carlson and Maffi ‘the conservation of biological diversity and the maintenance of healthy ecosystems should proceed hand in hand with support of the survival, health and continued development of traditional societies’ (Carlson & Maffi 2004b: 5). Furthermore, only if more serious consideration is given to the viewpoint that ‘the wisdom of the bodies must be understood in the light of the cultural wisdom of societies’ (Hahn & Kleinman 1983: 19), then the advancement of human welfare can proceed hand in hand with the conservation of biocultural diversity.

I envisage that the proposed research will be conducive to the advancement of research in the social and natural sciences, for the promotion of multicontextual research on the complex relationships between humans and their environment, and for the design of

applicable solutions to the multicausal problems associated with modernisation, culture change and the transformation of traditional environmental knowledge.

10 Bibliography

- Abel, S., J. Park, D. Tipene-Leach, S. Finau & M. Lennan. 2001. Infant care practices in New Zealand: a cross-cultural qualitative study. *Social Science & Medicine* **53**, 1135-1148.
- Agelet, A., B.M. Angels & J. Valles. 2000. Homegardens and their role as a main source of medicinal plants in mountain regions of Catalonia (Iberian peninsula). *Economic Botany* **54**, 295-309.
- Agrawal, A. 1995. Dismantling the divide between indigenous and scientific knowledge. *Development and Change* **26**, 413-439.
- Akerele, O., V. Heywood & H. Synge (eds) 1991. *The Conservation of Medicinal Plants*. Cambridge: Cambridge University Press.
- Alcorn, J.B. 1981. Factors influencing botanical resource perception among the Huastec: suggestions for future ethnobotanical inquiry. *Journal of Ethnobiology* **1**, 221-230.
- Alexiades, M.N. (ed.) 1996. *Selected Guidelines for Ethnobotanical Research : a Field Manual*. New York: New York Botanical Gardens.
- . 1999. Ethnobotany of the Ese Eja: Plants, Health and Change in an Amazonian Society: PhD thesis, City University of New York.
- . 2004. Ethnobiology and globalisation: science and ethics at the turn of the century. In *Ethnobotany and the Conservation of Biocultural Diversity* (eds) T.J.S. Carlson & L. Maffi, 283-306. New York: The New York Botanical Gardens.
- Alland, A. 1970. *Adaptation in Cultural Evolution: an Approach to Medical Anthropology*. New York: Columbia University Press.
- Ama, A. 2003. Maeva: Rites of passage, the highlights of family life. In *Akono'anga Maori: Cook Islands Culture* (eds) R. Crocombe & M.T. Crocombe, 119-126. Suva, Fiji; Rarotonga, Cook Islands: Institute of Pacific Studies and Cook Islands Extension Centre, University of the South Pacific.
- Anderson, D., J. Salick, R.K. Moseley & O. Xiaokun. 2005. Conserving the sacred medicine mountains: a vegetation analysis of Tibetan sacred sites in Northwest Yunnan. *Biodiversity and Conservation* **14**, 3065-3091.
- Appleyard, R.T. & C.W. Stahl. 1995. *South Pacific Migration: New Zealand Experience and Implications for Australia*. Australian Agency for International Development.
- Association of Social Anthropologists of the Commonwealth. 1999. Ethical guidelines for good research practice. <http://les1.man.ac.uk/asa/Ethics/ethics.htm>, last accessed: 10/2/2003
- Baddeley, J. 1985. Traditional healing practices of Rarotonga, Cook Islands. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 129-143. Honolulu: University of Hawai'i Press.
- Baer, H.A. 1989. The American dominative medical system as a reflection of social relations in the larger society. *Social Science and Medicine* **28**, 1103-1112.
- Balée, W. 1994. *Footprints of the Forest. Ka-apor Ethnobotany-the Historical Ecology of Plant Utilisation by an Amazonian People*. New York: Colombia University Press.

- (ed.) 1998. *Advances in Historical Ecology*. New York: Columbia University Press.
- Balick, M.J. & P.A. Cox. 1996. *Plants, People and Culture. The Science of Ethnobotany*. New York: Scientific American Library.
- Barker, J.A. 1989. Western medicine and the continuity of belief: the Maisin of Collingwood Bay, Oro Province. In *A Continuity Trial of Treatment. Medical Pluralism in Papua New Guinea* (eds) S. Frankel & G. Lewis, 69-94. Dordrecht: Kluwer Academic Publishers.
- Beaglehole, E. 1948. Social and Political Changes in the Cook Islands. *Pacific Affairs* **21**, 384-398.
- Beaglehole, E. & P. Beaglehole. 1971 [1938]. *Ethnology of Puka Puka* **150**. Honolulu: Bernice P. Bishop Museum.
- Becker, A.E. 1994. Nurturing and negligence: working on others' bodies in Fiji. In *Embodiment and Experience. The Existential Ground of Culture and Self* (ed.) T. Csordas, 100-115. Cambridge: Cambridge University Press.
- Becket, J. 1971. Social change in Puka Puka. In *Polynesia. Readings of a Culture Area* (ed.) A. Howard, 280-300. Scranton: Chandler Publishing Company.
- Begon, M., J.L. Harper & C.R. Townsend. 1996. *Ecology*. Oxford: Blackwell Science.
- Bellwood, P. 1969. Archaeology on Rarotonga and Aitutaki, Cook Islands: a preliminary report. *Journal of the Polynesian Society* **78**, 517-530.
- . 1974. Prehistoric contacts in the Cook Islands. *Mankind* **9**, 278-280.
- Benjamin, T.J., P.I. Montanez, J.J.M. Jimenez & A.R. Gillespie. 2001. Carbon, water and nutrient flux in Maya homegardens in the Yucatan peninsula of Mexico. *Agroforestry Systems* **53**, 103-111.
- Berkes, F. 1999. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Philadelphia: Taylor and Francis.
- Berkes, F. & I.J. Davidson-Hunt. 2006. Biodiversity, traditional management systems, and cultural landscapes: examples from the boreal forest of Canada. *International Social Science Journal* **58**, 35-47.
- Berkes, F. & C. Folke. 2001. *Linking Social and Ecological Systems*. Cambridge: Cambridge University Press.
- Berlin, B. 1992. *Ethnobiological Classification: Principles of Categorisation of Plants and Animals in Traditional Societies*. New Jersey: Princeton University Press.
- Berlin, E.A. & B. Berlin. 1996. *Medical Ethnobiology of the Highland Maya of Chiapas, Mexico*. Princeton: Princeton University Press.
- Bernard, H.R. 2002. *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. London: Sage publications.
- Biggs, B. 1985. Contemporary healing practices in East Futuna. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 108-128. Honolulu: University of Hawai'i Press.
- Bloch, M. 1990. Language, anthropology and cognitive science. *Man* **26**, 183-198.
- Bodeker, G., K.K.S. Bhat, J. Burley & P. Vantomme (eds) 1997. *Medicinal Plants for Forest Conservation and Health care* (Non-wood forest products series **11**). Rome: Food and Agriculture Organisation of the United Nations.
- Booth, H. 1999. Pacific Island suicide in comparative perspective. *Journal of Biosocial Science* **31**, 433-448.

- Borofsky, R. 1987. *Making History. Pukapukan and Anthropological Constructions of Knowledge*: Cambridge University Press.
- Boulos, L. 1983. *Medicinal Plants of North Africa*. Michigan: Reference publications.
- Bourdy, G. & A. Walter. 1994. Traditional medicine and history in Tahiti. In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L. Crowl, 7-34. Suva: Institute of Pacific Studies, University of the South Pacific.
- Boyd, R. & P.J. Richerson. 1985. *Culture and the Evolutionary Process*. London: The University of Chicago Press.
- Brownrigg, L. 1985. *Home Gardening in International Development: What the Literature Shows*. League for International Food Education.
- Buckley, A.D. 1976. The secret-an idea of Yoruba medicinal thought (trans.) Association of Social Anthropologists. In *Social Anthropology and Medicine* (ed.) J.B. Loudon, 397-421. Monograph 13. London: Academic Press.
- Buse, J. & R. Taringa. 1995. *Cook Islands Maori Dictionary*. Canberra: The Cook Islands Ministry of Education, Australian National University.
- Byers, B.A., R.N. Cunliffe & A.T. Hudak. 2001. Linking the conservation of culture and Nature: A Case Study of Sacred forests in Zimbabwe. *Human Ecology* **29**, 187-218.
- Cambie, R.A. & A.A. Brewis. 1997. *Anti-fertility Plants of the Pacific*. Melbourne: CSIRO.
- Carlson, T.J.S. & L. Maffi (eds) 2004a. *Ethnobotany and Conservation of Biocultural Diversity*. New York: The New York Botanical Gardens.
- . 2004b. Introduction: ethnobotany and the conservation of biocultural diversity. In *Ethnobotany and Conservation of Biocultural Diversity* (eds) T.J.S. Carlson & L. Maffi, 1-8. New York: The New York Botanical Gardens.
- Casson, R.W. 1983. Schemata in cognitive anthropology. *Annual Review of Anthropology* **12**, 429-462.
- Cattel, V. 2001. Poor people, poor places and poor health: the mediating role of social networks and social capital. *Social Science & Medicine* **52**, 1501-1516.
- Chambers, A. & Chambers K.S. 1985. Illness and healing in Nanumea, Tuvalu. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 16-50. Honolulu: University of Hawai'i Press.
- Clerk, C. 1995. 'That isn't really a pig': spirit traditions in the Southern Cook Islands. In *South Pacific Oral Traditions* (eds) R. Finnegan & M. Orbell, 161-176. Bloomington and Indianapolis: Indiana University Press.
- Connor, L.H. 2004. Relief, risk and renewal: mixed therapy regimens in an Australian suburb. *Social Science and Medicine* **59**, 1695-1705.
- Convention on Biological Diversity. 1998. *Convention on Biological Diversity : Text and Annexes*. Montreal Secretariat of the Convention on Biological Diversity.
- Cook, G.C. (ed.) 1996. *Manson's Tropical Diseases*. London: WB Saunders Company Ltd.
- Cook Islands Statistics Office. 2001. Census and surveys. Rarotonga: Cook Islands Government.

