“Buoyancy – Bifo and Afta”:
A Climate Change Vulnerability/Resilience Framework for Tourism – The Case Study of Vanuatu Dive Tourism

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ABSTRACT

The Earth's climate is changing. This affects physical, biological and social systems around the globe. Although it is recognised that tourism is a sector heavily affected by climate change, very little research has been undertaken on how tourism destinations/systems can adapt to climate change. Dive tourism represents a significant player in Vanuatu's economy and the country's tourism sector is highly vulnerable to climate change. Nevertheless, there is a paucity of research on climate change adaptation for tourism in the Pacific, let alone in Vanuatu. In addressing the current research gaps, the overarching aim of this PhD thesis is to develop a conceptual climate change vulnerability/resilience (V/R) framework for tourism, using the dive tourism sub-sector in a specific area of Vanuatu as a case study.

Luganville was selected as the case study, representing a key dive tourism destination in Vanuatu. Primary data was collected from key stakeholders of the sector through 56 semi-structured interviews, three group discussions undertaken across two field visits and three field diaries kept by the data collectors. Overall, 107 individuals participated in the research. These individuals represent the dive tourism sector covering public sector, private sector, NGOs, donor agencies and local community members.

The key findings of this study can be divided into two parts. The first part is an examination of the factors that cause vulnerability in the dive tourism system in Luganville, Vanuatu and proposed adaptation action that will help build the system’s resilience to climate change. The second part is the development of a new climate change V/R framework. This builds on the knowledge from current vulnerability and resilience frameworks within disaster risk management, sustainability science and tourism, together with the knowledge gained from the case study in Vanuatu. The proposed climate change V/R framework provides the tool that allows the sector to identify its vulnerability and resilience and, thereby, develop effective adaptation measures.

STUDENT DECLARATION

I, Louise Munk Klint declare that the PhD thesis entitled *"Buoyancy – Bifo and Afta": A Climate Change Vulnerability/Resilience Framework for Tourism – The Case Study of Vanuatu Dive Tourism* is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature Date

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On March 28 2009, I signed the enrolment papers at Victoria University. Since then, I have travelled along my PhD journey expanding on my knowledge base, making new contacts and developing my thesis. The PhD journey is nearing the end and has opened up new paths. I would like to take this opportunity to thank a number of people that have helped me pursue my dream and supported me throughout my PhD journey, which has been challenging on both a professional and personal level.

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This thesis is dedicated to my grandfather

Knud Pedersen

27 February 1920 – 29 August 2011

LIST OF PUBLICATIONS AND AWARDS

The research undertaken as part of this thesis has resulted in a number of publications including:

Double-Blind Refereed Journal articles (Published):

- **Klint, L. M**., Jiang, M., Law, A., DeLacy, T., Filep, S., Calgaro, E., Dominey-Howes, D. and Harrison, D. (2012). Dive Tourism in Luganville, Vanuatu: Shocks, Stressors and Vulnerability to Climate Change. *Tourism in Marine Environments*, *8*(1-2), 91-109.
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Conference papers:

- **Klint, L. M.** (2012). *Tourism, the Environment and Sustainability: An Exploration of Melanesian Constitutions*, 2012 National CAUTHE Conference, Melbourne, Australia, February 2012.
- **Klint, L. M.**, DeLacy, T. and Filep, S. (2011*). Developing a climate change vulnerability/resilience model for dive tourism,* World Research Summit for Tourism and Hospitality (WRSTH), Hong Kong, December 2011.
- **Klint, L. M.**, Jiang, M., Law, A., DeLacy, T., Calgaro, E. and Filep, S. (2011). *Climate Change & Tourism – Sensitivities of the Dive Tourism Sector in Vanuatu*, Islands and Small States Tourism Conference, University of South Pacific, Fiji, September 2011.
- **Klint, L. M.**, Jiang, M., Law, A., Calgaro, E. and DeLacy, T. (2011). *Climate Change & Dive Tourism: Understanding the Vulnerability of Luganville's Dive Tourism System to Climate Change*, 2011 National CAUTHE conference, Adelaide, February 2011.

- **Klint L. M.** (2010). *Climate Change Adaptation Processes and Dive Tourism: Understanding the Policy Environment in Vanuatu*, the 3rd Conference 'Oceanic Transformations', Melbourne, Australia, April 2010.

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ADB	Asian Development Bank
ADRA	Australian Development Research Award
ASEAN	Association of Southeast Asian Nations
AusAID	Australian Aid Agency
APTC	Australia-Pacific Technical College
AVL	Airports Vanuatu Limited
BOM	Bureau of Meteorology
CIM	Coastal Infrastructure Management
COA	Commonwealth of Australia
CO_2	Carbon Dioxide
COP7	Seventh Conference of the Parties
COTS	Crown-of-Thorns Starfish
CRP	Comprehensive Reform Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTSR	Centre for Tourism and Services Research
DFID	Department for International Development
DFTA	Duty Free Traders Association
DRR	Disaster Risk Reduction
DSF	Destination Sustainability Framework
ENSO	El Niño-Southern Oscillation
EIA	Environmental Impact Assessment

ESTA	Espiritú Santo Tourism Association
ESTO	Espiritú Santo Tour Operators Association
EU	European Union
FAR	Fourth Assessment Report
FSPI	Foundation of the Peoples of the South Pacific International
FSPV	FSPI branch in Vanuatu
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFC	Global Financial Crisis
GHG	Greenhouse Gases
GTZ	German Agency for Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit)
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LDCs	Least Developed Countries
MCA	Millennium Challenge Account
MDG	Millennium Development Goal
NACCC	National Advisory Committee on Climate Change
NAPA	National Adaptation Program for Action
NGO	Non-Governmental Organisation
NIWAR	National Institute of Water and Atmospheric Research
NTDO	National Tourism Development Office
NTEE	Nature-Triggered Environmental Extremes

NZTRI	New Zealand Tourism Research Institute
PAA	Priorities and Action Agenda
PACC	Pacific Adaptation to Climate Change
PADI	Professional Association of Dive Instructors
PATA	Pacific Asia Travel Association
PAR	Pressure-and-Release
PCCSP	Pacific Climate Change Science Program
PICCAP	Pacific Islands Climate Change Assistance Program
PICTs	Pacific Island Countries and Territories
PIFACC	Pacific Islands Framework for Action on Climate Change
PRA	Participatory Rural Appraisal
PT-CAP	Pacific Tourism – Climate Adaptation Project
QDA	Qualitative Data Analysis
RAF	Regional Adaptation Framework
RCVA	Rapid Collaborative Vulnerability Assessment
REEEP	Renewable Energy & Energy Efficiency Partnership
RRA	Rapid Rural Appraisal
RRC	Reef Research Centre
SARS	Severe Acute Respiratory Syndrome
SES	Socio-Ecological Systems
SIDSTs	Small Island Developing States and Territories
SLA	Sustainable Livelihood Approach
SLFT	Sustainable Livelihood Framework for Tourism

SOPAC	Secretariat of the Pacific Community Applied Geoscience and Technological Division
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Program
TDR	Tourism Destination Region
TGR	Tourism Generating Region
TMDF	Tourism Marketing and Development Fund
TR	Transit Route
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
UNWTO	United Nations World Tourism Organisation
VHRA	Vanuatu Hotels and Resorts Association
VIBTA	Vanuatu Island Bungalow and Tourism Association
VIPA	Vanuatu Investment Promotion Authority
VNSO	Vanuatu National Statistics Office
VSD	Vulnerability Scoping Diagram

VSOA	Vanuatu Scuba Operators Association
VTAP	Vanuatu Tourism Action Program
VTO	Vanuatu Tourism Office
VPF	Vanuatu Police Force
V/R	Vulnerability/Resilience
WTTC	World Travel and Tourism Council
WWII	World War II

PROLOGUE

As a reader you may be asking the question why I have used the intriguing title 'Buoyancy – Bifo and Afta'. Apart from wanting to capture your attention, the following will provide a clarification of this title choice.

Buoyancy has been proposed by Connell (2007) to be an appropriate interpretation for the resilience of development prospects in small island developing states. "According to Archimedes' principle, the buoyancy of an object reflects the ability of an object to sink or float in water and is measured by the weight difference between an object and an equal volume of water" (Strauss and Aksenow, 2004, p 12). Consequently, being in control of the buoyancy, just like in diving, means that one can control the upward or downward movement by adapting to the environment in which one is situated. As the science of climate change has evolved, it is now evident that we are at a point in society where it is important to control our growth and our greenhouse gas (GHG) emissions. We must adapt to the changes occurring now and in the future in order to ensure sustainability. Due to the identified vulnerability of small island developing states and territories (SIDSTs), the ability to control their buoyancy will be crucial to protect their tourism sector, which is vital to growing local livelihoods.

Furthermore, I wanted to connect to the country in which the study was undertaken. I was, therefore, motivated to use some of the national language in my thesis title. Bislama (a type of Pidgin English) is the national language of Vanuatu. *Bifo* and *Afta* are the Bislama words for the English *before* and *after*. This thesis will provide the framework that allows dive tourism systems, in particular Luganville in Vanuatu, to understand their overall vulnerability, identify current adaptations, and highlight areas requiring further adaptation to climate change. Evaluation will help assess the vulnerability of the tourism system after adaptations have been implemented. The framework presented in this thesis should be seen as a dynamic cycle. Consequently, it will identify the vulnerability of the given dive tourism system before (*bifo*); it will also assist the system's stakeholders in building the overall resilience of the system after (*afta*).

1 INTRODUCTION

"Climate change is perhaps our planet's gravest threat and challenge, and coastal communities are where the full brunt and impact of the predicted physical changes will be the greatest."
(Beatley, 2009, p. xii)

The Earth's climate is changing.

This thesis is concerned with the vulnerability and resilience of tourism systems and the urgent need for tourism to adapt to the effects of climate change[i]. In this thesis, I (the research candidate) present research that has been carried out since early 2009 in order to fulfill the requirements of a Doctor of Philosophy degree. As the title of the dissertation infers, the research presented in the following pages is about contributing to the knowledge of climate change vulnerability and resilience of tourism within Vanuatu, the Pacific and beyond. With a Pacific island context, the specific focus of this thesis is to understand the current vulnerability of the case study of dive tourism in Luganville, Vanuatu and propose ways to build the resilience of its tourism system. The rationale for this research and relevant background information are outlined in this introductory chapter, which also presents the research aim and objectives. The structure of the thesis is also discussed.

1.1 Rationale, research aim and objectives

This research was driven by thirteen important scientific[ii] assertions: (1) climate change is real; (2) climate change is a threat to physical, biological and social systems and one of greatest challenges faced by humanity; (3) climate change is primarily caused by anthropogenic factors; (4) tourism as an economic sector is a source of greenhouse gas (GHG) emissions as well as a victim of its effects; (5) tourism is an important sector in the Pacific, and in particularly Vanuatu; (6) small island developing states and territories (SIDSTs) are vulnerable to climate change; (7) tourism in SIDSTs is

[i] In this thesis, the term climate change refers to any changes occurring in the climate over time, whether caused by natural variability or anthropogenic causes (IPCC, 2007a).

[ii] By the word scientific, I refer to both natural and social science.

vulnerable to climate change; (8) tourism in the Pacific is particularly vulnerable to climate change; (9) Vanuatu is highly vulnerable to climate change; (10) dive tourism is a growing market; (11) dive tourism is a coupled human-environment system; (12) adaptation to climate change is crucial; and (13) there is a current paucity in tourism-related climate change research and no effective frameworks are currently available for dive tourism systems in SIDSTs to adapt to climate change.

Climate change is real (Intergovernmental Panel on Climate Change (IPCC), 2007a). The climate has always varied, but the rate of change has increased. Over the last 100 years, 11 of the 12 warmest years occurred in the period of 1995-2006; atmospheric water vapour has increased in the last three decades; a warming of the ocean has occurred, causing sea level rise; westerly winds in mid-latitudes are greater than before; droughts have become longer and more intense; widespread changes have been observed in weather extremes (e.g. less frequency in cold days and more frequent hot weather); more heavy precipitation has taken place; and the intensity of cyclone activity has increased (IPCC, 2007a, pp. 5-9). The IPCC (2007a) highlighted in their Fourth Assessment Report (FAR)[iii] that even with GHG concentrations stabilised, a general warming of the Earth and sea level rise will continue.

Climate change is a threat to physical, biological and social systems and one of greatest challenges faced by humanity (Beatley, 2009; Hall & Higham, 2005; IPCC, 2007a; Pearman, 2008; Rechkemmer & von Falkenhayn, 2009; Schnellnhuber et al., 2010; The World Bank, 2010). The threat of climate change was first officially recognised in the mid-1960s (Agrawala, 1998). In the following years, political and scientific interest in the topic grew and the IPCC was established in 1988 (Agrawala, 1998; United Nations Framework Convention on Climate Change (UNFCCC), 2012). Globally, the effects of climate change will cause: shifts in precipitation patterns; extreme events; crop failures and reduction in agricultural productivity; hunger and malnutrition; loss of homes due to sea level rise and coastal inundation; and disease (The World Bank, 2010). It has, consequently, become a global problem (Agrawala, 2008) representing one of the biggest challenges faced by humanity in the 21st century (Beatley, 2009; Hall & Higham, 2005; Schnellnhuber et al., 2010; The World Bank, 2010**)**.

[iii] The FAR is to date the most extensive and comprehensive report on climate change involving the work of 152 lead authors and more than 600 experts from around the world (IPPC, 2007a).

Climate change is primarily caused by anthropogenic factors. Human activities like the burning of fossil fuels, agriculture and the change of land-use through deforestation have caused a significant discharge of GHG emissions into the atmosphere from the time of the pre-industrial period (IPCC, 2007a). Since the industrial period, the Earth has already seen a warming of almost 1˚C (The World Bank, 2010). As the major contributor to climate change, humans will have to be a part of the solution. Yet, in the past there has been reluctance across all levels of society to both comprehend climate change and to act on it. This inaction is largely due to the many uncertainties related to the climatic processes and the economic and political complexities of effective action (Flannery, 2009).

Tourism as an economic sector is both a source of anthropogenic climate change and a victim of its effects (Becken & Hay, 2012; Cabrini, 2010; Pang, McKercher & Prideaux, 2012). On the one hand, tourism is a global economic sector that contributes to GHG emissions, because of its reliance on the transport sector, as well as activities within its own sector or other economic sectors requiring the use of fuel (Becken & Hay, 2007; 2012 Forsyth, Dwyer & Spurr, 2007; Hall & Higham, 2005; Hares, Dickinson & Wilkes, 2010). On the other hand, tourism is a climate dependent sector and the ecosystems on which most tourism activity is based will be impacted by climate change. For example, even modest ocean warming causes coral bleaching (Riegl et al., 2009), which then affects dive tourism. Consequently, tourism has been identified as highly vulnerable to climate change due to a high dependence on the natural environment (Richardson & Witkowski, 2010) and, in some cases, long-haul travel (Scott et al., 2008). Yet, this sector plays a crucial role in the economy of many SIDSTs, such as those in the Pacific.

Tourism is an important sector in the Pacific, and in particularly Vanuatu. Tourism allows Pacific nations to compete in global markets. It provides many benefits, including increases in Gross Domestic Product (GDP), foreign exchange earnings, employment (especially of women) and conservation incentives for environmental and cultural heritage; it is a growing market in SIDSTs. Tourism accounts for between 0.1 per cent (i.e. Papua New Guinea) and 67.1 per cent (i.e. Palau) of GDP (Harrison & Prasad, Forthcoming). In approximately half of the Pacific Island Countries and Territories (PICTs), tourism is the leading export earner (Becken & Hay, 2007;

Commonwealth of Australia (COA), 2009). Although, tourism in Oceania[iv] represents a small percentage of global international tourism (less than 1.2 per cent) (United Nations World Tourism Organisation (UNWTO), 2011), it is a significant sector in these PICTs (Becken & Hay, 2007; Briguglio et al., 1996; COA, 2006). Tourism represents a particularly important economic sector in Vanuatu[v]. For Vanuatu tourism is expected to represent 70.3 per cent of exports; 37.7 per cent of GDP indirectly (19.4 per cent directly); and 47.7 per cent of employment indirectly (16.8 per cent directly) in 2011 (World Travel & Tourism Council (WTTC), 2011) far exceeding the importance of tourism in other PICTs. As a result, tourism is one of the key productive sectors of Vanuatu (Global Environment Facility (GEF), United Nations Development Program (UNDP), & Secretariat of the Pacific Regional Environment Program (SPREP), 2009; Republic of Vanuatu et al., 2007; UNDP, 2005) and represents the key foreign exchange earner of the nation (Méheux & Parker, 2006).

SIDSTs are vulnerable to climate change (Attzs, 2009; Mehéux, Dominey-Howes & Lloyd, 2007; United Nations (UN), 2010). General characteristics of SIDSTs include, but are not limited to: their small physical size and isolation; limited natural resources; a proneness to natural hazards and climate extremes; poorly developed infrastructure (Lück, 2008); limited freshwater resources; high population density and growth rates; limited economic and human resources; and a low economic resilience due to the high sensitivity to changes in external markets (IPCC, 2007b; Mehéux et al., 2007; Sem & Moore, 2009; UN, 2010). In IPCC's (2007b) FAR, it was stated that these specific characteristics of SIDSTs "make them especially vulnerable to the effects of climate change, sea-level rise and extreme events" (p. 689).

Tourism in SIDSTs is particularly vulnerable to the impacts of climate change. For example, to many SIDSTs, coral reefs are an important source of coastal protection, food, income and employment, they also contribute to beach formation (Burke, Reyta, Spalding & Perry, 2011; de Groot, Wilson & Boumans, 2002). Yet this natural ecosystem is one of the most sensitive to the effects of climate change (Riegl et al.,

[iv] The United Nation's World Tourism Organisation's definition of Oceania is: Australia; Fiji; Kiribati; New Zealand; Papua New Guinea; Samoa; Solomon Islands; Tonga; Tuvalu; Vanuatu; among other countries and territories.

[v] Vanuatu is an archipelago of 83 islands in the South Pacific region that offers great tourist attractions in the form of coral reefs and underwater environments, pristine beaches, waterfalls, volcanoes, tribal communities and a warm climate year round (Méheux & Parker, 2006; Vanuatu Tourism Office, 2009a).

2009). Consequently, tourism systems in SIDSTs are especially vulnerable when they depend on natural resources, like coral reefs, fisheries and beaches (Richardson & Witkowski, 2010).

Tourism in the Pacific is particularly vulnerable to climate change impacts. With the majority of the Pacific Island's infrastructure being coastal-based, tourism will be extremely vulnerable to sea level rise and more intense tropical cyclones. Furthermore, coastal deterioration in the form of beach erosion and coral bleaching caused by climate change will likely cause a decrease in the tourism destination values (National Institute of Water and Atmospheric Research (NIWAR), 2007). In view of this, climate change in the Pacific Islands presents a real challenge for the public and private sectors, as the direct impacts (in the form of hazards) and the indirect impacts (in the form of devaluation) affect the economic base (Pelling & Uitto, 2001). Pacific island tourism suffers from a range of specific difficulties, including isolation from major markets, small populations, inadequate transportation links, lack of local appropriate skills and inadequate amounts of local capital, which lead to a lower resistance to external shocks (Scheyvens & Momsen, 2008). Consequently, a concerted effort will be required to build the resilience of the Pacific tourism sector against the risks posed by climate change.

Vanuatu as a nation is especially vulnerable to climate change (GEF et al., 2009; Pelesikoti, Government of Vanuatu & Pacific Disaster Risk Management Partnership Network, 2007; Sem & Moore, 2009). Other PICTs, such as Samoa, also have a high coral reef threat exposure and high reef dependence but, due to high levels of adaptive capacity, are less vulnerable (Burke et al., 2011). Vanuatu, on the other hand, has been pinpointed as a nation "with high to very high exposure and reef dependence, and low to medium adaptive capacity" (Burke et al., 2011, p. 74), and this vulnerability will influence various economic sectors and local livelihoods. Consequently, Vanuatu's tourism system and, in particular, its dive tourism system that is so important to its people's future livelihood is threatened by the effects of climate change.

Dive tourism is one of the fastest growing markets in the tourism sector (Davis & Tisdell, 1995; Van Treeck & Schuhmacher, 1998) and a growing market of the Asia Pacific region (UNWTO, 2000). Dive tourism has been defined as "individuals travelling from their usual place of residence, spending at least one night away, and

actively participating in one or more diving activities, such as scuba diving, snorkelling, snuba or the use of rebreathing apparatus" (Garrod & Gössling, 2008, p. 7). Garrod and Gössling (2008) provide one plausible reason for this growth, stating that international travel is an important part of the diving sport, as "...the majority of 'world-class' diving locations are in the tropical regions, particularly where coral reefs are to be found" (p. 5). As this quote suggests, dive tourism occurs primarily in warmer waters.

Dive tourism is a coupled human-environment system[vi] (Perry & Ommer, 2010). It is a global high-energy intensive tourism activity often entailing long-haul travel, the use of powerful boats and air-conditioned accommodation (Garrod & Gössling, 2008). These high-energy intensive activities produce GHG emissions. Yet, dive tourism is highly dependent on the health of coral reefs, which are sensitive ecosystems already under pressure from a warming of the oceans and human activities such as fishing and tourism development (Riegl et al., 2009; Garrod & Gössling, 2008). Future climatic changes will conceivably have significant impacts on the health of coral reefs around the world and, consequently, impact dive tourism. As a result, it will be vital for the sustainability of dive tourism to understand the vulnerability and develop a strategic framework that will assist government and tourism businesses, amongst others, to build their resilience and better adapt to climate change.

Adaptation to climate change is crucial. A clear outcome of multiple studies is the need to acknowledge and address climate change on a global scale and the urgent need to take action now (Desai, 2010; IPCC, 2007a, 2007b; Leary et al., 2008; Pearman, 2008; Preston et al., 2006; Scott et al., 2008; Stern, 2006; The World Bank, 2010). Humanity can act on climate change through mitigation and adaptation. In order to slow or prevent climate change, mitigation aims to reduce GHG emissions, whereas adaptation measures lessen the vulnerability to the effect of climate change (Sanderson & Islam, 2007). Adaptation is crucial as global warming will continue for decades (IPCC, 2007a) and the effects of global warming and the consequent environmental changes are already being felt by nations and economic sectors across the globe (Rechkemmer & von Falkenhayn, 2009), including tourism destinations (Scott et al., 2008). Consequently, adaptation as a mean to deal with climate change is both crucial and urgent (IPCC, 2007b, Jopp, DeLacy, Mair & Fluker, 2012; Scott et al., 2008; Simpson

[vi] This is also termed socio-ecological system (SES) by some academics.

et al., 2008; Urwin & Jordan, 2008), particularly for SIDSTs in the Pacific (Wong, DeLacy & Jiang, Forthcoming).

Yet, there is a current paucity in tourism-related climate change literature and effective frameworks do not exist for SIDSTs' dive tourism systems to adapt to climate change. Although there is a growing academic interest in the topic of tourism and climate change, tourism-related research represents less than one per cent of all climate change research (Pang et al., 2012). Within this, very few studies have been undertaken to assess the vulnerability of tourist-dependent island states to climate change (Payet, 2008) or the consequences of climate change on coastal tourism (Moreno & Becken, 2009). Further research focusing on potential adaptation measures is, therefore, required in the area of tourism and climate change tourism (Moreno & Becken, 2009). This knowledge gap is highlighted in the literature review in Chapter 2.

The lack of research in the field of climate change adaptation for tourism combined with the challenges faced by dive tourism in the Pacific, warrants an in-depth investigation of the vulnerability and resilience of the dive tourism sector in Vanuatu. In addition, with the economic importance of tourism in Vanuatu, an assessment of the tourism system's structure and vulnerability to climate change is needed to ensure successful adaptation to climate change, thus building the resilience of the tourism system.

In acknowledging the thirteen important scientific recognitions discussed above and addressing the current research gaps, the overarching aim of this PhD thesis is to develop a conceptual climate change vulnerability/resilience (V/R) framework for tourism. In order to develop this conceptual framework, three research objectives have been developed to: (1) establish the key elements of a climate change V/R assessment for tourism based on current frameworks and gaps in the literature; (2) test the established key elements of a climate change V/R assessment for tourism in the context of Vanuatu's dive tourism system; and (3) propose a new climate change V/R framework for tourism based on an evaluation of the effectiveness of the established key elements of a climate change V/R assessment for tourism (i.e. research objective 2).

Table 1-1 has been designed to provide a visual overview of the research framework. It details the research objectives, the information required to achieve individual objectives, the methods applied and why these were the most appropriate methods. It also outlines in which chapter the information is covered.

TABLE 1-1: RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?	Thesis chapter
(1) Establish the key elements of a climate change V/R assessment for tourism based on current frameworks and gaps in the literature.	• Elements of V/R frameworks as presented in current literature. • Gap in current frameworks.	• Literature review.	• The overarching aim is to develop a framework, so it is vital to know what different frameworks have been reported in the literature, what are the commonalities between these and what are the gaps.	2
(2) Test the established key elements in the context of Vanuatu's dive tourism system.	• Methodologies applied in other V/R assessments.	• Literature review.	• Previous studies and the key elements of a V/R assessment guide the methodology of the research.	3
	Step 1: Tourism system • Elements of Luganville's dive tourism system.	• Analysis of secondary data; • Semi-structured interviews; and • Observations noted in field diaries.	• Secondary data provide the basic framework for a tourism system. • Primary data allows for a contextual approach – as all tourism destinations are unique.	4
	Step 2: Risks and opportunities • Shocks and stressors. • Climatic stimuli.	• Semi-structured interviews; • Group discussions; • Analysis of secondary data; and • Observations noted in field diaries.	• Local knowledge and observations are vital for understanding the risks and opportunities of climate change and may identify impacts of climatic stimuli that are not covered in the literature. • An analysis of secondary data (there is much in the area of climate change projections and climate change impacts) is sufficient to identify risks and opportunities.	5
	Step 3: Policy analysis • Policy-making environment. • Policy-making mechanisms. • Policy inventory.	• Semi-structured interviews; and • Analysis of secondary data.	• Not all policies have been documented yet, which meant that an analysis of secondary data would not be sufficient. • Semi-structured interviews will help identify	6

	• Adaptation conduciveness. • Policy gaps.		important information about policy environment and relevant policies. • Existing policies may impact on the dive tourism-climate system.	
	Step 4: Sensitivity and adaptive capacity • Sensitivities. • Adaptive capacity.	• Semi-structured interviews; • Group discussions; • Observations noted in field diaries; and • Analysis of secondary data	• Assessing the vulnerability (function of exposure (covered in steps 1, 2 and partly 3), sensitivity and adaptive capacity) of a system requires a multi-facetted data collection. This has been based on previous research undertaken (Calgaro, 2010).	7
	Step 5: Adaptation • Types of adaptation.	• Analysis of all data (i.e. semi-structured interviews, group discussions, observations noted in field trip diaries and secondary data).	• Builds on existing knowledge. • Takes the local context into consideration. • Involves appropriate stakeholders to ensure sustainability. • An analysis of all data will highlight the areas of vulnerability within the system and, thereby, identify areas requiring adaptation.	8
	Step 6: Evaluation • Successful • Unsuccessful/Maladaptation	• This study will be unable to test the proposed adaptations, but highlights the importance of evaluation.	• In coming years, the proposed resilience-building actions need to be tested with the local stakeholders to ensure successful implementation.	8
(3) Propose a new climate change V/R framework for tourism based on an evaluation of the effectiveness of the established key elements	• Effectiveness of key elements of V/R framework. • Applicability of framework. • Limitations to framework. • Proposed applicability of framework to other contexts.	• Overview of the analysis of primary and secondary data.	• The key elements of a V/R assessment were tested in the second research objective and provide an indication of the effectiveness of these steps in a V/R framework. • The development of theory from case studies involves the reflection on data collection and analysis (Carroll & Swatman, 2000).	9

Source: Adapted from Hancock and Algozzine (2006, p. 58)

Table 1-1 does not include reference to Chapter 1, because it is the introductory chapter, or Chapter 10, which provides the thesis conclusion.

Research objective 1 is designed to take into account the current knowledge in tourism as well as climate change literature. Through identifying current V/R frameworks, key elements of a V/R assessment are established and gaps in the reported frameworks in the literature identified. This knowledge then forms the basis for data collection of primary data. Research objective 2 is developed to test the applicability of the key elements and Research objective 3 aims to evaluate the effectiveness of the established key elements and proposes a new climate change V/R framework for tourism.

This study focuses on the dive tourism system in Luganville in the province of Sanma in Vanuatu. The study takes a holistic systems approach and will, therefore, cover elements of the whole functioning dive tourism, from the dive tourism generating regions to the dive tourism destination in Luganville. The study does not attempt to compare the findings with other studies, but will draw upon any lessons learned from such research.

1.2 Structure of the thesis

The thesis has been divided into ten chapters. Chapter 1 has provided an introduction to the rationale behind this study, outlining the research problem and its specific aim and objectives.

The next chapter provides an overview of the current literature relevant to the study, covering aspects such as climate change, tourism systems, tourism and climate change in the Pacific, the science of vulnerability and resilience, and climate change vulnerability frameworks. This identifies the types of information (i.e. key elements) required to assess the vulnerability and resilience of a tourism system.

Chapter 3 provides an overview of the methodological design that was applied to this research. The methodological paradigms, justifying the mixed methods methodology applied in this study, are outlined. Next, Chapter 3 presents the methodological approaches applied in this study generally, before moving onto the specific methods, data collection and analysis. Finally it discusses the limitations of the study.

Chapters 4 to 8 present elements of the empirical study to test the key elements of existing V/R frameworks. Chapter 4 presents the findings from Vanuatu in relation to the dive tourism system in Luganville. In the next chapter, the risks and opportunities for tourism in Vanuatu are established by looking at the perturbations that have impacted dive tourism in Luganville and the predicted effect from climatic stimuli. In Chapter 6, a policy analysis highlights the policies that are conducive to climate change adaptation and an overview and discussion of the policy environment is provided. Chapter 7 assesses the vulnerability of the dive tourism system in Luganville by outlining the key sensitivities and areas of adaptive capacity. Chapter 8 proposes how the resilience of the dive tourism system can be built in the long-term through a range of adaptations and the evaluation of these.

Following this, Chapter 9 discusses the findings presented in Chapters 4 to 8 in relation to the literature and analyses the effectiveness of the key elements of a V/R framework in the case study of Luganville's dive tourism system. Following this, a newly developed climate change V/R framework for tourism is presented.

Chapter 10 concludes the thesis by reviewing the findings in relation to the research objectives outlined here in Chapter 1. Following this review, the contributions of the study are outlined and practical implications are discussed. Finally, future research directions are suggested, in which this thesis might be used as a platform.

2 LITERATURE REVIEW

"Knowledge is not something which exists and grows in the abstract. It is a function of human organisms and of social organization. Knowledge, that is to say, is always what somebody knows: the most perfect transcript of knowledge in writing is not knowledge if nobody knows it. Knowledge however grows by the receipt of meaningful information – that is, by the intake of messages by a knower which are capable of reorganizing his [/hers] knowledge."

(Boulding, 1956, p. 198)

2.1 Introduction

The research problem and research objectives highlighted in Chapter 1 were established by the completion of an intensive literature review (Dooley, 2002), which is presented in this section. This chapter discusses knowledge relevant to this thesis, including climate science, tourism, vulnerability and resilience. It first provides a broad overview of the science of climate change, and then it addresses tourism on a global scale before moving on to Pacific tourism and dive tourism. The chapter then discusses the interconnected relationship between climate change and tourism, with a particular focus on the effects of climate change on tourism. Following this, it touches on the science of vulnerability and resilience. Finally, the chapter addresses the first research objective by critically analysing current climate change vulnerability frameworks, highlighting a tourism, climate change and policy research gap and establishing the key elements of a vulnerability/resilience framework for tourism (Table 2-1).

TABLE 2-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(1) Establish the key elements of a climate change V/R framework for tourism based on current frameworks and gaps in the literature.	• Elements of V/R frameworks as presented in current literature. • Gap in current frameworks.	• Literature review.	• The overarching aim is to develop a framework, so it is vital to know what different frameworks have been reported in the literature, what are the commonalities between these and what are the gaps.

The chapter has been divided into nine broad categories—each at the core of this thesis, as follows: climate change; tourism from a systems' perspective; dive tourism; climate change and tourism; the science of vulnerability and resilience; climate change vulnerability and resilience frameworks; tourism, climate change and policy; and key phases of a vulnerability/resilience assessment.

2.2 Climate change

A discussion of climate change is necessary as the thesis focuses on climate change adaptation, as a way of building the resilience of tourism systems. The climate is a very complex phenomenon.

A simple definition of climate is the average weather that is "described in terms of the mean and range of variability of natural factors such as temperature, rainfall and wind speed" (Garnaut, 2008, p. 27). More broadly, however, it is a complex system involving living organisms and environments, such as the atmosphere, land and water (Schnellnhuber et al., 2010; The World Bank, 2010). It is primarily determined by incoming and outgoing energy (The World Bank, 2010), and is caused by a number of interlinked processes, including physical, bio-physical and chemical, the time-scale of these processes and of these processes' reactions to change (Pearman, 2008; The World Bank, 2010). All of these interactions have an influence on the global climate (IPCC, 2007a).

The Earth's climate is changing due to anthropogenic causes. The Earth has experienced a general warming, an increase in extreme events and changes to precipitation patterns (IPCC, 2007a, 2012; Preston et al., 2006; Scott et al., 2008). In the latest IPCC (2007a) assessment report and the recent IPCC (2012) special report on extreme events and disasters, it was confirmed that it is extremely unlikely that global warming in the past 50 years has been caused by natural forcing factors alone and that extreme events have been changed by anthropogenic causes. The Earth's increasing population, our technological advancement and our desires and needs are causing significant heat—a heat, which McEwan (in Schnellnhuber et al., 2010) termed "the hot breath of our civilization" (p. xviii). In other words, anthropogenic causes, such as the burning of fossil fuels and land changes, have caused an increase in GHG emissions, which in turn play a major role in climate change (IPCC, 2007a, 2012; Preston et al., 2006).

The Earth will continue to experience changes to the environment. Even if GHG concentrations were to be stabilised, global warming will continue due to the time scales of past emissions and the oceans' thermal inertia (IPCC, 2007a; Scott et al., 2008). The IPCC (2007a) has indicated that there will be increases to the global average surface air temperature, sea levels and the intensity and frequency of heat waves and cyclones, changes in evaporation and precipitation, and a decrease in the number of frost days, snow cover and sea ice. It is further projected that climate change will impact heavily on coral reefs, fisheries, coastal conditions, freshwater resources and climate sensitive diseases (NIWAR, 2007; Mataki, Koshy & Nair, 2006; Pelling & Uitto, 2001; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), 2000; UNWTO, 2003). Consequently, climate change is a global phenomenon that requires a collective approach to address (Stern, 2006).

With a natural variability in the climate system, a gap in the knowledge of the global climate system and the difficulty in establishing future GHG emissions, the science community can only provide educated estimations as to what will happen in the future in the form of projections and scenarios (Preston et al., 2006). Consequently, uncertainty is a key aspect of the global climate system (Zillman, McKibbin & Kellow, 2005). Uncertainty – not comprehending all elements of a system – does not represent a valid excuse to not act on climate change. UNESCAP (2000) highlighted that "it will require at least 50 years before any reduction [in GHG emissions] begins to reverse predicted climate change and sea level rise" (n.p.). Consequently, today we know for certain that we need to act urgently to reduce the risks and limit the costs of climate change (Stern, 2006; UNWTO et al., 2003). With this in mind, an understanding of the uncertainties of climate change is vital to ensure an appropriate response to climate change at a national as well as international level (Zillman et al., 2005).

Some sectors, nations and regions are particularly vulnerable to the effects of climate change. Highly climate sensitive sectors include agriculture, energy, insurance, tourism and transportation (IPCC, 2007b; Simpson et al., 2008). In terms of nations and whole regions, the IPCC (2007b) stated with very high confidence—at least 90 per cent chance of being correct–that small islands are "especially vulnerable to the effects of climate change, sea-level rise, and extreme events" (p. 689) due to a number of country characteristics. This is relevant for this thesis, as the research project involves assessing climate change vulnerability in a small island nation. Eight SIDSTs characteristics have

been identified: (1) limited size; (2) limited natural resources; (3) natural hazards; (4) limited water supply; (5) low economic resilience; (6) population growth and density; (7) infrastructure; and (8) limited funds and human resource skills (Sem & Moore, 2009). Least Developed Countries (LDCs) as the world's poorest countries face even further challenges with their limited economic resources, low human and economic development and high rural populations that depend on the natural environment for income creation and sustenance. (Sem & Moore, 2009). Consequently, SIDSTs and LDCs will be hit hardest by the effects of climate change than other regions/nations/sectors.

2.2.1 Climate change in the Pacific

The Pacific Ocean's SIDSTs have been identified as hotspots for major impacts of climate change that will affect tourism destinations across the region (Scott et al., 2008). Poorer countries, like Vanuatu, will be affected worst and first although no nation will be untouched by climate change (Green, 2008). Table 2-2 provides an overview of the different nations in the Pacific and their status as SIDSTs and if they are also officially considered LDCs. Five nations in the Pacific (i.e. Kiribati, Samoa, Solomon Islands, Tuvalu and Vanuatu) are considered both SIDSTs and LDCs, making them particular vulnerable to climate change (see light blue highlight in Table 2-2).

TABLE 2-2: OVERVIEW OF PICTS, SIDSTS AND LDCS

Pacific Island Countries and Territories (PICTs)	Small Island Developing State and Territories (SIDSTs)	Least Developed Countries (LDCs)
Fiji	✓	×
Kiribati	✓	✓
Marshall Islands	✓	×
Federates States of Micronesia	✓	×
Nauru	✓	×
Palau	✓	×
Papua New Guinea	✓	×
Samoa	✓	✓
Solomon Islands	✓	✓
Tonga	✓	×
Tuvalu	✓	✓

Vanuatu	✓	✓
American Samoa	✓	×
Cook Islands	✓	×
French Polynesia	✓	×
Guam	✓	×
New Caledonia	✓	×
Niue	✓	×

(Based on United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UNOHRLLS), 2010)

The Pacific region will be affected by climate change through a number of impacts. Table 2-3 below summarises the details of the climate change projections for the Pacific (2006 and 2011 projections) and Vanuatu (2011 projections) from three studies. Common across these studies, projections entail increases to sea levels, temperatures, precipitation during the wet season, and intensity of cyclones. Common to the two 2011 climate change studies in Vanuatu and the Pacific is the projection that ocean acidification will continue to occur. This climate change impact was not covered in the 2006 projections for the Pacific. With these predicted changes to the climate and environment, Vanuatu will be affected significantly by climate change.