- Cox, P.A. 1991. Polynesian herbal medicine. In *Islands, Plants and Polynesians: an Introduction to Polynesian Ethnobotany* (eds) P.A. Cox & S.A. Banack, 147-168. Portland, Oregon: Dioscorides Press.
- Crocombe, R. 1967. From ascendancy to dependency: the politics of Atiu. *Journal of Pacific History* **2**, 97-111.
- . 1971a. Overview: The pattern of change in Pacific land tenures. In *Land Tenure in the Pacific* (ed.) R. Crocombe, 1-25. Melbourne: Oxford University Press.
- . 1971b. The Cook, Niue and Tokelau Islands: fragmentation and emigration. In *Land Tenure in the Pacific* (ed.) R. Crocombe, 60-90. Melbourne: Oxford University Press.
- . 2001. *The South Pacific*. Suva, Fiji: The University of South Pacific.
- . 2003. Introduction: The evolution of Cook Islands culture. In *Akono'anga Maori: Cook Islands Culture* (eds) R. Crocombe & M.T. Crocombe, 11-22. Suva, Fiji; Rarotonga, Cook Islands: Institute of Pacific Studies and Cook Islands Extension Centre, University of the South Pacific.
- Crocombe, R. & M.T. Crocombe (eds) 2003. *Akono'anga Maori: Cook Islands Culture*. Suva, Fiji; Rarotonga, Cook Islands: Institute of Pacific Studies and Cook Islands Extension Centre, University of the South Pacific.
- Crocombe, R.G. 1964. *Land Tenure in the Cook Islands*. Melbourne: Oxford University Press.
- . 1990. *Voluntary Service and Development in the Cook Islands*. Rarotonga and Suva: Cook Islands Extension Centre and Institute of Pacific Studies of the University of the South Pacific.
- Crocombe, R.G. & V. Rere. 1959. Naming in Atiu. *Journal of Polynesian History* **68**, 180-188.
- Csordas, T.J. 1996. Imaginal performance and memory in ritual healing. In *The Performance of Healing* (eds) C. Laderman & M. Roseman, 91-114. New York: Routledge.
- Cunningham, A.B. 1993. *African Medicinal Plants. Setting Priorities at the Interface between Conservation and Primary Healthcare*. UNESCO.
- . 2001. *Applied Ethnobotany*. London: Earthscan.
- D'Andrade, R.G. 1995. *The Development of Cognitive Anthropology*. Cambridge: Cambridge University Press.
- Das, T. & A.K. Das. 2005. Inventorying plant diversity in the homegardens; a case study in Barak Valley, Assam, North East India. *Current Science* **89**, 155-163.
- Davidson-Hunt, I. 2000. Ecological ethnobotany: Stumbling toward new practices and paradigms. *MASA Journal* **16**, 1-13.
- Davies, G. 1994. The medical culture of the Ovambo of southern Angola and northern Namibia: PhD thesis, University of Kent.
- Davis, J. 1992. *Exchange*. Buckingham: Open University Press.
- Del Angel-Perez, A.L. & M.A. Mendoza. 2004. Totonac homegardens and natural resources in Veracruz, Mexico. *Agriculture and Human Values* **21**, 329-346.
- Demian, M. 2006. Reflecting on loss in Papua New Guinea. *Ethnos* **71**, 507-532.
- Donner, W.W. 1992. Lineages and land disputes on a Polynesian outlier. *Man* **27**, 319-339.

- Dove, M. 1985. The agroecological mythology of the Javanese and the political economy of Indonesia. *Indonesia* **39**, 1-36.
- . 1993. A revisionist view of tropical deforestation and development. *Environmental Conservation* **20**, 17-24.
- . 2002. Hybrid histories and indigenous knowledge among Asian rubber smallholders. *International Social Science Journal* **54**, 349-359.
- Eeuwijk, B.O. 1992. *Small but strong. Cultural contexts of (mal-) nutrition among the Northern Kwanga (East Sepik Province, Papua New Guinea)* Basler Beitrage zur Ethnologie. Basel: Wepf & Co. AG Verlag.
- Ellen, R. 2003. Variation and uniformity in the construction of biological knowledge across cultures. In *Nature across cultures: views of nature and the environment in non-western cultures* (ed.) H. Selin, 47-74. London: Kluwer Academic Publishers.
- (ed.) 2006a. *Ethnobiology and the Science of Humankind*. Oxford: Blackwell.
- . 2006b. Introduction. In *Ethnobiology and the Science of Humankind* (ed.) R. Ellen. 1-23 Oxford: Routledge.
- . 2006c. *The categorical impulse: essays on the anthropology of classifying behaviour*. New York: Bergahn Books.
- . 2007a. How ethnobiological classification respond to the introduction, loss and changing significance of plant species: Department of Anthropology, University of Kent.
- . 2007b. Local and scientific understanding of forest diversity on Seram, Eastern Indonesia. In *Local Science vs. Global Science. Approaches to Indigenous Knowledge in Development* (ed.) P. Sillitoe, 41-74. New York: Berghan Books.
- . 1996. Putting plants in their place: anthropological approaches to understanding the ethnobotanical knowledge of rainforest populations. In *Tropical Rainforest Research: Current Issues* (eds) S.E. Edwards, W.E. Booth & S.C. Choy, 457-465. Kluwer: Dordecht.
- , R. 1990. Trade, environment and the reproduction of local systems in the Moluccas. In *The Ecosystem Approach in Anthropology* (ed.) E.F. Moran, 191-227. Michigan: The University of Michigan Press.
- Ellen, R. & H. Harris. 2000. Introduction. In *Indigenous Environmental Knowledge and its Transformations* (eds) R. Ellen, P. Parkes & A. Bicker, 1-34. London: Hardwood Academic Publishers.
- Ellen, R., P. Parkes & Bicker A. (eds) 2000. *Indigenous environmental knowledge and its transformations*. London: Hardwood Academic Publishers.
- Elvin-Lewis, M. & W.H. Lewis. 1995. New concepts in medical and dental ethnobotany. In *Ethnobotany. Evolution of a Discipline* (eds) R.E. Schultes & R.E. Reis, 303-310. London: Chapman and Hall.
- Elzing, C.L., D.W. Salzer, J.W. Willoughby & G. J.P. 2001. *Monitoring Plant and Animal Populations*. London: Blackwell Science.
- Etkin, N.L. 1986. Multidisciplinary perspectives in the interpretation of plants used in indigenous medicine and diet. In *Plants in Indigenous Medicine and Diet. Biobehavioural Approaches* (ed.) N.L. Etkin, 2-30. Bedford Hills, New York: Redgrave Publishing Company.
- . 1988a. Cultural constructions of efficacy. In *The Context of Medicines in Developing Countries* (eds) S. van der Geest & S.R. Whyte, 229-326. Dordecht: Kluwer.

- . 1988b. Ethnopharmacology-biobehavioral approaches in the anthropological study of indigenous medicines. *Annual Review of Anthropology* **17**, 23-42.
- . 1998. Indigenous patterns of conserving biodiversity: pharmacologic implications. *Journal of Ethnopharmacology* **63**, 233-245.
- . 2002. Local knowledge of biotic diversity and its conservation in rural Hausaland, northern Nigeria. *Economic Botany* **56**, 73-88.
- Farnsworth, N.R. & D.D. Soejarto. 1991. Global importance of medicinal plants. In *The Conservation of Medicinal Plants* (eds) O. Akerele, V. Heywood & H. Synge, 25-52. Cambridge: Cambridge University Press.
- Fawcett, J.T. 1989. Networks, linkages, and migration systems. *International Migration Review* **23**, 671-680.
- Finau, S.A. 1994. Traditional medicine in modern Pacific: a dilemma or a blessing? In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L. Crowl, 47-64. Suva: Institute of Pacific Studies, University of the South Pacific.
- Finerman, R. 1989. The forgotten healers: women as family healers in an Andean community. In *Women as Healers. Cross-cultural perspectives* (ed.) C. Sheperd Mc Clain, 24-41. New Brunswick: Rutgers University Press.
- Finerman, R. & R. Sackett. 2003. Using home gardens to decipher health and healing in the Andes. *Medical Anthropology Quarterly* **17**, 459-482.
- Firth, R. 1936. *Primitive Polynesian Economy*. London: Routledge & Kegan Paul.
- . 1941. The analysis of Mana: an empirical approach. In *Polynesian Anthropological Studies*. Memoirs of the Polynesian Society. 189-216. Wellington: Thomas Avery and Sons limited.
- Fischer, M. 1996. Thinking with others: 'Modern' traditions in Pakistan and the Cook Islands. Paper presented to the Culture as distributed cognition. American Anthropological Association Meetings, 1996.
- . 2004. Powerful knowledge: Applications in a cultural context. In *Development and Local Knowledge. New approaches to Issues in Natural Resources Management, Conservation and Agriculture* (eds) P. Sillitoe, A. Bicker & J. Pottier, 1-10. London: Routledge.
- Fischer, M.D., R. Ellen, D. Zeitlyn, G. Martin, G. Bowman, R. Puri, J. Bagg, D. Novellino & S.A. Vougioukalou. 2007. *Interactive data collection-reproduction/Transmission of environmental knowledge*. University of Kent.
- Florey, M.J. & X.Y. Wolff. 1998. Incantations and herbal medicines: Alune ethnomedical knowledge in a context of change. *Journal of Ethnobiology* **18**, 39-67.
- Fosberg, F.R. 1991. Polynesian plant environments. In *Islands, Plants and Polynesians: an Introduction to Polynesian Ethnobotany* (eds) P.A. Cox & S.A. Banack. Portland, Oregon: Dioscorides Press.
- Frankel, S. & G. Lewis (eds) 1989a. *A Continuity Trial of Treatment: Medical Pluralism in Papua New Guinea*. Dodrecht: Kluwer Academic Publishers.
- . 1989b. Patterns of continuity and change. In *A continuity Trial of Treatment: Medical Pluralism in Papua New Guinea* (eds) S. Frankel & G. Lewis, 1-34. Dodrecht: Kluwer Academic Publishers.
- Friedman, J. 1994. *Cultural Identity and Global Process*. London: Sage Publications.

- Geertz, C. 1969. Two types of ecosystems. In *Environment and Cultural Behaviour. Ecological Studies in Cultural Anthropology* (ed.) A.P. Vayda, 202-220. New York: The Natural History Press.
- Gill, W.W. 1995 [1894]. *From Darkness to Light in Polynesia*. Suva: University of South Pacific.
- Glaskin, K. 2005. Innovation and ancestral revelation: the case of dreams. *Journal of the Royal Anthropological Institute* **11**, 297-314.
- Golomb, L. 1988. *An Anthropology of Curing in Multiethnic Thailand*. Urbana University of Illinois Press.
- Guiart, J. 1962. The millenian aspect of conversion to Christianity in the South Pacific. In *Millenial Dreams in Action* (ed.) L. Thrupp, 122-138. New York: Cambridge University Press.
- Hahn, R.A. & A. Kleinman. 1983. Belief as a pathogen, belief as a medicine: 'Voodoo death' and the 'placebo phenomenon' in anthropological perspective. *Medical Anthropology Quarterly* **14**, 3-19.
- Hamilton, A. 2003. Medicinal plants and conservation: issues and approaches. WWF, London <http://www.wwf.org.uk/filelibrary/pdf/medplantsandcons.pdf>
- Handy, E.S.C. 1978 [1927]. *Polynesian Religion*, volume **34**. Honolulu: Bernice P. Bishop Museum.
- Hartan, M. 2002. Traditional knowledge in the Cook Islands. Paper presented in *5th European Society for Oceanists conference*. Vienna.
- Hartley, S. & W.E. Kunin. 2003. Scale dependency of rarity, extinction risk, and conservation priority. *Conservation Biology* **17**, 1559-1570.
- Hecht, J.A. 1985. Physical and social boundaries in Pukapukan theories of disease. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 144-156. Honolulu: University of Hawai'i Press.
- Heckler, S. 2004. Cultivating sociality: aesthetic factors in the composition and function of Piaroa homegardens. *Journal of Ethnobiology* **24**, 203-232.
- Heinrich, M., A. Pieroni & P. Bremner. 2005. Medicinal plants and phytomedicines. In *The Cultural History of Plants* (eds) G. Prance & M. Nesbitt, 205-238. New York: Routledge.
- Helman, C.G. 2001. *Culture, Health and Illness*. London: Arnorld.
- Herdt, G.H. 1989. Doktas and shamans among the Sambia of Papua New Guinea. In *A Continuity Trial of Treatment: Medical Pluralism in Papua New Guinea* (eds) S. Frankel & G. Lewis, 95-114. Dordrecht: Kluwer Academic Publishers.
- Hewlett, B.S. & L.L. Cavalli-Sforza. 1986. Cultural transmission among Aka pygmies. *American Anthropologist* **88**, 922-934.
- Heywood, V.H. & S.D. Davis. 1995. Introduction. In *Centres of Plant Diversity. A Guide and Strategy for their Conservation* (eds) S.D. Davis, S.D. Heywood & A.C. Hamilton, 10-38. London: WWF and IUCN.
- Hickling, H.H. 1945. Notes on the adoption and naming of children in Mangaia. *Journal of the Polynesian Society* **54**, 83-86.
- Hiroa, T.R. 1971 [1934]. *Mangaian Society*, volume **122**. Honolulu: Bernice P. Bishop Museum.
- Hobsbawm, E. & T. Ranger. 1984. *The Invention of Tradition*. Cambridge: Cambridge University Press.

- Hogbin, H.I. 1961. *Law and Order in Polynesia. A Study of Primitive Legal Institutions*. Hamden: The Shoe String Press, Inc.
- Hooper, A. 1985. Tahitian healing. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 159-198. Honolulu: University of Hawai'i Press.
- Idiens, D. 1990. *Cook Islands Art*. London: Shire Ethnography Publishing.
- Inglis, J.T. (ed.) 1993. *Traditional Ecological Knowledge. Concepts and Cases*. Ottawa: International Development Research Centre.
- International Council for Science. 2002. *Science and Traditional Knowledge*. Report from the ICSU Study Group on Science and Traditional Knowledge. <http://www.icsu.org/Library/ProcRep/TK-report/finalTKreport.pdf>, Last accessed: 15/3/2003
- International Society of Ethnobiology. 1998. Code of Ethics. <http://users.ox.ac.uk/~wgtrr/isecode.htm>, Last accessed: 5/2/2003
- Jenkins, R.W.G. & S.R. Edwards. 2000. *Sustainable use of wild species-a draft guide for decision makers*. IUCN-The World Conservation Union.
- Johannes, A. 1986. Medicinal plants in the New Guinea highlands: an ethnopharmacologic and phytochemical update. In *Plants in Indigenous Medicine and Diet. Biobehavioural Approaches* (ed.) N.L. Etkin, 186-210. Bedford Hills, New York: Redgrave Publishing Company.
- Johnston, W.B. 1953. Land, people, and progress in the Cook Islands. *Economic Geography* **29**, 107-124.
- Kauraka, K. 1982. *Tales of Manihiki*. Suva: Institute of Pacific Studies of the University of South Pacific.
- Kautai, N., T.K. Malcolm, P. Mokoroa, T. Tanga, T. Tangatapoto, T. Tatuava & T.R. Touna (eds) 1995. *Atiu: an Island Community*. Suva: University of the South Pacific.
- Keesing, R.M. 1974. Theories of culture. *Annual Review of Anthropology* **3**, 73-97.
- King, M. 1983. *Maori. A Photographic and Social History*. Auckland: Heinemann.
- Kinloch, P.J. 1985. Midwives and midwifery in Western Samoa. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 199-202. Honolulu: University of Hawai'i Press.
- Kleinman, A. 1978a. Concepts and a model for the comparison of medical systems as culture systems. *Social Science and Medicine* **12**, 85-93.
- . 1978b. What kind of model for the anthropology of medical systems? *American Anthropologist* **80**, 661-665.
- . 1980. *Patients and Healers in the Context of Culture: an Exploration on the Borderline between Anthropology, Medicine and Psychiatry*. Berkeley, Los Angeles and London: University of California Press.
- Koteka, A. 2003. *Ora'anga o te po*. The culture of the night on Rarotonga. In *Akono'anga Maori: Cook Islands Culture* (eds) R. Crocombe & M.T. Crocombe, 179-193. Suva, Fiji; Rarotonga, Cook Islands: Institute of Pacific Studies and Cook Islands Extension Centre, University of the South Pacific.
- Krauss, B.H. 1993. *Plants in Hawaiian Culture*. Honolulu: University of Hawaii Press.
- Krishnan, V.P., P. Schaeffel & J. Warren. 1994. *The Challenge of Change. Pacific Island Communities in New Zealand, 1986-1993*. New Zealand Institute for Social Research and Development Ltd.

- Kuipers, S.E. (ed.) 1997. *Trade in Medicinal Plants* (Medicinal plants for forest conservation and health care. Rome: FAO.
- Kumar, B.M. & P.K.R. Nair. 2004. The enigma of tropical homegardens. *Agroforestry Systems* **61**, 135-152.
- Kura, P., N. Manu, M. Kakepare, T. Tanga, K. Kapao, T. Tanga, U. Teiotu, V.M. Koronui, Rongomatane Maka Kea Ariki, N.T. Mana, T. Cameron, N. Koronui, M. Tanga, T. George, T. Rau, T. Mariri & N.K. Bob. 1984. *Atiu nui maruarua: e au tua ta'ito*. Suva: Institute for Pacific Studies of the University of the South Pacific.
- Lagrotteria, M. & J.M. Affolter. 1999. Sustainable production and harvest of medicinal and aromatic herbs in the Sierras de Cordoba region, Argentina. In *Ethnoecology. Situated knowledge/Located lives* (ed.) V.D. Nazarea, 175-189. Tuscon: The University of Arizona Press.
- Landauer, K. & M. Brazil (eds) 1990. *Tropical Home Gardens*. Tokyo: United Nations University Press.
- Landy, D. (ed.) 1977. *Culture, Disease and Healing. Studies in Medical Anthropology*. New York: MacMillan Publishing Co.
- . 1990. Towards a biocultural medical anthropology. *Medical Anthropology Quarterly* **4**, 358-369.
- Lange, R.T. 1982. A history of health and ill-health in the Cook Islands: University of Otago.
- Lawton, J.H. 1993. Range, population abundance and conservation. *Trends in Ecology and Evolution* **8**, 409-413.
- Leaman, D.J. 2001. Conservation, trade, sustainability and exploitation of medicinal plant species. In *Development of Plant-based Medicines: Conservation, Efficacy and Safety* (ed.) P.A. Saxena, 1-15. New York: Springer.
- Lemaitre, Y. 1994. Traditional medicine and history in Tahiti. In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L. Crowl, 77-86. Suva: Institute of Pacific Studies, University of the South Pacific.
- Levi, G. 1988. *Inheriting Power: the Story of an Exorcist*. Chicago: University of Chicago Press.
- Levin, B.W. & C.H. Browner. 2005. The social production of health: critical contributions from evolutionary, biological and cultural anthropology. *Social Science and Medicine* **61**, 745-750.
- Lieban, R.W. 1977. The field of medical anthropology. In *Culture, Disease and Healing. Studies in Medical Anthropology* (ed.) D. Landy, 13-30. New York: MacMillan Publishing Co.
- Linnekin, J. 1992. On the theory of politics of cultural construction in the Pacific. *Oceania* **62**, 249-263.
- Lock, M. & M. Nichter. 2003. Introduction: from documenting medical pluralism to critical interpretations of globalised health knowledge, policies and practices. In *New Horizons in Medical Anthropology. Essays in honour of Charles Leslie* (eds) M. Nichter & M. Lock, 1-34. London: Routledge.
- Loomis, T.M. 1983. The Cook Islands haircutting ritual as practiced in New Zealand. *Journal of the Polynesian Society* **92**, 215-232.
- Low, D. 1943. Birth and allied customs in Aitutaki. *Journal of the Polynesian Society* **52**, 199-201.

- Lyon, W. 1995. Social context and the limits on symbolic meaning. In *Studies in Anthropology*, 14. <http://lucy.ukc.ac.uk/tradition/vaka.html>, last accessed: 10/10/06
- MacDonald, J. 1985. Contemporary healing practices in Tikopia, Solomon Islands. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 65-86. Honolulu: University of Hawai'i Press.
- Macpherson, C. 1985. Samoan Medicine. In *Healing Practices in the South Pacific* (ed.) C.D.F. Parsons, 1-15. Honolulu: University of Hawai'i Press.
- Maffi, L. 2004. Maintaining and restoring biocultural diversity: the evolution of a role for ethnobotany. In *Ethnobotany and Conservation of Biocultural Diversity* (eds) T.J.S. Carlson & L. Maffi, 9-37. New York: The New York Botanical Gardens.
- Makirere, T. 2003. 'Irinaki'anga: changing beliefs and practices. In *Akono'anga Maori: Cook Islands Culture* (eds) R. Crocombe & M.T. Crocombe, 109-118. Suva, Fiji; Rarotonga, Cook Islands: Institute of Pacific Studies and Cook Islands Extension Centre, University of the South Pacific.
- Marsh, R. 1998. *Building on Traditional Gardening to Improve Household Food Security*. Food and Agriculture Organisation, Rome
- Martin, G.A. 1995. *Ethnobotany: a Methods Manual*. London: Chapman and Hall.
- Mauseth, J.D. 1995. *Botany. An Introduction to Plant Biology*. Philadelphia: Saunders College Publishing.
- McArthur, N. 1961. *Island Populations of the Pacific*. London: Australian National University Press, C.Hurst & Co.
- McClatchey, W., R. Thaman & S. Juvik. 2004. Ethnobiodiversity surveys of human/ecosystem relationships. In *Biodiversity Assessment of Tropical Island Ecosystems* (eds) D. Mueller Dombois, K. Bridges & C. Daehler, 159-186. Honolulu: University of Hawaii.
- McCormack, G. 2002. *Cook Islands Biodiversity. Strategy and Action Plan*. Rarotonga: Cook Islands government.
- . 2004. Cook Islands Biodiversity Database. <http://cookislands.bishopmuseum.org>, Last accessed: 22/8/08
- McElroy, A. & P. Townsend. 1989. *Medical Anthropology in Ecological Perspective*. Wadsworth: Westview Press.
- McKee. 2005. The dynamics of local knowledge of botanical pest management in Wag Hamra, Ethiopia: PhD thesis, University of Kent.
- Mehlgarten, M. 1999. *Resource Management Plan, Atiu*. Cook Islands government, GTZ, SPC, PGRFP.
- Mello Amorozo, M.C. 2004. Pluralistic medical settings and medicinal use in rural communities, Mato Grosso, Brazil. *Journal of Ethnobiology* **24**, 139-161.
- Mendez, V.E., R. Lok & E. Somarriba. 2001. Interdisciplinary analysis of homegardens in Nicaragua: micro-zonation, plant use and socioeconomic importance. *Agroforestry Systems* **51**, 85-96.
- Millat-e-Mustafa, M.D., J.B. Hall & Z. Teklehaimanot. 1996. Structure and floristics of Bangladesh homegardens. *Agroforestry Systems* **33**, 263-283.
- Milliken W. 1997. Traditional anti-malarial medicine in Roraima, Brazil. *Economic Botany* **3**, 212-237.