2.2.2 Climate change in Vanuatu

According to AusAID et al. (2011), the following observations have been made in relation to Vanuatu's climate:

- Temperature increases – Maximum temperatures have increased at a rate of 0.17˚C in Port Vila and minimum temperatures have also increased on average;
- Sea level rise – Since 1993 the sea level in the vicinity of Vanuatu has risen by approximately 6mm;
- Ocean acidification – Acidification has increased in the waters of Vanuatu since the 18th Century;
- Changes to precipitation – Wet season rainfall has been decreasing on average since 1950 in some areas of Vanuatu (e.g. Port Vila), but no clear trend can be detracted for other areas of Vanuatu or for dry season or annual rainfall.

In addition to the current observations of changes to the climate, a number of climate change projections have been established for Vanuatu, including sea level rise, ocean

acidification, temperature increases, precipitation changes and cyclone intensity increases (Table 2-3).

TABLE 2-3: OVERVIEW OF CLIMATE CHANGE PROJECTIONS FOR AND VANUATU

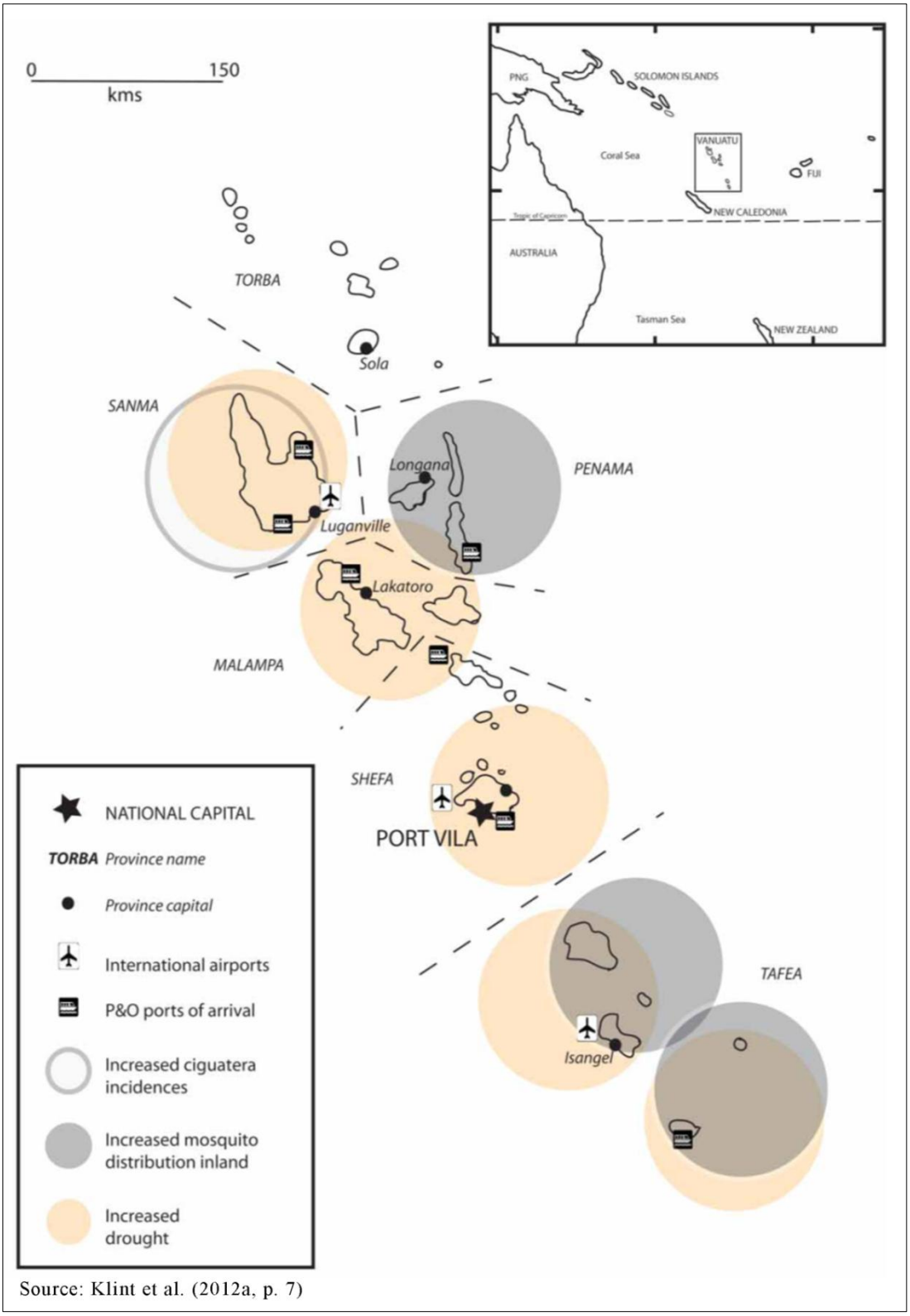
Climate change impact	**2006 Pacific projections** (Preston et al., 2006)	**2011 Pacific projections** (Australian Government Bureau of Meteorology (BOM) & Commonwealth Scientific and Industrial Research Organisation (CSIRO, 2011)	**2011 Vanuatu projections** (AusAID et al., 2011)
Sea level rise	Regional sea variability will occur, but on a global scale the following sea level rises have been predicted: 2030: 3-16cm 2070: 7-50cm.	Improved understanding required, however sea level rise of 0.55 to 1.1m by 2100 is possible, although a more plausible estimate is at around 80cm by 2100.	2030: 3-17cm 2055: 7-31cm 2090: 17-63cm
Ocean acidification	N/A	Further ocean acidification expected to occur.	Ocean acidification increases will continue.
Temperature increases	2030: 0.5-2° C 2070: 1-7° C	Air temperature: 2030: 0.5-1.0°C 2055: 1.0-1.5°C 2090: 1.5-3.0°C Sea surface temperatures: 2030: 0.7-1.4°C 2055: 0.8-2.2°C 2090: 0.6-2.6°C	2030: 0.2-1.0˚C 2055: 0.5-2.0˚C 2090: 0.7-3.2˚C
Precipitation Changes	Increased rainfall during summer monsoon season in decades ahead (although some uncertainty related to the regional distribution of this).	Increases in annual mean rainfall for some countries, annual number of rain days will increase for some countries, widespread increase in days of heavy rainfall, droughts expected to occur less often.	Rainfall decrease in dry season and increase in wet season (although some uncertainty as climate change framework results are not consistent).
Cyclone intensity increases	More intense tropical cyclones and changes to the El Niño-Southern Oscillation (ENSO).	More intense tropical cyclones. Possible decrease in number of cyclones.	Average wind speed increase of 2-11 per cent and rainfall intensity increase of 20 per cent in a 100km radius of the cyclone centre. Frequency of tropical cyclones to decrease by end of 21st century.

The projections of an AusAID et al. (2011) study is based on three carbon dioxide (CO_2) concentrations emission scenarios: low emissions scenarios (550 parts per million (ppm) by 2090); medium emissions scenarios (700 ppm by 2090); and high emission scenarios (850 ppm by 2090), with projected change presented for the years 2030, 2055 and 2090 (Table 2-3). The detailed projections for Vanuatu are provided in Table 2-3 covering the range of all three emission scenarios, where provided. For more detail, see AusAID et al., 2011). With the current observations and the projected changes, the impact on all provinces of Vanuatu is evident. The distribution of this may, however, differ.

The main climate change issues and vulnerabilities identified by the Republic of Vanuatu et al. (2007) as affecting all the provinces of Vanuatu are: coastal erosion; tropical cyclones; flooding; salt water intrusion; scarcity of water resources; landslides associated with prolonged and intense rainfall; declining crop production; and changes in temperatures. In addition, some provinces of Vanuatu will be impacted by an expansion of mosquito distribution inland; increased ciguatera incidences [vii] (food poisoning caused by the ingestion of seafood with ciguatoxin), and drought, as shown in Figure 2-1.

The dive tourism sector in Vanuatu will need to adapt to climate change. To ensure a successful adaptation process, there is a need to understand the vulnerability of the sector in order to identify appropriate adaptation measures. This thesis will provide a framework that can assist this adaptation process in the future. Vanuatu serves as an excellent case study for testing such a framework, due to its significant tourism sector, which has shown considerable growth in recent years and has a strong reliance on dive tourists. Accepting the need to act urgently, this chapter moves on to tourism, which has been identified as a system that will be particularly affected by climate change. Tourism is also the system for which this thesis aims to establish the key elements of a climate change V/R assessment.

[vii] According to the IPCC (2007b), ciguatera incidences are caused by pollution and reef degradation amongst other factors.



Source: Klint et al. (2012a, p. 7)

FIGURE 2-1: MAP OF THE REPUBLIC OF VANUATU AND PROJECTED CLIMATE CHANGE EFFECTS

2.3 Tourism from a systems approach

As the second research objective of the thesis is to test a newly developed framework on the dive tourism system in Luganville, this section discusses tourism from a systems perspective. It provides a definition of tourism, an overview of tourism on a global scale and a brief discussion on the possible positive and negative influences of tourism. This is followed by a discussion on why a systems approach is appropriate for the study reported in this thesis.

Tourism is defined by many academics (Smith, 2010). Definitions have developed through time from very simple meanings, such as that of Mathieson and Wall in 1982[viii] (Gunn, 1994), to more detailed designations. These later definitions acknowledge the complexity of tourism from a systems approach, such as McIntosh et al.'s (1995) definition[ix] that incorporates new elements that had been neglected in earlier definitions of tourism (Ritchie, 2009), or Jafari's (2000) definition[x], which indicates that the individual parts of tourism relate to each other (Gunn, 1994). This thesis applies the UNWTO's (n.d.) definition of tourism: "Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes" (n.p.). Furthermore, the UNWTO definition of a visitor is also applied, as follows:

> "A visitor is a traveller taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. A visitor (domestic, inbound or outbound) is classified as a tourist (or overnight visitor), if his/her trip includes an overnight stay, or as a same-day visitor (or excursionist) otherwise" (UNWTO, n.d., n.p.).

I have used these UNWTO definitions as they are the official definitions provided by the UNWTO that are accepted by most national statistical offices (Smith, 2010).

[viii] "…the temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations, and the facilities created to cater for these needs" (Mathieson & Wall, 1982, p. 1).

[ix] "…*the sum of the phenomena and relationships arising from the interaction of tourist, business suppliers, host governments, and communities in the process of attracting and hosting these tourists and other visitors*" [italics in original source] (McIntosh et al., 1995, p. 10).

[x] "…the study of man (the tourist) away from his[/her] usual habitat, of the touristic apparatus and networks responding to his[/her] various needs, and of the ordinary (where the tourist is coming from) and nonordinary (where the tourist goes to) worlds and their dialectic relationships" (Jafari, 2000, p. 585).

Furthermore, the tourism definition indicates the complexity of tourism by recognising the social, cultural, economic and environmental aspects of tourism. Smith (2010) presents the complexity of tourism in another way by stating, "It [i.e. tourism] is a form of human behaviour; a social phenomenon; an economic sector; a policy field; and a source of social, environmental, and economic change" (p. 1).

Globally, the tourism sector is now one of the largest economic sectors (Douglas, Douglas & Derrett, 2001; Weaver & Oppermann, 2000). In 1950, 25 million international visitor arrivals globally were accounted for, whereas in 2009, these arrivals had grown to 880 million and the industry accounted for US$852 billion in tourism receipts globally (UNWTO, 2010). Tourism accounts for an overall export income of approximately US$3 billion per day (UNWTO, 2008). The tourism sector has since seen a further growth and in 2010, the global international tourism sector saw 935 million international arrivals (UNWTO, 2011). On a global scale, the sheer size of the tourism sector means it has immense potential to provide significant social, economic and environmental benefits to local communities and countries through sustainable development (WTTC, UNWTO & Earth Council, 1995).

Tourism can bring about a range of positive and negative influences on the environment, people and the economy. On the one hand, the positive impacts of tourism may include but are not limited to, cross-cultural understanding, direct revenue, employment, improved infrastructure, sense of place, economic multiplier effects, contribution to conservation and protection, poverty eradication, peace, sense of pride, health and well-being and a promotion of cultural values (Douglas et al., 2001; Hang, 2008; McIntosh et al, 1995; Pedersen, 2002; Weaver & Oppermann, 2000). On the other hand, it has long been acknowledged that tourism can also bring about costs in the form of direct and indirect impacts. The costs of tourism can include crowding, congestion, increased crime rates, loss of access to resources, loss of place, pollution, environmental degradation, economic leakages, generation of waste, cultural commodification and seasonality (Briguglio et al., 1996; Douglas et al., 2001; Hang, 2008; McIntosh et al., 1995; Pedersen, 2002; Weaver & Oppermann, 2000).

There are a number of theoretical frameworks presented in the tourism literature to explain the complexity of tourism. "Tourism frameworks can apply to whole systems or sub-systems, and to various spatial scales: site/project; locality; region; national; or

international" (Getz, 1986, p. 23). For example, Gunn (1994) presented a descriptive framework of tourism, which defined tourism as the balance of two sub-systems (i.e. demand and supply) that sit within a greater context. McIntosh et al. (1995), however, looked at tourism from a purely supply aspect showing the links between tourist suppliers and activities; and Butler (1980) looked at the evolution of tourism on a spatial scale covering the tourism destination. Getz (1986) reviewed 150 tourism frameworks, of which only four applied a whole systems approach (Farrell & Twining-Ward, 2004). Due to the complexity of tourism, a whole of systems approach is deemed more appropriate for this study. It is through this systems lens that the previous climate change adaptation tourism studies have been addressed (e.g. Jopp, DeLacy & Mair, 2010, Moreno & Becken, 2009).

Systems theory is not a new concept. It was developed in the 1930s with the aim of reducing complexity by breaking the whole system into smaller elements while highlighting the connection between these various elements (Jafari, 2000). Boulding (1956) argued that there were nine levels of the theoretical discourse of systems: 1) static frameworks (e.g. Copernican Revolution); 2) clock works (e.g. solar system); 3) control mechanism, or otherwise named thermostat, (e.g. the homeostasis framework); 4) open system, or otherwise called a cell (e.g. a river); 5) genetic-societal level (e.g. plants); 6) animal level; 7) human-level; 8) social organisations; and 9) transcendental systems. As the above discourse levels show, a system can be looked at from micro to macro scales, but the system is viewed as a unified whole (McIntosh et al., 1995). Hence, "a system can be defined as a group of interrelated, interdependent and interacting elements that together form a single functional structure" (Weaver & Oppermann, 2000, p. 23). Since its development, systems theory has been applied to a range of fields of knowledge (Boulding, 1956).

Systems theory was not applied to tourism until the latter period of the twentieth century. Tourism has often been described as an open system (Jafari, 2000), as its core elements are affected by a range of external factors, including natural resources, government policies, community and cultural resources, to name a few (Gunn, 1994). In other words, the tourism system is embedded in external systems, such as economic, political, socio-cultural and physical systems (Ritchie, 2009; Weaver & Oppermann, 2000). This is a notion that in vulnerability science is termed the "coupled human–environment system" (Turner et al., 2003). Getz (1986) provides an overview of some

of the first holistic tourism frameworks that were reported in the literature in the 1960s through to the 1980s. Included in this short list of whole systems frameworks was Neil Leiper's "basic whole tourism system", which is considered one of the most renowned tourism system frameworks (Weaver & Oppermann, 2000).

In order to test the established key elements of a V/R assessment in the context of Vanuatu's dive tourism system (the second research objective of this thesis), an understanding of the elements of a tourism system is required. The following describes and discusses the various elements based on the current literature.

The 'basic whole tourism system' is an open system that incorporates five key elements. The five basic elements of Leiper's (2004) tourism system framework include: (1) tourists; (2) tourist-generating regions (TGR); (3) tourist destination regions (TDR); (4) transit route (TR); and (5) tourism industries. These elements do not exist in a vacuum; they are embedded within a wider socio-political, economic, and environmental context. This context shapes every aspect of the system from the tourists' desires and expectations through to legal parameters of travel (visa requirements, airline emission standards, and flight curfews), tourism planning and policy structures and processes, as well as economic revenue flows that run through the economic goods and services value chain. Tourism activity does centre on the destination, but the impact and consequences of shocks and more slow-onset stressors, such as global warming and sea-level rise, on one part of the system reverberate throughout the entire system (Calgaro & Lloyd, 2008). This echo of effects highlights the close integration of "the world's economies, transport systems and media and communication networks" (Hall, 2010, p. 401). Figure 2-2 provides an overview of the functioning tourism system and the external factors that may influence the system.

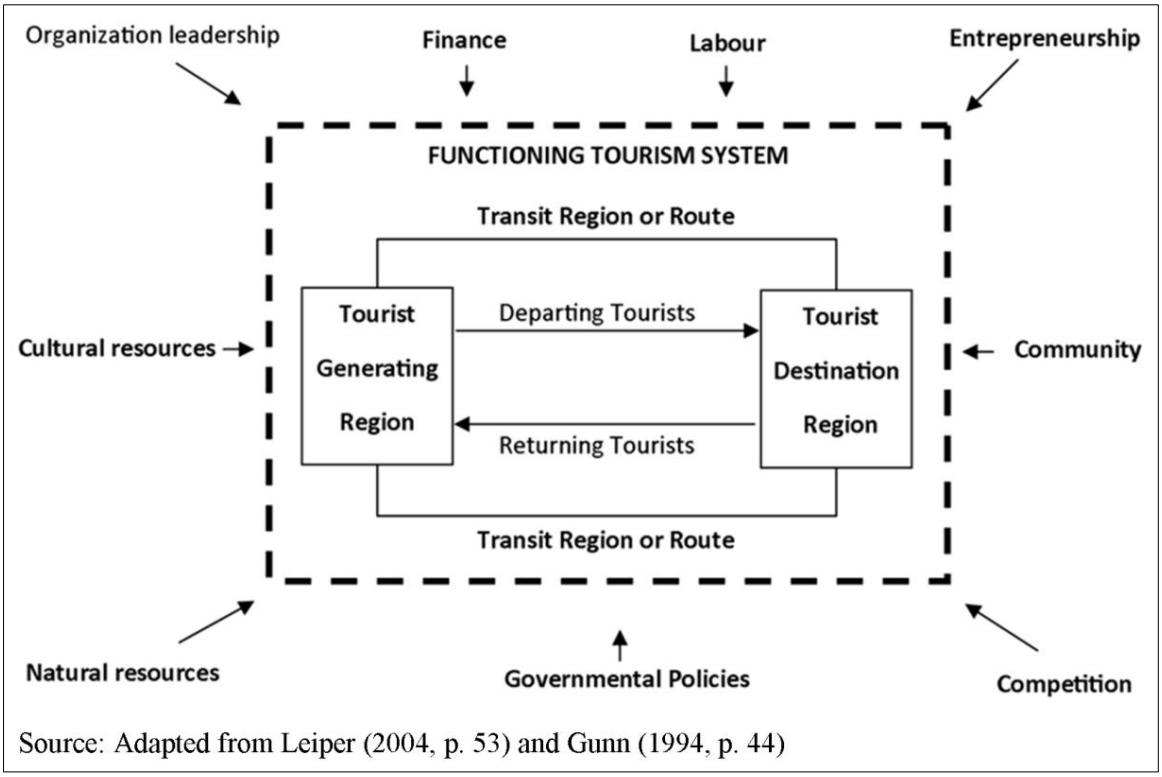


FIGURE 2-2: EXTERNAL INFLUENCES ON THE FUNCTIONING TOURISM SYSTEM

There is a number of industry sectors involved in the tourism system. Each has a different role to play and the level of involvement can range from negligible through to major. For example, some have an important role to play in the TGR but are negligible in the TDR, whereas others play a major role in the TDR but are negligible in the TGR. Weaver and Oppermann (2000) developed an overview of the varying roles of the different industry sectors across the TGR, TR and TDR—an adapted version is shown in Table 2-4.

TABLE 2-4: LEVEL OF INVOLVEMENT OF INDUSTRY SECTORS WITHIN THE TOURISM SYSTEM

Categories	**Tourist Generating Region (TGR)**	**Transit Route (TR)**	**Tourist Destination Region (TDR)**
Travel agencies	Major	Negligible	Negligible
Transportation	Minor	Major	Major
Accommodation	Negligible	Major	Major
Food & beverages	Negligible	Major	Major
Tour operators	Minor	Minor	Major
Attractions	Negligible	Negligible	Major
Merchandisers	Minor	Minor	Major

Source: Adapted from Weaver & Oppermann (2000, p. 47)

2.4 Dive tourism

Dive tourism, the focus of this thesis, is a fast growing area of tourism. Dive tourism can be seen as a sub-set of coastal and marine tourism, which is a rapidly developing area (Hall, 2001; Hall & Page, 2002; Musa & Dimmock, 2012). Research into dive tourism has occurred in a number of areas across environmental and social science disciplines (Musa & Dimmock, 2012). These include consumer behaviour (Musa et al., 2010); divers' impact on the underwater environment (Worachananant et al., 2008); and diver experiences and satisfaction (MacCarthy, O'Neill & Williams, 2006; O'Neill et al., 2000). One area of dive tourism that has received limited attention is climate change adaptation. This is one of the research gaps that this thesis aims to bridge.

Dive tourism can occur all over the world ranging from tropical, temperate to arctic regions (Garrod & Gössling, 2008). Nevertheless, the more popular dive destinations are in warmer waters (Garrod & Gössling, 2008; Kenchington, 1993) and most often are destinations on tropical coasts. Many of these destinations have poorly developed economies (Van Treeck & Schuhmacher, 1998). Globally, key dive tourism destinations include, but are not limited to: Australia (in particular the Great Barrier Reef); the Caribbean; Egypt (in particular the Red Sea, which attracts 540,000 dive tourists annually); the Maldives; and Thailand (Garrod & Gössling, 2008; Lemke & Olech, 2011; Petreas, 2003; Marshall, et al., 2010). Apart from these suggested key dive destinations, many of the Pacific Islands, such as Vanuatu (Howard, 1999), rely on dive tourism for their tourism growth.

2.4.1 Pacific tourism and diving

This section aims to provide an overview of the importance of tourism in the Pacific to provide the context for climate change adaptation in a Pacific Island nation. The tourism sector in SIDSTs has grown considerably (Craigwell, 2007) and is continuing to grow (COA, 2006). In most of the Pacific, tourism is the fastest growing sector (Crocombe, 2008). Table 2-5 provides an overview of the international arrivals to PICTs from 1985 to 2010.

TABLE 2-5: INTERNATIONAL ARRIVALS TO PICTS 1985-2010

Country	1985	2007	2008	2009	2010 (%)	% increase 1985-2010	% change 2008-2010
Cook Islands	29,000	97,019	94,184	101,110	102,156 (7.1)	252.3	8.5
Fiji Islands	228,000	539,255	582,602	542,186	631,868 (43.8)	177.1	8.5
French Polynesia	122,000	218,241	196,496	160,447	153,919 (10.7)	26.2	-21.7
Kiribati	3,000	4,709	3,871	3,944	4,701 (0.3)	90.0	21.4
Marshall Islands	3,000 (est.)	7,200	6,022	4,923	4,563 (0.3)	52.1	-24.2
New Caledonia	51,000	103,363	103,672	99,379	98,562 (6.8)	93.3	-4.9
Niue	2,000 (est.)	3,445	4,748	4,662	6,214 (0.4)	210.7	31.0
Papua New Guinea	30,000	104,122	120,139	125,891	146,933 (10.2)	389.8	22.3
Samoa	39,000	122,250	121,578	128,804	129,487 (9.0)	232.0	6.5
Solomon Islands	12,000	13,748	16,264	18,260	20,300 (1.4)	69.2	24.8
Tonga	14,000	46,040	49,400	50,645	43,823 (3.0)	213.0	-11.3
Tuvalu	1,000 (est)	1,130	1,559	1,622	1,657(0.1)	65.7	6.3
Vanuatu	25,000	81,345	90,654	100,675	97,180 (6.7)	288.7	7.2
TOTAL	558,000	1,341,957	1,391,189	1,253,548	1,441,763 (100)	158.4	3.6
Oceania (million)*	3.8 (est.)	11.2	11.1	10.9	11.6	205.3	4.5
Global tourism (million)	332.7	901.0	917.0	882.0	940.0	181.0	2.5

Original Source: *UNWTO Tourism Highlights: 2010 and 2011 Editions*, Madrid: UNWTO; SPTO, July 22nd 2011 (personal communication). Adapted from Harrison & Prasad, Forthcoming, p. 3

* The UNWTO region of Oceania includes all the above countries, along with American Samoa, Australia, Guam, Heard and McDonald Islands, Micronesia, New Zealand, Norfolk Island, Northern Mariana Islands, Palau, Pitcairn and Wallis and Futuna Islands.

(est.) = estimate

Source:

The tourism sector in Pacific Asia Travel Association (PATA) countries is said to have doubled in numbers from 1980 to 1990 (Miller, 1993) and in 2011, Pacific tourism numbers were reported to have reached record highs (Radio Australia, 2012). Key reasons for this growth were suggested by Veve (quoted in Radio Australia, 2012), who stated:

> "We've seen the Pacific has an attractive package, it's close to Australia and New Zealand, it's got the sun and sea factor, it's safe, it's got an interesting cultural component to the visit. So it's trying to leverage off those positives and see more financial returns from [sic] the country from the tourists" (n.p.).

Tourism is one of the largest export sectors in the majority of the Pacific nations and provides great opportunities for economic growth, employment and sustainable development (TRIP Consultants, 2007). It provides one of few viable sectors with a range of employment opportunities both direct and indirect, particularly for women (Chok, Macbeth & Warren, 2007; COA, 2006; Craigwell, 2007). Tourism represents a main contributor to the GDP (Becken & Hay, 2007; Briguglio et al., 1996; COA, 2006) with its direct, indirect and induced impacts.

Table 2-6 highlights the expected economic significance of the tourism sector for a number of the PICTs. Vanuatu has been highlighted due to its significant dependence on the tourism sector for economic growth. With the positive effects of tourism, many Pacific Island governments have identified tourism as a tool to alleviate poverty and boost economic growth.

TABLE 2-6: OVERVIEW OF THE EXPECTED ECONOMIC SIGNIFICANCE OF TOURISM FOR THE PACIFIC IN 2011

Pacific Island Countries and Territories (PICTs)	Tourism (direct) as a percentage of GDP 2011	Tourism (indirect) as a percentage of GDP 2011	Tourism (direct) as a percentage of employment 2011	Tourism (indirect) as a percentage of employment 2011	Tourism as a percentage of exports 2011	Projected number of international arrivals (overnight) 2011
Fiji	10.0	27.8	9.0	25.1	35.5	600,000
Kiribati	5.1	15.1	4.3	13.0	22.9	6,000
Papua New Guinea	1.1	3.0	0.9	2.6	.0	144,000
Samoa	n/a	n/a	n/a	n/a	n/a	n/a (2004) 98,024
Solomon Islands	3.7	9.9	3.1	8.6	20.3	18,000
Tonga	3.7	11.6	4.2	6.0	45.8	47,000
Tuvalu	n/a	n/a	n/a	n/a	n/a	n/a (2004) 1,214
Vanuatu	19.4	37.7	16.8	47.7	70.3	108,000
Cook Islands	n/a	n/a	n/a	n/a	n/a	n/a (2004) 83,333
French Polynesia	n/a	n/a	n/a	n/a	n/a	n/a (2004) 211,893
New Caledonia	n/a	n/a	n/a	n/a	n/a	n/a (2004) 99,515
Niue	n/a	n/a	n/a	n/a	n/a	n/a (2004) 2,558

No data available for: Marshall Islands, Federates States of Micronesia, Nauru, Palau, American Samoa, Guam.

Source: based on WTTC, 2011, 2004 arrivals are based on Milne, TourismWorx and New Zealand Tourism Research Institute (NZTRI) 2005.

Dive tourism as a growth market is important to the Pacific. Globally, millions of people have gained some form of certification for scuba diving, with the number of certified divers having grown from less than three million in the late 1980s to close to 18 million in the late 2000s (Musa & Dimmock, 2012). The certifications provided by the largest diving school, the Professional Association of Dive Instructors (PADI), have doubled in numbers for the period 1999-2009 (Moskwa, 2012). Dive tourism has been considered one of the most profitable tourism systems (Petreas, 2003) and as a multi-billion dollar sector (Musa & Dimmock, 2012), dive tourism is an important economic activity of Pacific Island communities (Edney, 2012). Nevertheless, there seems to be no detailed statistics for dive tourism in the Pacific. Even though dive tourism is a growth market (Edney, 2012; Kler & Tribe, 2012; Moskwa, 2012; Musa & Dimmock, 2012; Paterson et al., 2012), Pacific (dive) tourism will continue to face several challenges due to the specific characteristics of small island states and their vulnerability to climate change impacts (Sem & Moore, 2009).

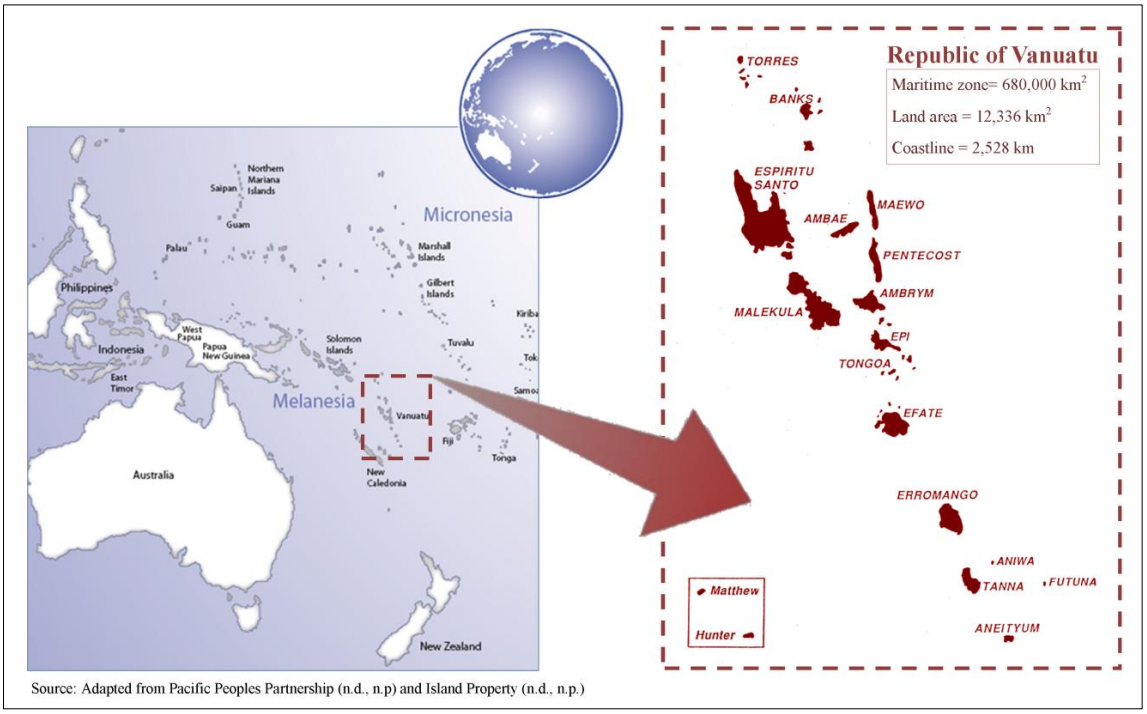
Dive tourism is strongly dependent on a high quality of the marine environment in which it operates (Kenchington, 1993). Yet, these fragile marine environments (e.g. coral reefs) are already under stress due to coastal development, pollution, tourism and fishing. Climate change in the form of sea level rise, increases in temperature and seawater chemistry (e.g. acidification[xi]) will lead to additional stress (Garrod & Gössling, 2008; Lück, 2008), which can lead to coral bleaching and biodiversity loss (Lück, 2008). Apart from the impacts of climate change, dive tourism is also an energy-intensive sector requiring effective management. Diving often requires long-haul travel to remote destinations around the world, use of high-energy consuming accommodation and speed boats. Consequently, it also contributes to climate change (Garrod & Gössling, 2008).

2.4.2 Vanuatu tourism and diving

Vanuatu (the case study country) is an archipelago consisting of 83 islands in the South Pacific (see Figure 2-3). The nation covers 680,000 km^2 of maritime zone and 12,336 km^2 of land area with a coastline of 2,528 km (Republic of Vanuatu et al., 2007). The

[xi] Acidification refers to the lowering of the pH value of oceans around the world caused by an uptake of CO_2.

islands are primarily volcanic in nature with nine active volcanoes (Harewood et al., 2006).



Source: Adapted from Pacific Peoples Partnership (n.d., n.p) and Island Property (n.d., n.p.)

FIGURE 2-3: MAP OF VANUATU, LOCATED IN SOUTH PACIFIC

The population of Vanuatu has tripled in the last forty years with 234,043 residents in 2009, of whom 76 per cent lived in rural areas and 24 per cent lived in urban areas (Vanuatu National Statistics Office (VNSO), 2009a). The population and infrastructure is primarily located in low lying coastal areas making the nation more vulnerable to cyclones and associated storm surges, sea level rise (GEF et al., 2009), and coastal erosion and inundation (Republic of Vanuatu et al., 2007).

Dive tourism is important to Vanuatu (UNDP & UNWTO, 1995). Scuba diving (including wreck and reef diving) is one of the key tourism attractions in Vanuatu (ADB, 2002; UNEP & WTO, 1995). Howard (1999) argued that 30 per cent of the tourism expenditure comes from dive tourism and that just under half of international arrivals to Vanuatu participate in dive tourism. The significance of dive tourism to Vanuatu is confirmed by the more recent Vanuatu 2004 Visitor Survey Report (VNSO, 2007), which stated that "snorkelling topped the list of activities engaged by visitor[s] while in Vanuatu" (p. 26). One of the key dive tourism destinations in Vanuatu is the island of Espritú Santo (also known as Santo), Vanuatu's largest island.

Santo is one of the three most visited provincial destinations in Vanuatu; the two others being Tanna and Outer Islands. Accounting for approximately ten per cent of visitors arriving by air to Vanuatu, Santo is the second most visited destination (TRIP Consultants, 2008). The Lonely Planet guide promotes the destination like this: "Want to dive? Then Santo is the place to be. In fact, you shouldn't come to Santo without trying a dive" (Harewood et al., 2006, p. 128). Although sectors like agriculture, forestry and fisheries also play a significant role in the island of Santo, the municipality of Luganville—the case study destination of this thesis—is relying on tourism for its cash economy (Republic of Vanuatu et al., 2007). Consequently, the tourism sector provides real opportunities to improve local livelihoods. Luganville is located on the southern part of the island of Santo. Outside of Luganville, which is the largest town in Santo, one will find the world's number 14 dive site 'SS President Coolidge' (Garrod & Gössling, 2008).

2.4.3 The effects of climate change on (dive) tourism in Vanuatu

A key aspect of understanding the dive tourism destination's vulnerability and resilience to climate change is an awareness of how climate change can impact tourism. Climate change will have both direct and indirect effects on the tourism sector in Vanuatu.

Observations have shown an increase in the frequency of cyclones, a gradual increase in temperatures, and a gradual decline in rainfall (Republic of Vanuatu et al., 2007). With the availability of safe and reliable drinking water being a critical issue in Vanuatu (UNDP, 2005), increases in temperatures and decline in rainfall will increase the demand for potable water and, thereby further exacerbate water shortages (GEF et al., 2009; Republic of Vanuatu et al., 2007). This is an issue of critical relevance to the tourism sector due to its significant consumption of water (Belle & Bramwell, 2005). Coastal infrastructure is already experiencing sensitivity due to enhanced human activities, such as sand mining and the removal of coastal vegetation (e.g. mangroves). It will be particularly vulnerable to increases in the frequency and intensity of cyclones, storm surges (Republic of Vanuatu et al., 2007), and sea-level rise (GEF et al., 2009). Furthermore, climate change will affect the natural attractions of Vanuatu through coral bleaching, sea-level rise, coastal inundation, and coastal erosion (Jiang et al., 2009). This coastal deterioration will likely cause a decrease in the attractiveness of the tourism destination (NIWAR, 2007).

Apart from the impacts on natural attractions, studies have shown that climate change policies (e.g. long-haul travel becoming more expensive relative to short-haul travel due to carbon prices and taxes) and perceptions may impact on tourism demand and the aviation sector (Cohen & Higham, 2011; DeLacy & Lipman, 2010; Forsyth et al., 2007). This indicates that, in addition to the impact of a possible decrease in attractiveness, Vanuatu may also be facing changes in international travel flows. Climate is a key factor when tourists decide on their preferred destination (Uyarra et al., 2005). This is also important in the case of Vanuatu, as the second most important decision-making factor for visitors to come to Vanuatu was ranked as 'climate' (VNSO, 2007). In addition, the most important type of activity carried out by visitors while in Vanuatu was snorkelling (VNSO, 2007). Consequently, climate change adaptation will be vital for this nation and its tourism sector to cope with the impacts of a changing climate.