- Milliken W. & B. Albert 1997. The use of medicinal plants by the Yanomami Indians of Brazil II. *Economic Botany* **51**, 264-278.
- Mitchell, R. & T. Hanstad. 2004a. *Small homegarden plots and sustainable livelihoods for the poor*. FAO, Rural Development Institute.
- . 2004b. *Small homegarden plots and sustainable livelihoods for the poor* (ed.) Access to Natural Resources Sub-Programme, USA: FAO.
- Moerman, D.E. 1998. Native North American Food and Medicinal Plants: Epistemological Considerations. In *Plants for food and medicine* (eds) H.D.V. Prendergast, N.L. Etkin, D.R. Harris & P.J. Houghton, 69-74. London: Royal Botanical Gardens, Kew.
- Mokorua, P. 1995a. *Arataki: Leadership*. In *Atiu: an Island Community* (eds) N. Kautai, T.K. Malcolm, P. Mokorua, T. Tanga, T. Tangatapoto, T. Tatuava & T.R. Touna, 20-34. Suva: University of the South Pacific.
- . 1995b. *Raaukanga Puapinga: Achievements throughout history*. In *Atiu: an Island Community* (eds) N. Kautai, T.K. Malcolm, P. Mokorua, T. Tanga, T. Tangatapoto, T. Tatuava & T.R. Touna, 11-20. Suva: University of the South Pacific.
- . 1995c. *Tumu nu. The bush beer school*. In *Atiu: an Island Community* (eds) N. Kautai, T.K. Malcolm, P. Mokorua, T. Tanga, T. Tangatapoto, T. Tatuava & T.R. Touna, 74-81. Suva: University of the South Pacific.
- Morrison, J., P. Geraghty & L. Crowl (eds) 1994. *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* **3**. Suva: Institute of Pacific Studies, University of the South Pacific.
- Murdock, G.P. 1980. *Theories of Illness: a World Survey*. Pittsburg: University of Pittsburg Press.
- Nazarea, V.D. 1998. *Cultural Memory and Biodiversity*. Tucson: The University of Arizona Press.
- (ed.) 1999. *Ethnoecology. Situated knowledge/Located lives*. Tuscon: The University of Arizona Press.
- Nichter, M. 1992. Ethnomedicine: diverse trends, common linkages. In *Anthropological Approaches to the Study of Ethnomedicine* (ed.) M. Nichter, 223-245. Amsterdam: Gordon & Brach Science Publishers.
- . 2003. The social relations of therapy management. In *New Horizons in Medical Anthropology. Essays in Honour of Charles Leslie* (eds) M. Nichter & M. Lock, 81-110. Routledge: London.
- Ninez, V.K. 1987. Household gardens: theoretical and policy considerations. *Agricultural systems* **23**, 167-186.
- Nordstrom, C. 1989. It's all in a name: local-level female healers in Sri Lanka. In *Women as Healers. Cross-cultural Perspectives* (ed.) S. McClain, 24-41. New Brunswick: Rutgers University Press
- Oliver, D.L. 1974. *Ancient Tahitian Society*. Canberra: Australian National University Press.
- OMIA Ministry, Office of the Minister for the Outer Islands. 2003. *Atiu Island Profile*. Cook Islands Government.
- On, T.V., D. Quyen, L.D. Bich, B. Jones, J. Wunder & J. Russel-Smith. 2001. A survey of medicinal plants in Ba Vi National Park, Vietnam: methodology and

- implications for conservation and sustainable use. *Biological Conservation* **97**, 295-304.
- Padoch, C., T.C. Jessup, H. Soedjito & K. Katawinata. 1991. Complexity and conservation of medicinal plants: anthropological cases from Peru and Indonesia. In *The Conservation of Medicinal Plants* (eds) O. Akerele, V. Heywood & H. Synge, 321-328. Cambridge: Cambridge University Press.
- Parkin, R. & L. Stone. 2004. *Kinship and Family: An Anthropological reader*. Oxford: Blackwell Publishing.
- Parr, T.W., A.R.J. Sier, R.W. Battarbee, A. MacKay & J. Burgess. 2003. Detecting environmental change: science and society-perspectives on long-term research and monitoring in the 21st century. *The Science of the Total Environment* **310**, 1-8.
- Parsons, C.D.F. (ed.) 1985a. *Healing practices in the South Pacific*. Honolulu: University of Hawai'i Press.
- . 1985b. Preface. In *Healing practices in the South Pacific* (ed.) C.D.F. Parsons, vii-xii. Honolulu: University of Hawai'i Press.
- . 1985c. Tongan healing practices. In *Healing practices in the South Pacific* (ed.) C.D.F. Parsons, 87-107. Honolulu: University of Hawai'i Press.
- Pei, S.J. 2001. Ethnobotanical approaches of traditional medicine studies: Some experiences from Asia. *Pharmaceutical Biology* **39**, 74-79.
- Pelto, P.J. & G.H. Pelto. 1996. Research designs in medical anthropology. In *Medical Anthropology. Contemporary Theory and Method* (eds) C.F. Sargent & T.M. Johnson, 293-325. London: Praeger.
- . 1997. Studying knowledge, culture, and behaviour in applied medical anthropology. *Medical Anthropology Quarterly* **11**, 147-163.
- Phillips, O. & A.H. Gentry. 1993. The useful plants of Tambopata, Peru: I. Statistical hypothesis with a new quantitative technique. *Economic Botany* **47**, 15-32.
- Phillips, O., A.H. Gentry, C. Reynel, P. Wilkin & C. Galvez-Durand B. 1994. Quantitative ethnobotany and Amazonian conservation. *Conservation Biology* **8**, 225-248.
- Plotkin, M.J. 1991. Traditional knowledge and medicinal plants-the search for new jungle medicines. In *The Conservation of Medicinal Plants* (eds) O. Akerele, V. Heywood & H. Synge, 53-64. Cambridge: Cambridge University Press.
- Posey, D.A. 2000. Ethnobiology and ethnoecology in the context of national laws and international agreements affecting indigenous and local knowledge, traditional resources and intellectually property rights. In *Indigenous Environmental Knowledge and its Transformations* (eds) R. Ellen, P. Parkes & A. Bicker, 55-55. London: Hardwood Academic Publishers.
- Pragnell, A. 2003. 'Good governance' in a local context: Devolution and local institutions on Atiu: MA thesis, University of Auckland.
- Rao, M.R., M.C. Palada & B.N. Becker. 2004. Medicinal and aromatic plants in agroforestry systems. *Agroforestry Systems* **61**, 107-122.
- Redford, K.H. 1992. The empty forest. *Bioscience* **42**, 412-424.
- Rubel, A.J. & M.R. Hass. 1996. Ethnomedicine. In *Medical Anthropology. Contemporary Theory and Method* (eds) C.F. Sargent & T.M. Johnson, 113-130. Praeger: London.

- Ruddle, K. 1993. The transmission of traditional ecological knowledge. In *Traditional Ecological Knowledge. Concepts and Cases* (ed.) J.T. Inglis, 17-31. Ottawa: International Development Research Centre.
- Sahlins, M. 1985. *Islands of History*. Chicago: University of Chicago.
- Sahlins, M.D. 1963. Poor Man, Rich Man, Big-Man, Chief: Political Types in Melanesia and Polynesia. *Comparative Studies in Society and History* **5**, 285-303.
- Salick, J. 1995. Toward an integration of evolutionary ecology and economic botany—personal perspectives on plant/people interactions. *Annals of the Missouri Botanical Gardens* **82**, 25-33.
- Salick, J., A. Biun, G. Martin, L. Apin & R. Beaman. 1999. Whence useful plants? A direct relationship between biodiversity and useful plants among the Dusun of Mt. Kinabalu. *Biodiversity and Conservation* **8**, 797-818.
- Schensul, J.J., M.D. LeCompte, B.K. Nastasi & S.P. Borgatti. 1999. *Enhanced Ethnographic Methods* (Ethnographer's toolkit **3**). London: Altamira Press.
- Schultes, R.E. & S. Reis. 1995. *Ethnobotany. Evolution of a Discipline*.
- Seeth, H., S. Chachov & A. Surinov. 1998. Russian poverty: muddling through economic transition with garden plots. *World Development* **26**, 1611-1623.
- Selener, D., N. Endara & J. Carvajal. 1999. *Participatory Rural Appraisal and Planning*. Quito: International Institute of Rural Reconstruction.
- Shanley, P. & L. Luz. 2003. The impacts of forest degradation on medicinal plant use and implications for health care in eastern Amazonia. *Bioscience* **53**, 573-584.
- Sheldon, J.W., M.J. Balick & S.A. Laird. 1997. *Medicinal plants: Can Utilisation and Conservation Coexist?* (Advances in Economic botany **12**). New York: New York Botanical Garden.
- Sheperd Mc Clain, C. 1989a. Reinterpreting women in healing roles. In *Women as Healers: Cross-cultural Perspectives* (ed.) S. Sheperd Mc Clain, 1-20. New Brunswick: Rutgers University Press.
- . 1989b. *Women as Healers: Cross-cultural Perspectives*. New Brunswick: Rutgers University Press.
- Shinwari, Z.K. & S.S. Gilani. 2003. Sustainable harvest of medicinal plants at Bulashbar Nullah, Astore (Northern Pakistan). *Journal of Ethnopharmacology* **84**, 289-308.
- Shultes, R.E. & R.E. Reis (eds) 1995. *Ethnobotany. Evolution of a Discipline*. London: Chapman and Hall.
- Siikala, A.L. & J. Siikala. 2005. *Return to Culture. Oral Tradition and Society in the southern Cook Islands*. Helsinki: Academia Scientiarum Fennica.
- Sillitoe, P. 1998. The development of indigenous knowledge: a new applied anthropology. *Current Anthropology* **39**, 223-252.
- Sillitoe, P. & A. Bicker. 2004. Introduction. Hunting for theory, gathering ideology. In *Development and Local Knowledge. New Approaches to Issues in Natural Resources Management, Conservation and Agriculture* (eds) P. Sillitoe, A. Bicker & J. Pottier. London: Routledge.
- Singer, M. 1989. The limitations of medical ecology: the concept of adaptation in the context of social stratification and social transformation. *Medical Anthropology* **10**, 223-234.
- Soini, E. 2005. Land use change and livelihood dynamics on the slopes of Mt. Kilimanjaro, Tanzania. *Agricultural Systems* **85**, 306-323.

- Soule, M.E. 1995. The social siege of nature. In *Reinventing Nature? Responses to Postmodern Deconstruction* (eds) M.E. Soule & G. Lease, 137-170. Washington: Island Press.
- Sowerwine, J.C. 2004. Effects of economic liberation on Dao Women's traditional knowledge, ecology and trade of medicinal plants in Northern Vietnam. In *Ethnobotany and the Conservation of Biocultural Diversity* (eds) T.J.S. Carlson & L. Maffi, 235-262. New York: The New York Botanical Gardens.
- Steiner, F.B. 1999. *Taboo, Truth and Religion*. Methodology and History in Anthropology **2**. New York: Bergahn Books.
- Stephenson, R.A. 1976. Perception of Environment in Anthropology, Atiu, Southern Cook group: a Case Study: PhD thesis, University of Oregon.
- Stepp, J.R., F.S. Wyndham & R. Zarger (eds) 2002. *Ethnobiology and Biocultural Diversity : Proceedings of the Seventh International Congress of Ethnobiology*. Athens: International Society for Ethnobiology.
- Sumner, J. 2000. *The Natural History of Medicinal Plants*. Portland: Timber Press.
- Swiss Biodiversity Forum. 2002. *Visions in Biodiversity Research. Towards a New Integrative Biodiversity Science*. Swiss Biodiversity Forum.
- Takhtajan, A. 1986. *Floristic Regions of the World*. Berkley: University of California Press.
- Talkuder, A., L. Kiess, N. Huq, S. Pee, I. Darnton-Hill & M. Bloem. 2000. Increasing the production and consumption of vitamin A-rich fruits and vegetables: Lessons learned in taking the Bangladesh homestead gardening programme to a national scale. *Food and Nutrition Bulletin* **21**, 165-172.
- Tan, M.L. 1989. Traditional or transitional medical systems? Pharmacotherapy as a case for analysis. *Social Science and Medicine* **29**, 301-307.
- Tan, M.L. & N.L. Etkin. 1994. Introduction. In *Medicines: Meanings and Contexts* (eds) N.L. Etkin & M.L. Tan, 1-8. Amsterdam: Hain.
- Tatuava, T. 1995. *Anau: childbirth*. In *Atiu: an Island Community* (eds) N. Kautai, T.K. Malcolm, P. Mokoroa, T. Tanga, T. Tangatapoto, T. Tatuava & T.R. Touna, 34-36. Suva: University of the South Pacific.
- Tavana, N.G.V. 2001. Traditional knowledge is the key to sustainable development in Samoa: examples of ecological, botanical and taxonomic knowledge. *Environment Forum* **3**, 11-14.
- Thaman, R.R. 1990. Mixed homegardening in the Pacific Islands: present status and future prospects. In *Tropical Home Gardens* (eds) K. Landauner & M. Brazil, 41-65. Tokyo: United Nations University Press.
- . 1994. Ethnobotany of Pacific Island coastal plants. In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L. Crowl, 147-164. Suva: Institute of Pacific Studies, University of the South Pacific.
- The Royal Society. 2003. *Measuring Biodiversity for Conservation*. The Royal Society.
- Thornhill, A. 2003. Social scientists and conservation biologists join forces. *Conservation Biology* **17**, 1476.
- Tictin, T. 2004. The ecological implications of harvesting non-timber forest products. *Journal of Applied Ecology* **41**, 11-23.
- Timi, D. 1994. Medicinal plant survey of Papua New Guinea. In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L.

- Crowl, 185-188. Suva: Institute of Pacific Studies, University of the South Pacific.
- Tongia, N.M. 1991. *Learning Rarotonga Maori*. Rarotonga: Tauranga Vananga, Ministry of Cultural Development.
- Trawick, M. 1992. An Ayurvedic theory of cancer. In *Anthropological Approaches to the Study of Ethnomedicine* (ed.) M. Nichter, 207-222. Amsterdam: Gordon and Brach.
- Tuperu Carpenter, T.T. & C. Beaumont. 1995. *Kai Korero. A Cook Islands Maori language coursebook*. Auckland: Pasifika Press.
- Ulijaszek, S. 2002. Modernization and the diet of adults on Rarotonga, the Cook Islands. *Ecology of Food and Nutrition* **41**, 203-228.
- UNCTAD. 2000. Expert Meeting on Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices. Geneva. http://r0.unctad.org/trade_env/tk.htm, Last accessed: 20/4/2006
- van Royen, P. & S.D. Davis. 1995. Regional overview: Pacific Ocean islands. In *Centres of Plant Diversity. A Guide and Strategy for their Conservation* (eds) S.D. Davis, S.D. Heywood & A.C. Hamilton, 519-525. London: WWF and IUCN.
- Vayda, A.P. & B.B. Walters. 1999. Against Political Ecology. *Human Ecology* **27**, 167-179.
- Vini, N. 1976. Tongareva death and mourning rituals. *Journal of the Polynesian Society* **85**, 367-373.
- Vougioukalou, S.A. 2000. Consequences of forest fragmentation on the fruiting patterns of the Pacific Banyan, *Ficus prolixa* and associated hymenopteran fauna, in Atiu, Cook Islands. MSc thesis: University of Leeds.
- . 2006. Weaving knowledge and weaving plants in the Cook Islands: what will survive the 21st century? Paper presented to the 4th International Conference of Ethnobotany, Istanbul, Turkey, 2006.
- Waldstein, A. & C. Adams. 2006. The interface between medical anthropology and medical ethnobiology. *Journal of the Royal Anthropological Institute* **Special Issue**, 95-118.
- Warren, D.M. 1992. *Indigenous Knowledge, Biodiversity Conservation and Development*. <http://www.ciesin.org/docs/004-173/004-173.html>, Last accessed: 15/7/2006
- Watson, C.W. (ed.) 1999. *Being there: Fieldwork in Anthropology*. London: Pluto Press.
- Wedenoja, W. 1989. Mothering and practice of 'Balm' in Jamaica. In *Women as Healers: Cross-cultural Perspectives* (ed.) S. Mc Clain, 76-98. New Brunswick: Rutgers University Press.
- Weiner, A.B. 1992. *Inalienable Possessions: the Paradox of Keeping-while-giving*. Berkeley: University of California Press.
- . 1995. The sibling incest taboo: Polynesian cloth and reproduction. In *Cosmos and Society in Oceania* (eds) D. Copper & A. Iteanu, 275-237. Oxford: Berg.
- Wessen, A.F., A. Hooper, J. Huntsman & C.E. Salmond (eds) 1992. *Migration and Health in a Small Society: the Case of Tokelau* (Oxford Science Publications. Oxford: Clarendon Press.
- Whistler, W.A. 1985. Traditional and herbal medicine in the Cook Islands. *Journal of Ethnopharmacology* **13**, 239-280.

- . 1990. Ethnobotany of the Cook Islands: the Plants, their Maori Names, and their Uses. *Allertonia* **5**, 347-424.
- . 1992. *Polynesian Herbal Medicine*. Hong Kong: Everbest Printing Co.
- Wilder, G.P. 1931. Flora of Rarotonga. *Bernice P. Bishop Museum Bulletin* **86**, 4-114.
- Wiley, A.S. 1992. Adaptation and the biocultural paradigm in medical anthropology: A critical review. *Medical Anthropology Quarterly* **6**, 216-236.
- Woodward, A., S. Hales, N. Litidamu, D. Phillips & J. Martin. 2000. Protecting human health in a changing world: the role of social and economic development. *Bulletin of the World Health Organisation* **78**, 1148-1155.
- Workman, A.M., L. Cruz-Ortiz & D. Kaminga-Quinata. 1994. Use of traditional medicine and healers on Guam. In *Science of Pacific Peoples: Fauna, Flora, Food and Medicine* (eds) J. Morrison, P. Geraghty & L. Crowl, 201-234. Suva: Institute of Pacific Studies, University of the South Pacific.
- WWF. 1996. Indigenous Peoples and Conservation: WWF Statement of Principles. <http://lucy.ukc.ac.uk/Rainforest/indigeng.html>, Last accessed 3/2/2003
- Yen, D.E. 1998. Subsistence to commerce in Pacific agriculture: some four thousand years of plant exchanges in the Pacific. In *Plants for Food and Medicine* (eds) H.D.V. Prendergast, N.L. Etkin, D.R. Harris & P.J. Houghton, 161-183. London: Royal Botanical Gardens, Kew.
- Young A. 1982. The anthropologies of illness and sickness. *Annual Review of Anthropology* **11**, 257-287
- Zaldivar, M.E., O.J. Rocha, E. Castro & R. Barrantes. 2002. Species diversity of edible plants grown in hometowns of Chibchan Amerindians from Costa Rica. *Human Ecology* **30**, 301-316.
- Zent, E.L. & S. Zent. 2004. Amazonian Indians as ecological disturbance agents: the Hoti of the Sierra de Maigualida, Venezuelan Guayana. In *Ethnobotany and the Conservation of Biocultural Diversity* (eds) T.J.S. Carlson & L. Maffi, 79-112. New York: The New York Botanical Gardens.
- Zent, S. 2000. *A Genealogy of Scientific Perspectives of Indigenous Knowledge*. Oak Seminar Series

11 Appendix

11.1 Methods timetable

N o	Method	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	Participant observation		x	x	x	x	x	x	x	x	x	x	x	x	x
2	Household survey								x	x	x	x	x	x	
3	Illness survey								x	x	x	x	x	x	
4	Hospital staff interview								x			x	x		
5	Community leaders interview		x											x	
6	Freelisting of Illness								x	x	x	x	x	x	
13	Visit to Mitiaro island													x	
14	Homegarden interviews									x	x	x	x	x	
15	Homegarden maps										x	x	x	x	
16	Transects									x	x				
17	Habitat survey					x	x	x							
18	Medicinal Plant freelisting													x	
19	Plant case studies								x	x	x				
20	Botanical identification	x	x	x	x	x	x	x	x	x	x	x	x	x	x
21	School teaching								x	x			x	x	

N o	Method	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
22	Church events		x			x	x	x	x	x	x	x	x	x	x
23	Participant observation of healers												x	x	
24	Research on traditional crafts					x	x	x				x	x	x	
25	Tropical Ethnobotany course	x													
	Location	Haw aia	Raro	Raro	Raro	Atiu	Atiu	Atiu	Atiu	Atiu	Atiu	Atiu	Atiu	Atiu	Raro

11.2 List of Atiuan names for illnesses & description

System	English name	Maori name	Maori name translation	Symptoms	Common knowledge Number of treatments	Specialised Knowledge Number of treatments
Circulatory	High blood pressure	<i>Toto kake</i>	High blood	Breathlessness	2	1
Circulatory	Varicose veins	<i>Uaua torotoro</i>		Visible veins on legs, sometimes inherited	0	1
Dental	Tooth ache	<i>Mamae te ni'o</i>	Pain of the teeth		0	0
Endocrine	Diabetes	<i>Toto vene</i>	Sweet blood	Associated with obesity and an excessive consumption of sugar (for women) and alcohol (for men)	1	1
Gastrointestinal	Diarrhoea	<i>'Eke</i>		Runny faeces	0	1
Gastrointestinal		<i>Ivi ika (raoa)</i>	Bone ?	Fishbone obstructing oesophagus	0	1
Gastrointestinal	Colic pain	<i>Kōpū takaviri</i>	Stomach twist		0	0
Gastrointestinal	Prolapsed rectum	<i>Koūre topa</i>	Anus fall		0	0
Gastrointestinal	Stomach pain	<i>Mamae te kopu</i>	Pain stomach	Sore stomache, colic abdominal pain	0	1
Gastrointestinal	Dinoflagellate crustacea poisoning	<i>Opu</i>		Severe pain in the abdomen followed by the consumption of 'the wrong part' of the crayfish	0	1
Gastrointestinal	Cancer ?	<i>Ou viri</i>	Ulcer that never heals	Illness with no cause, general feeling of unwellness	0	2
Gastrointestinal	Oesophageal carcinoma?	<i>Pua roto</i>	Soap? Inside	Feeling unwell, abdominal lump	0	1
Gastrointestinal		<i>Pukuatu puta puta</i>	Heart whole	Vomit after eating, very serious	0	1
Gastrointestinal	Vomiting	<i>Ruaki</i>	Vomit		0	0
Gastrointestinal	Vomiting blood	<i>Ruaki toto</i>	Vomit blood		0	0
Gastrointestinal	Fish poison	<i>Taero</i>		Ciguatera, caused by fish with ciguatoxin contaminated flesh	0	1