2.5 Climate change and tourism

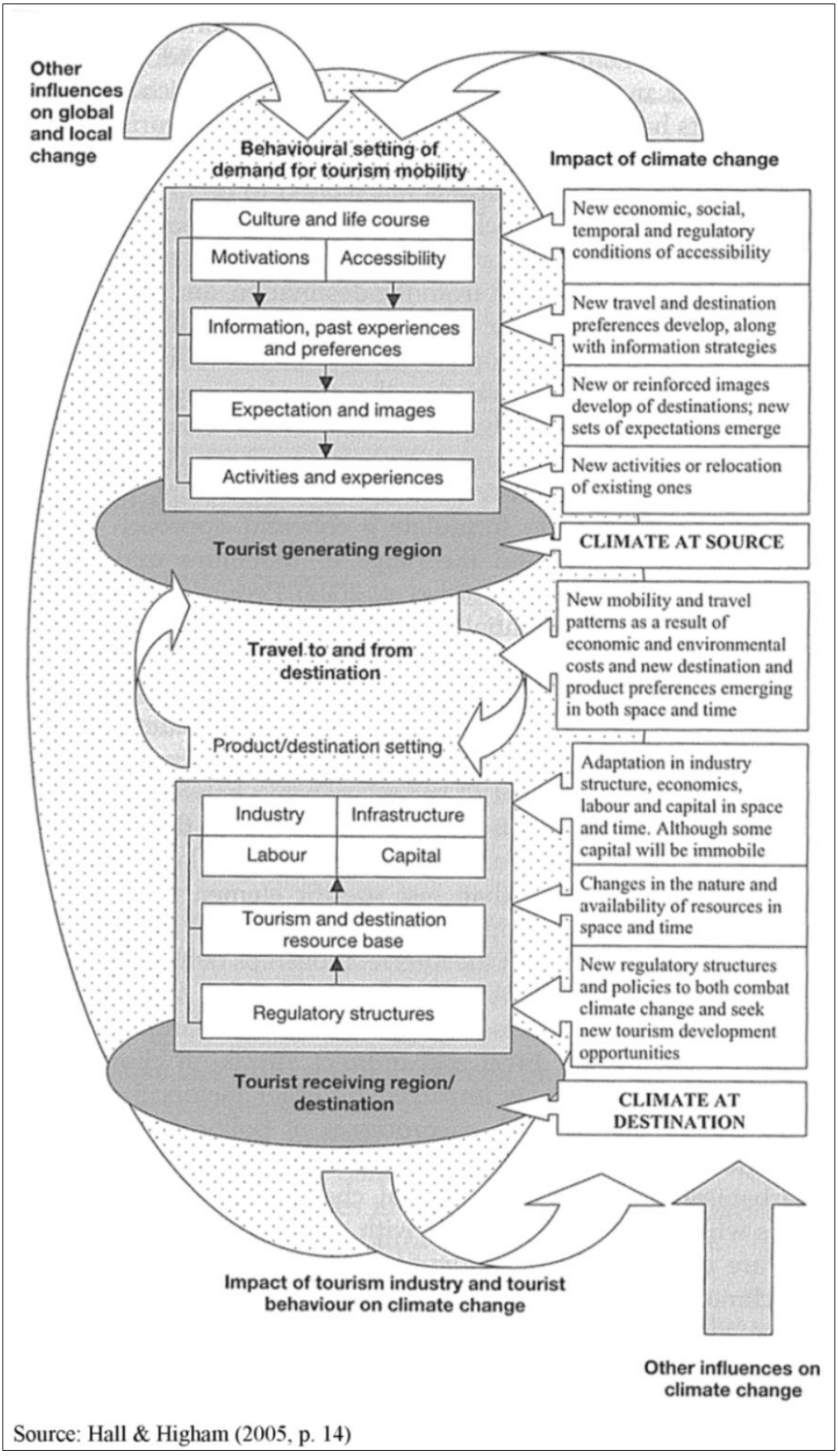
Climate change has been studied in a number of fields, such as science (Bright, 1999), sociology (e.g. Urry, 2009), political science (e.g. Lie, 2007; Roman, Lynch & Dominey-Howes, 2011; Tang et al., 2010), business management (e.g. Hoffman & Woody, 2008; Winn et al., 2010), sustainable development (e.g. Lu, 2011; Mirza, 2003; Robinson et al., 2006), economics (e.g. Stern, 2006), health (e.g. Haines et al., 2006; McMichael et al., 2003), agriculture (e.g. Barnett, 2011), technology (e.g. Titirici, Murach & Antonietti, 2010), and tourism (e.g. Becken & Hay, 2007, 2012; Belle & Bramwell, 2005; Buultjens, White & Willacy, 2007; Hamilton & Maddison, 2005; Moreno & Amelung, 2009; Patterson, Bastianoni & Simpson, 2006; Scott et al., 2008; Wall, 2007; Wall & Badke, 1994; Zeppel, 2012). This section focuses on the research in tourism and climate change.

The emergence of tourism and climate change research has been growing in recent years, particularly since the First International Conference on Climate Change and Tourism held in Djerba Tunisia in 2003, and more substantially in the last five years (Becken & Hay, 2012). The UNWTO 2003 convened conference brought together 140 delegates from 45 countries and the outcome—the Djerba Declaration—encouraged further "research of the reciprocal implications between tourism and climate change" (UNWTO et al., 2003, p. 14). It thereby placed climate change on the international

agenda within the tourism sector. This section discusses the interconnectedness of climate change and tourism.

Tourism can cause changes to the climate system. Tourism affects natural resources, including air, land, water, flora and fauna (Douglas et al., 2001). It impacts on natural resources through land use changes and emissions of GHG (Becken & Hay, 2007). The estimated contribution to CO_2 emissions by tourism globally ranges from 3.9 to 6.0 per cent with air transport accounting for the major share of emissions, followed by car transport (Scott et al., 2008). Although tourism impacts on the climate through the emission of GHG, climate change will also impact tourism (Becken & Hay, 2007, 2012).

Climate change will impact tourism in a number of ways. The natural environment plays an important role in the tourism sector (Moreno & Becken, 2009; Scott et al., 2008; UNWTO et al., 2007), and climate is a key driver of international tourism (Becken & Hay, 2007; Hall & Higham, 2005; Hamilton et al., 2005; Payet, 2008). Accordingly, a changing climate and consequently a change in the natural environment can and will have a substantial impact on tourism (Becken & Hay, 2007; Hamilton et al., 2005; Scott et al., 2008; UNWTO et al., 2007; Uyarra et al., 2005). Figure 2-4 illustrates where climate change may impact tourism. The figure is a good illustration of the holistic impacts of climate change that affect tourism (Scott et al., 2008) at all levels of the tourism system, whether at the tourism generating region, the transit route or the tourism destination region.



Source: Hall & Higham (2005, p. 14)

FIGURE 2-4: TOURISM SYSTEM AND CLIMATE CHANGE

Marshall et al. (2011) propose five categories of climate change impacts on tourism: "direct climatic impacts, indirect environmental change impacts, impacts of mitigation policies on tourist mobility, indirect societal change impacts and attitudinal and behavioural change impacts" (p. 509).

The direct climatic impacts will influence tourism in a range of ways. "The physical impacts include sea-level rise, beach erosion, increased frequency and intensity of extreme events, droughts, floods and changes in ecosystems' structures and biodiversity" (Moreno & Amelung, 2009). Destination appeal will be affected by the direct climatic impacts through changes to the climate, the natural resources upon which the destination is based (Marshall et al., 2011) or to the overall destination image (Hall & Higham, 2005). Changes to the climate may also affect the suitability of some activities (Hall & Higham, 2005), such as beach tourism and winter tourism (Scott et al., 2008). Studies have predicted that the popular tourist destinations will gradually change to countries near the poles and to mountainous areas (Hamilton et al., 2005). The seasonality of tourism may also change due to direct climatic impacts (Hall & Higham, 2005). With a dependency on environmental conditions, input/operating costs will also be affected by climate change (Marshall et al., 2011; Scott et al., 2008). For example, increasing temperatures will affect tourists' comfort levels (Hall & Higham, 2005) and could cause increases to cooling costs (Scott et al., 2008), such as the running of air conditioners. Consequently, the tourism industry needs to prepare itself to monitor the developments and ensure that any planning reflects changes to the environment (UNWTO, 2003) and tourism demand.

A number of indirect environmental change impacts may also occur from climate change. These may present themselves as risks or opportunities (Moreno & Amelung, 2009; Pacific Islands Regional Assessment Group, 2001; Scott et al., 2008). Climate change may negatively influence biodiversity, coral cover, reef aesthetics, fishery production, ecosystem services (e.g. coastal protection and beach replenishment) (Marshall et al., 2009); whereas positive changes may include increases in visitation to certain destinations due to improved climatic conditions (Scott et al., 2008). For example, in Northern Europe, countries may see an increase in visitation during their summer due to the Mediterranean being too hot during the peak of summer (Hall & Higham, 2005).

Tourist mobility may also be impacted by the implementation of mitigation policies. As tourism relies heavily upon transportation, the sector will be sensitive to any future transport policies that aim to mitigate GHG emissions through increasing the price of carbon (Hall & Higham, 2005). As Burns and Vishan (2010) highlight, energy costs present a major cost of tourism operations due to the high reliance on fossil fuels. Consequently, mitigation policies may also affect the competitiveness of nations through affecting the relative costs of energy (Becken & Hay, 2007). A number of studies have highlighted that mitigation policies may influence the flow of travel through affecting the preferences and attitudes of tourists (Cohen & Higham, 2011; DeLacy & Lipman, 2010; Forsyth et al., 2007; Marshall et al., 2011).

Climate change will cause various societal changes (Green, 2008; The World Bank, 2010) that may impact the tourism sector. Climatic extremes may affect food security (Pacific Institute of Public Policy, 2009) through inundation and drought, which can cause significant social disruption (Passioura, 2005), as past famines in Africa have shown. The Pacific region has been impacted by tropical cyclones in the past, affecting food supply and creating substantial financial losses (Barnett, 2001). Consequently, climate change with its predicted increases in drought and cyclone intensity may create social upheavals and present significant security risks. Such societal changes may influence tourists' perceived attractiveness of a destination.

As the awareness of the effects of climate change spreads, attitudinal and behavioural impacts will occur. Marshall et al. (2011) suggest that climate change policies may encourage carbon off-setting in tourism. Furthermore, as suggested by Yeoman and McMahon-Beattie (2006), climate change can become a major driver in consumer demand. In relation to these impacts, greener destinations may have an advantage over less sustainable destinations. Consequently, it is apparent that climate change and tourism are interconnected, influencing each other in a range of ways.

Accepting the interconnected relationship between tourism and climate change, the tourism sector is beginning to acknowledge its responsibilities in reducing its GHG emissions, ensuring sustainable tourism practices and the development of effective planning processes to enable the industry to adapt to the impacts and challenges brought about by climate change (UNWTO, 2003). This recognition has led to increasing

research in this area. The current focus of research in tourism and climate change falls into the following six categories:

1) *Climate change and tourism relationship* – (see Hall & Higham, 2005; Patterson et al., 2006);
2) *Public and private sector perceptions of climate change risks* (see Belle & Bramwell, 2005; Becken, Hay & Espiner; 2011; Huebner, 2012; Wall & Badke, 1994;);
3) *Visitor and consumer preferences and perceptions* (see Cohen & Higham, 2011; Scott, Gössling & de Freitas, 2007; Uyarra et al., 2005);
4) *Impacts of climate change on tourism* (see Coombes, Jones & Sutherland, 2009; Hamilton et al., 2005; Moore, 2010; Payet, 2008) ;
5) *Vulnerability of tourism destinations* – (see Calgaro & Lloyd, 2008; Calgaro, 2010, Jopp et al. 2010. Jopp et al., 2012; Klint et al., 2011, 2012a; Moreno & Becken, 2009, Richardson & Witkowski, 2010); and
6) *Climate change policy environments, policies and plans* (see Becken & Clapcott, 2011; Jiang et al., 2011; Klint et al., 2012b; Tompkins, 2005; Wong et al., 2012).

The Second International Conference on Climate Change and Tourism was held in Davos Switzerland in 2007, in the same year that IPCC brought out their FAR. The FAR stated that observations of increased air and ocean temperatures globally, rising sea levels and the widespread melting of ice and snow means that it can no longer be denied that the climate system is warming (IPCC, 2007a). Table 2-7 from the FAR provides an overview of the likelihood of observed trends, the human impact of these and future trends based on projections—important knowledge when developing an appropriate climate change vulnerability/resilience framework. Understanding the trends of climate change and the likelihood of these occurring is crucial to understanding the vulnerability and resilience of any system to climate change.

TABLE 2-7: LIKELIHOOD OF OBSERVED RECENT TRENDS, THE HUMAN IMPACT OF THESE AND FUTURE TRENDS BASED ON PROJECTIONS

Phenomenon[a] and direction of trend	Likelihood that trend occurred in late 20th century (typically post 1960)	Likelihood of a human contribution to observed trend[b]	Likelihood of future trends based on projections for 21st century using SRES scenarios
Warmer and fewer cold days and nights over most land areas	*Very likely*[c]	*Likely*[d]	*Virtually certain*[d]
Warmer and more frequent hot days and nights over most land areas	*Very likely*[e]	*Likely (nights)*[d]	*Virtually certain*[d]
Warm spells/heat waves. Frequency increases over most land areas	*Likely*	*More likely than not*[f]	*Very likely*
Heavy precipitation events. Frequency (or proportion of total rainfall from heavy falls) increases over most areas	*Likely*	*More likely than not*[f]	*Very likely*
Area affected by droughts increases	*Likely* in many regions since 1970s	*More likely than not*	*Likely*
Intense tropical cyclone activity increases	*Likely* in some regions since 1970	*More likely than not*[f]	*Likely*
Increased incidence of extreme high sea level (excludes tsunamis)[g]	*Likely*	*More likely than not*[f,h]	*Likely*[i]

Table notes:

[a] See Table 3.7 for further details regarding definitions.
[b] See Table TS.4, Box TS.5 and Table 9.4.
[c] Decreased frequency of cold days and nights (coldest 10%).
[d] Warming of the most extreme days and nights each year.
[e] Increased frequency of hot days and nights (hottest 10%).
[f] Magnitude of anthropogenic contributions not assessed. Attribution for these phenomena based on expert judgement rather than formal attribution studies.
[g] Extreme high sea level depends on average sea level and on regional weather systems. It is defined here as the highest 1% of hourly values of observed sea level at a station for a given reference period.
[h] Changes in observed extreme high sea level closely follow the changes in average sea level. {5.5} It is *very likely* that anthropogenic activity contributed to a rise in average sea level. {9.5}
[i] In all scenarios, the projected global average sea level at 2100 is higher than in the reference period. {10.6} The effect of changes in regional weather systems on sea level extremes has not been assessed.

Source: IPCC, 2007a, p. 8

In recognising the significance of the work undertaken by the IPCC and the effect climate change may have on tourism, the *Davos Declaration* stated that "the tourism sector must rapidly respond to climate change" (Scott et al., 2008, p. 13) and that this must be done in the following four categories of action:

(1) **Mitigation** measures, particular for transport and accommodation sectors
(2) **Adaptation** measures for businesses as well as destinations
(3) **Technology** improvements (new and existing)
(4) **Financial resources** secured to help poor regions as well as nations

The need to urgently act has been echoed across the literature (see Desai, 2010; Flannery, 2009; Garnaut, 2008; Green, 2008; Hall & Higham, 2005; Haque & Burton, 2005; IPCC, 2007a, 2007b; Leary et al., 2008; Maclellan et al., 2009; Marshall et al.,

2010; Preston et al., 2006; UNWTO et al, 2007; Pearman, 2008; Preston et al., 2006; Schellnhuber et al., 2010; Scott et al., 2008; Stern, 2006; The World Bank, 2010), and as recognised above, there are two approaches in dealing with climate change: mitigation and adaptation (Füssel & Klein, 2004; IPCC, 2007b; Nicholls & Lowe, 2004; Pearman, 2008; Polsky, Neff & Yarnal, 2007; Stern, 2006; Tompkins & Adger, 2003; Richardson & Witkowski, 2010). The use of technology (new as well as current) and the securing of financial resources are not approaches in their own right, but can aid in the mitigation or adaptation of climate change. The following section interrogates the distinction between mitigation and adaptation to frame the adaptation focus of this thesis.

There are a number of definitions of mitigation in the literature. Smit et al. (2000) state that mitigation refers to the reduction and stabilisation of GHG emissions that will diminish further climate change. It was later defined by Nicholls and Lowe (2004), as the "reduction of the sources or enhancement of the sinks of greenhouse gases" (p. 230). It is, therefore, a deliberate measure, which is implemented and sustained in advance to ensure a decrease in the impact of the risk or hazard (Haque & Burton, 2005). The benefits of mitigation are primarily global and external (Jopp et al., 2010; Leary et al., 2008). Just like there is more than one definition of mitigation, there is also variation in the literature on defining adaptation.

The definition of adaptation has evolved from its initial mention in the literature to its current meaning. Adaptation was defined by the UNFCCC (cited in United Nations Environment Program (UNEP), 2009) as "actions taken to help communities and ecosystems cope with changing climate conditions" (n.p.). This early focus of adaptation was to cope with negative change, whereas the focus has now shifted to also focus on advantages and opportunities. Adaptation is not about returning to the same state, it is about the co-evolving of social and natural systems (Tompkins & Adger, 2003). Evolution is, therefore, an important connotation of adaptation (Haque & Burton, 2005). The benefits of adaptation, unlike mitigation, are primarily local and internal (Jopp et al., 2010; Leary et al., 2008). Adaptation was later defined as the "adjustment in natural or human systems in response to actual or expected climate stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Haque & Burton, 2005, p. 342). This definition is the one applied to this study as it highlights the fact that climate change is not only creating risks for tourism, but may also create

opportunities—a notion that is beginning to be recognised in the literature (Becken & Hay, 2007; Jopp et al., 2010; Jopp et al., 2012; Scott et al., 2008). Subsequently, climate change can be dealt with through four options: (1) do nothing; (2) adapt; (3) mitigate; and (4) adapt and mitigate combined (Tompkins & Adger, 2003).

Most literature has focused on mitigation (Nicholls & Lowe, 2004), but in recent years there has been a shift towards adaption due to the potential that adaptation measures can offer. In fact it would be imprudent to only focus on mitigation, when some warming of the globe is unavoidable (Zillman et al., 2005). Since the failure of the 2009 Copenhagen Conference to deliver effective global action on mitigation, it has become inevitable that climate change adaptation is required and that more research needs to be devoted to adaptation (Jäger & Moll, 2011). As Becken & Hay (2007) emphasises, adaptation measures, if implemented successfully, can reduce the vulnerability of a system to climate change impacts.

Although mitigation is an important approach in dealing with future climate change, adaptation is where SIDSTs and PICTs will need to focus their attention due to their limited contribution to GHG emissions. For example, the Pacific region accounts on an annual basis for less than one tonne of CO_2 emissions per capita of the global GHG emissions (Sem & Moore, 2009). To put this into perspective, Figure 2-5 presents an overview of the CO_2 emissions per capita for selected countries, such as PICTs, Australia, the United States of America, the United Kingdom and the United Arab Emirates. In addition to the argument that PICTs are small emitters of CO_2 emissions, climate change is happening now, making adaptation to the impacts even more important (Stern, 2006).

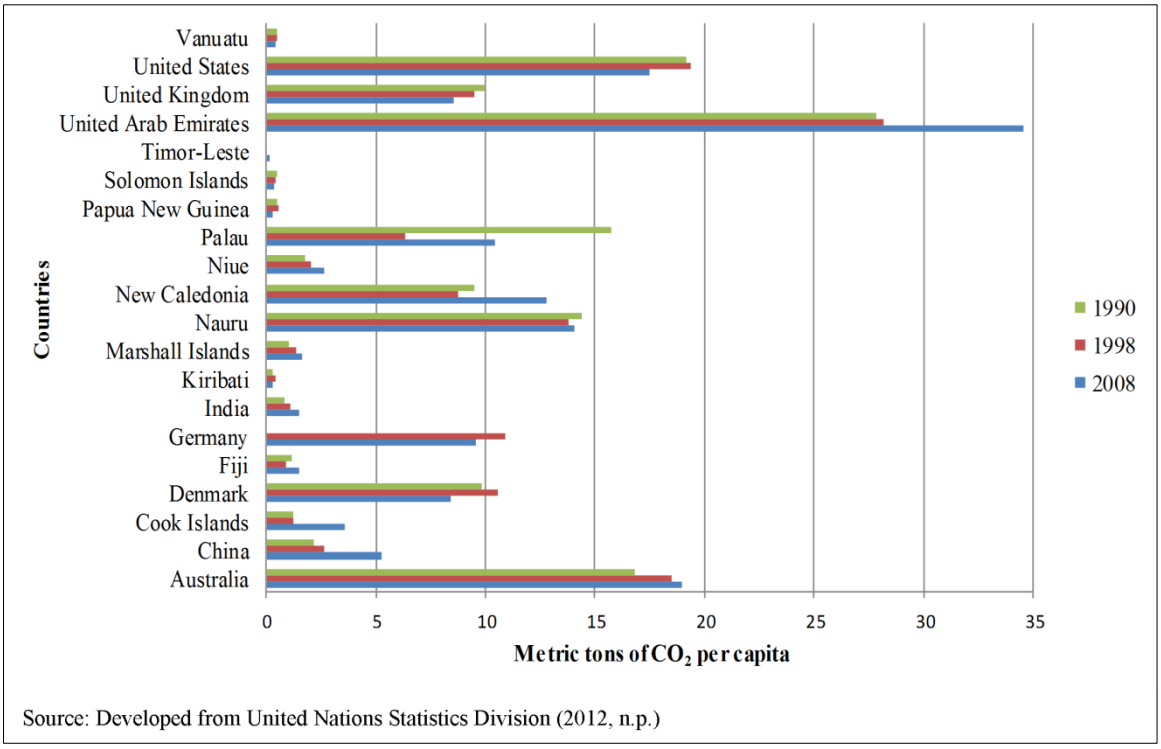


FIGURE 2-5: CARBON DIOXIDE EMISSIONS (CO_2), METRIC TONS OF CO_2 PER CAPITA FOR SELECTED COUNTRIES

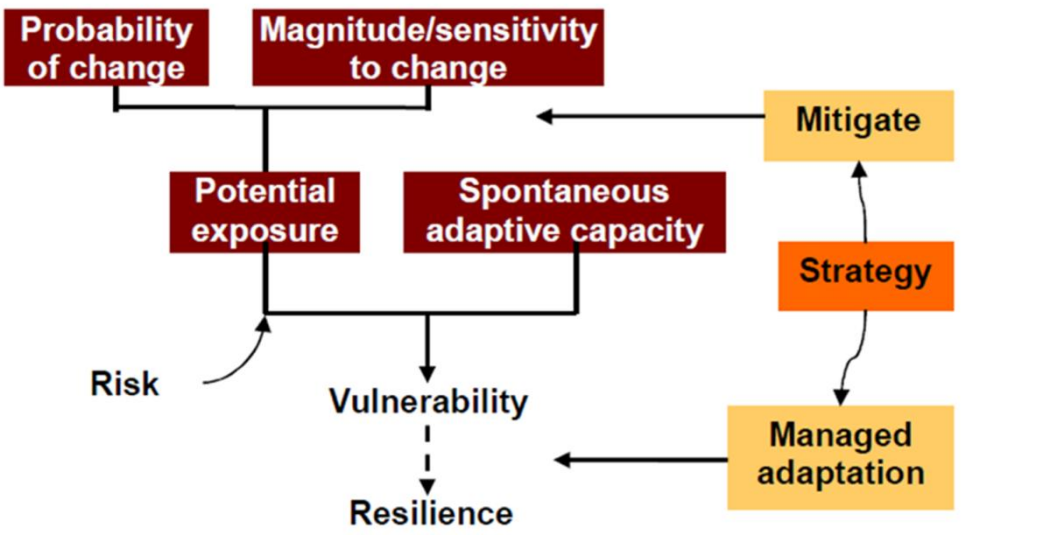
A difference between adaptation and mitigation is in the distribution of benefits. Adaptation benefits are felt more locally whereas the benefits of mitigation efforts are felt on a global scale (Jopp et al., 2010). Consequently, SIDSTs need to direct their actions towards adaptation, and make a key focus of their adaptation actions on building resilience (Maclellan et al, 2009; Nurse & Moore, 2005).

Green (2008) emphasises the need for every nation in the world to assess their climate change vulnerability in order to protect their citizens by identifying adaptation options and planned responses. There has been much research undertaken in the area of climate change vulnerability, including reports from international organisations (e.g. Bhatia et al., 2010), intergovernmental organisations (e.g. IPCC, 2007b, 2012), non-governmental organisations (e.g. Dazé, Ehrhardt & Ambrose, 2009) and governments (e.g. Allen Consulting Group, 2005; Waterman, 1996), as well as academic books (e.g. Adger et al., 2001; Green, 2008) and articles (e.g. Adger et al., 2005; Birkmann, 2007; Brooks, Adger & Kelly, 2005; Daly et al., 2010; Fraser, 2003; Füssel, 2007; Gallopín, 2006; Moreno & Becken, 2009; Pelling & Uitto, 2001; Polsky et al., 2007; Richardson & Witkowski; Romieu et al., 2010; Sales Jr., 2009; Scheyvens & Momsen, 2008; Schröter & ATEAM Consortium, 2004; Smit & Wandel, 2006). Key to effective adaptation is an

understanding of the science of vulnerability and resilience, which is at the focus of research objective one (i.e. establish the key elements of a climate change V/R assessment for tourism).

2.6 The science of vulnerability and resilience

In accordance with this literature review's aim of touching on the science of vulnerability and resilience, Pearman (2008) presented in his report to the Australian Government a simplified framework of how vulnerability and resilience can be defined (see Figure 2-6). Through this framework, one can see the interrelationship of the concepts adaptation, adaptive capacity, vulnerability, resilience, exposure and sensitivity that are applied to global change science (Smit & Wandel, 2006). A brief explanation of each concept is provided below, as an understanding of all these concepts and their relationships to each other are crucial for developing effective adaptation.



Note: Risk reflects the probability of an event occurring and its impact if it does occur. This leads to a potential exposure and vulnerability or loss of resilience.

Source: Pearman (2008, p. 9)

FIGURE 2-6: RISK AND THE RELATIONSHIP BETWEEN PROBABILITY AND IMPACT

2.6.1 Vulnerability

Vulnerability is a concept that has co-evolved within three fields of knowledge (Dilley & Boudreau, 2001): (1) the disaster risk science (Office of the United Nations Disaster Relief Co-ordinator, 1979); (2) food security (Chambers 1989 reprinted in Chambers, 2006); and (3) climate science (Timmerman, 1981). Timmerman was one of the first to link society's resilience to climate change with vulnerability (Klein, Nicholls &

Thomalla, 2003)). In the 1970-80s, vulnerability was linked to physical fragility (e.g. the likelihood of building structures collapsing due to the effects of an earthquake, for example), but in recent years the concept has come to encompass much more (Birkmann, 2007). The concept is founded on the hazards research that has a tradition of being multi-disciplinary and integrated (Cutter, 2003), but has also, as mentioned earlier, been applied within food security and climate science (Moreno & Becken, 2009). Now, vulnerability can refer to individuals, groups, communities, sectors, systems and places (Cutter, 2003; Larsen, Calgaro & Thomalla., 2011) and can refer to physical vulnerability, economic vulnerability, ecological vulnerability and social vulnerability (Ritchie, 2009). Twenty-seven academic definitions of vulnerability have been collated by the WeAdapt Team (2011), covering risk/hazard definitions, political economy and political ecology lineage definitions, and ecological resilience thinking definitions (see Appendix 12.1 for an overview of these definitions).

For this thesis, the IPCC's definition of climate change vulnerability is used. The IPCC (2007a) defined vulnerability as "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes" (p. 6). It is, as acknowledged earlier and as shown in Figure 2-6, a function of the exposure, sensitivity and adaptive capacity. In other words, it can be seen as a function of the interaction between geo-physical processes and the decisions made by humans (Beatley, 2009), which are based on socio-cultural and economic systems. Vulnerability, then, is not only about the present or the future, but is a product shaped by the past that may take centuries in the making (Hillhorst & Bankoff, 2004).

This means that vulnerability can vary and that some systems will be more vulnerable than others. For example, marginalised individuals and communities in society are more vulnerable than powerful people (Green, 2008) and, as established previously, SIDSTs such as Vanuatu are more vulnerable than non-SIDSTs (UN; 2010). This is a very simple example, as vulnerability is much more complex than this. Some examples of vulnerability indicators include: elevation of coastline; coastal development; dependence on (imported) oil and fossil fuels (UN, 2010); marginalisation; poverty; access to resources; dependency on resources; diversity; inequality; and the appropriateness of institutional structures (Adger et al., 2001). Vulnerability is, therefore, established from an understanding of the context, the hazards, the system and the factors that make the system vulnerable to hazards (Brooks et al., 2005).

2.6.1.1 Perturbations

Perturbations can be divided into two types, those where the impact is sudden-onset and those where the impacts are slow-onset (Calgaro et al, 2010). Sudden-onset (or rapid-onset) perturbations can include floods, earthquakes and tsunamis, storms, volcanic eruptions, landslides, avalanches and wild fires; slow-onset perturbations can include famines and drought (Wisner et al., 2004). In structural vulnerability, perturbation is explained in terms of recurrent and progressive shocks (Guillaumont, 2012). In this thesis, perturbation is looked at in terms of shocks and stressors. Shocks are short-term events (i.e. sudden-onset), such as a natural hazard; stressors are long-term processes (i.e. slow-onset), such as environmental degradation or climate change (Romieu et al., 2010). These terms are used as they present a clearer understanding of the division between sudden-onset and slow-onset perturbations. It is noteworthy to mention that shocks and stressors can be triggered by both anthropogenic and natural causes. Furthermore, shocks and stressors can be measured in terms of magnitude, frequency and duration (Calgaro, 2010; Birkmann, 2007).

2.6.1.2 Exposure

Bhatia et al. (2010) define exposure as the people and assets exposed to a hazardous event. Consequently, exposure requires an understanding of the hazards and the system (e.g. people and assets) being affected. Haque & Burton (2005) define hazards as generated and classified by extreme natural events and the tangible as well as intangible damages, which these natural events have the potential to cause. This definition, however, is limited to the natural system. Socio-cultural and economic systems can also cause hazardous events. Exposure, therefore, relates to the identification of the location of people, livelihoods, environmental services and resources, infrastructure, and assets (economic, social and cultural) within a given place "that could be adversely affected by physical events and which, thereby, are subject to potential future harm, loss, or damage" (IPCC, 2012, p. 32).

Tourism is particularly vulnerable to both natural and human caused disasters (Sönmez, 1999). Tsunamis, earthquakes, Severe Acute Respiratory Syndrome (SARS), bird flu, terrorism and the recent global financial crisis (GFC) have had a significant impact on tourism and its flows and are examples of how tourism can be affected by natural and human caused disasters. In responding to the shock of SARS, for example, many countries applied travel restrictions to SARS-infected countries, other countries

introduced quarantine systems or completely closed borders resulting in tourism arrivals to the Asian region falling by around 70 per cent (McKercher & Chon, 2004). Consequently, any hazards approach to the vulnerability of tourism should incorporate events from both natural and social systems (Füssell & Klein, 2004) and crisis and disaster management requires an understanding of the interrelationship of the natural and social systems (Ritchie, 2009). Furthermore, climate change has the capacity to exacerbate current shocks and stressors (The World Bank, 2010), as well as create new risks (Haque & Burton, 2005). An important element of adaptation policies is, therefore, that they should not only consider the vulnerability of future climate change, but also that of current climate variability (Füssell & Klein, 2004). Therefore, any climate change V/R framework needs to incorporate past, current and future shocks and stressors in the assessment. An assessment of these shocks and stressors is, hence, relevant for a dive tourism V/R framework in Luganville, Vanuatu.

Although a system might be highly exposed to a perturbation, this does not mean that it is vulnerable per se, as there may be a range of factors and/or processes that enhance the system's adaptive capacity, thereby allowing the system to resist the perturbation (IPCC, 2012). Consequently, an understanding of factors that contribute to sensitivity and adaptive capacity is also required in order to assess the vulnerability of a system.

2.6.1.3 Sensitivity

Climate change sensitivity refers to "the degree to which the community [or system] is affected by climatic stresses" (Dazé et al., 2009, p. 5). Accepting that the tourism system can be sensitive to not only climatic stressors, it is proposed that the definition of sensitivity includes all types of shocks and stressors. Furthermore, sensitivity does not only have to refer to an adverse impact, but may also incorporate beneficial effects (IPCC, 2007b). For example, a change in temperatures may cause a decline in one tourism market (i.e. beach tourism), but may at the same time cause an increase in another type of tourism market (cultural tourism). The level of sensitivity can, therefore, depend on the system and place under investigation. For example, some tourism and recreational activities (e.g. a visit to the beach) will be more sensitive to a change in the climate than others (e.g. a visit to a museum); the region (e.g. tropical or temperate) in which the activity takes place may also influence the system's level of sensitivity (Hall & Higham, 2005). The unit of investigation that is less affected by the impacts of climate change can be said to have a higher adaptive capacity.

2.6.1.4 Adaptive capacity

Adaptive capacity is defined as "the ability of a system to adjust to *climate change* (including *climate variability* and extremes) to moderate potential damages to take advantage of opportunities, or to cope with the consequences" [italics in original source] (IPCC, 2007b, p. 869). A key notion of this is that the former condition is either not desirable or not possible to return to and that systems should move to new and possibly better circumstances (Beatley, 2009). Another important aspect of adaptive capacity is the close connection to the notion of learning (Folke et al., 2002). The adaptive capacity of tourism, as a global system, has proven to be very high in relation to recent shocks (e.g. SARS and terrorism), but this capacity can vary considerably within the sector so that some individual businesses, destinations and sub-sectors have more or less adaptive capacity when compared to other businesses/destinations/sub-sectors (Cabrini, 2010; Scott et al., 2008). For example, a beach resort in PICTs like Vanuatu would have less adaptive capacity than a tour operator in a big city like Rome, Italy. This is because the tour operator in Rome would have more flexibility in the tours offered, thereby enabling the operator to be influenced by and influence demand, whereas a resort owner have little to no flexibility due to the immobility of the capital asset (i.e. the resort infrastructure) (Scott et al., 2008).

Adaptive capacity is non-static due to the context specific nature of the concept (Adger et al., 2005; Jopp et al., 2010; Smit & Wandel, 2006) and "varies from country to country, from community to community, among social groups and individuals, and over time" (Smit & Wandel, p. 287). This emphasises the importance of understanding the adaptive capacity of the tourism system, as it will vary from tourism system to tourism system. The adaptive capacity is shaped by factors such as the presence and appropriateness of social, institutional and educational factors (Jopp et al., 2010). It is "dynamic and influenced by economic, natural resources, social networks, entitlements, institutions, governance, human resources and technology" (IPCC, 2007b, p. 69). Adaptive capacity can be increased through the successful implementation of purposeful action (Adger et al., 2005). For example, an alpine snow resort can increase its adaptive capacity in relation to fewer days of snow cover through the implementation of snow-making facilities or through the development of alternatives to ski-tourism, such as all year tourism activities or activities in winter not related to snow (Hall & Higham, 2005). Consequently, a tourism system can be enhanced through the implementation of

capacity building, education and communication measures (Richardson & Witkowski, 2010, p. 327). Through these adaptation actions tourism systems can build their resilience to the effects of climate change. This is an example of the strong linkages between adaptive capacity and the notion of resilience (Dazé et al., 2009).

This section has focused on the literature on the concept of vulnerability. It has discussed the four elements that determine whether a system is vulnerable or not: the perturbations that impact the system; the exposure of the system to the perturbation; the sensitivity of the system; and the system's adaptive capacity. An understanding of these four elements will be important for establishing the key elements of a climate change V/R assessment for tourism (research objective one). The following section discusses the concept of resilience before moving on to a critical review of current vulnerability frameworks.

2.6.2 Resilience

The concept of resilience had its origins in ecology in the 1960s and 70s and has since been applied to many other fields of knowledge (Folke, 2006), including business studies, engineering, materials science, psychology (Hudson, 2010) and sociology (Klein et al., 1998). Resilience can occur across multiple geographical scales (Beatley, 2009) and is broadly defined as: "the capacity of ecosystems, individuals, organisations or materials to cope with disruption and stress and retain or subsequently regain functional capacity and form" (Hudson, 2012, p. 12). Resilience can now be seen as an umbrella term entailing ecological resilience (Adger, 2000; Klein et al., 1998), engineering resilience (Holling, 2010), social resilience (Adger, 2000; Klein et al., 1998), morphological resilience (Klein et al., 1998) and economic resilience (Jayaraman, 2004; Klein et al., 1998). The characteristics, focus, threshold description and indicators for this range of resilience concepts have been provided in Table 2-8.

TABLE 2-8: RANGE OF RESILIENCE CONCEPTS

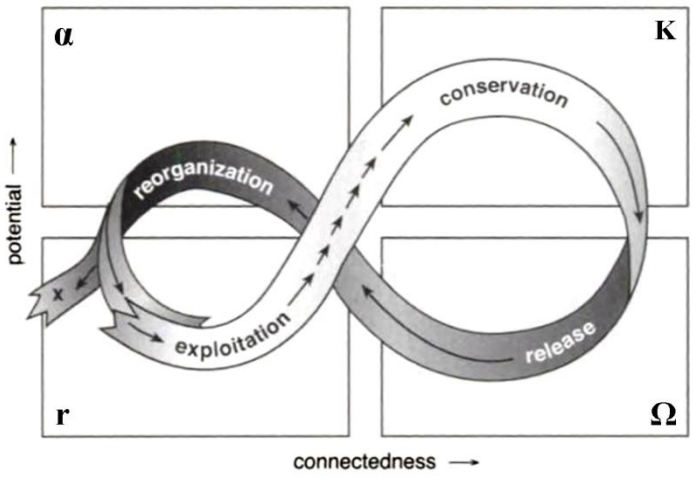
Concepts	Characteristics	Focus	Threshold Description	Indicators
Engineering resilience	Return time, efficiency.	Recovery, constancy.	Recovery time.	Time to recover (months or years).
Ecological/ eco-system	Buffer capacity, withstand shock, maintain function.	Persistence, robustness	Loss of essential functions.	*Ecosystem* Habitat fragmentation, number of endangered species, reduction in soil biological activity, lack of alternative water resources. *Social system.* International isolation.
Morphological resilience (based on Klein et al., 1998)	Long-term changes conditioned by active sediments, linked to ecological resilience.	Evolving systems, long-term changes.	Sediment becomes immobile.	Sediment mobility in active profile.
Social-ecological resilience	Interplay disturbance and reorganisation, sustaining and developing	Adaptive capacity, transformability, learning, innovation.	Loss of capacity to learn and adapt.	Forces outwards migration, loss of traditional knowledge, lack of institutional memory.
Economic resilience (based on Jayaraman, 2004)	Withstand adverse impacts, forge ahead economically.	Correcting mistakes, learning from the past,	Economic downturn, living standards decrease.	Competitiveness, foreign direct investment, good governance, flexibility of fiscal policy.