System	English name	Maori name	Maori name translation	Symptoms	Common knowledge Number of treatments	Specialised Knowledge Number of treatments
Gastrointestinal	Polyp? In anus and throat	<i>Toe tupu</i>		A growth in the anus or throat with multiple bodies, very sore	0	2
Gastrointestinal	Hiccups	<i>Toka mauri</i>			0	0
Gastrointestinal	Intestinal worms	<i>Toketoke</i>	Worm worm		0	0
Gastrointestinal	Abdominal pain	<i>Tūpito</i>		Sore inside the belly button', severe abdominal pain, when place finger on the belly button feel pulse	0	2
Gastrointestinal	Hernia?	<i>Ua roto</i>	Ball inside	Very soft abdominal muscles, can't breathe, burp	0	2
Gynaecological		<i>Mimi</i>	Diuretic	Diuretics for pregnant woman's well being	0	1
Gynaecological		<i>Aka eke</i>	To cause diarrhoea	Purgatives for pregnant woman's well being	1	2
Gynaecological	Menstruation	<i>Maki vaine, maki marama</i>	Illness women, illness moon	Monthly bleeding	0	0
Gynaecological	Labour pains	<i>Mamae 'ānau, rangi</i>	Pain birth	Pains, contractions	0	0
Gynaecological	Post-partum cleansing	<i>Tama te vairanga</i>	Clean the womb	Blood clots inside womb-toto kino, vaginal soreness	5	0
Gynaecological	Abortion	<i>Titiri pōtiki</i>	Drop baby	Early abortion usually through herbal medicine or massage	0	3
Gynaecological	Prolapsed uterus?	<i>Vairanga tapa/ vairanga neke</i>	Uterus fall	Severe pain in lower abdomen	0	1
Immune	Fever	<i>Veravera</i>	Hot hot	High temperature, runny nose		2
Muscular-Skeletal	Fractures	<i>Ati</i>	Break	Pain when walking, mainly refers to sprains	1	5
Muscular-Skeletal		<i>Maki uaua</i>	Pain muscle	Sore tendons	0	1
Muscular-Skeletal	Backache	<i>Mamae tua</i>	Pain back		2	0
Muscular-Skeletal	Leg sprain	<i>Mamae vavea</i>	Pain legs	Pain, difficulty to walk	1	0
Muscular-Skeletal	Neck pain	<i>Tā'ui</i>		Neck pain muscular	1	0

System	English name	Maori name	Maori name translation	Symptoms	Common knowledge Number of treatments	Specialised Knowledge Number of treatments
Muscular-Skeletal Circulatory	Filiariasis	<i>Māriri</i>		Rash or inflammation, legs turn red and swell, similar to gout, no longer common	0	0
Nervous	Headache	<i>Terangi para</i>		Headache from one side of the head only	1	0
Nervous	Headache severe	<i>Tui kai roro</i>	Tui eat brain	Severe headache, migraine? pain between eyebrows	0	2
Nervous	Headache	<i>Oa</i>		Migraine, acute headache, nausea, visual disturbances, 'sickness of the brain'	1	1
Ophthalmological	Eye sty	<i>Kiritau</i>		Staphylococcus infection of hair follicle	0	1
Ophthalmological	Conjunctivitis	<i>Maki mata</i>	Illness eyes	Itchy eyes with fluid	0	1
Ophthalmological	Eyes with pus	<i>Mata pīrau</i>	Eyes pus		0	1
Ophthalmological		<i>Mata pura</i>		Eye pain due to object in the eye	1	0
Ophthalmological	Blindness	<i>Matapō</i>	Eyes darkness		0	0
Otolaryngological	Ear-pain	<i>Taringa mamae</i>	Ear pain	Pain inside the ear	0	1
Otolaryngological	Ear-discharging pus	<i>Taringa pē</i>	Ear pus		0	0
Otolaryngological	Ear-deafness	<i>Taringa turi</i>	Ear ?		0	0
Otolaryngological	Internal pimple	<i>Ua'ua kava</i>	Egg bitter	Inflamed pimple inside ear, nose, mouth or painful	0	1
Paediatrics		<i>Inu ranu</i>		Babies have sore throat, vomit, something like yellow jaundice	0	1
Paediatrics		<i>Ira</i>		'White' of eyes goes blue', extensive crying, twitching during sleep	0	4
Paediatrics	Mouth thrush	<i>Kea</i>		Candidiasis, white filmy patches on tongue, causes discomfort, sleeplessness and pain to infants	1	2
Paediatrics	Sculp impetigo	<i>Tui</i>		Pimples on babies head at the back, Staphylococcus infection, can be very serious, headache between eyebrows	0	3
Paediatrics	Convulsions	<i>Uti</i>		Shakes	0	1
Paediatrics Dermatological	Nappy rash	<i>Nappy rash</i>		Rash	1	0

System	English name	Maori name	Maori name translation	Symptoms	Common knowledge Number of treatments	Specialised Knowledge Number of treatments
Paediatrics Dermatological		<i>Spots on belly</i>		Spots on abdominal area	0	1
Respiratory	Flu	<i>Flu</i>		Sore throat, cough	0	0
Respiratory		<i>Kooma pe'e</i>		Bad cough	0	1
Respiratory	TB	<i>Maki marō</i>	Illness dry	Dry bone marrow	0	1
Respiratory	Cough	<i>Mare</i>		Coughing, sore neck	0	0
Respiratory	Asthma	<i>Potopoto au/ popoaka ea</i>	Short-?		0	2
Respiratory Circulatory	Weak heart	<i>Pukuatu paruparu</i>	Heart weak	Breathlessness, general heart problems	0	1
Skin	Boil	<i>Akapū</i>		Infection of the hair root and sweat glands caused by staphylococcus bacteria, it is red and inflamed with a central point that can occur anywhere. A pustule develops and increases in size and tension	1	1
Skin	Deep infection	<i>Ivi marō</i>	Bone dry	'Inflamed cyst on the bone', considered very serious	1	0
Skin	Eczema	<i>Kovi</i>		Itchy skin, progressively worsening, leading to cracks, associated with cold weather	0	1
Skin	Lice	<i>Kutu</i>			0	0
Skin		<i>Maki tupapaku</i>	Illness spirit	Big red spots on the arms that are very sore, it looks like you have been laid by an octopus	0	1
Skin	Scabies, measles, chickenpox	<i>Mangio pukupuku</i>	Itchy spots	Fever, itchy sores, 'red dots', start from the head and spread to the rest of the body	0	3
Skin	Eczema	<i>Mangio/ maki taati</i>		Rash over body	0	1
Skin	Cut	<i>Motu</i>	Cut		5	1
Skin	Ringworm	<i>Mūnā</i>			2	1
Skin	Burn	<i>Pakapak a, pakiri koropupu</i>	Dry, skin burn		3	5
Skin	Pale spots	<i>Tane</i>		Tinea vesicolor	0	0
Skin	Boil	<i>Tāpō</i>			3	1

	complex					
System	English name	Maori name	Maori name translation	Symptoms	Common knowledge Number of treatments	Specialised Knowledge Number of treatments
Skin	Wounds	<i>Tati</i>			3	1
Skin	Carbunkle	<i>Taūpo</i>		Similar to boil but much more serious and painful; a kind of boil with 3-4 eyes which is big and deep (multiple hair follicle infection); like a boil but the eyes are not outside but inside so the piriau (pus) goes inside, the boil was growing big (like the size of a potato) inside the body	0	1
Skin	Skin sepsis	<i>Une</i>		Allergy, sore skin, itchy like eczema, blisters with pus, aggravated by washing clothes	1	0
Toxicological	Stonefish sting	<i>Putā nou</i>	Hole	Extreme pain on the foot caused by <i>Synenceia verrucosa</i> envenoming	2	0
Toxicological	Centipede bite				0	0
Toxicological	Wasp bite				1	3
Urogenital	Urine infection	<i>Maki mimi</i>	Illness urine	General feeling of unwellness	0	12
Urogenital	Urination with pain & pus	<i>Opi</i>		Sexually transmitted disease, symptoms are loss of appetite, it is sore when urinating and pus comes out	0	0
Urogenital	Male impotence	<i>Tira moe</i>	Penis sleep	Erection problems, temporary	0	1
Urogenital	Male impotence	<i>Tira ngaro</i>	Penis lost	No erection at all, permanent	0	1
Urogenital	Priapic	<i>Tira ora</i>	Penis alive	Man in constant erection and desire for sex, violent behaviour	0	1
Urogenital		<i>Ua oro</i>	Testicles run	Balls disappear, very painful, can cause death	0	1
Urogenital	Lymphatic filariasis?	<i>Ua toro</i>	Balls big	Inflamed testicles, from lifting heavy weights, doesn't happen any more	0	1

11.3 List of Atiuan names of body parts

English	Maori	Notes
anus	<i>koūre</i>	generic term, can also refer to genitalia
arm	<i>rima</i>	means five
bladder	<i>vairanga mimi</i>	vai means water, mimi means urine
blood	<i>toto</i>	
bones	<i>ivi</i>	
brain/ internal part of the head	<i>roro</i>	also means plant fluids
breasts	<i>tītī</i>	
buttocks	<i>koure</i>	
calf	<i>takari</i>	
ear	<i>taringa</i>	
elbow	<i>poro rima</i>	poro means ball, rima means arm
eye	<i>mata</i>	
eyebrow	<i>uruuru mata</i>	uru means brush
faeces	<i>tūtae</i>	
finger marriage	<i>tapuru ake</i>	
finger middle	<i>roa</i>	means long
finger pointer	<i>teariki motu</i>	
finger small	<i>koiti</i>	means the small in Rarotonga dialect
finger thumb	<i>nui</i>	nui means big
fingers	<i>mangamanga rima</i>	rima means hand and five
hand	<i>rima</i>	also means five
head	<i>upoko</i>	
heart	<i>puku'atu</i>	
heel	<i>poro vāvia</i>	lit. ball foot
internal organs	<i>ngakau</i>	general term
intestines	<i>ngakau</i>	
knee	<i>turi</i>	
legs	<i>vavea</i>	
liver	<i>ate</i>	also refers to other major internal organs
mouth	<i>vā</i>	
nose	<i>putāngiu</i>	
penis	<i>ure, ra'o</i>	
shoulders	<i>pakuivi</i>	
skin	<i>pakiri</i>	also used for tree bark
stomach	<i>kopu</i>	
teeth	<i>ni'o</i>	
testicles	<i>uārao, uā</i>	the eggplant is called uarao pokonio (goats testicles)
thighs	<i>Ū'ā</i>	
throat	<i>karoponga</i>	
toes	<i>mangamanga vāvia</i>	
vagina	<i>ika</i>	

11.4 Maori and English names for plant parts

Maori term	English term
<i>aka</i>	root
<i>aka metua</i>	tap root
<i>atava</i>	branch
<i>kaui</i>	composite inflorescence
<i>kiko</i>	root tuber
<i>ko</i>	husk
<i>moko</i>	very young leaf
<i>mokomoko</i>	youngest part, leaflet or root tip
<i>pakiri</i>	bark
<i>rākau</i>	plant
<i>rara</i>	branch
<i>rau</i>	leaf
<i>roro</i>	juice
<i>te mata o-te-aka</i>	root tip
<i>tiare</i>	flower
<i>tumu</i>	trunk
<i>ua</i>	fruit
<i>uri</i>	seedling

11.5Maori and English names for flowering stages

Maori term	English term
<i>matapuku</i>	bud
<i>para</i>	ripe
<i>pi</i>	unripe/green
<i>puera</i>	flower open