Source: Based on Folke (2006, p. 259) and Renaud et al. (2010, p. 753) – new additions highlighted in light blue (based on Jayaraman (2004) and Klein et al. (1998)

Similar to the concept of vulnerability, each field of knowledge applies separate definitions. For example, in terms of social resilience, it can mean "The ability of a community to resist, absorb, and recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity" (Dazé et al., 2009). Ecological resilience refers to "the ability of these systems to absorb changes and still persist" (Holling (1973) paraphrased in Klein et al. (1998, p. 261)). Commonly, the term resilience reflects a system's ability to reorganise itself after a hazardous event has taken place, as well as its ability to build capacity to learn and adapt (Adger et al., 2005). It means the system is able to remain its primary function

even though it is experiencing disturbances to the system (Petrosillo et al., 2006). Two key conceptual frameworks closely connected to the concept of resilience are the Adaptive Cycle Metaphor and the Panarchy.

The Adaptive Cycle Metaphor framework (see Figure 2-7) was initially developed by Holling and Gunderson (2002). In this framework, they emphasised that an ecological system does not undergo continuous, gradual or consistently chaotic change, but that change is episodic—perforated with phases of releases and reorganisation (Holling & Gunderson, 2002). In other words, the Adaptive Cycle Metaphor highlights that stability is "offset by periods of disturbance and disorder associated with the cyclic life of ecosystems" (Farrell & Twining-Ward, 2004, p. 281).



Source: adapted from Holling & Gunderson (2002, p. 34)

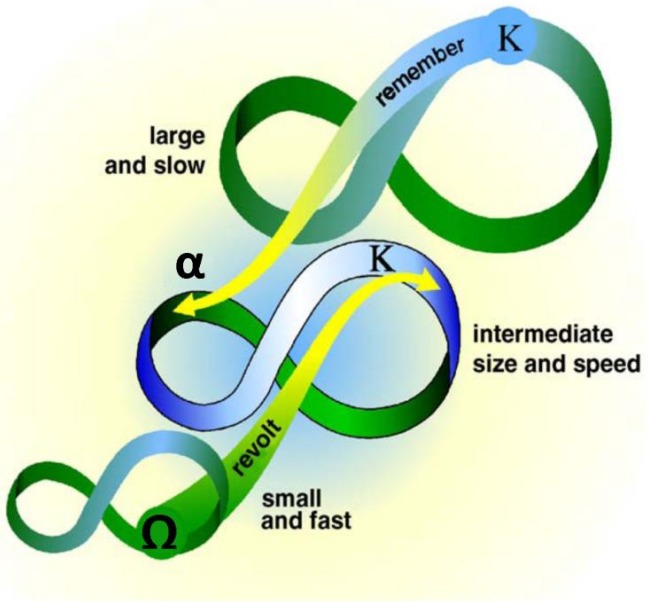
FIGURE 2-7: THE ADAPTIVE CYCLE METHAPHOR

A major strength of this framework is its ability to portray the dynamic cycle of the system through its four key components: (1) exploitation (r), (2) conservation (K), (3) release (Ω); and (4) and reorganisation (α) (Gotts, 2007). These phases capture the essence of change in adaptive cycles of systems (Calgaro, 2010). The original mechanical definition of resilience relied on an equilibrium state that a system would rebound back to after disturbance (Klein et al., 1998), but in Gunderson and Holling's (2002) framework, the system reorganises itself although the main functions remain the same. It is in this reorganisation stage (α) that resilience and potential grows, after a

release stage (Ω) where the system's potential crashes—triggered by an internal or external event (Gotts, 2007).

Acknowledging that adaptive cycles do not occur in a vacuum, Gunderson and Holling (2002) developed the Panarchy theory (see Figure 2-8). This is an integrative theory that can help researchers understand the cause of, as well as role of, change in systems—particularly adaptive systems that undergo transformation (The Resilience Alliance, 2002). Drawing on notions of scale and hierarchy of influences,

> "The term [Panarchy] was created as an antethesis to the word hierarchy in its original meaning of a set of sacred rules. Panarchy is a framework of nature's rules, hinted at by the name of the Greek god of nature- Pan - whose persona also evokes an image of unpredictable change" (The Resilience Alliance, 2002, n.p.).



System components:

Ω represents the release stage when an event (internal or external) has caused the system to collapse

K represents the conservation stage where the system is stable, but also susceptible to be triggered by an external event that can cause a collapse.

Ω indicates a rapid reorganisation of the system.

Connections representing interplay across scale and between nested systems:

Revolt refers to a small trigger event that escalates step by step into a larger and slower disturbance, consequently, affecting another system.

Remember is based on the accumulated memory of a system from scales above or below that provides opportunities for renewal, innovation and reorganisation of a system.

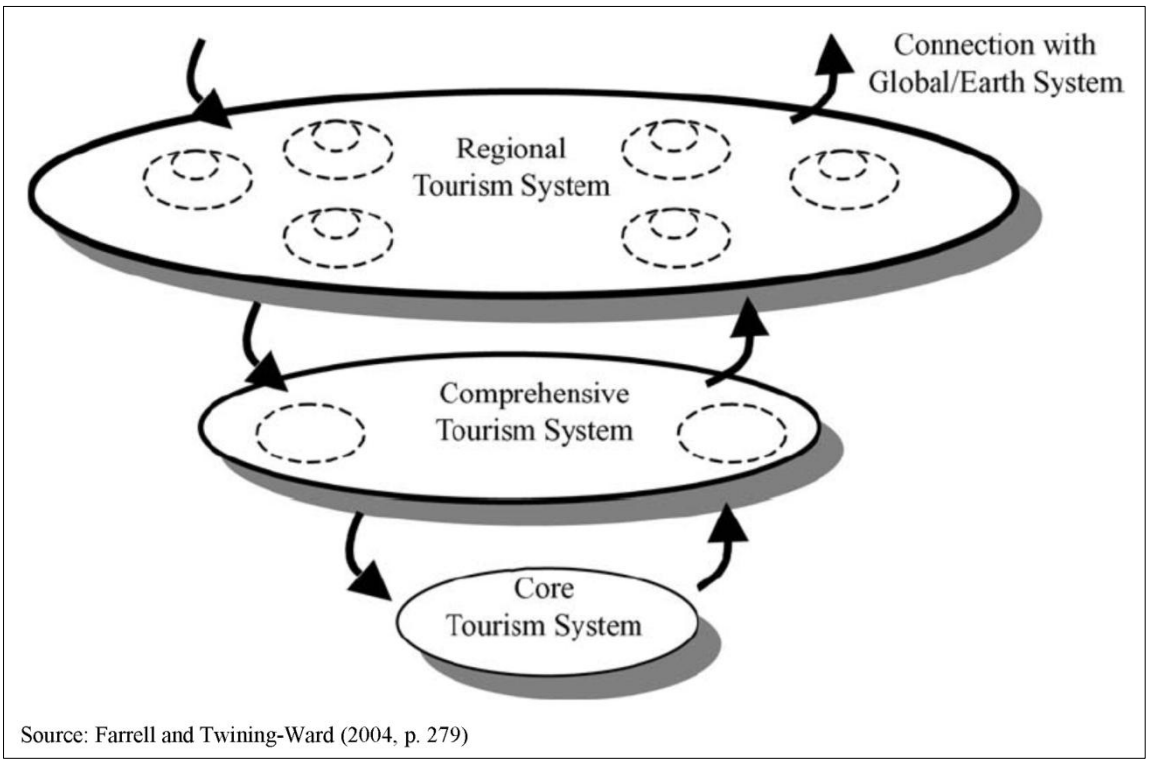
Source: Adapted from Folke (2006, p. 258) who had modified it from Gunderson and Holling (2002)

FIGURE 2-8: PANARCHY

The Panarchy represents the interactive dynamics occurring between a nested set of adaptive cycles (Folke et al., 2010; Gotts, 2007). It was—like the Adaptive Cycle Metaphor—originally based on ecological systems and can be used to characterise the vulnerability of these systems to disruption (Fraser, 2003). Nevertheless, both ecological and coupled human-environment systems form these nested sets of adaptive

cycles (Gotts, 2007). The Panarchy, therefore, has the ability to conceptualise the coupled human-environment system (Gotts, 2007).

This heuristic framework has also been applied and adapted to the context of tourism— Farrell and Twining-Ward developed a Tourism Panarchy (see Figure 2-9).



Source: Farrell and Twining-Ward (2004, p. 279)

FIGURE 2-9: THE TOURISM PANARCHY FRAMEWORK

The Tourism Panarchy presents a core tourism destination system that consists of structures, goods, services and resources that are closely linked to a more comprehensive tourism system. This system covers broader components of sociology, economy, ecology, and geology that are shaped by processes and functions at the regional level, which is connected to the global/Earth system (Farrell & Twining-Ward, 2004). Understanding a tourism destination as a nested system within a Panarchy will allow for discovery, maintenance and enhancement of tourism destination characteristics (Farrell & Twining-Ward, 2004). As has been seen in tourism systems and/or destinations, small events can escalate and affect tourism systems on a broader scale, as was seen with SARS and tourism (McKercher & Chon, 2004), which was discussed earlier.

It is important to note that positive as well as negative feedback processes will mediate the concepts of resilience and adaptive capacity (Gibbs, 2009). In climate science,

positive feedback loops perpetuate the variability whereas negative feedback loops dampen the variability (Gibbs, 2009). In other words, a maladaptation will increase the sensitivity of a system thereby also increasing the vulnerability of the system, whereas a successfully implemented adaptation action will reduce the sensitivity of the system and thereby build its resilience to change. This is a shift from the traditional thinking of resilience, which attempted to control changes to a system in order to make them stable. Now resilience refers to the ability of the system to sustain and enhance the capacity of these systems to adapt to unexpected events (Adger et al., 2005). Uncertainty is an element of climate change research that may never be completely eliminated (Zillman et al., 2005), as discussed earlier, and so it needs to be incorporated into the process of risk management (Pearman, 2008). Consequently, a resilient region—to use an example—is one that seeks to develop transformational actions that develop their capacity to learn by anticipating and seeking to prepare for impacts of change and are efficient in securing the necessary resources to implement the proactive actions (Hudson, 2010). Resilience is, therefore, just as much about renewal opportunities that arise from disturbances, as it is about being persistent or robust to perturbations (Folke, 2006).

Finally, the concepts of vulnerability, adaptive capacity and resilience, as discussed above, are different manifestations of an open system's response to changes in its relationship with an external environment (Gallopín, 2006). They are, in other words, common and related concepts that have been applied to different scientific disciplines (Klein et al., 1998). The vulnerability and resilience of a system will influence how society copes with change (Tompkins, 2005). Therefore, any response to climate change should contain elements of all of the above mentioned concepts. In order to undertake an assessment of the dive tourism system in Luganville (the case study), the key elements of a climate change V/R framework for tourism also need to be established based on an understanding of the current frameworks.

2.7 Climate change vulnerability frameworks

In partly addressing research objective one, the following presents a discussion of current vulnerability frameworks reported in the literature. Climate change vulnerability studies have been undertaken in different knowledge fields, such as disaster and risk management science, sustainability science and tourism. The following section concludes with an analysis of the few current vulnerability frameworks presented in the tourism and climate change literature.

2.7.1 Frameworks in disaster and risk management science

There are a number of disaster and risk management frameworks presented in science literature. These will be relevant to this study because, as Barnett (2001) states, "Given that exacerbated temperature and rainfall variability and increasingly severe cyclones may well be the most immediate threat to the persistence of island social-ecological systems, preparing for disasters is equally preparation for climate change" (p. 979). This section will provide an overview of three generic disaster and risk management science frameworks that have been presented in the literature since year 2000. A discussion of the benefits and limitations of the various elements of these frameworks will be presented, before moving on to the specific V/R frameworks in the field of tourism. This discussion will assist in better understanding elements which are relevant to forming the climate change V/R framework in this thesis.

The first framework to be described is the gross anatomy of adaptation to climate change and variability (Smit et al., 2000) (Figure 2-10). In 2000, Smit et al. presented this framework of adaptation covering two key elements: what is adaptation and how good is the adaptation. The first element includes four factors: 1) the adaptation to what, in terms of climate-related stimuli; 2) non-climate forces and conditions; 3) who and what adapts in relation to the system definition and characteristics; and 4) how adaptation occurs in regards to the types of processes and outcomes. The second element is an evaluation of the adaptation measures and incorporates criteria and principles. This framework is a very simple overview of adaptation, but has a number of strengths attached to it.

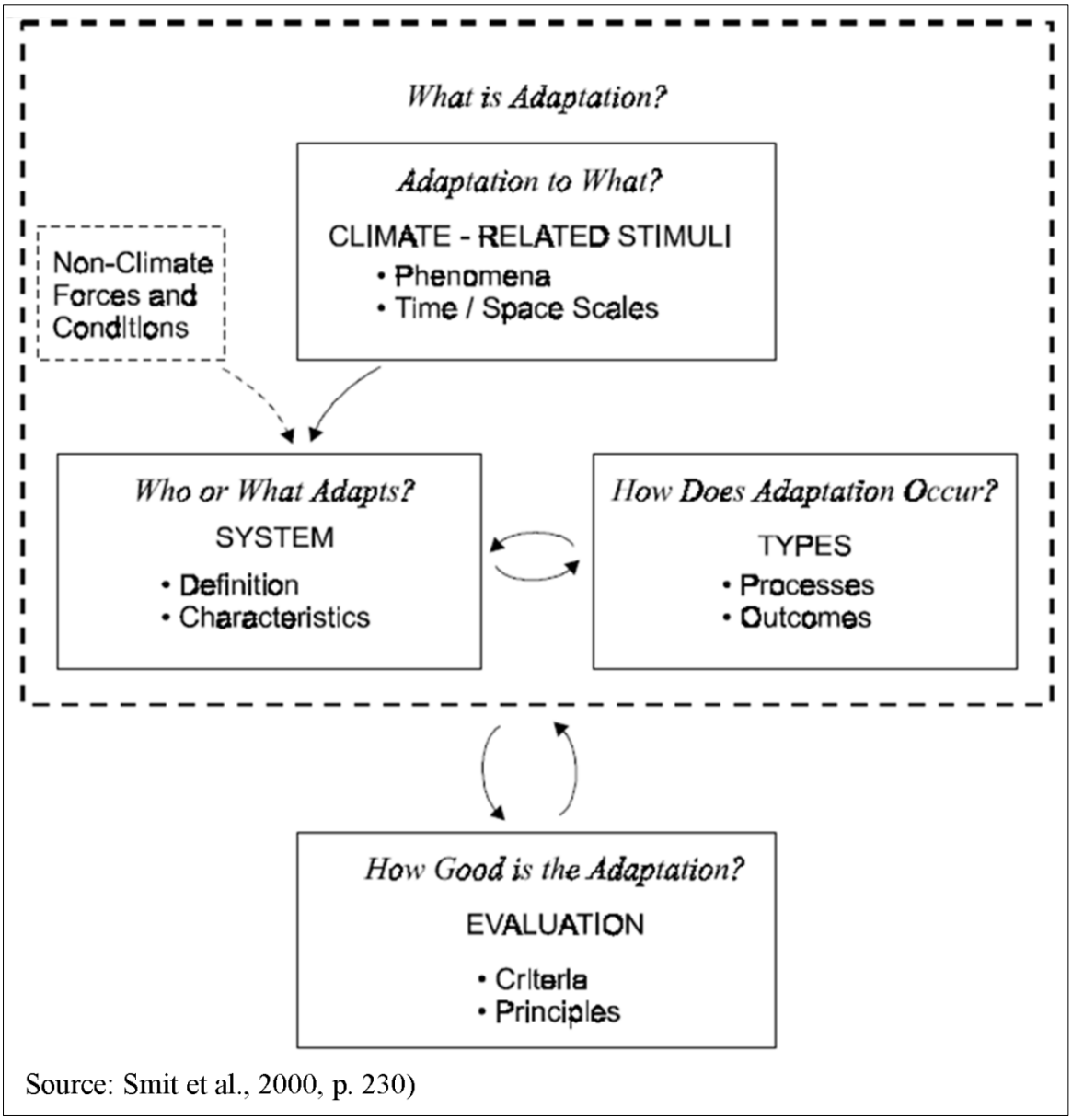


FIGURE 2-10: GROSS ANATOMY OF ADAPTATION TO CLIMATE CHANGE AND VARIABILITY

Four strengths of the gross anatomy of adaptation to climate change and variability framework have been identified. First, it points out the importance of incorporating space and time scales when assessing the climate-related stimuli, which can be looked at as shocks and stressors. This is important as global or regional events may still influence a local tourism destination, even if the event did not take place in this local area, and can continue to influence the destination over a period of time after the disaster has occurred, as the examples of terrorism and SARS have shown (Wall, 2007). Second, it emphasises the importance of understanding the different characteristics of the system. Third, it identifies that adaptation can take place through various processes,

such as autonomous adaptation, which in a natural environment is the built-in responses of the system that occur naturally; and the planned adaptation, which is undertaken actively through policy decisions (Smit et al., 2000). Finally, it recognises the importance of evaluating the adaptation measures, as these will influence the vulnerability and resilience of the system.

Apart from the benefits of this framework, there are also a number of limitations in its application to tourism. For example, it is a very broad framework and does not recognise what the various aspects of the system include or what the different types of adaptation that can be implemented are. The time and space scales are acknowledged in the climate-related stimuli, but not in relation to the system or the types of adaptation. Just as climatic stimuli can be categorised in terms of the time scale, so can the impact of short-term events have both short and long-term effects on the system. Moreover, tourism systems, as discussed earlier, involve not only a single tourism destination, but also other geographical areas like TRs and TGRs; all of these are dynamic and evolve over time. Adaptation should also be looked at in terms of time scales, as it can be implemented now and the effects of this are not seen until perhaps many years down the track. Finally, contextual factors of the place, like those recognised by Gunn (1994) in his tourism system, are not explicitly taken into consideration, but will influence the very fabric of society and affect responses to climate change adaptation. Consequently, in undertaking a climate change V/R assessment of the dive tourism system in Luganville (second research objective) a consideration should be given to the influences of time, place and scale.

The second framework to be discussed is the process of human vulnerability to nature-triggered environmental extremes (NTEE) (Hague & Burton, 2005). In 2005, Haque and Burton presented a schematic flow diagram, which identified the complex processes occurring between the human society and the natural environment (Figure 2-11).

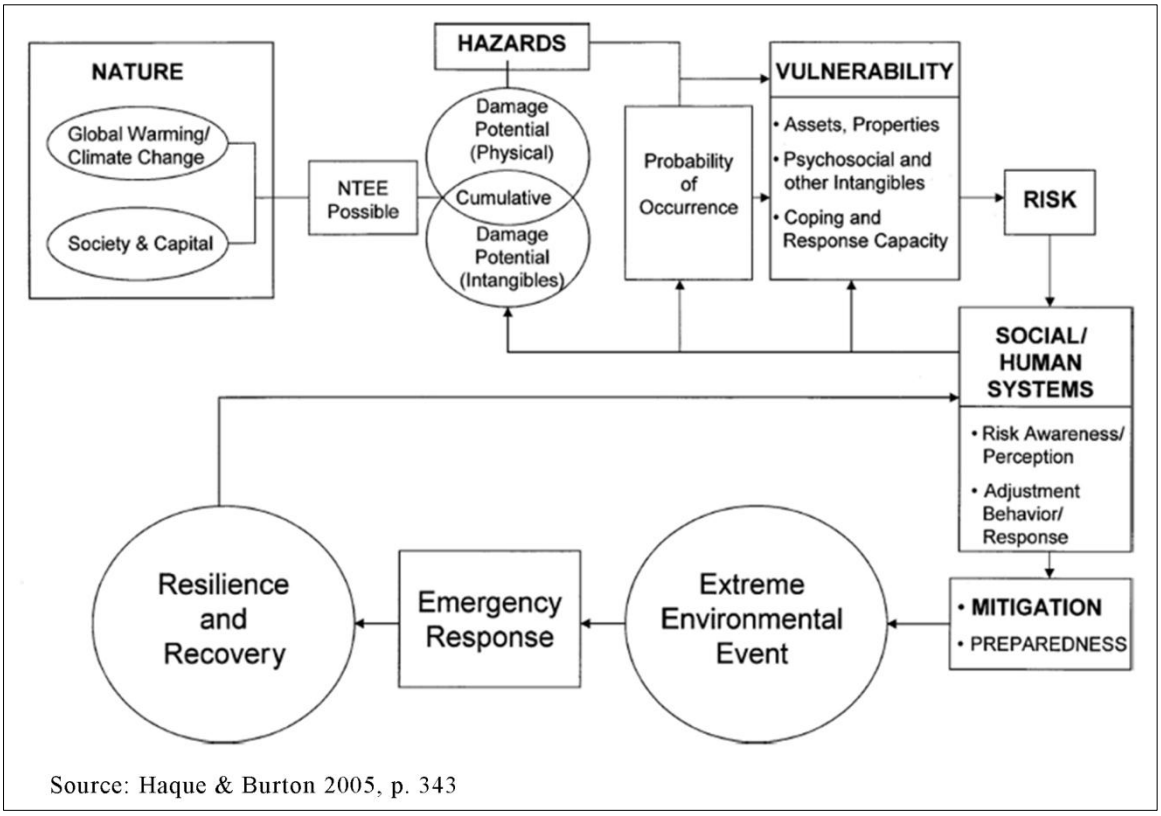


FIGURE 2-11: THE PROCESS OF HUMAN VULNERABILITY TO NTEE

As the general framework presented by Pearman (2008), this framework includes elements of risks, vulnerability and resilience. Benefits of this framework include a focus on: tangible and intangible damages; emergency responses; risk awareness and perceptions; preparedness and the inclusion of feedback loops. Disaster events can influence not only built infrastructure, but can also affect intangible cultural and social aspects of society, which can be far more costly than the tangible damages (Haque & Burton, 2005). As Bird, Gísladóttir and Dominey-Howes (2011) emphasise, the importance of risk mitigation, therefore, needs to be undertaken in "the context of the society it aims to protect and within a framework that incorporates both the social and physical aspects of hazards" (p. 17). For example, the strong family networks in Vanuatu form significant informal social protection systems, which leave this nations more resilient to disaster events than if this was not present (Ratuva, 2010). Emergency responses and the knowledge of these will affect how we deal with a disaster (Bird et al., 2011), and risk awareness and perceptions will influence how people respond to risk (Maher et al., 2010), thereby affecting the preparedness to deal with the given disaster.

Nevertheless, for the purpose of applying this framework to tourism, there are several limitations. First, the framework treats the natural environment and the social and human systems as separate (although the interconnectedness is acknowledged in the paper), and the focus is on NTEE. This means that any risks resulting from mitigation policies, for example, are not covered in this framework. As Haque and Burton (2005) state, disaster mitigation involves the mitigation of all types of disasters: non-natural and natural, including climatic, geophysical and biological. Second, although feedback loops are included, indicating that any mitigation efforts undertaken would influence the social and human system, they do not directly identify that this can be in the form of both a decrease or an increase of the exposure, vulnerability and/or adaptive capacity. Moreover, it does not explicitly acknowledge the different spatial spheres that occur. Nor does it directly acknowledge the time sphere, which is an important aspect of responding to climate change. For example, emergency procedures are undertaken immediately and for the short-term (Calgaro, 2010; Haque & Burton, 2005), whereas adaptation actions are developed as a long-term response (Calgaro, 2010).

Lastly, the framework guiding questions in the investigation of Socio-Ecological Systems (SES) was presented by Renaud et al. (2010) (Figure 2-12). This framework was based on the earlier work of Gallopín (1994). As discussed earlier, tourism is an open system that is closely connected with the climate and the environment, and as a result of this, tourism cannot be looked at in a vacuum. Consequently, a key benefit of this framework is the acknowledgement of the human-environment system, and the recognition of external influences on the system. It acknowledges the various actors of the system, but neglects a detailed definition and description of the system, which was established as a benefit of the framework developed by Smit et al. (2000).

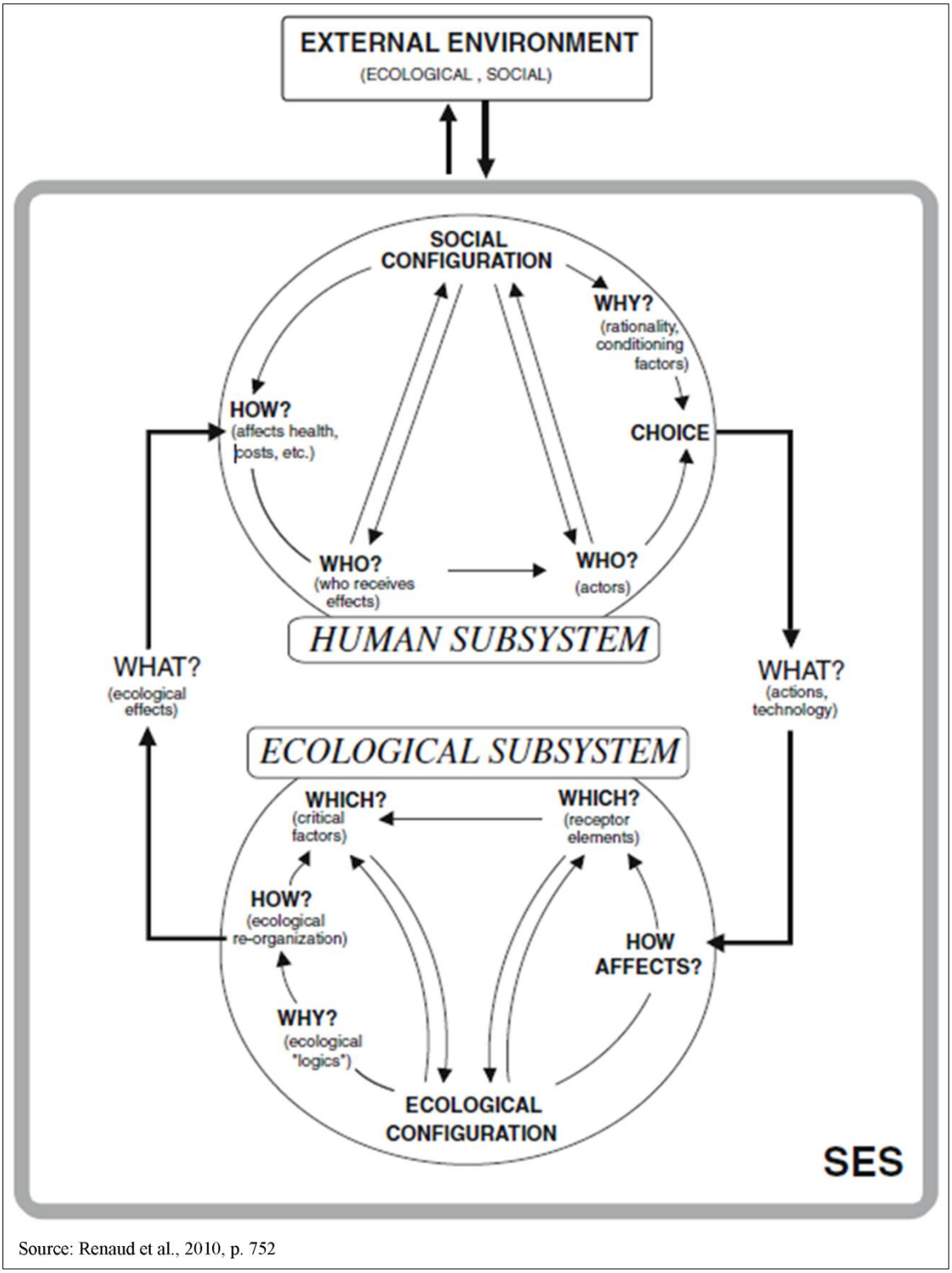


FIGURE 2-12: GUIDING QUESTIONS IN THE INVESTIGATION OF SES

Acknowledging the many benefits and limitations of the three frameworks discussed from the disaster risk management sciences, the focus now shifts to the specific V/R frameworks presented in the field of "sustainability science".

2.7.2 Frameworks in "sustainability science"

"Sustainability science" is an emerging discipline that focuses on seeking to understand the interactions between society and the environment (Kates et al., 2001). The following presents three frameworks: (1) The Sustainable Livelihoods Approach (SLA); (2) The Sustainable Livelihood Framework for Tourism[xii] (SLFT); and (3) The Vulnerability Framework.

The SLA was developed by the United Kingdom's Department for International Development (DFID, 1999) and has received a growing interest in tourism academia (Shen, 2009). In its schematic form (Figure 2-13), the SLA aimed to provide a guiding tool for analysing livelihoods in order to promote debate on how to improve poverty reduction performance (Department for International Development (DFID), 1999).

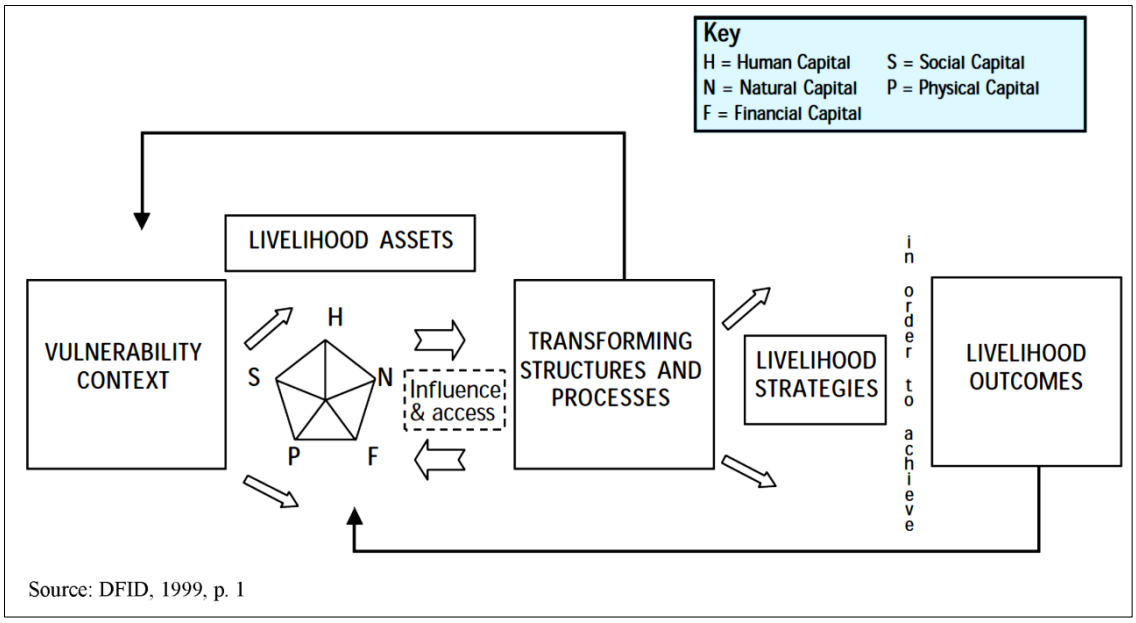


FIGURE 2-13: THE SLA

A key strength of this framework is the identification of the five types of capital that are essential for ensuring sustainable livelihoods (Calgaro, 2010; Graci & Dodds, 2010). The ability of the framework to aid in the understanding and illumination of opportunities for new livelihood options, covering both local strategies and political dimensions, prompted the use of this framework in three case studies across desert Australia, to explore the dynamics of the social-ecological systems in these regions (Davies et al., 2008). In this research it was found that culture was not adequately

[xii] This framework was based on the SLA that not originally designed for tourism, which is why I present it here and not in Section 2.7.3 on frameworks in tourism.

represented in the framework, as culture influences all facets of livelihood sustainability and is not only a livelihood asset (Davies et al., 2008). Furthermore, the SLA only applies the concept of vulnerability broadly and the role scale and time play in vulnerability has not been sufficiently represented (Calgaro, 2010).

Almost a decade later, the SLA was adapted to a tourism context by Shen, Hughey and Simmons (2008). The SLFT (see Figure 2-14) aims to bridge the current gap between tourism and the SLA, but the authors encouraged further evaluation and improvement of the framework to ensure its applicability (Shen et al, 2008).

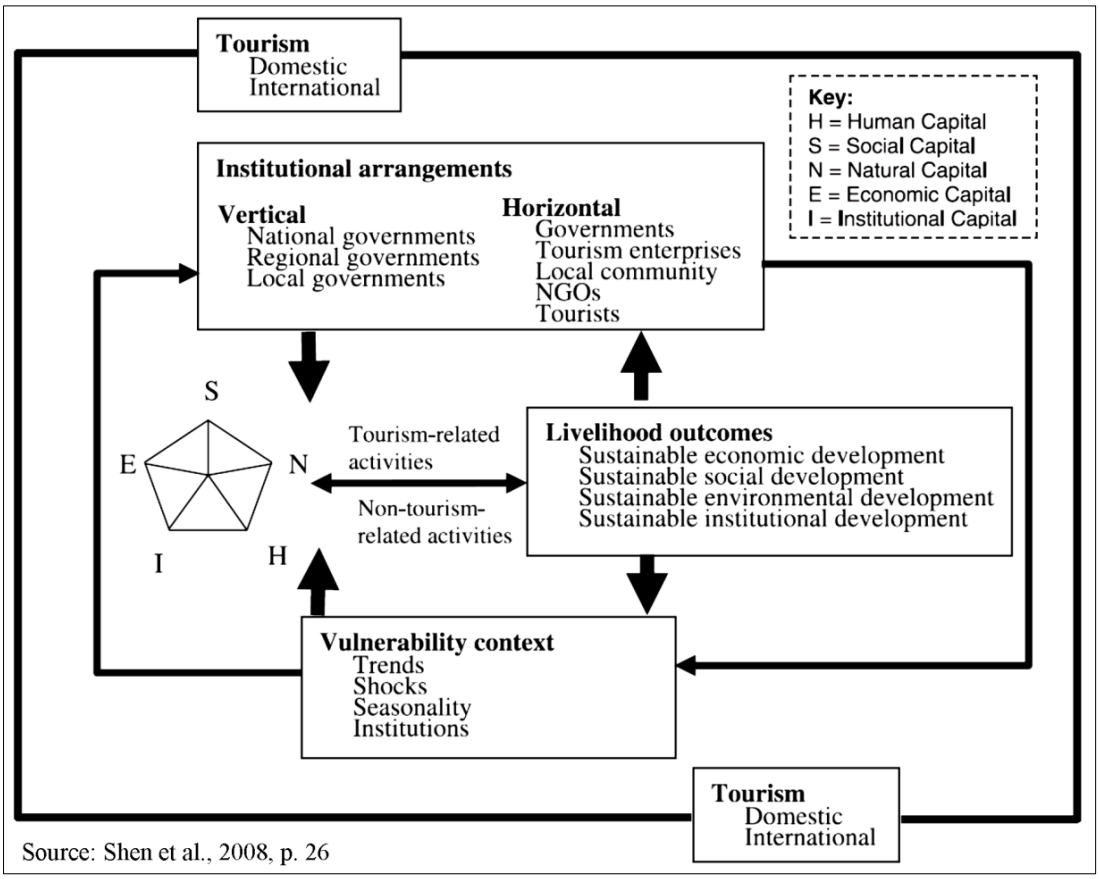
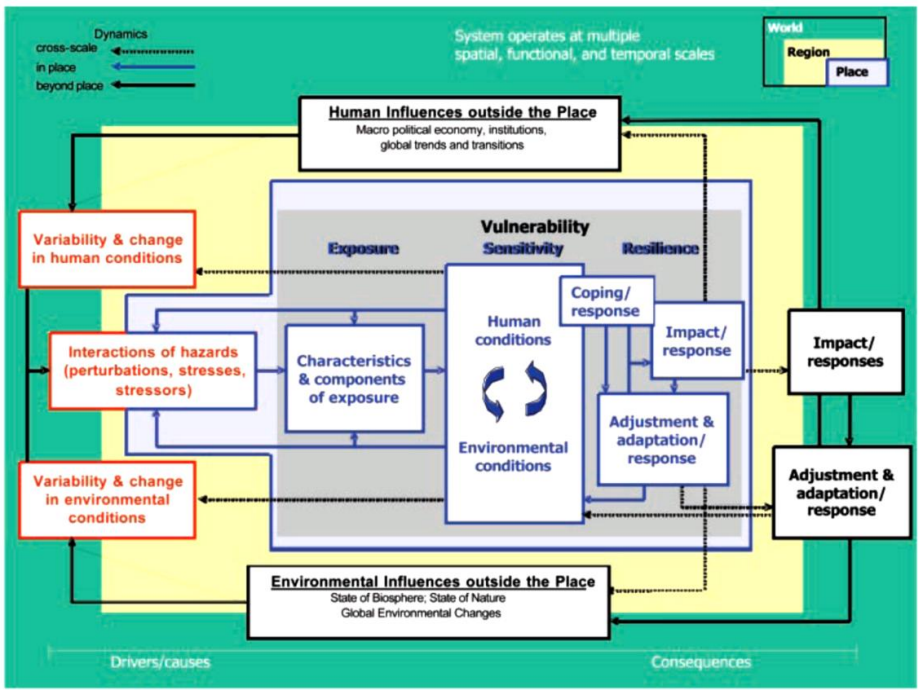


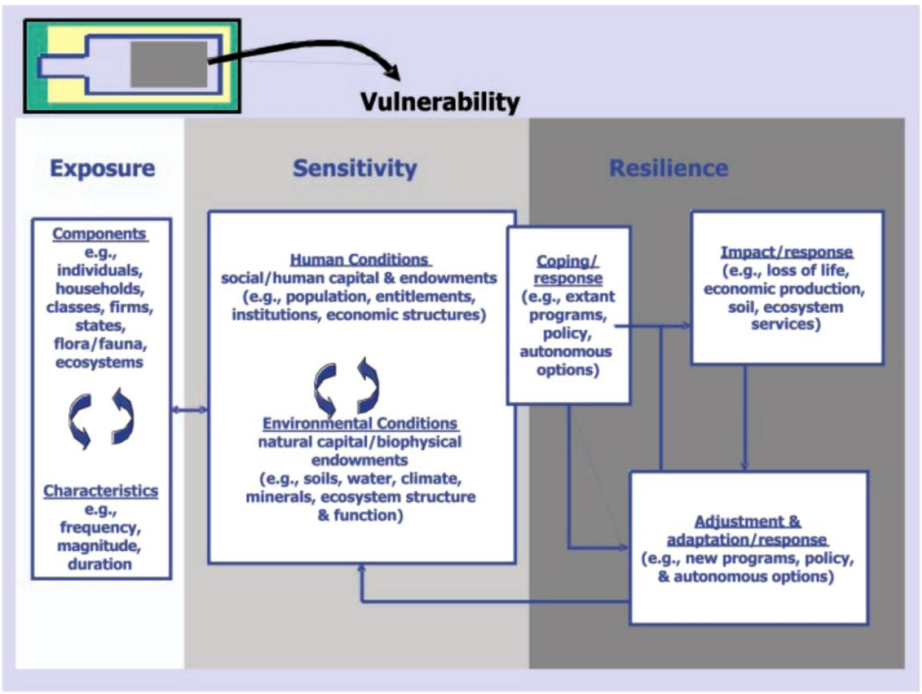
FIGURE 2-14: THE SLFT

In the SLFT, a number of adaptations were made to the SLA. The SLFT incorporated an additional livelihood asset that covers institutional capital, including access to tourism markets, policy-making processes and political decisions reflecting people's willingness to be involved in the policy-making process (Shen et al., 2008). The framework has since been tested in three case studies of mountainous rural tourism destinations in China (Shen, 2009). Shen (2009) concluded that the 2008 SLFT framework lacked a focus on attractions, including natural, cultural and other types of attractions that attract

tourist arrivals and benefit local people and that this should be reflected in future applications of the SLFT framework. Furthermore, the SLFT, like the SLA, lacks a clear coverage of scale and time, and does not cover climate change explicitly. Nor does it cover the adaptation types and processes that tourism systems will need to implement to adapt to the effects of climate change.