11.6Maori and English names for leaf shapes

Maori term	English term
<i>keokeo</i>	sharp
<i>taratara</i>	sharp edges
<i>nira</i>	needle-like
<i>mangamanga</i>	composite
<i>rau punupunu</i>	round

11.7 Medicinal plant ecological distribution

Abundance index: 1-rare, 2-uncommon, 3-common, 4-very common

Origin index: N- native, I-P- Polynesian introduction, I-R- European or recent introduction

Medicinal Plant Database					Distribution						
Life form	Scientific name	English Name	Atiuan name	Origin	Overall Abundance	Coast	Ma-ka-tea	Ta-Ro	Low-lands	Up-lands	Vi-llage
Herb	<i>Alpinia purpurata</i>	Red Ginger	Kōpuī	I-R	1						1
Herb/Shrub	<i>Aloe arborescens</i>	Octopus Aloe	‘Āroe	I-R	1						1
Herb/Shrub	<i>Aloe vera/Aloe arborescens</i>	Aloe Vera	‘Āroe	I-R	1						1
Shrub	<i>Ocimum tenuiflorum</i>	Sacred Basil	Miri	I-R	1						1
Tree	<i>Spondias dulcis</i>	Otaheite Apple	Vī Kavakava	I-P	1						1
Tree	<i>Eriobotrya japonica</i>	Loquat	Koata	I-R	1						1
Shrub	<i>Solanum viride</i>	Garland Berry	Poroporo	I-P	1						1
Herb	<i>Nervilia aragoana</i>	One-leaf Orchid	Pia Rau-ta’i	I-P	1				1		
Tree	<i>Citrus sinensis</i>	Sweet Orange	‘Ānani m aori	I-R	1			1			
Fern	<i>Acrostichum aureum</i>	Leather Fern	Piākato	N	1		1				
Fern	<i>Ophioglossum reticulatum</i>	Stalked Adder's-tongue Fern	Ti’āpito	N	1		1				
Herb	<i>Musa troglodytarum</i>	Mountain Banana	Meika Vē’ī	I-P	1		1				
Herb	<i>Lindernia crustacea</i>	Lindernia	Tūtāe Tōrea	N	1		1				
Herb	<i>Sigesbeckia orientalis</i>	Yellow Crown-head	Kamika	I-P	1		1				
Herb	<i>Dichrocephala integrifolia</i>	Medicine Daisy	Takataka i’ara	I-P	1		1				
Tree	<i>Erythrina variegata</i>	Coral Tree	Ngatae	N	1	1					
Tree	<i>Annona muricata</i>	Soursop	Kātara’a pa	I-R	2				2		0
Herb	<i>Leucas decemdentata</i>	Leucas	Nūroa	N	2	2			2	1	1

Life form	Scientific name	English Name	Atiuan name	Origin	Overall Abundance	Coast	Ma-ka-tea	Ta-Ro	Low-lands	Up-lands	Vi-llage
Herb	<i>Oxalis corniculata</i>	Yellow Wood-sorrel	Kōki'i	I-P	2			1	1		1
Tree	<i>Vitex trifolia</i> var. <i>trifolia</i>	Medicinal Vitex	Rara	N	2				1		1
Tree	<i>Citrus limon</i>	Lemon	Rēmene	I-R	2				1		1
Shrub	<i>Abelmoschus moschatus</i>	Muskmallo w	Vavai Tara	I-P	2			2			1
Tree	<i>Pandanus tectorius</i> complex	Pandanus Inga / Ice-cream	'Ara-tai	N	2	1	1				1
Tree	<i>Inga ynga</i>	Bean Native	Pākaiē	I-R	2		1				1
Herb	<i>Lepidium bidentatum</i>	Peppergras s	Naunau	N	2	2	2				1
Shrub	<i>Ocimum basilicum</i>	Sweet Basil, Thai Basil	Miri Kura	I-R	2						1
Vine	<i>Passiflora edulis</i>	Purple Passionfruit	Pārapōtin i Papa'ā	I-R	2						1
Herb	<i>Inga ynga</i>	Shell	Pakaie	I-R	2					1	2
Herb	<i>Alpinia zerumbet</i>	Ginger	Kaopui	I-R	2					1	2
Grass	<i>Centosteca lappacea</i>	Centosteca Grass	Ko'eko'e	I-P	2					2	2
Tree	<i>Syzygium malaccensis</i>	Malay Apple	Kaika Makatea	I-P	2		2		1		2
Tree	<i>Averrhoa carambola</i>	Carambola	Raparapa	I-R	2				1		2
Herb	<i>Ananas comosus</i>	Pineapple	'Ara Painapo	I-R	2				2		2
Tree	<i>Syzygium cumini</i>	Jambolan	Kaika	I-R	2				2		2
Grass	<i>Saccharum officinarum</i>	Sugarcane	Tō	I-P	2						2
Herb	<i>Mirabilis jalapa</i>	Four-o'clock Flower	Tiare Moe	I-R	2						2
Herb	<i>Nicotiana tabacum</i>	Tobacco	'Ava'ava	I-R	2						2
Herb	<i>Amaranthus viridis</i>	Slender Amaranth	Va'ine 'Ara	I-P	2						2
Herb	<i>Begonia popenoei</i>	Giant-leaf Begonia	Pēkōnia	I-R	2						2

Life form	Scientific name	English Name	Atiuan name	Origin	Overall Abundance	Coast	Ma-ka-tea	Ta-Ro	Low-lands	Up-lands	Vi-llage
Herb	<i>Rorippa sarmentosa</i>	Polynesian Cress	Toatoa 'Enea	I-P	2						2
Herb	<i>Boerhavia tetrandra</i>	Boerhavia tetrandra	Runa	N	2						2
Herb	<i>Talinum paniculatum</i>	Pink Flameflower	Pī	I-R	2						2
Herb	<i>Aster lanceolatus</i>	White Michaelmas-Daisy	Daisy	I-R	2						2
Shrub	<i>Asparagus scandens</i>	Basket Asparagus	Remu	I-R	2						2
Tree	<i>Plumeria rubra</i>	Frangipani	Tīpani	I-R	2						2
Tree	<i>Bauhinia monandra</i>	Pink Orchid-tree	Pīpī	I-R	2						2
Tree	<i>Citrus aurantifolia</i>	Lime	Tīporo	I-R	2	1	1		1		
Tree	<i>Calophyllum inophyllum</i>	Polynesian Mahogany	Tamanu	N	2		2	2	2		
Shrub	<i>Pipturus argenteus</i>	Pipturus	'Ōrongā	N	2				2		
Herb	<i>Solanum americanum</i>	Black Nightshade	Poro Puaka	N	2			2			
Tree	<i>Thespesia populnea</i>	Pacific Rosewood	Miro	N	2		2				
Tree	<i>Cordia subcordata</i>	Cordia	Tou	N	2		2				
Vine	<i>Passiflora maliformis</i>	Hard Passionfruit	Pārapōtin i 'Enea	I-R	3				2	1	1
Tree	<i>Aleurites moluccana</i>	Candlenut	Tuitui	I-P	3			3	3		1
Fern	<i>Dicranopteris linearis</i>	Tangle Fern	Tuenu'e	N	3				3		1
Shrub	<i>Manihot esculenta</i>	Cassava	Māniota	I-R	3				3		1
Herb	<i>Musa (AAA group)</i>	Cavendish Banana	Meika Kina	I-R	3			2	2		2
Shrub	<i>Capsicum frutescens</i>	Chilli Pepper	'Ōporo	I-R	3			2	2		2
Shrub	<i>Codiaeum variegatum</i>	Variegated Croton	Kaitava	I-R	3						3
Herb	<i>Zingiber zerumbet</i>	Shampoo Ginger	Niniore	I-P	3			2	2	1	
Tree	<i>Artocarpus altilis</i>	Breadfruit	Kuru enua	I-P	3			2	3	1	

Life form	Scientific name	English Name	Atiuan name	Origin	Overall Abundance	Coast	Ma-ka-tea	Ta-Ro	Low-lands	Up-lands	Vi-llage
Herb	<i>Phyllanthus aumars</i>	Phyllanthus amarus	Moemoe	I-R	3		3	2	2		
Shrub	<i>Coffea arabica</i>	Arabian Coffee	Kaope	I-R	3				3		
	<i>Cucurbita pepo</i>										
Vine	<i>Pumpkin</i>	Pumpkin	Motini	I-R	3		1	2			
Tree	<i>Casuarina equisetifolia</i>	Pacific Ironwood	Toa	I-P	3	3	3				
Tree	<i>Ficus prolixa</i>	Pacific Banyan	Ava	N	3		3				
Tree	<i>Barringtonia asiatica</i>	Barringtonia	‘Utu	N	4		4			1	2
Tree	<i>Psidium guajava</i>	Common Guava	Tuava	I-R	4		2	2	2	2	2
Tree	<i>Hibiscus tiliaceus</i>	Tree Hibiscus	‘Au	N	4		2	3	3	2	2
Tree	<i>Morinda citrifolia</i>	Indian Mulberry	Nono	N	4		2	1	2		2
Fern	<i>Davallia solida</i>	Polynesian Davallia	Tūrei ‘Āua	N	4		3				2
Herb	<i>Bidens pilosa</i>	Beggar's-tick	Piripiri	I-R	4		2	2	3	2	3
Palm	<i>Cocos nucifera</i>	Coconut Palm	Nū	N	4	4	4	3	3	2	3
Tree	<i>Carica papaya</i>	Pawpaw	Puaka	I-P	4	3	3	3	3		3
		Unscented	Tūrei								
Fern	<i>Microsorium grossum</i>	Oak-leaf Fern	Mangamanga	N	4		3				3
Shrub	<i>Gardenia taitensis</i>	Tahitian Gardenia	Tiare Māori	I-P	4	2	2	1	2		4
			Kaute /								
Shrub	<i>Hibiscus rosa-sinensis</i>	Red Hibiscus	‘Eua	I-P	4			2	2		4
Grass	<i>Cynodon dactylon</i>	Bermuda Grass	Matie	I-R	4						4
Sedge	<i>Cyperus rotundus</i>	Nut Sedge	‘Ōniāni	I-R	4						4
Vine	<i>Vigna marina</i>	Beach Pea	Kēketa	N	4	3					4

11.8 Medicinal plant use and frequency

Medicinal Plant Database				Use frequency(1=rare use by few people 2=moderate use 3-common use by many people, R-root, Rtu-tuber, T-trunk, B-bark, L- leaves, F-fruit, Fl-flowers, S-seeds, St-Stem)			
Life form	Scientific name	Atiuan name	English name	Medicine	Food	Craft	Orname- ntal
Tree	<i>Erythrina variegata</i>	Coral Tree	Ngatae	1B			
Tree	<i>Casuarina equisetifolia</i>	Pacific Ironwood	Toa	1B, 1L		2T	
Tree	<i>Barringtonia asiatica</i>	Barringtonia	‘Utu	1F		1F, 1L	
Tree	<i>Pandanus tectorius complex</i>	Pandanus	‘Ara-tai	1F		1F	
Herb	<i>Aster lanceolatus</i>	White Michaelmas-Daisy	Daisy	1F		2F	
Herb	<i>Ananas comosus</i>	Pineapple	‘Ara Painapo	1F	2F		
Tree	<i>Citrus aurantifolia</i>	Lime	Tīporo	1F	2F		
Shrub	<i>Abelmoschus moschatus</i>	Muskmallow	Vavai Tara	1F			
Tree	<i>Citrus limon</i>	Lemon	Rēmene	1F, 2L			
Shrub	<i>Hibiscus rosa-sinensis</i>	Red Hibiscus	Kaute / Kaute ‘Enea	1L		2S	4Fl
Grass	<i>Cynodon dactylon</i>	Bermuda Grass	Matie ‘Enea	1L			
Sedge	<i>Cyperus rotundus</i>	Nut Sedge	Matie ‘Ōniāni	1L			
Herb	<i>Bidens pilosa</i>	Beggar's-tick	Piripiri	1L			
Fern	<i>Davallia solida</i>	Polynesian Davallia	Tūrei ‘Āua	1L		2L	2L
Shrub	<i>Codiaeum variegatum</i>	Variegated Croton	Kaitava	1L			2L
Shrub	<i>Coffea arabica</i>	Arabian Coffee	Kaope	1L	2F		
Fern	<i>Dicranopteris linearis</i>	Tangle Fern	Tuenu‘e	1L		2L	
Shrub	<i>Capsicum frutescens</i>	Chilli Pepper	‘Ōporo	1L	2F		
Herb	<i>Phyllanthus amarus</i>	Phyllanthus amarus	Moemoe	1L			
Vine	<i>Passiflora maliformis</i>	Hard Passionfruit	Pārapōtini ‘Enea	1L	1F		

Life form	Scientific name	Atiuan name	English name	Medicine	Food	Craft	Orname- ntal
Shrub	<i>Pipturus argenteus</i>	Pipturus	‘Ōrongā	1L			
Herb	<i>Oxalis corniculata</i>	Yellow Wood-sorrel	Kōki‘i	1L			
Shrub	<i>Ocimum basilicum</i>	Sweet Basil, Thai Basil	Miri Kura	1L			2L
Herb	<i>Amaranthus viridis</i>	Slender Amaranth	Va‘ine ‘Ara	1L			
Grass	<i>Centosteca lappacea</i>	Centosteca Grass	Ko‘eko‘e	1L			
Vine	<i>Passiflora edulis</i>	Purple Passionfruit	Pārapōtini Papa‘ā	1L	2F		
Herb	<i>Begonia popenoei</i>	Giant-leaf Begonia	Pēkōnia	1L			2Fl
Tree	<i>Bauhinia monandra</i>	Pink Orchid-tree	Pīpī	1L			
Herb	<i>Solanum americanum</i>	Black Nightshade	Poro Puaka	1L			
Tree	<i>Averrhoa carambola</i>	Carambola	Raparapa	1L	2F		
Tree	<i>Calophyllum inophyllum</i>	Polynesian Mahogany	Tamanu	1L		2T	
Herb	<i>Rorippa sarmentosa</i>	Polynesian Cress	Toatoa ‘Eua	1L			
Herb	<i>Leucas decemdentata</i>	Leucas	Nūroa	1L			
Tree	<i>Inga ynga</i>	Inga / Ice-cream Bean	Pākaiē	1L			
Tree	<i>Vitex trifolia</i> var. <i>trifolia</i>	Medicinal Vitex	Rara	1L			
Shrub	<i>Asparagus scandens</i>	Basket Asparagus	Remu	1L			2L
Herb	<i>Boerhavia tetrandra</i>	Boerhavia tetrandra	Runa	1L			
Herb	<i>Talinum paniculatum</i>	Pink Flameflower	Pī	1L			
Herb	<i>Inga ynga</i>	Inga	Pakaie	1L			
Herb	<i>Alpinia zerumbet</i>	Shell Ginger	Kaopui	1L			
Fern	<i>Acrostichum aureum</i>	Leather Fern	Piākato	1L			

Life form	Scientific name	Atiuan name	English name	Medicine	Food	Craft	Orname- ntal
Tree	<i>Citrus sinensis</i>	Sweet Orange	‘Ānani maori	1L	2F		
Tree	<i>Eriobotrya japonica</i>	Loquat	Koata	1L	1F	1T	
Herb	<i>Alpinia purpurata</i>	Red Ginger	Kōpuī	1L			
Herb	<i>Lindernia crustacea</i>	Lindernia	Tūtāe Tōrea	1L			
Herb	<i>Sigesbeckia orientalis</i>	Yellow Crown-head	Kamika	1L			
Herb	<i>Nervilia aragoana</i>	One-leaf Orchid	Pia Rau-ta‘i	1L			
Herb	<i>Dichrocephala integrifolia</i>	Medicine Daisy	Takatakai‘ara	1L			
Fern	<i>Ophioglossum reticulatum</i>	Stalked Adder's-tongue Fern	Ti‘āpito	1L			
Tree	<i>Cordia subcordata</i>	Cordia	Tou	1L, 1B		2T	
Tree	<i>Spondias dulcis</i>	Otaheite Apple	Vī Kavakava	1L, 1B			
Shrub	<i>Solanum viride</i>	Garland Berry	Poroporo	1L, 1F			1F
Fern	<i>Microsorium grossum</i>	Unscented Oak-leaf Fern	Tūrei Mangamanga	1L, 1R		2L	2L
Herb	<i>Zingiber zerumbet</i>	Shampoo Ginger	Niniore	1R			
Tree	<i>Ficus prolixa</i>	Pacific Banyan	Ava	1R		2B	
Tree	<i>Hibiscus tiliaceus</i>	Tree Hibiscus	‘Au	1R, 1B		2B, 2L	
Tree	<i>Carica papaya</i>	Pawpaw	Vī Puaka	1R, 1L	4F	1L	
Shrub	<i>Manihot esculenta</i>	Cassava	Māniota	1Rtu	3RTu		
Tree	<i>Artocarpus altilis</i>	Breadfruit	Kuru enua	1St	2F	1B	
Herb	<i>Musa (AAA group)</i>	Cavendish Banana	Meika Kina	1St	3F	3T	
Vine	<i>Cucurbita pepo</i> <i>Pumpkin</i>	Pumpkin	Motini	1St	2F, 2S		
Herb	<i>Musa troglodytarum</i>	Mountain Banana	Meika Vē‘ī	1St	1F	1S	
Tree	<i>Aleurites moluccana</i>	Candlenut	Tuitui	2B, 1F		1S	
Shrub	<i>Gardenia taitensis</i>	Tahitian Gardenia	Tiare Māori	2Fl		1S	4F

Life form	Scientific name	Atiuan name	English name	Medicine	Food	Craft	Orname- ntal
Tree	<i>Thespesia populnea</i>	Pacific Rosewood	Miro	2F		2T	
Vine	<i>Vigna marina</i>	Beach Pea	Kēketa	2L			
Herb	<i>Lepidium bidentatum</i>	Native Peppergrass	Naunau	2L			
Herb	<i>Nicotiana tabacum</i>	Tobacco	‘Ava‘ava	2L			
Tree	<i>Annona muricata</i>	Soursop	Kātara‘apa	2L	2F		
Shrub	<i>Ocimum tenuiflorum</i>	Sacred Basil	Miri	2L			2L
Herb/Shrub	<i>Aloe arborescens</i>	Octopus Aloe	‘Āroe	2L			
Herb/Shrub	<i>Aloe vera/Aloe arborescens</i>	Aloe Vera	‘Āroe	2L			
Tree	<i>Psidium guajava</i>	Common Guava	Tuava	2L, 1B	2F		
Herb	<i>Mirabilis jalapa</i>	Four-o'clock Flower	Tiare Moe	2RTu			1F
Tree	<i>Plumeria rubra</i>	Frangipani	Tīpani	2St			2Fl
Grass	<i>Saccharum officinarum</i>	Sugarcane	Tō	2St	2S		
Palm	<i>Cocos nucifera</i>	Coconut Palm	Nū	3F, 2R, 2B	3F	3L, 3B	
Tree	<i>Morinda citrifolia</i>	Indian Mulberry	Nono	3F, 3L, 2B		2F, 1R	
Tree	<i>Syzygium cumini</i>	Jambolan	Kaika	3L			
Tree	<i>Syzygium malaccensis</i>	Malay Apple	Kaika Makatea	3L	2F		

11.9 Household survey interview questions

Interview no

Part 1: Household census

Name *Ingoa*

Age *Mataiti*

Sex M F

Village *Oire*

Source of income *E'aa taau anga anga?*

Additional sources *Me euanga moni taau i rauka nei te ra oki e e tanutanu, kama, tuitui te vaiatura?*

Community role/traditional title *Toou turanga i toou akonoanga pera akotoa i runga i te 'enua?*

Responsibilities *Meea i tikai tei a paianga i toou turanga?*

Religion *Akonoanga*

Physiological status

Household quality

Tv Video Freezer Fridge Stereo Stove Oven

Watertank

No of people in household *Eia tangata i roto i toou ngutuare?*

Migration status of household members

Mei i akaruke aine koe i Atiu nei no te roa ote tuatau?

Part 2: Illness and health questions

What are the main health problems and their causes in the Cook Islands and Atiu?

Eaa te maki putuputu i tupuana i roto i toou ngutuare? Eaa uki te apinga i tupu e i teia maki i runga i totao 'enua?

Do you believe that papaa medicine can cure all illnesses?

I toou mano ko anga e meitaki ainei te vairākau i te papaa?

Can you name 5 illnesses that WM is best for?

E aka kite mai koe e rima tuanga maki te kameitaki i te vairākau ote papaa?

Do you believe that Maori medicine works?

I toou mano ko anga e meitaki ainei te vairākau maori?

If no, why?

Can you name 5 illnesses that it is best for?

E aka kite mai koe e rima tuanga maki te kameitaki i te vairākau maori?

What are the main differences between WM and MM?medicine/doctor

Eaa te mea etuke i te vairākau o te papaa e te vairākau maori?

Can you name the names of 10 illnesses (in maori)?

Tata mai koe te tou maki taau i kite?

Can you sort them in groups according to their similarities?

What can cause the illness?

What about the curse, name or *tūpāpaku*?

11.10 Healer interview

Name:

Age:

Household:

Remedies

What illnesses do you know how to treat?

What plants do you use?

Are there any taboos associated with this practice?

When were you last visited?

From who?

How many people did you see in the last year?

Are there any taboos or prohibitions associated with this medicine?

Why did you become a healer?

Origin of knowledge

Who taught you how to heal? When? Where? Why?

How old was your teacher? Are you related?

Who taught your teacher? When? Where? Why?

Have you taught anybody? Who?

Are you going to teach anybody else?

Origin of plants

Where do you get the plants from?

Are there many or a few?

Who planted them there? Wild/cultivated?

How do you harvest them? When?

11.11 Specialist plant use interview

Name:

Age:

Household:

Practice

What craft do you know how to make?

What plants do you use?

Are there any taboos associated with this practice?

When did you last make it?

For who?

How many times did you do it in the last year?

Are there any taboos or prohibitions associated with this practice?

Why did you become a specialist?

Origin of knowledge

Who taught you how to make it? When? Where? Why?

How old was your teacher? Are you related?

Who taught your teacher? When? Where? Why?

Have you taught anybody? Who?

Are you going to teach anybody else?

Origin of plants

Where do you get the plants from?

Are there many or a few?

Who planted them there? Wild/cultivated?

How do you harvest them? When?