The Vulnerability Framework (see Figure 2-15) aimed to bring together the concerns of sustainability and global environmental change science within the context of a vulnerability analysis (Turner et al., 2003).





Source: Turner et al., 2003, pp. 8076-8077

FIGURE 2-15: THE VULNERABILITY FRAMEWORK

It drew upon previous frameworks, such as the Pressure-and-Release (PAR) framework, which was developed in 1994 by Wisner et al. (2004) and more than a decade later was adapted to a SIDSTs context by Mercer et al. (2007). Turner et al.'s (2003) framework emphasised that "vulnerability rests in a multi-faceted coupled system with connections operating at different spatiotemporal scales and commonly involving stochastic and nonlinear processes" (p. 8076)—something that was underscored in the PAR

framework. This framework, however, lacks the detail of the political economy of resource distribution that is provided in both SLA and the PAR (Calgaro, 2010). Furthermore, there is no identification of tourism specific sensitivities, like there is in Calgaro's (2010) Destination Sustainability Framework (DSF), which will be discussed further in the next section.

2.7.3 Frameworks in tourism

The field of tourism is the last field that this thesis focuses on in terms of climate change vulnerability frameworks. There are currently three major V/R frameworks specifically designed for tourism. These are the Five-Step Vulnerability Assessment (Moreno & Becken, 2009); the Regional Adaptation Framework (RAF) (Jopp et al., 2010); and the DSF (Calgaro, 2010). Each of these frameworks has considerable strengths, but there are also weaknesses, as there were for the disaster risk management frameworks described above. A discussion of these tourism frameworks is presented next, in order to help establish the key elements a V/R assessment for tourism (research objective one).

Moreno and Becken (2009) developed a Five-Step Vulnerability Assessment. The assessment sets out a five stage process that acknowledges tourism as a complex system (Jopp et al., 2010; Moreno & Becken, 2009). The five steps are set out linearly (see Figure 2-16), but can also be viewed as a cyclical framework and entail: (1) a systems analysis; (2) climate induced hazards identification; (3) vulnerability assessments for selected at-risk sub-systems through the use of the vulnerability scoping diagram (VSD)—developed by Polsky et al. (2007); (4) scenario-constructions integrating the individual vulnerability assessments; and (5) communication of the results to stakeholders. Strengths of this framework are that it identifies individual vulnerability factors and acknowledges tourism as a complex system. Furthermore, it integrates stakeholders in the process and is easily applicable (Moreno & Becken, 2009). Nevertheless, the framework focuses on selected sub-systems within the tourism system and has a limited focus on the policy environment. Furthermore, there is no explicit consideration of how resilience can be built considering the current status of vulnerability, although the adaptive capacity of the system is considered and the role of the local stakeholders in adaptation is recognised.

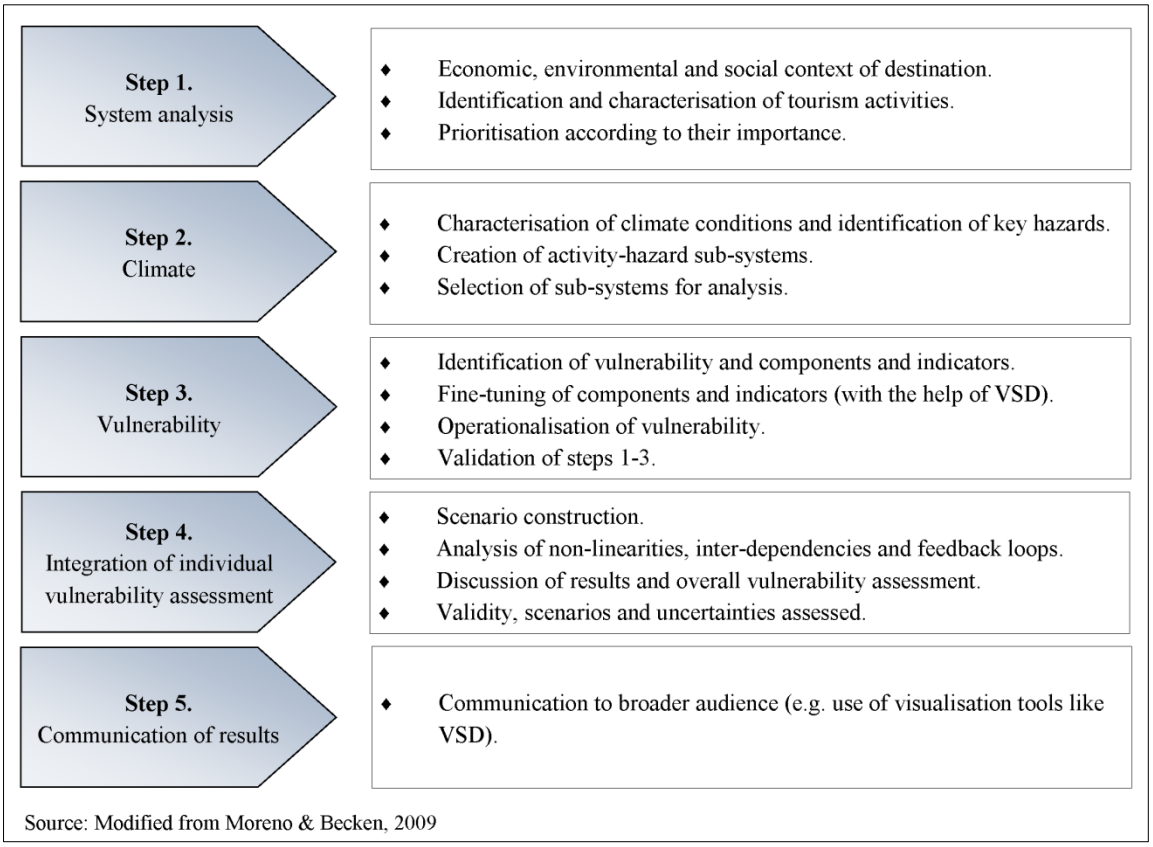


FIGURE 2-16: THE FIVE-STEP VULNERABILITY ASSESSMENT

In 2010, Jopp et al. reported on a RAF, taking a regional approach to the tourism system focused on establishing the risks and opportunities. This framework involves two phases (see Figure 2-17). The first phase entails a vulnerability assessment in which the tourism system, the risks and opportunities, and the adaptive capacity are identified. The second phase focuses on developing appropriate adaptation measures through testing with the consumers and the implementation of these measures. Particular strengths of this framework are its focus on the consumers, its focus on both risks and opportunities and the identification of adaptation options, and the evaluation of implemented measures. Nevertheless, it lacks explicit attention to the policy environment and policies, which may influence the system's capacity to adapt to climate change. Furthermore, there is limited incorporation of already implemented adaptations and no explicit identification of where adaptation is required or even possible within the tourism system.

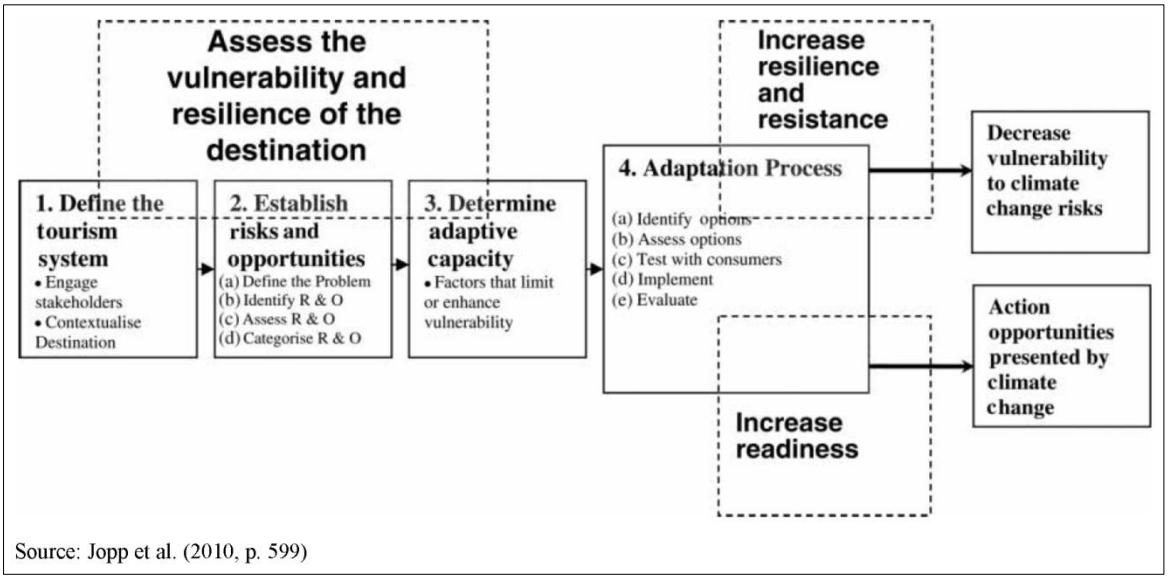
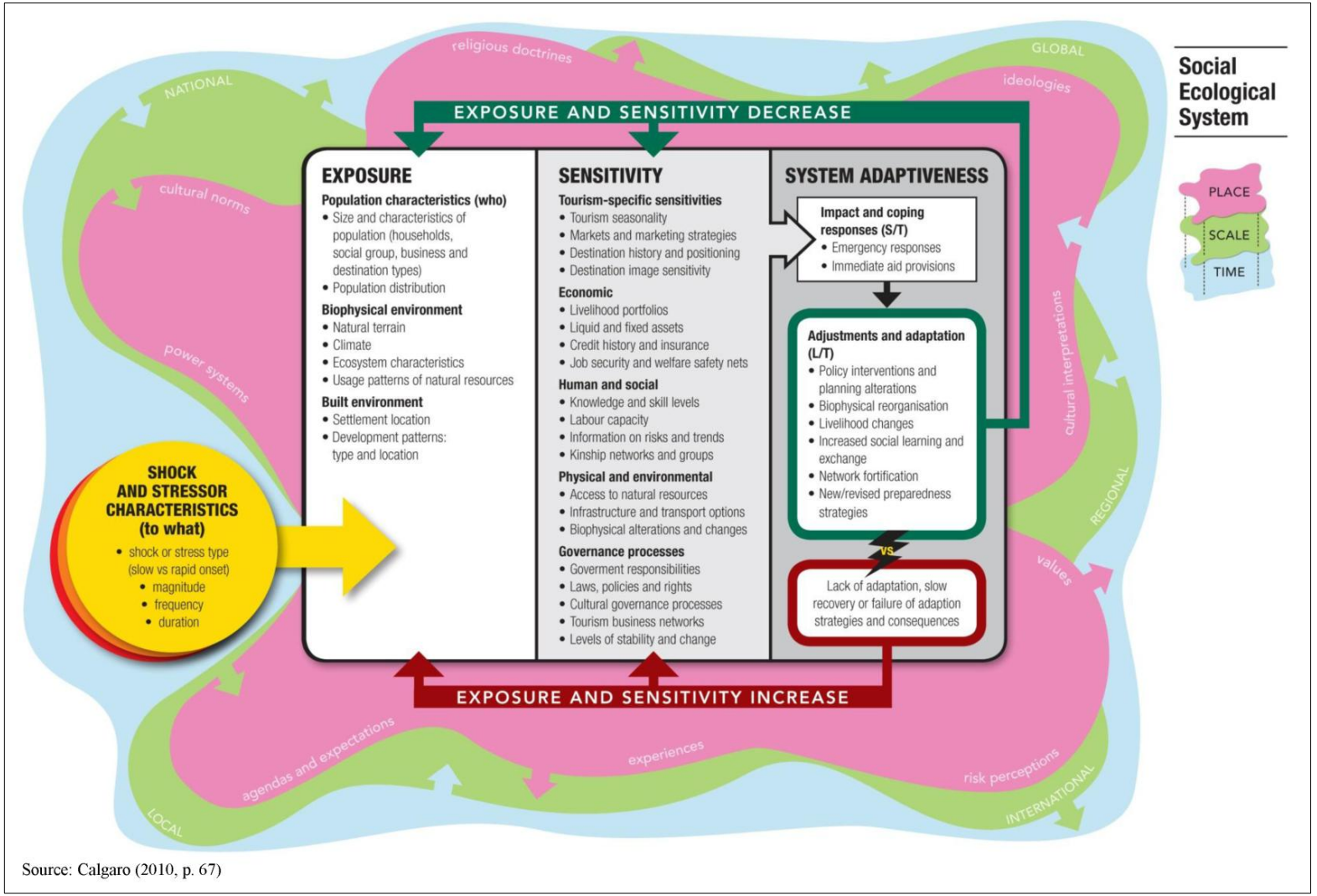


FIGURE 2-17: THE RAF

Finally, Calgaro's (2010) DSF recognises the need to understand the multiple factors and processes that influence vulnerability. The framework incorporates three key phases incorporating the key elements of vulnerability: exposure, sensitivity and adaptive capacity (see Figure 2-18). The first phase is about establishing the exposure to whom (i.e. understanding the system of the destination) and by what (i.e. shocks and stressors). The second phase entails an evaluation of five sensitivity categories (i.e. tourism specific sensitivities, economic, human and social, physical and environmental and government processes). The last phase identifies the adaptive capacity of the system through the recognition of current adaptation measures. It aims to build resilience by implementing possible adaptation measures. The framework, furthermore, emphasises the important feedback loops that influence the system's vulnerability.



Source: Calgaro (2010, p. 67)

FIGURE 2-18: THE DSF

A key strength of the framework is the recognition of feedback loops, as actions implemented may either decrease or increase sensitivity. Other strengths of the framework include: a holistic identification of shocks and stressors; the holistic assessment of destination characteristics and sensitivities that may lead to a sensitivity of the system; a focus on building the resilience of the system through possible adaptation measures; and an incorporation of place, scale and time concepts. Particularly, Calgaro (2010) incorporates the concept of relational scale to the knowledge of vulnerability assessments. The concept of relational scale will be discussed in depth in Section 9.2.7.1.

Nevertheless, the DSF was operationalised using a single-hazard case study (i.e. tsunami-affected destinations in Thailand) and did not focus on climate change. Accordingly, it lacks explicit recognition of the specific climate change adaptation options available, and it does not clearly identify the particular opportunities arising from climate change. Nor is a broader understanding of the policy environment's ability to facilitate or hinder climate change adaptation covered in this framework. Finally, it does not clearly deal with the whole functioning tourism systems, but focuses primarily on the destination (although aspects of the whole system become apparent in the sensitivity phase).

As the frameworks discussed in this section suggest, there are a number of important elements to include in a climate change V/R assessment. These include: an investigation of the shocks and stressors and the climatic stimuli; an identification of the exposure in terms of defining the system and its characteristics and how these are affected by the shocks and stressors; an examination of the given system's sensitivities and adaptive capacity in the form of several factors (including tourism specific, social, cultural, environmental, economic and governance); and an understanding of the current adaptation actions. This combined knowledge will be crucial to the development of effective adaptation actions, which then need to be evaluated for their success. Any V/R framework will need to incorporate feedback loops, acknowledging that successfully implemented adaptive actions will increase the resilience of a destination, whereas a maladaptation may increase the vulnerability of the destination through an increase of the exposure or sensitivity of the system. Moreover, all of these must be looked at in relation to contextual factors that can be categorised as place, scale or time specific.

One aspect that has not been explicitly covered in any of the above tourism frameworks is the importance of policy in dealing with climate change. Although Calgaro (2010) highlight several aspects of governance, there is no specific identification of policies that facilitate or hinder climate change adaptation. The following section on tourism, climate change and policy discusses in detail why it is vital to also incorporate a key element of a policy analysis in a vulnerability/resilience assessment for tourism.

2.8 Tourism, climate change and policy

There is a clear link between tourism and governments with the governments of most LDCs being involved in tourism in one way or another (Harrison, 2001). As has long been recognised, governmental policies influence the tourism sector through hindering or fostering tourism development (Gunn, 1994; Kerr, 2003). Yet at the same time, tourism has become an intrinsic element of government in developed as well as developing countries (Hall & Jenkins, 1995). Climate change is a multi-scale policy problem requiring implementation of policies (Hall, 2009). National governments often lead and coordinate tourism system's adaptation to climate change (Becken & Hay, 2012). Although awareness of climate change is important, it will not ensure action; climate-smart development policies are required to succeed in addressing climate change (The World Bank, 2010). If SIDSTs fail to invest in policies that facilitate a response to climate change, they may be left unprepared to cope with the adverse changes and may, as a result of this, increase the probability of severe consequences (Belle & Bramwell, 2005). Further, Urwin and Jordan (2008) argue that "Policy is an important aspect of the wider context in which adaptive decisions are made" (p. 189). Consequently, understanding the tourism sector's ability to adapt to climate change requires a policy analysis.

2.8.1 Policy analysis

Policies are defined as the course of action or inaction and decision or non-decision taken by public authorities to address a particular problem, set of problems, concerns, or opportunities (Hall & Jenkins, 1995). Thereby, policy can be seen as the position of a government on significant issues (Dredge & Jenkins, 2007) and is, therefore, what the government decides to do or not to do (Dye, 1978). This definition, however, is limited in the way that it only addresses the influence of government on policy. Perhaps a better definition is that policy is the dynamic cooperation of policy actors that have various interests and the consequent legitimisation of a shared view through the institutions of

government (Considine, 1994). This view is further supported by Dredge and Jenkins (2007), who argued that tourism-relevant policies are also developed by non-governmental organisations (NGOs), particularly environmental NGOs, and the tourism sector.

A policy analysis has been defined by Munger (2000) as "the process of assessing, and deciding among, alternatives based on their usefulness in satisfying one or more goals or values" (p. 6). In the context of this thesis, the policy analysis is useful to assess what policies are pertinent to climate change adaptation and what would be the most appropriate action for future climate change adaptation of the tourism system. There is a growing recognition that the contexts in which decisions of adaptation are made require consideration (Urwin & Jordan, 2008). The act of formulating and implementing policies in a dynamic environment makes public policy a process (Hall & Jenkins, 1995). As Lindblom and Woodhouse (1993) argue, the process of making policies represents "a complexly interactive process without beginning or end" (p. 11). A policy analysis, therefore, should not only be confined to documented policies, but should also look at the policy-making environment and policy mechanisms and involve diverse stakeholders. This complexity is incorporated in Majchrzak's (1984) definition of a policy analysis, which states that it "is the study of the policymaking process" (p. 13).

An understanding of the policy-making process, which incorporates the policy-making environment and the power and interest dynamics, the policy mechanisms, the policies, and the policy gaps, will provide sufficient information to indicate the conduciveness of the policy environment to climate change adaptation. This is a current gap in the literature, which this thesis aims to bridge. The next section is divided into five sections each representing an element of a climate change policy analysis: (1) the policy-making environment; (2) policy-making mechanisms; (3) a policy inventory; (4) conduciveness of a policy environment; and (5) policy gaps.

2.8.1.1 Policy-making environment

The policy process happens in a complex organisational setting (Hill, 1997). This organisational setting creates the policy-making environment that helps shape the development of policies. Often the organisational setting is influenced by a nation's constitution. A *constitution* can be defined as "the written or unwritten laws that regulate the manner in which the highest position of authority in a state are filled, and

the scope and limits of such authority" (Mautner, 2000, p. 110). In other words, the constitution is the foundational document of the state and fundamental to all consequent policies, as these will be guided by the scope and limitations of the constitution. A constitution thereby acts as a set of rules for making decisions and shapes the political system in terms of the system, its processes and policy arrangements (Almond, Powell & Mundt, 1996). According to Aristotle's classification scheme, there are six types of government rule each representing either good or corrupt forms of rules and differing levels of those who rule (i.e. one, few or many): (1) monarchy (kingship); (2) aristocracy; (3) polity; (4) tyranny; (5) oligarchy; and (6) democracy (mob rule) (Landman, 2000). Furthermore, policies are developed in an environment that covers contesting value systems linked to the competing interests of policy actors and political parties will articulate these contesting values varyingly (Hill, 1997). Consequently, understanding the organisational context is crucial, as the institutions become the framework in which governments operate (Blondel, 1995; Hall, 2011; MacIntyre, 2003) fundamentally driven by ideas and contending issues (MacIntyre, 2003). In other words, policies might look completely different in another context (Munger, 2000).

2.8.1.2 Policy-making mechanisms

Policy-making mechanisms relate to the tools or means that policy makers apply to their policy objective (Majchrzak, 1984). Policy decisions are affected by the way decisions are made (Munger, 2000). As an example, external experts may have advice on how the policy process of a country could be reformed, which might not sit with the elected politicians of that country. Applying this to Vanuatu, external experts hired by AusAID (Cox et al., 2007) presented their advice on how the political process should be reformed in Vanuatu and, although not known as a fact, their report 'The Unfinished State: Drivers of Change in Vanuatu' might not have been popular with the elected politicians within Vanuatu. Nevertheless, one of the purposes of the report was exactly "to provoke debate within Vanuatu and the donor community on the priorities, risks and opportunities facing Vanuatu in the coming years" (Cox et al., 2007, p. i). In this report, the authors looked at the contextual factors (e.g. history of the country, nation-building processes, political culture and style, and demographics) and how these have affected the political system (Mayer, Burnett & Ogden, 1996). They, thereby, recognise that the policy-making structures and mechanisms do not occur in vacuum but are influenced by contextual factors of society (Mayer et al., 1996).

The political system[xiii] is reflected in the elements of authority, coercion, legitimacy and support that exists (Blondel, 1995). By using the term political system, there is recognition of this broader understanding of the policy process, which is not only confined to the legal and sovereign entities of the nation-state (Mayer et al., 1996). Policy outcomes are influenced by many peoples and social forces (Lindbloom & Woodhouse, 1993). Further to this, Blondel (1995) argues that at the foundation of the institutions and the behaviour of policy actors are societal values and norms. These social, economic and personal influences are important to recognise when they impinge on, or manifest themselves in, the organisational setting (Almond et al., 1996). Recognising the influence of decisions and the role that actors play within the organisational setting, the concept of 'new institutionalism' arose in the latter half of the 1980s (Blondel, 1995).

New institutionalism looks not only at the organisational structure that helps shape formal policy (e.g. the constitution, the government ministries and governmental departments) but also at how these institutions, and their policies, are shaped by the behaviours of policy actors (Blondel, 1995). The formulation of policies can be impacted by issues or events unfolding throughout time, the processing of these events by the different stakeholders, and the influence of these stakeholders in the decision-making (Dredge & Jenkins, 2007). The policy making then occurs at the pivotal stages of the policy-making process where parliament passes a bill or the ruling council of an authoritarian regime issues a directive that is followed by implementation and enforcement (Almond et al., 1996). Apart from strongly influencing the policy-making process, it is often within this latter stage of implementation and enforcement that the bureaucracy dominates (Almond et al., 1996).

2.8.1.3 Policy inventory of policies pertinent to climate change

There are two elements to the wider climate change adaptation policy context, including existing policies and new policies (Urwin & Jordan, 2008). In line with the definition of policies, an inventory of existing policies pertinent to climate change can be indicative of the action or inaction taken to address the risks and opportunities arising from climate change. Policies can be pertinent to climate change in two ways, according to the literature: (1) policies can be explicit climate change policies (hereafter 'explicit

[xiii] "The term political system refers to those institutions and processes that are integrally involved in making authoritative decisions for a society" (Mayer et al., 1996, p. 21).

policies'), where the policy is developed to either partly or wholly deal with the issue of climate change; or (2) policies can be implicit climate change policies (hereafter 'implicit policies') in that climate change action may be a component of a policy but not its main driver (Hall & Higham, 2005). The implicit policies, in other words, may contain actions that, if successfully implemented, would aid the tourism sector's adaptation to climate change in one way or another. Consequently, an understanding of the current policies and their pertinence to climate change can guide the development of new (explicit) policies.

In their work in tourism, Scott, DeFreitas and Matzarakis (2009) identified five climate change adaptation types, which are: (1) technical adaptation; (2) business management adaptation; (3) behavioural adaptation; (4) policy adaptation; and (5) research and education. First, technical adaptation refers to physical infrastructure and/or provision changes. Next, business management adaptation refers to changes made within individual businesses within the private sector (whether voluntary or involuntary). Third, behavioural adaptation refers to the adaptation measures undertaken by individuals in the community or by tourists. In my interpretation of this type of adaptation, behavioural adaptation can also refer to regulative policy measures that aim to exercise control over individuals and groups (e.g. communities) within society (Almond et al., 1996). Fourth, policy adaptation represents the development of new policies. Finally, research and education adaptation entails actions that aim to educate communities, strengthen understanding of adaptation and explore adaptation options.

Table 2-9 presents a list of general adaptation measures relevant to coastal-based tourism systems in SIDSTs and PICTs. Communities, business owners, managers and employees, NGO representatives, donor and development agencies, and government officials will be able to make practical use of such a list. It could guide discussion on what policies are pertinent to climate change through their inclusion of different adaptation types and which measures would be most effective in dealing with the projected climate changes and the current vulnerabilities.

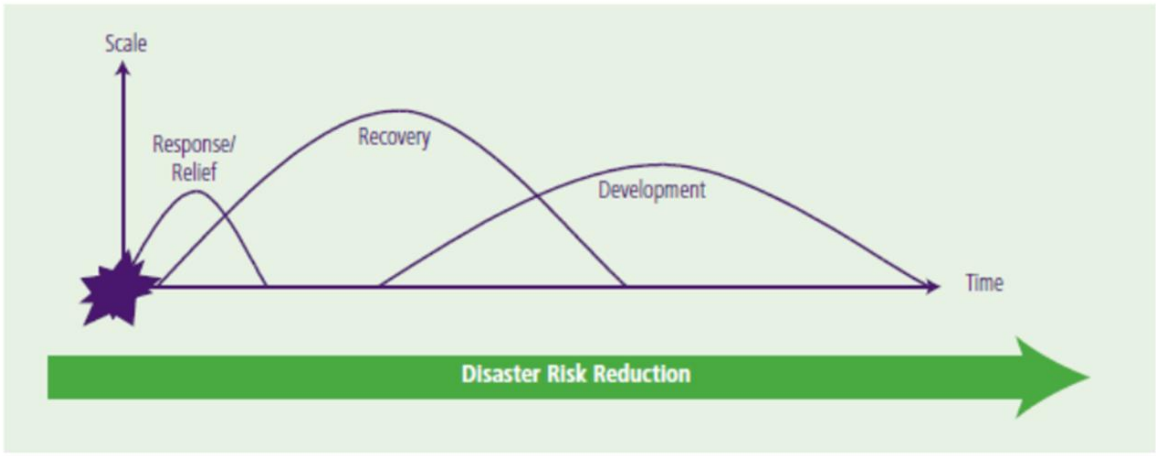
TABLE 2-9: OVERVIEW OF GENERAL ADAPTATION MEASURES IDENTIFIED IN THE LITERATURE

Type of adaptation	Adaptation measures	References
Technical	• Encourage traditional designs to deal with alternative methods of cooling • Enhance design and siting standards • Move coastal infrastructure (drainage, waste disposal, electricity, water supply and roads) back from eroding coast lines • Build tourism infrastructure back from the coast • Construct cyclone proof buildings, including installation of window shutters • Install drainage and pumping systems • Trim trees • Incorporate text messaging in early warning messages • Undertake beach nourishment • Improve drainage/control drainage • Install natural shelter belt (e.g. coconut trees) • Install compost toilets instead of flushing toilets • Install heating and cooling systems • Build shore defence structures • Construct desalination plants • Increase water storage facilities	Hall & Higham, 2005, pp. 79-83; Fiji Ministry of Tourism, 2006, p. 4; Becken & Hay, 2007, p. 48; Scott et al., 2009
Business management	• Factor increased insurance costs into resort profitability • Improve insurance cover • Develop alternative marketing strategies to cope with expanding/diminishing markets • Diversity markets, tourism product and/or activity • Purchase insurance to transfer risk • Control outbreaks of pests (e.g. Crown-of-Thorn Starfish (COTS)) and encourage tourist participation in this activity • Install water saving devices • Install own water storage facilities (e.g. rain tanks) • Increase self-sufficiency in energy supply • Control pollution • Pricing management	Hall & Higham, 2005, pp. 79-83; Fiji Ministry of Tourism, 2006, p. 4; Becken & Hay, 2007, pp. 48, 54; Scott et al., 2009

	• Marketing • Relocate	
Behavioural	• Adjust clothing • Change activity or destination • Adjust visit timing • Undertake indoor activities • Communicate evacuation plans	Scott et al., 2009; Becken & Hay, 2007, p. 54
Policy	• Mainstream adaptation in planning • Revise physical planning regulations to move building lines back from eroding coasts • Pass legislation to change policies, zoning and land use priorities, as necessary • Introduce new building regulations (i.e. use of building materials) • Include climate risk in tourism regulations/codes • Re-examine the water supply for increasingly arid areas • Develop alternative marketing strategies to cope with expanding/diminishing markets • Introduce built attractions to replace natural attractions • Adopt measures to protect vulnerable ecosystems • Introduce fiscal incentives or financial assistance for changes to built infrastructure to deal with the effects of climate change • Introduce changes to the school year in order to change peak holiday times • Revise policies on the financing of the national tourism office to ensure promotional and marketing material are tailored to the climatic realities (e.g. promote shoulder seasons) • Enhance and preserve natural defences (e.g. mangroves and coral reefs) • Rehabilitate mangroves • Develop and implement warning system (incl. evacuation plan and storage of supplied) • Encourage traditional taboo systems to allow for regeneration of reefs • Implement land use plans • Encourage eradication programs • Upkeep hygienic standards (e.g. water storage) • Promote environmental practices in marine based activities	Hall & Higham, 2005, pp. 79-83; Fiji Ministry of Tourism, 2006, p. 4; Becken & Hay, 2007, p. 48
Research and education	• Provide direct training to the tourism sector in dealing with the effects of climate change (e.g. hazard mapping) • Educate guests (e.g. water conservation, reef protection)	Hall & Higham, 2005, pp. 79-83; Fiji Ministry of Tourism, 2006, p. 4; Becken & Hay, 2007, p. 54

The purpose of climate change adaptation is about lessening the vulnerability to the effect of climate change (Sanderson & Islam, 2007), thereby reducing the risk of disaster. Furthermore, the practical outcomes of both disaster risk reduction (DRR) and climate change adaptation are often similar with both focusing on reducing vulnerability and enhancing resilience (Gero, Méheaux & Dominey-Howes, 2010). The following, therefore, provides a brief overview of the DRR Continuum.

Post a disastrous event occurring, the UNISDR (2009) have divided the DRR continuum into three phases: (1) response/relief; (2) recovery; and (3) development. A clear-cut division between these different phases of disaster risk reduction does not apply in real life, as highlighted by the UNISDR (2009), and shown in Figure 2-19.



Source: The World Bank (2009, p. 77)

FIGURE 2-19: DISASTER RISK REDUCTION CONTINUUM

The immediate response after a disaster is predominantly aiming to deal with the needs of the public in the short-term[xiv], although the boundaries between this phase and the following recovery phase are not clear-cut (UNISDR, 2009). The short-term *response* can be defined as

> "The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected" (UNISDR, 2009, p. 24).

In other words, the key objectives of such short-term responses are to save lives, alleviate suffering and maintain human dignity through immediate activities of rescue

[xiv] A clear-cut definition of short-term does not exist, but can be referred to as the first weeks to months after a disastrous event has occurred.

and relief (The World Bank, 2009). It can entail the supply of water, food, sanitation, health services and shelter (The World Bank 2009, UNISDR, 2009).

Adaptation for long-term[xv] disaster recovery represents the decisions and actions taken in order to restore the system (inducing a bounce-back of the system) or improve the system (through reorganisation) to reduce the impact of disasters in the future (The World Bank, 2009). The process aims to restore the capacity and facilities of the public sector, the private sector and civil society and entails helping communities develop coping mechanisms that can help address the socio-economic and psycho-social effects of a disaster (The World Bank, 2009). Activities range from the reconstruction or rehabilitation of infrastructure (e.g. bridges, electricity supply, roads, sanitation systems and water supply), facilities (e.g. health centres, hospitals and schools), agricultural irrigation systems, housing and settlements, and livelihoods (The World Bank, 2009). It is worth noting that stressors may have the capacity to place communities or systems in a constant recovery phase, where there is not enough time to recover completely between stressor events (The World Bank, 2009).

Reducing the risk of disaster further requires linking initiatives with relevant development plans and linkages to climate change adaptation (UNISDR, 2009). As with DRR (Daly et al., 2010; Jiang et al., 2009a; The World Bank, 2009) and climate change adaptation (Daly et al., 2010; Desai, 2010; Garnaut, 2008; Nurse & Moore, 2005; Pacific Institute of Public Policy, 2009; The World Bank, 2010), the most effective response in the long-term requires linking adaptation actions to the local and national development context. In fact, both climate change adaptation and DRR represent key development issues (Gero et al., 2010). Gero et al. (2010) argue that to achieve genuine participation and legitimacy in the decision-making process, the adaptation or DRR actions need to be aligned with the local needs and capacity and with local governance structures. Adaptation actions can occur within all three phases of the DRR continuum.

2.8.1.4 Conduciveness of a policy environment

The policy environment can contribute to the vulnerability or resilience of a tourism system by hindering or facilitating climate change adaptation (Urwin & Jordan, 2008). Consequently, an analysis of the policy environment's conduciveness to climate change

[xv] A clear-cut definition of long-term does not exist, but can be interpreted as more than a couple of months after a disastrous event has occurred

adaptation is important (Leary et al., 2008), as it informs the future direction of climate change adaptation actions. An enabling environment will have appropriate institutions, policies, plans and legislation in place and the presence of sufficient knowledge and skills, decision support tools and methods, and financing and technologies (Becken & Hay, 2012). The conduciveness of a policy environment can be assessed based on the level of commitment of key stakeholders to the policy agenda, resource availability, and the presence of an enabling policy mechanism (Ingram & Mann, 1980; Wong et al., 2011a, 2011b). The following provides a description of how and why that is.

Influencing the political system is the level of support provided by stakeholders (Blondel, 1995). Support of a political system can be divided into three intrinsically linked elements: (1) community; (2) the regime; and (3) the government (Easton, 1977). The first relates to whether a political community is engaged enough to want to contribute to the political system. The second refers to the acceptance of the constitutional principles. Finally, the third indicates support of the government, whether this is created by persuasion, consent or manipulation, as it handles conflicting demands. In other words, the support of the political system reflects individuals and groups abiding by the decisions of election, paying their taxes, obeying the laws and accepting the general decisions of the political system (Anderson, 1979). A policy then is more likely to become successful if the policy makers clearly specify the policies, are highly regarded and maintain the public's support for the political system (Ingram & Mann, 1980). Wong et al. (2011b) also argue that the level support is shaped by the degree of stake involved.

The implementation part of the policy process is of key importance—it is the stage in which policy is turned into action (Dredge & Jenkins, 2007; Hall, 2009). It is also through this stage that the success of the consensus-building between stakeholders can be proven. As suggested by Bramwell and Sharman (1999), implementation requires action rather than a process of convincing cynical stakeholders to adopt the policy-making process. Nevertheless, both the level of support of the political system and the resource availability influence the (successful) implementation of policies (Ingram & Mann, 1980). Resource availability can be divided into three aspects: (1) time resources; (2) financial resources; and (3) human resources/expertise (Ingram & Mann, 1980). All three are important to ensure the successful implementation of policies (Ingram & Mann, 1980; Sabatier & Mazmanian, 1979).

Finally, the presence of an enabling policy mechanism influences the conduciveness of a policy environment to climate change adaptation. The successfulness of the policy mechanisms is influenced by the stakeholder relationships, which are shaped by the level of trust, past and current interactions, and the level of stakeholders' common interests (Wong et al., 2011a, 2011b). Policy-making mechanisms then can be shaped by communications media, education facilities and business conditions (Ingram & Mann, 1980).

2.8.1.5 Policy gaps

Having gained an understanding of the policy environment, the policy-making mechanisms and the policies (through a policy inventory), as well as assessed the conduciveness of the policy environment, an understanding of the policy gaps should be clearer. For example, the policy inventory may highlight adaptation types that are not adequately covered or the assessment of conduciveness of the policy environment might highlight aspects that have facilitated or hindered the successful implementation of policies in the past. Such knowledge can be used to guide the development of new explicit policies covering a range of customised adaptation actions. The importance of customising the adaptation actions to fit the context is emphasised by Lim et al. (2004).

2.9 Key elements of a vulnerability/resilience assessment

In addressing research objective one, this section discusses the key elements of a V/R assessment. First, this section provides a gap analysis of the various vulnerability and resilience frameworks discussed in Section 2.7. This gap analysis (see Table 2-10) has been essential in identifying the key elements to be explored in a vulnerability/resilience framework. It incorporates the strengths of current frameworks and addresses the identified gap of climate change policies not being explicitly covered in any of the frameworks. Second, a brief overview of the established key elements, which will be tested in the case study of Luganville's dive tourism system (research objective two), is provided.

TABLE 2-10: GAP ANALYSIS

Attributes/ elements	**Frameworks**							
	Gross anatomy of adaptation to climate change and variability[1]	A process of human vulnerability to nature-triggered environmental extremes[2]	Guiding questions in the investigation of socio-ecological systems[3]	Sustainable Livelihood Framework for Tourism[4]	Vulnerability Framework[5]	Destination Sustainability Framework[6]	Regional Adaptation Framework[7]	Five-step tourism vulnerability assessment methodology[8]
Field of origin								
Systems approach:	✓	✓	✓	✓		✓	✓	✓
- Focus on sub-systems								✓
- Focus on whole system	✓	✓	✓	✓	✓	✓	✓	
Multiple shocks & stressors covered	✓	✓	✓	✓	✓	✓	✓	✓
Effect of climatic stimuli	✓	✓					✓	✓
Climate change policy analysis								
Vulnerability factors:				✓		✓	✓	✓
- Tourism specific				✓		✓		
- Economic		✓		✓	✓	✓		✓
- Human & Social		✓		✓	✓	✓	✓	✓
- Physical & Natural		✓		✓	✓	✓		✓
- Governance		✓		✓	✓	✓		✓
Adaptation options			✓		✓	✓	✓	
- Processes of adaptation	✓							
- Typologies of adaptation	✓						✓	
Evaluation incorporated	✓				✓	✓	✓	
- Consumers							✓	
- Other stakeholders						✓		✓
Feedback Loops	✓	✓	✓		✓	✓		✓
Place		✓	✓	✓	✓	✓		
Scale	✓	✓	✓		✓	✓	✓	✓
- Geographic	✓				✓	✓	✓	✓
- Relational						✓		
Time	✓	✓		✓	✓	✓		

[1] Smit et al., 2000; [2] Hague & Burton, 2005; [3] Renaud et al., 2010; [4] Shen et al.; [5] Turner et al. 2003; [6] Calgaro 2010; [7] Jopp et al. 2010; and [8] Moreno & Becken, 2009

✓ Criteria is met — Disaster and risk management — Sustainability science — Tourism management

Source: Adapted from Calgaro (2010, p. 55).

2.9.1 Step 1: Tourism system

An understanding of the tourism system was common across all three V/R frameworks for tourism as each of them start out by identifying the systems characteristics. Identifying the system characteristics provides the context for further analysis.

2.9.2 Step 2: Risks and opportunities

This element is apparent in all the frameworks. In terms of the tourism frameworks, the key hazards are identified in Moreno and Becken's (2009) framework, Calgaro's (2010) framework looks at the exposure in terms of shocks and stressors, and in Jopp et al.'s (2009) framework the focus is not only on the risks, but also on the identification of opportunities arising. This step entails an identification of the shocks and stressors that have affected the tourism system, an understanding of how the climatic stimuli have an effect on these.

2.9.3 Step 3: Policy analysis

Apart from Calgaro's (2010) framework, little emphasis has been paid to the policy environment and policies. Nevertheless, it has long been known that policies and the policy environment influence the tourism system (Gunn, 1994) and vice versa (Hall & Jenkins, 1995). Addressing climate change requires implementation of policies due to its nature as a multi-scale policy issue (Hall, 2009). Stakeholders of tourism systems are also becoming more involved in responses to climate change and tourism-specific responses are more apparent in nations with strong climate change policy frameworks (Becken & Hay, 2012). Nevertheless, none of the current V/R frameworks have a strong focus on the climate change adaptation policy environment. Consequently, in accordance with the literature review on tourism, climate and policy (Section 2.8), this step entails a policy analysis that seeks to: (1) observe the policy-making environment; (2) examine the policy-making mechanisms and implementation; (3) create an inventory of policies pertinent to PICT tourism climate adaptation; and (4) identify policy gaps and provide input for the evaluation of adaptive capacity of the tourism sector.

2.9.4 Step 4: Sensitivity and adaptive capacity

Once the exposure of the tourism system is understood (based on an analysis of step 1, 2 and partly 3), the overall vulnerability of the system can be identified through an understanding of the factors that either make the system sensitive or enhance the system's adaptive capacity. This involves a discussion of factors within the following

five categories: (1) tourism-specific; (2) economic; (3) human and social; (4) physical and environmental; and (5) governance processes.

2.9.5 Step 5: Adaptation

This phase is based on the knowledge gained from the outcome of the previous phases. Adaptation, as Becken and Hay (2007) emphasise, can if implemented successfully, reduce the vulnerability of a system to climate change impacts and make the system more resilient. Consequently, this step aims to look at current adaptation actions and to propose new adaptation actions that aim to further build the resilience of climate change adaptation. These can be divided into 5 categories: (1) technical; (2), business management; (3) behavioural; (4) policy; and (5) research and education.

2.9.6 Step 6: Evaluation

Not all adaptation measures are successful, resulting in maladaptation. Consequently, an evaluation of the adaptation measures is crucial in order to ensure that the resilience of the tourism system is built. This step recognises the feedback loops of the system. In this thesis, this step can only look at any past adaptation measures that may have been implemented in Vanuatu, affecting Luganville's dive tourism system, but it is still a vital step to emphasise.

2.9.7 Place, scale and time

As a sector that is largely dependent on natural resources (Gössling & Hall, 2006) and is particularly climate sensitive (Scott et al., 2008), the link between the environment and tourism can be studied at different levels, considering time, place and scale (Briassoulis & van der Straaten, 2000). Each is discussed individually below.

2.9.7.1 Time

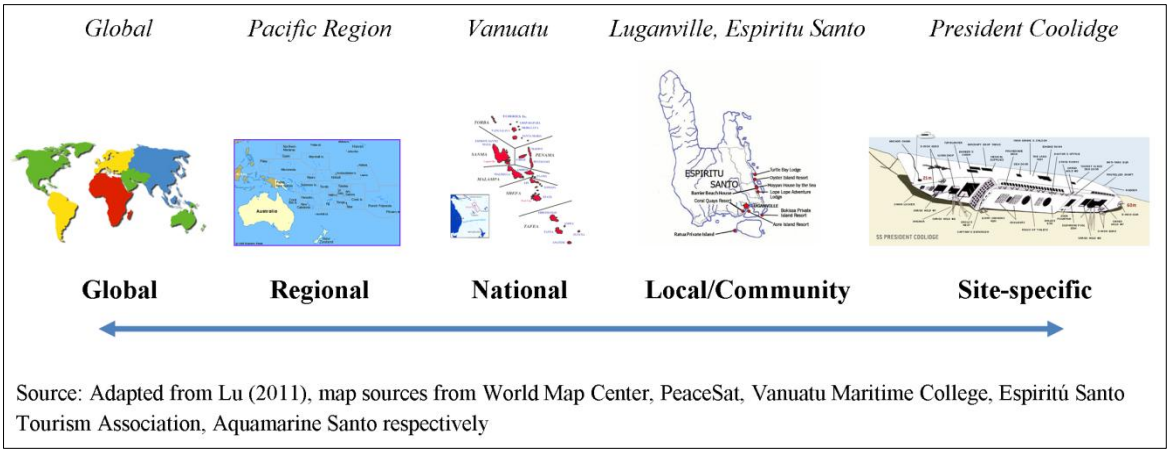
The environment is always changing and this is never uniform either across time or space (Gössling & Hall, 2006). There can be direct as well as indirect impacts of climate change, but the effect of these impacts may vary in intensity and/or breadth over time, including differentiation between seasons, years, and decades. Furthermore, adaptation is also not a measure which happens instantaneously, so the link between vulnerability and adaptive capacity relies very much on the timescales of the hazards concerned (Brooks et al., 2005).

2.9.7.2 Place

A detailed understanding of place is also crucial, as some elements of the socio-cultural fabric may either increase or decrease the sensitivity of the system. Consequently, the vulnerability of a system is very much specific to system and place (Smit & Wandel, 2006). Furthermore, identifying the limitations of the system in terms of scale may also have an effect on the outcomes of the study.

2.9.7.3 Scale

This can refer to the scale of which the assessment or investigation is undertaken. In line with Patterson et al. (2006), Figure 2-20 presents a selection of spatial scales applying to the case study of Luganville, covering: 1) global; 2) regional (e.g. Pacific region); 3) national (e.g. Vanuatu); 4) local/community (e.g. Luganville, Espiritú Santo); and 5) site-specific (e.g. President Coolidge) scales. Climate change adaptation will need to be implemented at all these spatial scales (Urwin & Jordan, 2008) to ensure an effective response. Relational scale is also important to assess in order to understand how opportunities are created across scale through various relationships between stakeholders.



Source: Adapted from Lu (2011), map sources from World Map Center, PeaceSat, Vanuatu Maritime College, Espiritú Santo Tourism Association, Aquamarine Santo respectively

FIGURE 2-20: A SELECTION OF SPATIAL SCALES APPLYING TO THE CASE STUDY OF LUGANVILLE'S DIVE TOURISM SYSTEM

2.10 Chapter 2 summary

Six main gaps have been identified throughout this literature review. First, an obvious gap in the knowledge is that very little of the vulnerability research has focused on tourism (Moreno & Becken, 2009). Second, most of the research in climate change adaptation is non-tourism specific (Jopp et al., 2010). Third, there has been very little involvement in the climate change and tourism debate by tourism and recreation experts

(Hall & Higham, 2005). Fourth, there is no tourism and climate change-related literature for Vanuatu, apart from the journal articles resulting from this study. Fifth, there has been a limited focus on policies in the current V/R assessments, particularly in the field of tourism. Finally, there has been limited research focused on the implementation of climate change adaptation (Smit & Wandel, 2006).

Through a gap analysis of current vulnerability/resilience frameworks in disaster and risk management science, sustainability science and tourism, four broad phases of a vulnerability/resilience assessment were provided: (1) identify tourism system; (2) establish the risks and opportunities; (3) assess the overall vulnerability of the system; and (4) build resilience of the tourism system. These four phases are shaped by contextual spheres of time, place and scale.

This thesis builds on the knowledge gained throughout this literature review and aims to bridge the identified gaps. This chapter has addressed the first research objective by identifying the key elements required in a V/R assessment. In light of this chapter, the second objective of this thesis is to test the established key elements of a V/R assessment in the context of Vanuatu's dive tourism. Following this, research objective three can be achieved through an evaluation of the effectiveness of the application of the key elements in the case study followed by the presentation of the newly developed V/R framework. The following chapter discusses the methodology applied in various V/R assessments, and describes the methodology applied in this research.

3 METHODS

"Research questions are like a door to the research field under study."
(Flick, 2002, p. 50)

3.1 Introduction

The key aim of this thesis is to develop a climate change V/R framework. In order to test the established key elements of a V/R assessment, as presented in Section 2.9, in the context of Vanuatu's dive tourism system (research objective two), this thesis adopts a mixed method research design. The purpose of this chapter is to provide an overview of the methodological approach and design of this study. The overarching paradigm of this thesis is outlined in Section 3.2 highlighting its importance and relevance to how the study was conducted. Further, this section presents a justification as to why a mixed method design was the most appropriate approach. The next section discusses the methodological approaches of case study and rapid rural appraisal (RRA) and presents an overview of the primary and supporting methods applied in this study. Following this, the sampling technique and thesis sample is discussed. Then, the data collection is outlined followed by the instrument construction for the primary methods. The data analysis is discussed in Section 3.7 before the limitations of thesis are covered. Finally, the chapter concludes with a methods summary.

3.2 Methodological paradigm

Much of the literature on research design and methods presents a discussion on paradigms (Gray, 2004; Jennings, 2010; Neuman, 2011; Tashakkori & Teddlie, 1998). When undertaking research, it is important to understand the epistemology and the theoretical perspectives, as these influence the researcher and the research methodology chosen. This is emphasised by Guba and Lincoln (1994) who iterate that the world views and belief systems are more important than choice of method. Moreover, Pansiri (2009) argues that the appropriate choice of methodology can only be made through a basic understanding of the different paradigms. As a result, this section is designed to provide a brief overview of the different types of paradigms and a rationale for why pragmatism is adopted as the most appropriate paradigm for this study. This is followed

by a discussion of mixed methods and a detailed explanation as to why this is deemed suitable for research on climate change and tourism and to this thesis' research objectives of: (1) establishing the key elements of a V/R framework for tourism; (2) testing these elements in the context of Luganville's dive tourism system; and (3) proposing a new climate change V/R framework for tourism.

3.2.1 Influence of epistemologies and paradigms

Epistemology is the "theory of knowledge" (Mautner, 2000, p. 174) and deals with how knowledge is produced, the nature of human knowledge, its scope and limitations (Mautner, 2000; Neuman, 2011). In other words, epistemology is the philosophical view that helps the researcher decide what types of knowledge are legitimate and what data is adequate (Gray, 2004). The epistemological basis, therefore, represents the relationship between what is being researched (e.g. participants, subjects or objects) and the researcher (Jennings, 2010). Epistemology can be seen as a continuum with objectivism at one end and constructivism at the other (Gray, 2004; Jennings, 2010).

These two opposite forms of epistemology (i.e. objectivism and constructivism) represent two distinct ontological (i.e. nature of reality) positions or approaches; objectivism is deductive and constructivism is inductive (Gray, 2004; Jennings, 2010). For example, in the objectivist epistemology, it is believed that an 'objective reality' is to be found 'out there' (Gray, 2004). In constructivism, meaning is a construction by the subject's interaction with the world, whereas the signs and language to be discovered are true representations of the external world in a representationalist epistemology (Gray, 2004).

Paradigms, as the world views or belief systems, can be seen as the lens through which the researcher views the inquiry (Tashakkori & Teddlie, 1998). "Paradigms, thus, define different views of the social world based upon different meta-theoretical assumptions with regard to the nature of science and society" (Pansiri, 2009, p. 84). It forms a theoretical framework for research (Neuman, 2011), which provides a set of assumptions, laws, and techniques that shape the basis of inquiry (Mautner, 2000). The different philosophical paradigms can also be seen in a continuum ranging from positivism at one end of the spectrum to interpretivism at the other (Gray, 2004). A number of other paradigms are situated within this range. These include, amongst others, critical realism, pragmatism, chaos and complexity theory, critical theory,

feminist perspectives, post-modernism and participatory paradigms (Jennings, 2010). The paradigm chosen affects the choice of method.

Methodology can be viewed as a set of guidelines used when conducting research (Jennings, 2010) with the two distinct methods of quantitative and qualitative (Tashakkori & Teddlie, 1998). Positivism is commonly aligned with a quantitative methodology, and is seen as the traditional and most dominant approach applied in social research (Esterberg, 2002; Neuman, 2011), whereas interpretivism is generally linked with qualitative methods (Jennings, 2010). This distraction resulted in what has been termed the paradigm wars, where researchers of each paradigm would discredit research of the other paradigm. As a result of this debate, the paradigm of pragmatism was developed as a middle-ground, acknowledging the compatibility of both qualitative and quantitative research (Tashakkori & Teddlie, 1998). Although both positivism and interpretivism have been dominating and influential approaches in social science research (Gray, 2004; Pansiri, 2005, 2009), "pragmatism has been hailed as the foundation of mixed methods, and, depending on the nature of the research, it can be adopted to yield better outcomes" (Pansiri, 2005, p. 191).

Pragmatism, unlike other theoretical perspectives, does not force particular types of methods to be applied in the inquiry (Pansiri, 2005). A significant aspect of pragmatism is the researcher's limited concern for the influence of values, although it is acknowledged that these play a significant role in the research from beginning to end (Tashakkori & Teddlie, 1998). I align myself with the theoretical stance of pragmatism, as for any pragmatist the beliefs and ways are socially constructed through different processes (Pansiri, 2005). Nevertheless, the key to pragmatism is not to find the ultimate truth, but to take a holistic approach in order to develop an understanding of the research problem and facilitate problem-solving (Powell, 2001; Panisiri, 2005). As Powell (2001) states, "To a pragmatist, a true proposition is one that facilitates fruitful paths of human discovery" (p. 884). In other words, the research question is more important than the method applied or the underlying world view (Tashakkori & Teddlie, 1998).

3.2.2 Mixed method research approach

Pragmatism is the most common paradigm for mixed-method research that contains elements of mixed methodology or methodological mixes (Tashakkori & Teddlie, 1998;

Pansiri, 2006). There are numerous designs of mixed method research (Pansiri, 2006), ranging from equivalent status designs, dominant-less dominant designs[xvi] and multi-level use of approaches (Tashakkori & Teddlie, 1998). This study adopted the multi-level use of approach, because of its capacity to collect "...data from more than one level of organizations or groups...to reach more comprehensive interferences regarding behaviours and/or events" (Tashakkori & Teddlie, 1998, p. 48). Furthermore, mixed method research is gaining momentum in tourism research, as well as social science in general (Pansiri, 2005, 2006).

The use of mixed methods can enable important questions to be answered during different stages of a study (Pansiri, 2005). As stressed by Phillimore and Goodson (2004), using a single method can result in selective perception, whereas the "the use of multiple methods paves the way for more credible and dependable information" (p. 162). Multi-method research is highly valuable as it allows for different aspects of a research problem to be illuminated (Henninck, 2007). Furthermore, the use of multiple methods may also ensure that multi-faceted meanings [people may view the same phenomena in different ways] can be summarised, thereby, allowing the reader to develop his/her view on the phenomena (Stake, 2005). Consequently, the mixed methods approach was deemed to be the most appropriate for this study, as it allowed for the triangulation of methods, thereby, eliminating the limitations of each individual method (Phillimore & Goodson, 2004). For example, relying on multiple sources of evidence will make the analysis much sounder than if the research relies on one source of evidence (Eisenhardt, 1989; Esterberg, 2002). Therefore, a number of methods were applied to the case study to ensure enough information was gained about Luganville's dive tourism system (the case) in Vanuatu (Stake, 2005).

A variety of methods have been used in vulnerability studies reported in the literature ranging from quantitative to qualitative research approaches (Calgaro, 2010; Daly et al., 2010; Fraser, 2003; Mataki et al., 2006; Moreno & Becken, 2010; Payet, 2008; Petrosillo et al., 2006; Polsky et al., 2007; Renaud et al., 2010; Richardson & Witkowski, 2010; Romieu et al., 2010; Sales Jr., 2009). Table 3-1 outlines the different types of methods applied to previous vulnerability studies undertaken in the areas of tourism, environmental science and coastal area management. Each of the methods

[xvi] This refers to a mixed-method study design where two research designs and paradigms are applied, but where one is more dominant than the other.

applied in these individual studies would have had strengths and weaknesses attached to them. This study applied an array of methods to diminish the weaknesses of any particular method, while at the same time building on the strengths of each and every other method (Gray, 2004).

TABLE 3-1: OVERVIEW OF METHODS APPLIED IN VULNERABILITY AND ADAPTATION STUDIES

Field of knowledge	Topic	Methods	Reference
Tourism	• Conceptual framework for assessment of economic vulnerability of tourism	• Surveys • Interviews • Industry data • Stakeholder workshops • Participatory deliberation	Richardson and Witkowski, 2010
	• Destination Sustainability Framework (DSF)	• Secondary data • Semi-structured interviews • Focus groups • Case histories	Calgaro, 2010
	• Five-step tourism vulnerability assessment methodology	• Secondary data • Workshop/collaboration with stakeholders • Surveys	Moreno and Becken, 2010
	• Statistical model of climate effects on visits to the Seychelles	• Surveys	Payet, 2008
Environmental science	• Socio-Ecological System (SES) adapted from Gallopín	• Secondary data	Renaud et al., 2010
	• Vulnerability Scoping Diagram (VSD)	• Secondary data - archival analysis • Interviews with stakeholders and experts	Polsky et al., 2007
	• Holling's Conceptual Sustainability model • Fragility model	• Secondary data	Petrosillo et al., 2006
	• Entitlement framework • Panarchy	• Secondary data	Fraser, 2003
	• SIS09 pilot study – based on socio-ecological systems approach	• Surveys • Secondary data	Mataki et al., 2006
Coastal area management	• Comparative literature review (of climate change science and natural hazard science)	• Secondary data	Romieu et al., 2010
	• CIM Plans	• Village meeting • Group discussions • Site visits	Daly et al., 2010
	• UNDP Adaptation Policy Framework	• Focus group discussions • Key informant/semi-structured interviews • Consultant workshops • Family case studies • Secondary data gathering	Sales Jr., 2009

3.3 Methodological approaches

A number of research design frameworks exist, including but not limited to, experimental research, quasi-experimental research, case study, action research, grounded theory research, ethnography and heuristic inquiry (Gray, 2004). This thesis, as shown in Figure 3-1, adopted a mixed method research design in more than one way. Following Pansiri (2005), it: 1) uses multiple methodological approaches (i.e. case study and RRA); 2) triangulates the data using multiple data collection methods (i.e. secondary data, observation, case histories, semi-structured interviews and group discussions); and 3) incorporates both quantitative (from secondary data) and qualitative data to ensure the best results. The justification for these methodological approaches is described below followed by an explanation of the different methods adopted for this study. The mixed use of methods was well suited to the philosophical paradigm of pragmatism with its key goal of facilitating problem-solving from a holistic approach.

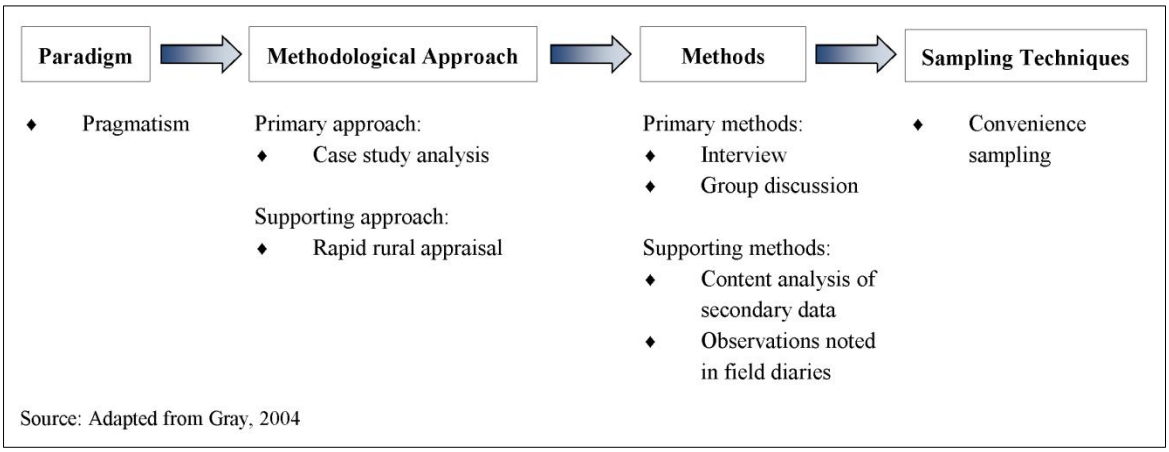


FIGURE 3-1: OVERVIEW OF PARADIGM, METHODOLOGICAL APPROACH, METHODS AND SAMPLING TECHNIQUE APPLIED IN THIS STUDY

In accordance with Figure 3-1 and pragmatism, this thesis applied case study as the primary methodological approach (Section 3.3.1.). Given the complexity of climate change and tourism, a supporting methodological approach (RRA) was applied to ensure sufficient data could be collected within the short timeframe (Section 3.3.2). Both the case study approach and RRA allows for the use of multiple methods (key to the RRA approach) to collect the data. The two primary methods at the core of this thesis are interviews (Section 3.3.3.1) and group discussions (Section 3.3.3.2). In order to fully comprehend the vulnerability and resilience of Luganville's dive tourism system, I decided to also use supporting methods of content analysis of secondary data (Section 3.3.4.1) and observations noted in field diaries (Section 3.3.4.2). These are not

core to this thesis, but helped support the findings of the data from the primary methods (i.e. interviews and group discussions).

3.3.1 Case study – The primary methodological approach

To test the key elements of a V/R assessment, the primary research design elected for this PhD study was a case study research approach, which has been discussed in detail by Yin (2009). Case study research "is an in-depth examination of an extensive amount of information about very few units or cases for one period of time or across multiple periods of time" (Neuman, 2011, p. 42). For this thesis, Luganville's dive tourism system represents the single case through which the established key elements of a V/R assessment are tested. This case study deals with the whole case of Luganville's dive tourism system, but at the same time this case study will not and cannot deal with everything about this case (de Vaus, 2001). In other words, the focus of this case study will be on the vulnerability and resilience of Luganville's dive tourism system, with particular attention on how the system's resilience can be built through climate change adaptation.

There are seven key reasons for why this method was chosen. First, the case study approach is commonly used in vulnerability analysis (Calgaro & Lloyd, 2008; Eriksen & Kelly, 2007), particularly as it provides a way to 'ground-truth' vulnerability profiles at the macro-level (O'Brien et al., 2004). Second, case study is frequently applied in political science studies (Majchrzak, 1984; Verschuren, 2003). Third, the phenomenon of the study (i.e. tourism's vulnerability and resilience to climate change) is difficult to distinguish from its context (Yin, 2009). Fourth, the case study approach is deemed appropriate when the introduction of interventions in the study is impossible (de Vaus, 2001). Fifth, the case study approach can be powerful in exploring a phenomena that is uncertain or ambiguous (Gray, 2004). Sixth, the case study approach aligns well with pragmatism, as it does not link to a particular method of data collection but allows for all, and multiple, data collection methods to be applied to a case study (de Vaus, 2001). Finally, the reason this was the most appropriate primary methodological approach follows Yin's (2009) analysis in that the underlying research questions of the second research objective were primarily how or why questions (i.e. Why, if at all, is Luganville's dive tourism system vulnerable to climate change? How can the resilience of Luganville's dive tourism system be built?); no control of the research environment could be exercised; and the focus of the research was on tourism and climate change (a

coupled human-environmental system), which is a current phenomenon with real-life context and an exploration of this phenomenon in depth.

Further to these key reasons, the case study approach was deemed the most appropriate methodology when compared to other methodological approaches. Even though the knowledge of the past can be important in building a system's resilience (Gallopín, 2006), a case-study approach was more relevant to this study than a pure historical approach, as direct observations of the event could be made and people impacted by the event could be interviewed (Yin, 2009). Qualitative research was a key element of the research design, as this research intended to take a holistic approach exploring a multitude of factors impacting the tourism-climate system, as opposed to focusing on only a few variables of this complex system (Hancock & Algozzine, 2006). As surveys and archival analysis were also relevant methods for the research questions posed (Yin, 2009), elements of these research approaches through the secondary data were also included in this study's research design, further strengthening the research approach.

The case study approach allows all data collection methods to be applied (de Vaus, 2001), although there is no clear direction in the literature as to which methods are most suited to case studies (see Verschuren, 2003). Yin (2009) identified six main data sources for case study research: documentation, archival records, interviews, direct observation, participant observation and physical artefacts. In applying the case study approach to the case of Luganville's dive tourism system, the main data sources used in this thesis include interviews and group discussions, as discussed further in Section 3.3.3 on primary methods, whereas the supporting methods include content analysis of secondary data and observations recorded in field diaries, as discussed further in Section 3.3.4 on supporting methods.

One key criticism of the case study approach is in relation to its generalisability (Flyvbjerg, 2006; Verschuren, 2003). Flyvbjerg (2006) counteracts this argument in his statement, "Social science has not succeeded in producing general, context-independent theory and, thus, has in the final instance nothing else to offer than concrete, context-dependent knowledge" (p. 223). The effects of climate change and how these effects impact on tourism systems around the world are very context specific. The case study approach is a well-suited methodological approach that can help achieve such context-dependent knowledge (Flyvbjerg, 2006). It might be that the findings of this study do

not apply to dive tourism systems in other parts of Vanuatu, the Pacific or in other parts of the world. However, the overall knowledge gained from testing the key elements of a V/R assessment in Luganville's tourism system context—a real life context—will guide the development of a conceptual climate change V/R framework for tourism (de Vaus, 2001), which is the main aim of this thesis. This framework can then be tested in other contexts by studies using other methodological approaches and/or methods.

As this thesis sets out to develop a conceptual climate change V/R framework, the elements of the structured-case research approach proposed by Carroll and Swatman (2000) and as presented in Figure 3-2 were applied. The three research objectives of this thesis fits well within the structured-case research method, as follows: (1) the first research objective aims at identifying the key elements of a climate change V/R assessment through literature-based scrutiny; (2) the second research objective aims to test the key element of a climate change V/R assessment through a case study of Luganville's dive tourism system that entails the planning, collecting and analysis of the data; and (3) the third research objective aims to propose a new climate change V/R framework for tourism by reflecting on and evaluating the effectiveness of the applied steps of the climate change V/R assessment.

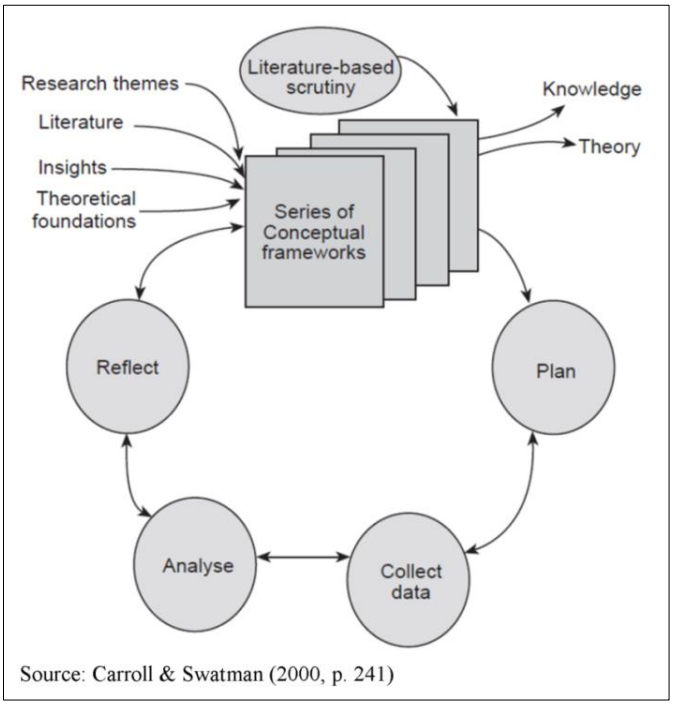


FIGURE 3-2: THE STRUCTURED-CASE RESEARCH APPROACH

3.3.2 Rapid rural appraisal (RRA) – The supporting methodological approach

RRA was applied as a supporting methodological approach. Developed in the late 1970s, it is the umbrella term for a number of methodologies involving a multi-disciplinary team, working with the local community (initially farming communities) in a rapid yet systematic manner (Chambers, 1992; Koutra, 2010; McCracken, Pretty & Conway, 1988). There are two central themes to RRA: (1) optimal ignorance (spending a short time in a location by using a multi-disciplinary team); and (2) diversity of analysis (by triangulation of data) (McCracken et al., 1988). In other words, key to RRA is that a multi-disciplinary team can get sufficient data in a very short period of time, whereas getting 100 per cent complete data by one individual would take years.

It was not until the mid-1980s that RRA approaches and methods started to gain some real credit in the field of research and it was acknowledged that RRA could provide qualitative information and insights that traditional methods could not (Chambers, 1992). It is a useful methodology to gain insights about a system by amalgamating the data from several sources of information, including prior research, direct observation and semi-structured interviews (Gibbs, 1995). During the 1980s, the RRA approach developed further and a slightly different approach formed (i.e. participatory rural appraisal (PRA)). The clearest difference between RRA and PRA is that RRA enables learning by outsiders whereas the PRA approach enables the local community to take part in the analysis, in the planning and in the actions taken (Chambers, 1992; Gibbs, 1995). Both approaches can have similar methods attached. For example, these might be secondary sources, direct observation, semi-structured interviewing, stories and portraits, and analytical games, such as mapping or ranking activities (McCracken et al., 1988).

The three principles of the RRA methodology, as detailed by Gibbs (1995), guided the design of the methodological approach of this study. The first principle is that of a systems approach. An identification of the system forms the basis for the following inquiry. Semi-structured interviews can be a useful method applied to identify the system from an insider's perspective. This principle is closely linked to the first step of a V/R assessment for tourism (i.e. the tourism system).

A second principle is that of triangulation. The term triangulation originates from a navigational method (Gibbs, 1995; Veal, 1997) that is commonly used by sailors and surveyors from which multiple perspectives or viewpoints are applied to "obtain a good fix on an object's true location" (Neuman, 2011, p. 164). Triangulation is also used in social research and is at the heart of pragmatism (Pansiri, 2005). As Phillimore and Goodson (2004) argue, triangulation is about "looking at the same phenomenon or research question from more than one source of evidence" (p. 167). In social research triangulation can take several forms including the triangulation of observers/investigators; measures/data; methods; methodologies; sampling strategies; and theory (Gibbs, 2011; Tashakkori & Teddlie, 1998; Veal, 1997). If three different approaches are applied to the same research question or objective and the findings are similar or even if they are different, triangulation has been effective as a tool for gaining a broader and more comprehensive understanding of the phenomenon or issues being studied (Veal, 1997) and the analysis is more sound than if only one approach was used (Esterberg, 2002). This principle (i.e. data triangulation) was applied to this study in several ways. For example, the second field visit involved three researchers, including myself, from different academic backgrounds and it entailed the application of multiple methods (see Section 3.6 for instrument construction for primary methods).

Finally, the last principle of RRA is iterative data collection and analysis by all team members. This allows for a flexible approach where the understanding of the system progresses and develops through feedback and interpretations gained during the fieldwork. A key aspect of RRA is the focus on understanding the system from an insider's perspective. RRA allows for the methods and the questions asked to be changed along the way, as new insights are gained (Gibbs, 1995; Koutra, 2010). This principle was also applied in the one field study, as the questions asked during the second field visit changed slightly as new themes or gaps of knowledge were identified during the data collection.

Apart from these flexible principles, there are also some absolute requirements (Gibbs, 1995). First, it is vital that the research team does not have a fixed system's perspective, but that the system is defined by the sources of the RRA (Gibbs, 1995). Consequently, the study is iterative and involves learning-as-you-go (McCracken et al., 1988). Second, the research team must consist of at least two people (Gibbs, 1995) from different disciplines and the majority of the learning occurs during the fieldwork (McCracken et

al., 1988). Lastly, the RRA is not a one-shot effort, but is a process of collecting data, discussing it, analysing it and collecting further information (Gibbs, 1995), thereby, representing an interactive approach (McCracken et al., 1988).

RRA, like any other methodological approach, has both advantages and disadvantages. Advantages include: cost-effectiveness; economical in terms of time; and the type of information gained (Gibbs, 1995; Koutra, 2010). It is highly useful when a description and understanding of the system is required or when recommendations are to be made (Gibbs, 1995; Koutra, 2010). Consequently, the RRA methodology fits well within the paradigm of pragmatism in its purpose of solving problems by suggesting solutions. Nevertheless, there are also some disadvantages of RRA. These include: non-probability sampling; individual judgements; and the recording, coding and analysis of information can be difficult (Gibbs, 1995). For example, the application of non-probability forms of sampling limits the representation of the data (i.e. the conclusion of the analysis relates to this percentage of the population). Consequently, it can only provide an enhanced picture of the phenomenon, but not a demonstration of the scale at which the phenomenon occurs (Koutra, 2010). Moreover, the individual judgements applied by the research team throughout the data collection may create a potential for bias or distortion of the data (Gibbs, 1995; Koutra, 2010).

Acknowledging the wide application of RRA in the field of tourism (Koutra, 2010; Towner & France, 1992) and the qualities of this methodological approach, this study combines the case study research approach with RRA for the following reasons:

- Sufficient information is gathered within a short period of time through the use of multiple methods and a multi-disciplinary team;
- Through the multi-disciplinary team it allows for a broader understanding of the phenomenon that is helpful when researching a complex topic such as tourism and climate change;
- It is a cost-effective methodological approach;
- It allows for an understanding of the dive tourism system and its vulnerability and resilience from an insider's perspective. This guides the adaptation recommendations that, if successfully implemented, should further build the resilience of the system;
- Its principle of triangulation is closely aligned to pragmatism;

- It allows for flexibility in the data collection, which is particular applicable when research is undertaken in a foreign country.

In order to apply this methodology, my research was part of a larger Australian Development Research Award (ADRA) investigation of climate adaptation for the Pacific island tourism sector, which includes Vanuatu. This ADRA investigation was titled the Pacific Tourism – Climate Adaptation Project (PT-CAP). Benefits of scaffolding onto this larger research project meant that I could benefit from the PT-CAP's stakeholder contacts and travel funding to assist with fieldwork. The opportunity to build on existing stakeholder contacts was seen as an important opportunity, as a "layer of complexity in researching real-world problems comes from the need to establish a relationship with various stakeholder groups" (O'Leary, 2005, p. 15).

Recognising the requirement that the work in a PhD thesis is the candidate's own work, I was responsible for the Vanuatu case study of the PT-CAP[xvii]. This meant that I took the lead in Vanuatu and was solely responsible for the development of the Vanuatu case study, including the development of the data collection instruments, contacting the respondents, leading the data collection, and all analysis of the data. The underpinning work (guidelines and instruments) undertaken by myself was, however, shared with my colleagues on the project for their use in other PT-CAP case study destinations[xviii], as well as for their comments and feedback. Only the second field visit of this PhD research involved a multi-disciplinary team, where two colleagues took notes during the interviews and group discussions and noted their personal observations in field diaries.

3.3.3 Primary methods

Now that the key methodological approaches of this study have been discussed in detail, the following section summarises the supporting research methods for this study in more detail.

This thesis' methods are based on previous related studies in tourism, human geography and political science. In particular, two former PhD studies (i.e. Calgaro (2010) and Wong (2008)—research that was later published by Wong, Mistillis & Dwyer (2011))—formed a critical basis for this study. Calgaro's vulnerability assessment focused on a

[xvii] The PT-CAP involved a policy analysis and a V/R assessment.

[xviii] Following my analysis of the Vanuatu case study, other PT-CAP case studies included Fiji, Samoa and Tonga and did not directly involve me.

comparative study of three coastal tourism destinations in Thailand that were impacted by the 2004 Indian Ocean tsunami. The methods applied in Calgaro's vulnerability assessment included three case studies that each involved individual methods of secondary data, semi-structured interviews, and focus groups (Calgaro, 2010). Wong's study explored the intergovernmental collaboration of the Association of Southeast Asian Nations (ASEAN). The key methods applied in Wong's study were semi-structured interviews and secondary data in the form of official ASEAN documents and unofficial documents, including journal articles, books, newspapers and trade magazines (Wong, 2008; Wong et al., 2011a, 2011b).

To test the established key elements of a V/R assessment using the case study of Luganville's dive tourism system, the primary methods that were applied to the case of Vanuatu's dive tourism sector included interviews, and group discussions (a focused discussion with a small group of people facilitated by a moderator). Supporting methods were also applied in this thesis and included analysis of secondary data (e.g. content analysis) and observations covered in field diaries. As Seidman (2006) argued, "Any method of inquiry worth anything takes time, thoughtfulness, energy, and money" (p. 12). Nevertheless, the variety of strengths and weaknesses vary across the different methods. Table 3-2 provides an overview of strengths and weaknesses attached to each of the methods described above. The combination of all of these methods allowed for data triangulation in line with pragmatism and helped reduce any potential method weaknesses (Esterberg, 2002; Gray, 2004). Interviewing and group discussions will be described further below followed by a brief discussion of observations recorded in field diaries.

TABLE 3-2: A SELECTION OF ADVANTAGES AND DISADVANTAGES FOR THE METHODS APPLIED IN THIS STUDY

Data source	Advantages of method	Disadvantages of method	References
In-depth interviews (a conversation between a researcher and an interviewee)	• Information about actions and reactions, motives and meanings of people in the context of everyday life can be captured. • Insight into feelings and reasons for behaviour. • Targeted and focusing on the topic of the case study. • Based on a set of topics rather than standardised questions. • Allows for clarification and detailed responses. • Insightful, providing original and illuminating data. • Applied when seeking to explore issues in more depth.	• Importance of rapport between participant and researcher. • Recording of interviews may inhibit the conversations. • Inaccuracies if recalling is poor. • Data capturing and analysing is slow, time consuming and can be costly. • Bias is potential, if questions are poorly constructed. • Response bias. • Reflexivity – respondents saying what they think the interviewer wants to know. • Characteristics of the interviewer may influence the answers received. • Labour-intensive. • Data findings cannot be generalised to a larger population.	Babbie, 2007; Esterberg, 2002; Gray; 2004; Minichiello et al., 1995; Neuman, 2011; Seidman, 2006; Smith, 2010; Yin, 2009
Group discussion (a focused discussion in a small group of people facilitated by a moderator)	• Valuable qualitative data can be gained about the topic of interest through discussion in permissive and non-threatening environment. • Orienting oneself to a new field. • A range of views can be recorded. • New issues can be identified. • Group members can build on ideas and opinions of other participants (stimulation of new perspectives). • Generating hypotheses based on insights of the participants. • A great basis for developing interview schedules or questionnaires. • Useful for assessing attitudes rather than actual behaviour.	• Absolute confidentiality cannot be ensured, as participants reveal themselves to others. • Influence of social pressure. • Group dynamics will influence the data collected. • Group dynamics are difficult to predict. • Require significant level of participant enthusiasm and cooperation. • Researcher has less control than in an individual interview. • Difficulty of documenting the data while identifying the	Babbie, 2007; Esterberg, 2002; Flick, 2002; Gray; 2004; Henninck, 2007; Krueger and Casey, 2009;

	• Large amount of data in a short period of time, covering multiple perspectives/opinions. • Low cost but rich in data. • Engaging people who are cynical or hostile toward the topic of discussion. • Participants do not have to be particularly literate. • Can often be easier to develop rapport with the participants. • Can explore shades of meanings, which might be missed in other forms of data collection.	individual participant's voice and distinguishing between statements of parallel speakers. • Recruitment of appropriate participants can be difficult. • Results cannot be generalised reliably.	Smith, 1995; Smith, 2010
Documentation (e.g. policy documents and technical reports)	• Stable – allowing for repeated review. • Unobtrusive, as it is not a result of the study. • Broad coverage of time, events and settings. • Exact, covering names, references and details of an event.	• Access – many organisations have confidentiality issues hindering access to the documentation. • Reporting bias – the bias of the document author is unknown. • Retrievability can be low. • Biased selectivity when collection is incomplete.	Gray, 2004; Yin, 2009
Personal observations	• Allows for exploring the world in many ways. • Presence of the observer. • Events are covered in real time. • Provides context of the events. • Insightful information about behaviour and motives. • Can see behaviour first-hand.	• Observer is part of the activity, unless the observer takes the role of spectator. • Difficulty of defining the role of the observer (spectator/participant). • Not all observations are recorded. • Time consuming and costly. • Investigator bias. • Reflexivity – event is changing because of the presence of the interviewer. • Selectivity unless broad coverage.	Babbie, 2007; Esterberg, 2002; Flick, 2002; Gray, 2004; Patton, 2002; Yin, 2009;
Field trip diaries	• Provides a reflection of things that were mentioned or not mentioned (e.g. during interviews) and what was observed.	• Field trip diaries need to be written immediately after an activity.	Minichiello et al., 1995

3.3.3.1 In-depth interviewing

In-depth interviewing was one of the primary methods applied in this study. The main idea behind an interview is to gain an understanding of the lived experience through a person's experience and to explore their interpretation of that experience (Seidman, 2006). Gray (2004) defined a research interview as "a conversation between people in which one person has the role of researcher" (p.213). In-depth interviewing, just like observation, allowed me to gain information about the actions and reactions, motives and meanings of people in the context of their everyday life (Minichiello, 1995). This method also allowed for possibly sensitive questions (i.e. questions about financial and skill levels) to be asked in a more sensitive manner than other methods, such as group discussions.

The research interview can be undertaken in several ways. An interview will have several stages, including an introduction, the main part and the exit or closing of the interview (Neuman, 2011). The flow of questions will follow these stages in terms of complexity. Research interviews are divided into five streams: structured; semi-structured; non-directive; focused and informal conversational interviews (Gray, 2004). Structured interviews are useful for collecting quantitative data, whereas semi-structured and non-directive interviews are generally undertaken to collect qualitative data (Gray, 2004). This study applied semi-structured interviews during both field visits. A discussion of how this method is applied in this thesis is presented in Section 3.6.1.

In-depth interviewing allows the researcher to probe the respondents. A probe (i.e. a neutral follow-up question) can be used when the interviewer wants the interviewee to clarify a particular point made, which can be an incomplete answer, an ambiguous reply or to elicit a relevant response (Neuman, 2011). The probe does not have to be verbal; sometimes, interviewers can use their body language to probe further information from the respondent (Esterberg, 2002). At the same time, the respondent can also communicate in non-verbal language to the interviewer (Esterberg, 2002). This was seen as a real benefit of this method to my study, as it allowed me to clarify points mentioned by respondents that other methods would not allow for.

Possible bias is often associated with research interviews. Neuman (2011) presents six types of interview bias: errors by the respondent; unintentional errors or interviewer

sloppiness; intentional subversion by the interviewer; influence due to the interviewers' expectations; failure of an interviewer to probe; and influence on the answers due to the interviewer's appearance. Consequently, studies applying this method need to take interviewer bias into account and try to diminish this as much as possible. With an understanding of these possible interview biases, I attempted to diminish these as best as possible. Section 3.8 presents a discussion on the limitations of this study in detail.

3.3.3.2 Group discussion

The techniques involved in group discussions (also termed focus groups) were developed in the mid-twentieth century and have, in the last couple of decades, become more common as a social research method (Esterberg, 2002). Focus groups are extensively used in the fields of market research, media research and political polls (Esterberg, 2002; Flick, 2002; Gray, 2004). This thesis refers to this method as group discussions. Group discussions, as opposed to interviews and surveys, are more closely connected to forms of communication occurring on a daily basis (Flick, 2002). As Flick argues, group discussions "...correspond to the way in which opinions are produced, expressed and exchanged in everyday life" (p. 114). In a group discussion, the aim is to invite a group of people to attend a focused discussion in a permissive and non-threatening environment in order to gain valuable qualitative data about the topic of interest (Krueger & Casey, 2009). The number of participants of a group discussion is not fixed and can vary from group to group (Smith, 1995).

Group discussions can be held between homogenous and heterogonous groups (Flick, 2002). The group discussion participants are most often homogenous in some form or another (Patton, 2002). This could be related to age, ethnicity, gender or another characteristic relevant to the study (Esterberg, 2002). In this way, the group members have a similar background and are similar in the characteristics relevant to the research questions (Flick, 2002). There are, however, also heterogeneous groups. Here, participants represent different characteristics that are relevant to the research questions (Flick, 2002). The group discussion respondents in this study were homogenous, as will be highlighted in Section 3.4.

There are a number of advantages and disadvantages attached to the method of group discussions, as outlined in Table 3-2 above. Group discussions are cost-efficient (Gray, 2004) and are advantageous when studies seek to explore different perspectives, ideas

and the feelings of people, new ideas on a topic and when further information about collected qualitative data needs to be gained (Krueger & Casey, 2009). It can also be beneficial to engage people who are cynical or hostile toward the topic of discussion (Gray, 2004). The disadvantages of this method relate to social pressures and group dynamics. For example, this method requires a significant level of enthusiasm and cooperation by participants (Gray, 2004). There are also particular ethical issues that are somewhat unique to this method. As group discussions occur in a social setting, the disclosure of information by participants can result in over-disclosure of some information (this is particularly relevant when sensitive information is discussed) or in withholding of information by participants (this is relevant if participants feel less safe in a group setting) (Smith, 1995). Closely related to the disclosure of information, Gubrium and Holstein (2001) confirm that participants of group discussions may say something different than what they would have said in an in-depth interview, but argue that this does not mean that the information is distorted. In other words, the information provided by participants may be shaped by what other participants say, but it does not make that information inaccurate. Finally, absolute confidentiality of participants and the information gathered cannot be ensured, because this depends on the group dynamics (Smith, 1995). Section 3.8.3 on social and psychological risks of running group discussions presents how some of these ethical issues have been dealt with in this study.

The group discussion approach was applied in this study for the following reasons: (1) valuable qualitative data covering a range of views can be recorded; (2) new issues can be identified; (3) it is a cost efficient method resulting in rich data; (4) group members can build on the ideas and opinions of others and through this stimulation new perspectives and ideas might arise; and (5) it allowed me to orient myself to this new field of tourism and climate change in Luganville, Vanuatu. Section 3.6.2 will present a more detailed overview of how the method was applied in this study.

3.3.4 Supporting Methods

3.3.4.1 Content analysis of secondary data

Secondary data may include academic journals, books, conference papers, government publications, newspaper articles, reports, theses, statistics and websites (Gray, 2004). There is little work on climate change adaptation and vulnerability and resilience of

tourism in academic journals. Many NGOs and development and donor agencies have published on the topics of climate change adaptation and vulnerability and resilience of communities, particularly in developing countries. Albeit not touching on tourism, these sources of data (i.e. reports) have been important to this study in understanding the vulnerability and resilience of communities in developing countries to the effects of climate change.

There are two key approaches for applying a content analysis approach to qualitative data: manifest content and latent content. Manifest content is an analysis on a very simple level, where words, pictures or objects are counted directly (Esterberg, 2002). Latent content involves a more interpretive analysis of the underlying meanings of the text (Babbie, 2007; Esterberg, 2002). In this latter approach, which is also termed 'thematic analysis', categorical themes are identified as core meanings of the data (Patton, 2002). Section 3.7.1 provides details of the content analysis applied to both the primary and secondary data of this study.

3.3.4.2 Observations noted in field diaries

The observations were noted in written field diaries that, when possible, were completed immediately after any activity undertaken during the field trip (Berg, 2007). This was to ensure that the field notes would reflect "what was said (or not said) and observed" (Minichiello, 1995, p. 216). It is important to record enough detail for the reader to be able to understand and comprehend the situation that was studied (Patton, 2002). Therefore, the observations covered descriptions of the destination, activities undertaken, the stakeholders, and methodology barriers that were recorded as factual and accurate descriptions without covering trivial information or irrelevant minutiae (Patton, 2002).

During the second field visit, my two colleagues, who joined me in the field for data collection, were provided with guidance as to what aspects could be covered in the field diaries based on their observations. These included: time; place of the observation; specific facts (number and details of what has happened); personal responses; specific words/phrases; summaries of conversations; insider language; and questions about people or behaviour for future considerations, in accordance with Chiseri-Strater and Sunstein (2001 paraphrased in Berg 2007).

Research involving observation allows for exploring the world in many ways (Patton, 2002). The use of observational analysis in research allows the reader to be taken into the setting that was observed (Patton, 2002). The observation technique applied in the fieldwork in Vanuatu was informal and casual in nature and covered observations of interview settings and the buildings of government departments and organisations (with permission). Such observations provide an indication of a person's status or a department or organisation's climate and/or impoverishment (Yin, 2009).

Similarly, the technique was applied to achieve new dimensions for understanding the context (Yin, 2009) of the tourism system in Vanuatu. This was deemed important, as it was highly likely that the respondents would not see their involvement in tourism as part of a bigger tourism system. It was also applied for its ability to be an effective research method, when there is a need to understand the complexity of a situation, thereby considering that there are limits to the knowledge that can be gained from what people have said, verbally as well as written (Patton, 2002).

Table 3-3 presents a summary of the methods applied, the purpose of these methods and how they were applied in terms of the sources, participants and deployment. A further discussion of how the primary methods are applied in this thesis is provided in Section 3.6 on instrument construction.

TABLE 3-3: A SUMMARY OF THE METHODS APPLIED IN THE THESIS PROJECT

Method	Purpose	Sources, participants and deployment
Interviews (in-depth and semi-structured)	Applied in order to: (1) gain information about the actions and reactions, motives and meanings of people in the context of everyday life (Minichiello et al., 1995); and (2) allow for more sensitive questions (i.e. questions about financial and skill levels) to be asked in a more sensitive manner than other methods would allow for.	***Participants**:* The 37 interview participants represented the range of stakeholders of the dive tourism sector from the following four stakeholder groups: (1) donor/development agencies; (2) NGOs; (3) private sector; and (4) public sector. ***Deployment**:* Participants were selected through convenience sampling techniques.
Group discussions	Applied in order to: (1) develop an understanding of multiple perspectives and opinions (of what or who made the tourism system function and what events have impacted the system in the past); and (2) identify trends and patterns in these perceptions (Krueger & Casey, 2009). Furthermore, it allowed a discussion of what actions were required to deal with future shocks and stressors.	***Participants**:* 24 participants out of 40 actively participated in discussions over the course of the three group discussions held in Port Vila, Luganville and Port Olry. ***Deployment**:* Participants were selected through convenience sampling techniques.
Content analysis of secondary data	Provided the contextual information (Patton, 2002) that: (1) informed the selection of the case study destination; (2) highlighted factors and processes that may influence the destination's vulnerability to climate change not covered in the primary data; (3) helped shape and inform the interview questions; and (4) identified possible key informants for primary data collection.	***Sources**:* • Newspaper articles • Government policies and plans • Guide books • History books • Reports • Academic literature ◦ Text books ◦ Journal articles
Observation noted in field diaries	Applied to understand the complexity of the situation (Patton, 2002) and aimed to: (1) identify further stakeholder groups; (2) highlight any power relationships between stakeholders; (3) identify characteristics of the tourism destination; and (4) confirm key aspects of the tourism system and identify new aspects that were not already identified in the analysis of secondary data.	***Sources**:* Observation during transportation to and from Vanuatu and Luganville, in the host community and during data collection activities. ***Deployment**:* Immediately after any activity was undertaken during the field trip, field notes were completed covering aspects such as: date and time; place of the observation; specific facts (number and details of what has happened); sensory impressions (sights, sounds, textures, smells, tastes); personal responses; specific words/phrases and summaries of conversations (Berg, 2007).

Source: Adapted from Calgaro (2010, p. 124)

3.4 Sampling technique and thesis sample

This section discusses the sampling technique and thesis sample in order to start addressing the second research objective (i.e. to test the identified key elements of a V/R framework in the context of the Vanuatu dive tourism system). As with many other aspects of research, decisions are not made in isolation (Flick, 2002). The study presented in this thesis is designed to achieve an in-depth understanding of the vulnerability and resilience of dive tourism in Vanuatu in order to test the key elements of a V/R assessment (i.e. second research objective). The choice to apply a convenience sampling technique reflected the research objectives and the level of generalisability strived for (Flick, 2002). The following presents a discussion of the sampling techniques applied in this study followed by an overview of the complete study sample, covering both field visits.

There are two approaches to data sampling: 1) sampling structure is defined in advance; or 2) sampling structure is gradually developed, as it is shaped by the phases of selection, collection and interpretation (Flick, 2002). This study applied the second sampling structure, as a clear understanding of the dive tourism system was not available prior to the study.

In line with this second sampling structure, the respondents were selected using a convenience sampling technique, which is defined as "A non-probability sampling strategy that uses the most conveniently accessible people to participate in the study" (Gray, 2004, p. 396). Although convenience sampling was applied, I approached people in the field that I believed would be able to give me rich information that would allow me to test the key elements of a V/R assessment using the case study of Luganville's dive tourism system. Nevertheless, the availability of the identified respondents shaped my actual sample (Gray, 2004; Tashakkori & Teddlie, 1998).

A limitation to this type of sampling, however, is that it does not allow for generalisability (Patton, 2002). I therefore cannot state with confidence that a finding in my study is general to dive tourism in Vanuatu or to dive tourism systems in other parts of the Pacific. Nevertheless, this generalisability was never an objective of this research. Instead, this research aimed to test the key elements of a V/R assessment in order to develop an appropriate V/R framework for tourism. This can then be tested later in

other contexts (e.g. other dive tourism systems in Vanuatu or elsewhere, cultural tourism systems, community-based tourism systems, etc.).

Prior to any contact being made with participants of this study, Victoria University's Ethics Committee granted research ethics approval (i.e. HRETH 09/30 and HRETH 10/68) to conduct focus groups and semi-structured interviews for this research. The Government of Vanuatu also provided support for this research project (see Appendix 12.2 for a letter of support).

Figure 3-3 below provides an overview of the full data sample and the interviewees that were of key importance to the dive tourism system in Vanuatu and, more specifically, in Luganville. Descriptions of the sample size for the individual data collection field visits only provide information on representative groups and the number of interviews in each. This is intentional to de-identify specific organisations or business interviewees. It is noted that the interviews mentioned in Figure 3-3 were not all covered in the individual field visit samples (i.e. not all respondents were interviewed during both field visits), but is an overall sample of the entire study presented in this thesis. The data acquisition was undertaken during two field visits.

The first field visit to Vanuatu set out to explore Luganville's dive tourism system and identify the policies that were pertinent to climate change adaptation. During the first field visit, a total of 27 interviews were held with industry experts, key players of the tourism industry and government officials.

The second field visit aimed to assess the vulnerability and resilience of the dive tourism system and covered the shocks and stressors that had impacted the system in the past, an understanding of how climatic stimuli would impact these and an assessment of sensitivity and adaptive capacity factors. During the second field visit, a total of 29 interviews were held including 14 with government, 11 with the tourism industry, and four with NGOs and donors. Furthermore, three group discussions were held. The group discussions covered: one with dive operators (expatriate); one with tour operators (Ni-Vanuatu), and one with a local community (Ni-Vanuatu).

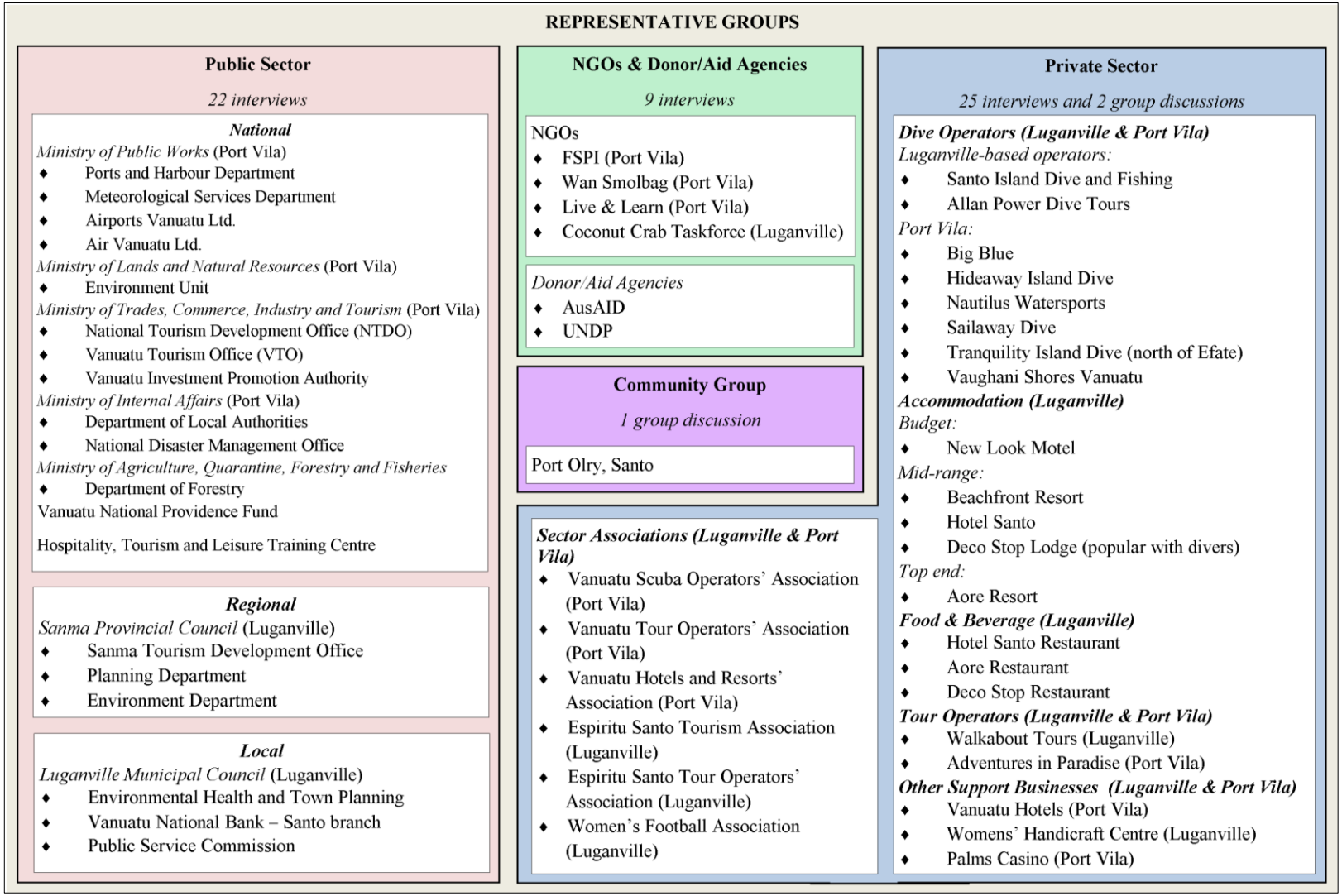


FIGURE 3-3: COMPLETE STUDY SAMPLE FOR BOTH FIELD VISITS

A combination of analysis of the data from both field visits allowed for appropriate recommendations to be made (these are discussed in Chapter 7) in order to meet step six of the second research objective (see Table 1-1).

To ensure the confidentiality of respondents, a further break down of the sample has not been provided. Table 3-4 highlights the number of semi-structured interviews undertaken from each of the interview groups. As the aim of the first field visit related to the tourism sector and public policy and the aim of the second field visit on the tourism sector's vulnerability and resilience to change, the interviews concentrated on industry and government representatives.

TABLE 3-4: INTERVIEW SAMPLE FOR FIELD VISITS 1 AND 2

Interview groups	**Number of interviews**	
	Field Visit 1	**Field Visit 2**
Public sector (incl. national, regional and local government bodies and educational providers)	8	14
Private sector	14	11
Donor and development agency	1	2
Non-governmental organisations	4	2
TOTAL	**27**	**29**

3.5 Data collection

The first field trip was undertaken from 18 November to 6 December 2009. During this visit, the observations and interviews conducted were designed to: (1) establish the different elements of the Vanuatu dive tourism system; (2) create a policy inventory and highlight any policy gaps; (3) examine the policy-making environment; and (4) explore the policy-making mechanisms. This is so that research objective steps one and three of the second research objective (see Table 1-1) could be met.

The second field visit was undertaken from 26 September to 17 October 2010. During this visit, the observations, interviews, and group discussions were designed to: (1) identify past shocks and stressors that had impacted the dive tourism system; (2) highlight how climatic stimuli may impact these; and (3) establish the sensitive and adaptive capacity factors influencing the system. This collection ensures that steps 2 and 4 of the second research objective are addressed (see Table 1-1).

On both field visits, Port Vila and Luganville were visited (Figure 3.3). The reason Port Vila was included in the data collection field visits is because it is the capital of

Vanuatu and the municipality in which most national government departments reside. In gaining an understanding of the climate change policy environment (part of research objective 2), it was deemed necessary to include respondents from Port Vila. Furthermore, Port Vila is the main gateway to Vanuatu and the hometown of the national tourism sector associations.

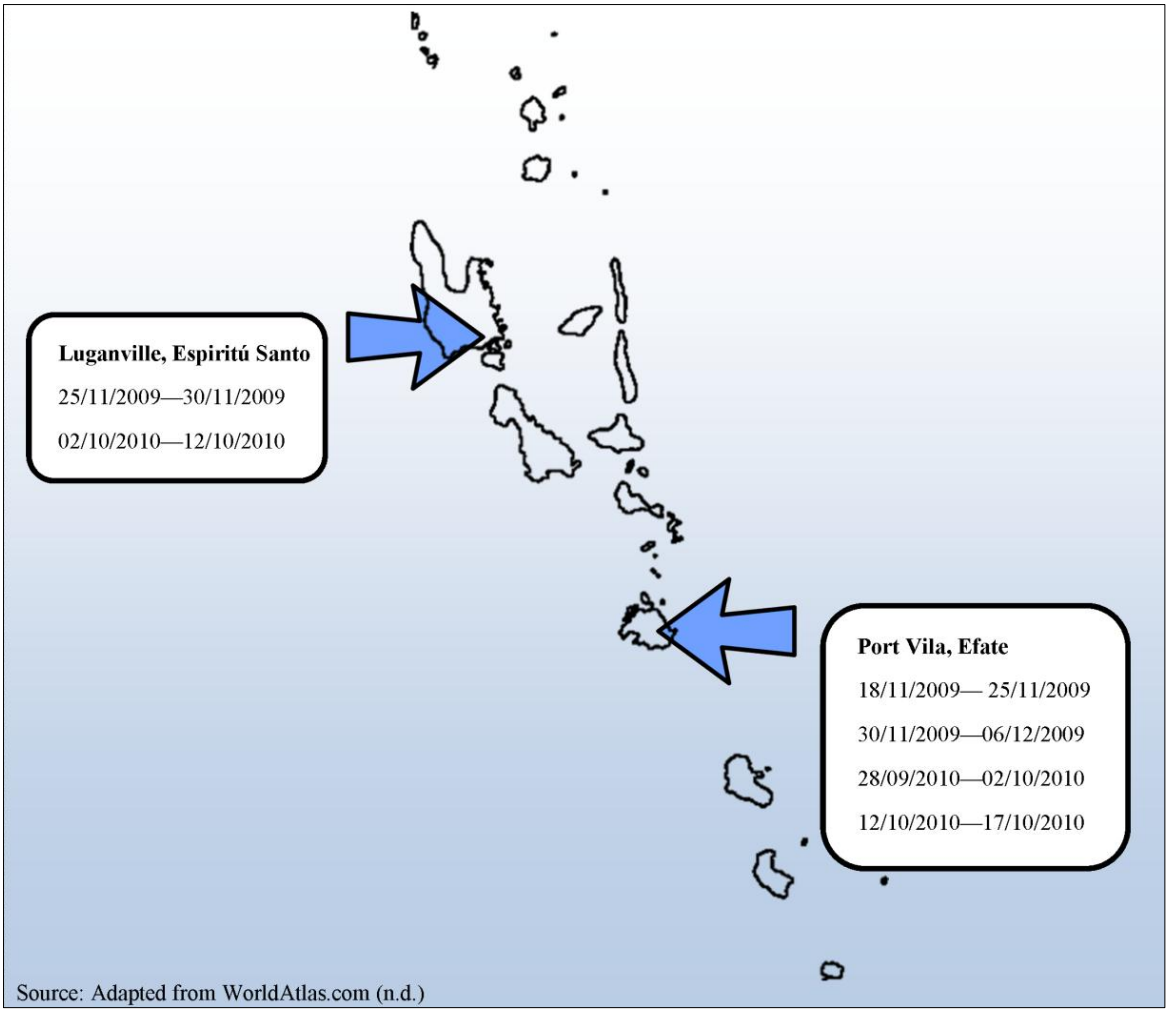


FIGURE 3-4: OVERVIEW OF FIELD VISIT DATES AND LOCATIONS

Through the analysis of the data from both field visits, the vulnerability/resilience of the dive tourism system could be established and recommendations for appropriate adaptations made. When continuously evaluated to ensure successful implementation, these will help build the resilience of the dive tourism sector. The following section discusses how the data collection instruments for both field visits were constructed.

3.6 Instrument construction for primary methods

3.6.1 Semi-structured interviews

For the first field visit, it was determined that primary data collected through semi-structured interviews would provide insights into the policy process in Vanuatu that would not have been identified in secondary data, as these may have been too sensitive to be documented. Consequently, primary data was collected through semi-structured in-depth interviews with key informants. The interviews were undertaken in November and December 2009 and were, on average, 40 minutes in length.

For the second field visit, primary data collected would provide in-depth insights into the exposure, sensitivity and adaptive capacity of the dive tourism system, all important elements for understanding the vulnerability/resilience of a system. Semi-structured interviews and group discussions were held with key informants. The data was collected during September and October 2010 and discussions were, on average, 50 minutes in length.

During both field visits, the interviews were held at the respondents' offices or at a cafe or outdoor setting chosen by the respondents or as suggested by me. The research setting was described in a short memo link attached to each of the individual interview notes or transcripts. The memo links contained a brief description of the interview setting, as well as general observations regarding the interview (see Appendix 12.3 for some examples of memo links for this study). The research settings often allowed for a more comfortable environment for the interviewees, but also meant that in many instances audio recording was unsuccessful.

3.6.1.1 Interview structure – First field visit

The interview structure was developed with several stages in mind (Neuman, 2007). The interviews started with simple communication and then moved into more detail and complexity as the interviews progressed. The interview questions outline was based on the process of policy formulation (Hall, 1995). The interview guidelines were divided into the following structure: introduction, scoping; policy purpose; conceptualisation; decision; implementation and coordination; outcome; and implications for climate change adaptation for the tourism sector (See Appendix 12.4.1. for an outline of the questions and Table 3-5 below for some examples). Although an interview guide had been developed, the interviews were of a semi-structured nature allowing flexibility in

the questions asked and for me to ask for clarification or further elaboration of particular topics.

Interview respondents were firstly provided with an introduction to the PT-CAP and the purpose of the research. This introduction served as an entry point to the interview (Neuman, 2007). During this introduction, each interviewee was advised that they could withdraw from the research project at any time and that their names would not be used in any publications written as a result of the study. Once I had received verbal and written consent, the interview progressed to the next phase.

TABLE 3-5: EXAMPLES OF SEMI-STRUCTURED INTERVIEW QUESTIONS FROM THE FIRST FIELD VISIT

Theme	Types of questions
Scoping	• Specified policy areas (climate change, tourism, and environment and disaster risk management)/policies introduced. • Can you add to this list?
Policy purpose	• What is the purpose of the policy? • Is the policy supranational, national or local?
Conceptualisation	• When was the policy developed? • What triggered the development of the policy? • Which agencies or individuals were involved?
Decision	• Which agencies or individuals were involved in decision-making? • What were the resources deployed? • Was the policy related to other ones?
Implementation and coordination	• Did the policy eventuate? • Which agencies or individuals were involved in implementation? • What kind/level of commitment was demonstrated?
Outcome	• What resulted from this policy? • What was the stakeholders' response?
Implications for climate change adaptation for the tourism sector	• Does the policy facilitate or hinder climate change adaptation for the tourism sector? • What are the outstanding adaptation issues to be addressed subsequent to this policy? • Who/which agencies should be involved to resolve these issues?

The interview questions had been designed to get the respondents to identify the three key areas of a policy process: precursors – formulation – outcome, based on the work of Hall (1995). First, interviewees were directed to the scope of policies that I wanted

identified. Second, the interviewees were asked questions related to the policy purpose of identified policies and to discuss the conceptualisation of individual policies. Here respondents could discuss when the policy was developed or what triggered the development or formulation of the policy amongst a range of sub-questions possible. These questions would lead the interviewer into discussing aspects of policy decisions, such as who was involved or what were the resources deployed to develop the policy. Before moving onto the outcome of the policy, interviewees were also asked to describe elements of the implementation and coordination of the policy, if this was relevant. Then, respondents were asked a range of questions in relation to the outcome of the policy. This section of the interview was designed to open up discussion on when the outcome occurred and if the result of the policy was the intended outcome or an unintended outcome. Finally, the interviewees were asked to discuss the individual policy's implication for climate change adaptation for the tourism sector. Here the interviewees were asked to reflect on the individual policies to identify if they would hinder or facilitate the tourism sector's adaptation to climate change. This section allowed for an identification of any outstanding issues and the agencies required to be involved in dealing with these.

The questions outline was implemented with a great deal of flexibility, reflecting the background, role, knowledge and experience of the interviewee. Some interviewees, particularly outside the public sector, had limited knowledge of individual policies and were, therefore, not expected to have an answer to all of the questions. Nevertheless, the questions outline allowed me to guide the interviewee in the right direction; follow-up questions were added at any point throughout the interview, when I felt that the point made needed clarification or a new theme emerging from the conversation required exploring.

3.6.1.2 Interview structure – Second field visit

The interview questions for the second field visit were adapted from a recent study, which used a systems approach to assess the vulnerability and resilience of tourism destinations in Thailand after experiencing the shock of the 2004 Indian Ocean tsunami (Calgaro, 2010). The interview questions covered events that had affected tourism and/or the destination in the past (i.e. shocks and stressors), the tourism system and destination characteristics (natural, socio-cultural and economic), and past adjustments and adaptations undertaken. Table 3-6 details a sample of the questions that were asked

under each theme (See Appendices 12.4.2 and 12.4.3 for complete outlines of the interview questions). The interview questions were designed to cover: (1) shocks and stressors in the form of any past short or long-term events that have affected the dive tourism system and/or the Luganville in the past; (2) exposure in the form of any particular tourism system and destination characteristics (i.e. natural, socio-cultural and economic); (3) sensitivity and adaptive capacity of the system covering a range of socio-economic, cultural and environmental factors; and (4) any past adjustments and adaptations undertaken.

TABLE 3-6: EXAMPLES OF SEMI-STRUCTURED INTERVIEW QUESTIONS FROM THE SECOND FIELD VISIT

Theme	Types of questions
Exposure to shocks and stressors	• What events have affected tourism numbers and business in the past 15 years (since 1995-96)? • Has Vanuatu experienced an increase or decrease in tourism numbers following negative events (political unrest, natural disasters, and health epidemics) that have occurred in-the Asia-Pacific (rival destinations)?
Sensitivity of system	• What skills and training/education opportunities are available for the locals to draw upon to set up tourism-related businesses? • Do the current policies and plans include building standards and or development regulations (including coastal set-backs)?
Adaptive capacity of system	• Are you aware of any existing/planned government policies that are designed to assist the tourism industry and your communities to respond to climate change? • Are you concerned about climate change's impact on tourism (including diving) activities?

Tape-recorders may inhibit conversation and may not always be the best way to record an interview, so respondents were asked if they were comfortable with the interview being recorded; if they were, a digital recorder was used. For all interviews, extensive notes were taken during the discussions.

3.6.2 Group discussions

The group discussions followed a detailed question outline covering the five categories of questions (i.e. opening, introductory, transition, key and ending), as adapted from Krueger and Casey (2009) (see Appendix 12.5). Questions included, amongst others: (1) Who is involved in making tourism work in Luganville/Vanuatu?; (2) Tell us about an event which has occurred in the past, where you have had to change your way of life or business?; and (3) Using the most concerning stressor and shock[xix], what are the actions that are needed to deal with shocks/stressors?

The questions sought to understand the stakeholders involved in making the tourism system function, events that had impacted participants significantly in the past causing a change in their life or business, and what actions were perceived necessary to deal with future shocks or stressors. The group discussion participants were then provided with a written summary of the discussions, post data collection, for their approval.

All interviews and group discussions were conducted in English, apart from the community meeting where one of the respondents helped translate English to Bislama and vice versa. The following section discusses how all of the data collected during both field visits were analysed to help achieve the key aims of this thesis.

3.7 Data analysis

To transform qualitative data into findings requires analysis (Patton, 2002). A good starting point is to organise and break the data into smaller chunks of more manageable data through coding (Welsh, 2002). In Patton's (2002) words,

> "This involves reducing the volume of raw information, shifting trivia from significance, identifying significant patterns, and constructing a framework for communicating the essence of what the data reveal" (p. 432).

In this study, the data was analysed using a content analysis technique, where the text (i.e. any kind of written material) was systematically analysed (Esterberg, 2002). This section initially discusses how the content analysis technique was applied to the data before moving on to outlining which data software was used to help me in the data analysis process. After this, the section highlights how the data was stored and confidentiality ensured.

[xix] These terms were defined to the participants.

3.7.1 Content analysis

The analytical software used for this thesis is QSR NVivo9.2, which is regarded as a sophisticated analysis package that facilitates qualitative data management, coding, retrieval of text and theory testing (Crowley et al., 2002; Bazeley, 2007). The reasons for using computer software for the data analysis are manifold. First, the study incorporated many methods and much data and, therefore, the software allowed for structural management of the data. Second, the coding facility of the software allows for a simpler approach to coding, where numerous nodes can be developed. All coded data under an individual node can be viewed, and the coding can be edited at all times.

Documents and nodes are key organising concepts used in NVivo (Bazeley, 2007; Crowley et al., 2002). Documents can be either internal or external and represent data in the form of text, image, video or audio recordings (Jennings, 2010). Consequently, the documents contained in this NVivo project included policy documents, interviews, group discussions and field trip diaries. These texts are important for three reasons: 1) they are the essential data upon which the findings are based; 2) they are the basis upon which interpretations are made; and 3) they are the key medium for communicating and presenting the findings (Flick, 2002). "Nodes represent ideas and may, if a coding approach to analysis is being used, be linked to marked up passages in documents" (Crowley et al., 2002, p. 195). There are two types of nodes: free nodes and tree nodes. Free nodes are stand-alone ideas and are useful when open codes are developed, especially if a link to another idea has not yet been established. Tree nodes are ideas that are linked to other ideas. In other words, one idea branches off to other ideas.

The latent content approach was the key approach applied in this research (Babbie, 2007). For example, in the policy analysis (data collected during field visit 1), the policy documents were systemically analysed for the types of adaptation measures incorporated in the policy as well as the policies' ability to address SIDSTs characteristics that exacerbate vulnerability. Further, in the vulnerability analysis (data collected from field visit 2), the data was systemically analysed in terms of the different factors' ability to constrain or facilitate adaptive capacity. The content analysis technique involved a number of start list codes (also termed focused coding) and was followed by open codes (i.e. open coding).

Based on current literature, an extensive list of codes was developed as a starting point for data analysis. Up to three levels of coding themes were applied to this study. A criterion attached ensured a more standardised coding process. For example, the literature identified that there can be two key processes of policies in relation to climate change adaptation: explicit and implicit (Hall & Higham, 2005). Each of these policy processes had a criterion attached. Explicit policies were, wholly or partly, formulated with the intention of addressing climate change. In these policies, the term climate change would usually be mentioned in the title and/or certain components of the policy. Implicit policies, on the other hand, were formulated with the intention of addressing issues other than climate change, but had components that were pertinent to climate change adaptation.

Another example of how the coding themes were derived from the literature is seen in the case of the different types of climate change adaptation. The five types of climate change adaptation that were considered relevant to the tourism sector, as identified by Scott et al. (2009), were: (1) technical (e.g. changes made to physical infrastructure or provisions); (2) business management (e.g. changes made by the private sector in their businesses); (3) behavioural (e.g. behavioural changes made by tourists or communities); (4) policy (e.g. changes in government plans or strategies); and (5) research and education (e.g. initiatives to strengthen the understanding of adaptation, explore adaptation options, and educating communities). Consequently, these five types served as five themes in the coding process.

Themes that were applied to the data gained from the first field visit include: tourism system, policy, policy environment, policy process (explicit versus implicit), the five adaptation types (i.e. technical, business management, behavioural, policy, and research and education), and implications for policies (e.g. awareness, transparency, implementation, and enforcement). The written policies were analysed using the climate change adaptation framework (explicit versus implicit and adaptation types) and their ability to address SIDST characteristics.

For the data from the second field visit, themes applied included shocks, stressors, and the sensitivity factors (tourism specific, economic, human and social, physical and natural and governance), in line with Calgaro (2010). As with the analysis of the first field visit, there were several levels of coding. For example, the theme of shocks

included the following sub-themes: cyclones, earthquakes, effect on demand due to media coverage and changes to international flights; the theme of stressors involved the following sub-themes: Crown-of-Thorns (COTS) outbreaks, and environmental degradation.

Open codes were also applied in this study. Open codes do not involve pre-established themes from the literature or the researcher, instead themes or categories are established based on the data source (Esterberg, 2002). Based on ideas that became obvious from the data, open codes were established. Some of these open codes became recurrent themes. For example, a theme emerged that explored the participants' perceptions of climate change, as there was a divergence in the perceptions held by Ni-Vanuatu and expatriates. It is worth noting that interviewees were not asked directly what they thought about climate change, but questions under the climate change and adaptation section of the semi-structured interview, such as 'are you concerned about climate change's impact on tourism (including diving) activities?' helped identify the respondents' perception of climate change. Therefore, an open code on climate change perception was developed.

3.7.2 Data storage and confidentiality

The data for this thesis was collected through numerous methods as discussed above. This data was kept in both soft and hard copy in the CTSR at Victoria University. Confidentiality was a key element of the consent form for this study. The confidentiality in this research refers to the release of the name and identity of the participants, and not in keeping the material gained from the interviews confidential (Seidman, 2006).

To ensure the confidentiality of the respondents, each interview has been given a number and each group discussion a letter. In chronological order, the sources of data from the interviews have been numbered 1-56 (field visit 1 covered interviews 1-27 and field visit 2 covered interviews 28-56). These numbers will be displayed in superscript when referring to these sources of data in the thesis. The three group discussions that were undertaken during the second field visit have been given the letters A, B and C. These letters in superscript will be used to refer to these sources of data throughout this thesis. Table 3-7 provides an overview of some contextual information (e.g. sector represented, cultural background and gender) of these sources of data (a detailed overview of the interview data can be found in Appendix 12.6 and a detailed overview

of group discussion data can be found in Appendix 12.7). Field diaries are lettered FD followed by a number. In accordance, field diary 1 is coded FD1, field diary 2 is FD2, and field diary 3 is FD3 and so on when discussed throughout this thesis. Furthermore, a date is supplied for when the comment was made in the field diary.

TABLE 3-7: OVERVIEW OF CONTEXTUAL INFORMATION OF ALL RESPONDENTS

Sector	Cultural Background	Gender	Interview/Group Discussion ID
Private	Ni-Vanuatu	Male	12, 48, B, C
		Female	30, 43, B
	Expatriate	Male	1, 5, 6, 8, 17, 18, 20, 22, 24, 26, 1, 38, 39, 40, 41, 51, 54, A
		Female	11, 16, 19, 44
Public	Ni-Vanuatu	Male	4, 9, 13, 14, 21, 23, 27, 28, 29, 35, 36, 37, 42, 45, 46, 50. 53
		Female	2, 3, 25, 32, 35, 47
	Expatriate	Male	52,
		Female	n/a
NGO	Ni-Vanuatu	Male	7, 10, 14, 15
		Female	n/a
	Expatriate	Male	55
		Female	n/a
Donor/ Development	Ni-Vanuatu	Male	23, 33, 49
		Female	n/a
	Expatriate	Male	23, 33, 49, 56
		Female	n/a

Note: Some interview/group discussion IDs cover more than one sector, cultural background or gender type, as there were multiple people present in some of the interviews/group discussions.

3.8 Limitations

Apart from individual method limitations, other resources also influence the collection of data. For example, as Seidman (2006) argues, "The criteria of sufficiency and saturation are useful, but practical exigencies of time, money and other resources also play a role, particularly in doctoral research" (p. 55). This section discusses the limitations of this research and the approaches applied to mitigate them. When considering the findings and implications of this study, the following should be kept in mind and are discussed below: (1) constraints of time and money; (2) interviews and group discussions in a broader social context; (3) social and psychological risks of

running group discussions; (4) respondents' research fatigue and research disinterest; (5) cultural sensitivities; (6) politics of self; and (7) language barriers.

3.8.1 Constraints of time and money

The available time and financial resources play key roles in the research design. For example, Patton (2002) acknowledges the influence of time and financial resources on the selection of sample size. Time and money can also influence the type of methods applied, with some methods more costly to apply than others. This study was undertaken overseas, which limited the time spend in the field and, thereby, the number of interviews that could be undertaken. Nevertheless, this issue was addressed through considerable planning and engagement with the Vanuatu Tourism Office (VTO), who helped with the organisation of interviews.

Furthermore, the available time played a role in gaining access to some stakeholders. For example, it might have been possible to achieve further information on the response and emergency management to disasters from the Vanuatu disaster risk management office, but an interview with this office was not possible during either of the field visits due to their busy schedule. During the first visit, the office was busy dealing with a volcano erupting in Gaua, Banks Islands and was unable to meet with me. On the second visit, the respondent also had a busy schedule, but a meeting was finally organised together with a development agency. Nevertheless, the respondent did not come to the meeting and I was unable to arrange another meeting due to time constraints.

3.8.2 Interviews and group discussions in a broader social context

A number of social forces will influence the interview process regardless of the efforts made to prevent this. These forces can include class, ethnicity, race, and gender (Seidman, 2006). This is particularly relevant to this study, which took place in another cultural context than what I am used to. I believe that I was genuinely sensitive to any cultural matters that may have caused distrust and that I undertook each interview with good manners. This, according to Seidman (2006), can reduce the effect that racial and ethnic barriers might have on an interview process.

Gender and ethnicity may have presented themselves as barriers during the data collection. During a writing retreat with Ron Adams, currently Acting Pro-Vice-

Chancellor (Community and International Engagement) at Victoria University, Melbourne, (personal communications, 30 October 2010), I was asked if I had considered how I would be received by senior government officials, as a young, blonde Danish/Australian girl. This question was prompted by Ron's extensive experience of research in Vanuatu as a Pacific historian. On reflection, there were situations during the research where the interviewing process was different to what was expected. For example, the following quote is from an NVivo memo of an interview with a senior government official:

> *"We were guided through the open space office, which had a nice setup with dark dividers and things looked a lot less cluttered and more modern than other government offices that we have been to. The meeting/conference room was large with a dark brown wooden table and fancy dark brown chairs. It looked very presentable and could seat up to 12 people. We sat down at the one end and when the respondent [name removed for confidentiality purposes] arrived to the room, he sat at the opposite end of the table – very far away from us. We moved closer to him. He was wearing a short sleeved brown shirt with a tropical print and slacks. He seemed very interested in climate change and was fairly chatty. It seemed like he had read through elements of the technical report on [the PT-CAP] policy analysis, and was interested in making his answers relevant to the information we were seeking. During the interview, a lady came and asked us what we would like to drink; they had a small form where we could provide our name and the type of drink we wanted. The tea and coffee were well presented with large biscuits, and the water was served with a large glass to serve it in."*

During this interview process, my colleagues (part of the RRA approach) and I had to move from the one end of the table to the other to get closer to the respondent. This was to be able to ask questions and hear the answers without having to deal with the residual noise of the ceiling fan. Whether this example was based on gender, ethnicity or even an age difference is not certain, but it was definitely unexpected. Nevertheless, in most of the interviews and group discussion undertaken, the gender issue was not obvious.

3.8.3 Social and psychological risks of running group discussions

There are both social and psychological risks related to running group discussions. Psychological risks may relate to privacy issues that arise as the participants reveal themselves not only to the researcher but to the group, hindering the assurance of absolute confidentiality. This is a particular concern if very sensitive subjects are discussed, and can present as a serious ethical issue in group discussions (Esterberg, 2002).

Social risks arise when participants share their point of view within a social context and take part in an interactive activity. This may make participants feel more or less comfortable in sharing information with the researcher. This is particularly evident if there are differences in power and status among the group discussion participants (Esterberg, 2002). Should this occur, self-censorship may be undertaken by participants, who then just defer to the group opinion (Esterberg, 2002).

The following actions were implemented before, during and after the group discussion activity to minimise and/or eliminate the above mentioned risks (based on Smith, 1995):

***Before**:*

The moderator of the group discussion would, prior to the group discussion activity commencing, discuss the possibility that other participants might share the information with other people after the event. Some ground rules were suggested and agreed upon by the group. I allowed for a debriefing component in the design of the group discussion activity giving participants the opportunity to discuss how they felt during the activity.

***During*:**

During the group discussion activity, the moderator of the group discussion monitored the group at all times, and if a sensitive matter was discussed or tension between participants seemed a possibility, the moderator would steer the communication towards less sensitive topics or interfere in another appropriate manner. The moderator did her best to ensure that all participants had their say and that the discussions were not dominated by one or two vociferous members.

***After**:*

I provided the participants of the group discussion activities with a summary of the discussions for the participants' information and approval.

3.8.4 Respondents' research fatigue and research disinterest

In the contact phase of the interview process, many respondents asked what they were getting out of the interview and what it was for. Some chose not to get involved purely because they saw no direct benefit of the interview. Others were happy to be interviewed, but shared their concern that so much research had already been conducted by NGOs and donor agencies and that little had been implemented into something practical and useful. Many respondents showed research fatigue and a general disinterest in the research topic. The following quote from a diary written during the second field trip indicate the difficulty in approaching some of the private sector businesses:

> *"He agreed to try and organise a meeting for Monday around lunch time with members of ESTA [Espiritú Santo Tourism Association]. He was pointing out that they were all really busy at this time and a little bit meeting'ed out, as they had had many meetings lately. Also he felt few would turn up, unless they had a real interest in it or would gain something from it"* FD1, 06 October 2010.

Respondents' interest in the research topic also influenced the data collection. As the research was focused on climate change and tourism, a number of prospective respondents were not interested in getting involved. As will be discussed later, climate change scepticism was a real issue in dive tourism in Vanuatu and this influenced the access to respondents. In order to deal with this barrier, I adjusted the data collection approach slightly to shift the verbal focus away from climate change. The new verbal focus was on events that had influenced the tourism sector in the past and how the respondents and the tourism system had dealt with these shocks and stressors. The following quote from a diary written during the second data collection highlights both the low priority of climate change and the difficulties faced in interviewing in the informal setting of a café:

> *"In the evening we had the first focus group [group discussion] with the dive operators. It was impossible to do the activities properly. I think it might have worked in an office or classroom setting but not in a cafe with a bunch of dive operators in the Pacific. Having said that they needed no encouragement to talk and brought up some fantastic aspects.*

> *I think we got an excellent insight into their lives and worries. Climate change is not very high on the agenda for them overall''*FD2, 01 October 2010.

3.8.5 Cultural sensitivities

As neither my colleagues (during the second field visit) nor I were of Vanuatu descent or expatriates in Vanuatu and we were female, there were some cultural sensitivity limitations to the research, particularly where the interviewee/s was/were male and/or of Ni-Vanuatu descent. Sekaran (1983) discussed one issue of cross-cultural research, where respondents provide the answers that they believe the researchers are looking for. Furthermore, as the project is funded by a donor agency, this may also have affected the responses provided by respondents. Due to the externality of the research, the ownership of the outcome by the dive tourism system may be contested. In order to deal with this, the stakeholders were involved in the research where possible.

3.8.6 Self/positioning within the research context

Human behaviour is to some extent directed by self-interest (Sears & Funk, 1991). Furthermore, it is argued that the researcher in case study research plays an interactive role in the data collection (e.g. methods such as in-depth interviews that are not structured and personal observations are highly linked to the personality of the researcher (Verschuren, 2003)). The facilitator/researcher also plays an important role in the creation of data from group discussions (Smith, 2010). I therefore seek to reflect on the personal politics of the self and position myself within the research context. This section discusses my motivation for the research and the connection to the PT-CAP, exploring how these aspects might have influenced the research.

I was motivated to undertake a PhD for strongly personal reasons. I had a great passion and interest in studying tourism during my bachelor and master degrees and following a short period of working in a peak user group, I felt the need to further challenge myself and undertake PhD research to further my career options. This expectation of the issue having consequences for one's self is something Sears and Funk (1991) entitle personal involvement. This personal involvement had driven my direction to continue studying tourism and with a strong drive to be part of creating a more sustainable tourism future, my interest in climate change opened up as its effects on all spheres of life became more and more obvious to me. Around the same time that I started the PhD, a three-year long AusAID research project (the PT-CAP) commenced on climate change and tourism in

the Pacific. By getting involved in the PT-CAP, I saw some real value in being able to undertake my individual research while still ensuring the practical outcomes that are required to ensure a more sustainable tourism future. Having grown up in a country (i.e. Denmark) that is a strong emitter of GHG, I also had a motivation to support a developing country like Vanuatu, which will be heavily impacted by the effects of climate change.

The connection to the PT-CAP acted as a gate-opener for my PhD research in more than one way. Being linked to a prestigious AusAID research grant helped me gain physical access to a number of high profile stakeholders within the public sector of Luganville's dive tourism system (Shah, 2004), which I believe would have been difficult to gain otherwise. Furthermore, the involvement in the project allowed me to leverage off colleagues' connections within the Pacific, and in Vanuatu particularly. On the other hand, I acknowledge that in some instances the connection to an AusAID funded project might have influenced the answers provided by some stakeholders, particularly during interviews with the public sector. During the first field visit, which focused on the policies, hardly any of the public sector respondents were critical of the policies, the policy environment or processes. Only one public sector respondent[27] was truly critical of the policy processes. Another public sector respondent[13] mentioned that a specific tourism policy was complementary with other sectoral plans, but was unable to elaborate on how they complemented each other, indicating the issue of reflexivity (e.g. respondents say what they think the interviewer wants to know).

In terms of a reflection on the key methods and my interactive role as a researcher, I have learned a lot through this PhD. I started out knowing very little about climate change, vulnerability and resilience and the Pacific and gained more and more knowledge as I went along. Nevertheless, being a PhD candidate in a foreign country has influenced my data collection to some extent. I am confident that if I went to do the same study now with my current knowledge, I might do the study or aspects of the study slightly differently (e.g. I would have written many more details in my field diary, taken more photos of the destination; spent more time in the field; queried the respondents further in some areas of the interview; and kept a diary on my knowledge as it has shaped and shifted directions throughout the last three and half years). Nevertheless, the data I have collected is sufficient to gain an understanding of the vulnerability and resilience of Luganville's dive tourism and, through this entire

process, I have learned a lot about myself, how to individually undertake a research study and how to improve for my next studies. As Flyvbjerg (2006) states: "The highest levels in the learning process, that is, virtuosity and true expertise, are reached only via a person's own experiences as practitioner of the relevant skills" (p. 223).

3.8.7 Language barriers

I do not speak Bislama, which in the group discussion with the local community could have been highly beneficial. Nevertheless, as English is an official language in Vanuatu, this did not present itself as a major limitation of the study. My colleague (who ran the group discussion while I was note-taker and observer) and I asked the participants questions without using jargon. Where this was not possible, the specific term, such as environmental degradation, was described in layman's terms.

3.9 Chapter 3 summary

This thesis sets out to address the current research gaps summarised in Section 2.10. In order to address this thesis' second research objective, this chapter discussed the methods applied to this study.

This study is grounded in the methodological paradigm of pragmatism. A mixed methods approach was used in the research, as this was deemed to be the most effective in achieving the research objectives. The study included two primary methods, consisting of three group discussions and 56 semi-structured interviews with respondents, and supporting methods, including content analysis of secondary data and observations made in field diaries. The first field visit of the study focused on understanding the context and defining the system for dive tourism in Vanuatu and undertaking a policy analysis, thereby identifying risks and opportunities. The second field visit of the study aimed to explore the exposure of the dive tourism system to shocks and stressors, including climate change, and identifying elements of sensitivity and adaptive capacity. Combined, the two field visits were designed to test the key elements of a V/R assessment (i.e. the second research objective).

The current knowledge on V/R frameworks (presented in Chapter 2) combined with the analysis of the questions asked during the two field visits generated the data necessary to develop a climate change V/R framework for the dive tourism sector in Vanuatu (third research objective). The results of the first field visit of the study are reported in Chapter 4 and 5 and parts of Chapter 8. The results of the second field visit are

presented in parts of Chapters 4, 5 and 8 and in all of Chapter 7. In Chapter 9, the testing of the key elements is evaluated before the newly developed climate change V/R framework for tourism is presented. This is followed by Chapter 10, which concludes the thesis.

4 TESTING THE KEY ELEMENTS: THE TOURISM SYSTEM

"In essence, tourism is a system and therefore a systems-based approach to the study and research of tourism is vital"

(Ritchie, 2009, p. 11)

4.1 Introduction

This section aims to address step one of research objective two by identifying the elements of Luganville's dive tourism system (see Table 4-1). As the literature review identified, a tourism system can be viewed from three geographical elements. In line with such structure, this chapter on Luganville's dive tourism system has been divided into three main sections: (1) the TGR; (2) the TR; and (3) the TDR. This is followed by a brief conclusion before moving onto establishing the risks and opportunities (i.e. step two of the second research objective) in Chapter 5.

TABLE 4-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(2) Test the established key elements in the context of Vanuatu's dive tourism system.	Step 1: Tourism system • Elements of Luganville's dive tourism system.	• Analysis of secondary data; • Semi-structured interviews; and • Observations noted in field diaries.	• Secondary data provide the basic framework for a tourism system. • Primary data allows for a contextual approach – as all tourism destinations are unique.

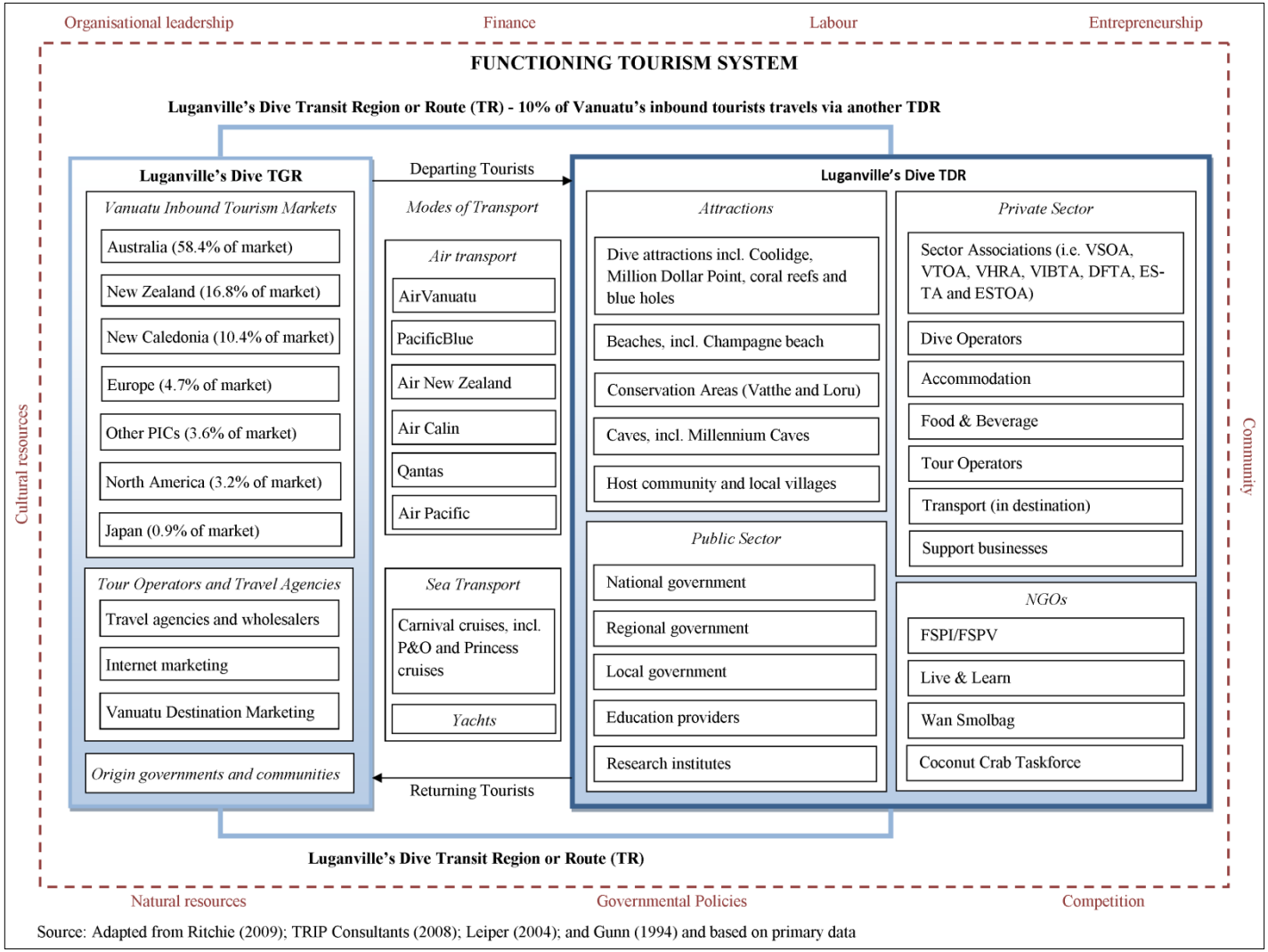
4.2 Luganville's dive tourism system

The main sources of data that provides the details of the tourism system include secondary data, interviews and observations noted in field diaries. The data showed a complex tourist system with numerous stakeholders involved (e.g. tourists, wholesalers, transport operators, private sector businesses and associations, government ministries and departments, NGOs, etc.). The findings are presented under the three geographical regions of Leiper's (2004) tourism system framework (see Table 4-2 for key themes and illustrative quotes) and the key findings are visually summarised in Figure 4-1.

TABLE 4-2: TOURISM SYSTEM DATA ANALYSIS – ILLUSTRATIVE QUOTES

System elements	Examples of themes from primary methods (i.e. interviews and group discussions)	Examples of themes from supporting methods (i.e. secondary data, observations noted in field diaries)
TGR	• ***Main tourism markets (Australia, New Caledonia and New Zealand dominates)*** *– "First, there is the customers and we have a really strong base of customers from Australia and secondary New Zealand, although currently New Caledonia has beaten New Zealand and then rest of the world, if you look at the stats."*[52] • **Tourists *(divers and budget tourists)*** *– "There are 2 types of tourists coming to [Luganville and] Vanuatu: Divers, and budget type tourists that include mass tourists, adventurous tourists, backpackers, and tourists wishing to experience the culture….A lot come as packaged tourists where meals and accommodation and often tours are already organised. The more adventurous tourists go to the villages and the islands, either by boat or plane."*[41]	• ***Main tourism markets (Australia, New Zealand and New Caledonia dominates)*** – "Australia dominates arrivals to Vanuatu and accounts for 58 percent of the market, followed by New Zealand (17 percent), New Caledonia (10 percent), Europe (5 percent) and then North America (3 percent)" (TRIP Consultants, 2008, p. 10). • ***Tourists (mix of tourists)*** *- "On the flight I noticed an interesting tourist mix: normal tourists, several other researchers (working on reports) and a few people in business attire. In the back of the plane were many teenagers – a boy scout group and a separate, larger group of girls. There was a 'charter flight atmosphere' on the plane overall."*[FD2, 26 September 2010]
TR	• ***Travel modes (cruise ships and air travel)*** *– "Cruise ships and flights bring in almost equal number of tourists. Cruise ships were about 120,000-130,000 visitors last year (this depends on number of port calls) whereas international [air] arrivals accounted for 100,000 visitors."*[32] • ***Travel modes (sea transport)*** *– "Sea transport is also*	• ***Travel modes (yachting and cruise ships) –*** "Vanuatu is a popular destination for yachts sailing the South Pacific… …Luganville has an existing urban infrastructure, is the island's principal population center, is situated adjacent to Pekoa Airport and contains a cargo wharf which can accommodate cruiseships" (UNDP & WTO, 1995, pp.7, 101). • ***Travel modes (air travel)*** *– "…it was time to head to the airport to catch the flight to Luganville. The terminal is chaotic and no security checks.*

	fundamental, in the sense, for the tourism industry as the cruise ships produce as many visitors for the country, as air transport."[52]	*The desks are basic and the planes small… …Our aircraft was a brand new propeller plane which was small but bigger than I expected. Once on board everything was very professional."*FD2, 2 October 2010
TDR	• ***Main attractions (mix of dive, culture, heritage and eco- and nature-based tourism attractions)*** – *"Attractions in Luganville include diving, culture, WWII sites, and ecotourism sites. We promote Santo with the following slogan: "Think Adventure – Think Espiritú Santo..." …Luganville/Santo's main attractions include dive sites – e.g. President Coolidge, WWII sites – relics, such as Million Dollar point, Millennium Caves – one of the largest caves in Vanuatu, where the tourists need to be fit and need to have strong muscles, Blue hole, Canoeing activities using local made canoes, Kayaking, Vatthe – one of the largest conservation areas, 2,200 ha, Loru protected area, Champagne beach, and cultural villages. Luganville offers a mixture of culture, history and nature or a flavour of people, nature, culture and history."*[37] • ***Main attractions (dive tourism attractions)*** – *"President Coolidge is the main dive tourism attraction. In fact, I would say 99.9 per cent of dive tourists come to dive the President Coolidge, but there are a lot of unexplored dive places in Vanuatu."*[53]	• ***Main attractions (mix of dive, nature-based, adventure and cultural tourism attractions)*** – "While diving opportunities are currently the principal draw, Santo and its satellite islands have many other resources on which to build a greatly expanded tourism sector. These include numerous stretches and pockets of attractive white sand beaches, extensive rainforests and pristine natural areas for adventure and nature seekers, custom villages rich in heritage and tradition, and many World War II land sites and relics concentrated in and around Luganville" (UNDP & WTO, 1995, p. 100). • ***Main attractions (heritage, dive and cultural tourism attractions)*** – *"In the afternoon, Anderson picked us up and took us on a tour of the local sights. We started by seeing some of the old sheds that the Americans had built during WWII. We then passed the land owned by the Catholic Church and their secondary school. We drove past the copra refinery, but were not able to have a look or get a guided tour of it. Then Anderson showed us the old prison used by the Americans, which is no longer used because of human rights. We then drove to the President Coolidge site where we met one of the dive operators and his divers getting ready for their dive. From here we went to the plane crash site and saw the wreckage. It was interesting to see how much was left, but was creepy walking through the remains, particularly as 6 people had died there in the crash. Then we went to the local cultural village, which is the only one in Luganville putting on a display of dances and other traditional activities, such as kava and weaving."*FD1, 10 October 2006



Source: Adapted from Ritchie (2009); TRIP Consultants (2008); Leiper (2004); and Gunn (1994) and based on primary data

FIGURE 4-1: LUGANVILLE'S DIVE TOURISM SYSTEM INFLUENCED BY EXTERNAL FACTORS

4.2.1 The tourism generating region (TGR)

The TGR can be viewed as the demand side of tourism using Gunn's (1994) tourism framework. This section discusses the key elements of the TGR for Luganville's dive tourism system. It starts with a discussion of the tourists, then the section moves onto tour operators and travel agencies, finishing with a brief discussion of origin country, governments and communities.

4.2.1.1 Tourists

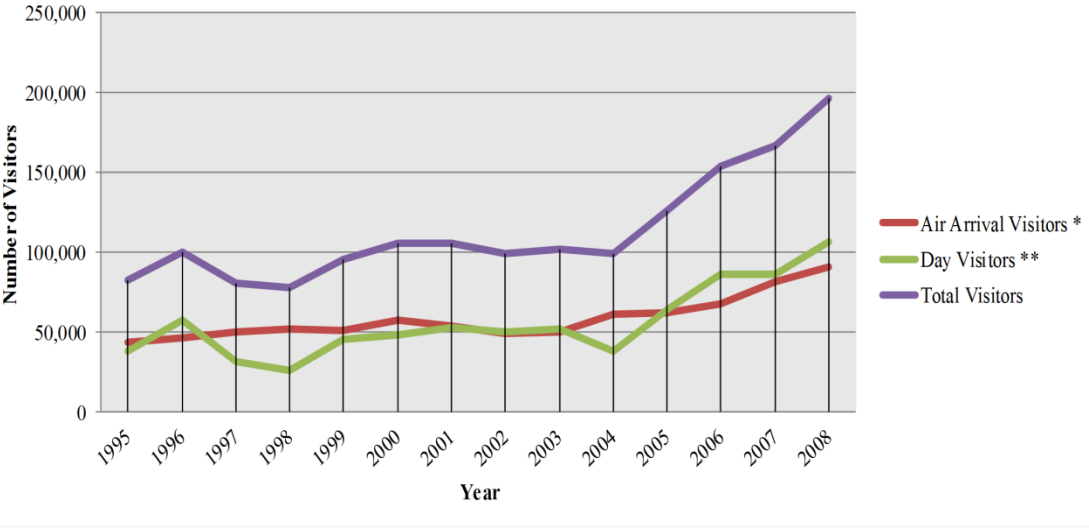
Tourists are a crucial component of demand. They also represent the one component of the tourism system with the greatest adaptive capacity to climate change (Cabrini, 2010; Jopp et al., 2012). The importance of the tourists was emphasised by a public sector respondent:

> *"Those [the tourists from Australia, New Zealand and New Caledonia] are the major players in terms of numbers, but we'd like to change that because our long-haul customers, the long haul markets, have been identified as having a more closer affiliation to what Vanuatu has to offer and would spend more, but they just can't get here, so that is part of the issue of where we are going. Those are at the top of the pyramid and we [airlines] are here to service these markets, cruise ships as well. So we are still like Fiji and Samoa, with their fairly heavy links to Australia and New Zealand, although they both have gateways to other countries, like the US, that we don't have. We are trying to break away from that. So they are the first part of the stakeholders."*[52]

The focus of this study is on inbound international tourists, as statistical data on the other types of tourists are lacking or limited. In accordance with McIntosh et al. (1995), the tourism demand in Vanuatu has been measured through visitor arrivals, visitor days and/or nights and visitor expenditure. A detailed overview of the demand in Luganville is not available, but estimates are provided where possible.

The international visitor arrivals to Vanuatu have been growing significantly over the last decade. From 1995 to 2008, the tourism sector has seen an annual average growth of 6.45 per cent with the total visitor arrivals reaching 196,795 in 2008 (VNSO, 2009c). Substantial growth since 2000 has been aided by the open sky policy which was legislated in 1999, then consequently by the emergence of Pacific Blue (Cheer, 2010).

This was further enhanced by the direct air route from Brisbane to Luganville and the upgrading of the road from south-east to north-east of the island of Santo and the ring road on Efate, which makes transportation to and within the country much easier. Figure 4-2 shows the significant growth in tourism that Vanuatu has experienced, particularly since 2004.



Note: International visitor arrivals and departures to Luganville commenced in November 2006

* refers to air arrivals including stop-over visitors; and

** refers to arrivals from cruise ships.

Source: Developed from VNSO (2009b)

FIGURE 4-2 NUMBER OF VISITOR (NON-RESIDENTS) ARRIVALS TO VANUATU

The top five tourism markets in Vanuatu are: (1) Australia; (2) New Zealand; (3) New Caledonia; (4) Europe; and (5) other Pacific countries. The majority of visitors to Vanuatu visit only Vanuatu as their travel destination, with only ten percent travelling to other countries prior to visiting Vanuatu (VNSO, 2007).

In 2004, the average stay of international tourists in Vanuatu was 8.2 days (VNSO, 2007). The average length of stay has increased slightly since the year 2000, where the average stay was 7.6 days (Asian Development Bank (ADB), 2002). The majority of tourists staying in Vanuatu stay in hotels or resorts, whereas guest houses, apartments and friends and relatives represent around 20 per cent of accommodation types used (VNSO, 2007). The majority of international arrivals come to Vanuatu for holiday purposes (ADB, 2002; VNSO, 2007).

The visitor expenditure was, in 2004, USD$74 million, a significant growth from 2000, where the expenditure totalled USD$46.2 million (VNSO, 2007). TRIP consultants

(2008) have since undertaken a tourism survey baseline study covering the following visitor segments: international (departing Port Vila – 1,542 surveys; departing Luganville – 85 surveys); domestic (202 surveys); yacht (27 surveys); and cruise ship (751 surveys). As part of the secondary data analysis in identifying the elements of Luganville's dive tourism system, the following data was collected: number of tourists in Vanuatu, length of stay and expenditure (daily and total) for each market segment. These statistics are presented in Table 4-3, with the added information of estimates for the island of Santo based on the percentages of the international market segments travelling to Santo provided by TRIP consultants. Although only estimates, they provide some indication of the visitor expenditure of the different market segments and of their scale (i.e. Vanuatu and/or Santo) (more recent figures across the different market segments were not available).

TABLE 4-3: ESTIMATES OF NUMBER OF TOURISTS, LENGTH OF STAY, AVERAGE DAILY EXPENDITURE AND TOTAL VISITOR EXPENDITURE

Segment	**Tourists 2007**	**Average length of stay (days)**	**Average daily expenditure**		**Estimated total direct expenditure**	
			(VUV)	**(AUD$*)**	**(VUV billion)**	**(AUD$* million)**
International air	81,345	7.7	15,542	167	9.732	104.511
to Santo (10.0%)	*8,134.5*	-	-	-	*0.973*	*10.446*
Cruise ship	85,922	1.0	20,160	217	1.732	18.605
to Santo (13.6%)	*11.685*	-	-	-	*0.236*	*2.535*
Yacht	924	59.6	4,711	51	0.265	2.846
to Santo (30.0%)	*277.2*	-	-	-	*0.080*	0.859
Domestic	75,000	10.1	3,920	42	2.969	31.920

*1 VUV = 0.0107388 AUD, rounding numbers.

Source: Adapted from TRIP Consultants (2008, p. 14).

The demand is influenced by a range of push factors, such as discretionary income, time, urbanisation, and technological advancements (Weaver & Oppermann, 2000). A dive operator highlighted the influence of currency rates:

> *"And there's just, there's so many things which are beyond our control to control it and we haven't got the big need to finally be able to do it. But when it does happen, this place could take off. Maybe the Australian*

> *dollar will help things along a little bit at the moment. We want the Fiji dollar to come up as well, and things could really come along. But everything is here."*[A]

Although important, understanding each of these push factors is beyond the scope of the thesis.

4.2.1.2 Tour operators and travel agencies

The TGR also includes the tour operators and travel agencies who help attract tourists to Luganville by 'selling' the destination. In terms of the tour operators, one public sector respondent noted: *"Oh and then there are the reps from VTO overseas of course."*[52]

Travel agencies play a significant role in tourism to Vanuatu. Of all holiday makers to Vanuatu, 70 to 80 per cent book through a wholesaler (ADB, 2002; VNSO, 2007), indicating the importance of this stakeholder type to the tourism generating region. These travel agencies or wholesalers can be seen as the middle men between the tourist(s) and the destination (McIntosh et al., 1995).

A public sector respondent noted the wholesalers as the second most important group of stakeholders, after the visitors:

> *"There is another group of stakeholders called LaTrade, which is a whole group of wholesalers. You know like Qantas holidays, Blue Holidays, South Pacific, if you talk around the industry there will be about 20 wholesalers out of the mainstream wholesalers that sell in Australia and New Zealand and other countries. There will be a couple in America and Japan that specialise in Vanuatu or Pacific special tours…"*[52]

However, as a private sector respondent pointed out, wholesalers have no specific agenda to send tourists to Vanuatu*: "They are not really fussed to send people directly here. Wholesalers – not fussed as to where people go, if in Vanuatu or not"*[A]. This means that if the effects of climate change affect the appeal of the Luganville as a dive tourism destination (Marshall et al., 2011); wholesalers have the ability to send tourists to destinations within other parts of Vanuatu, the Pacific or the rest of the world. This is a real implication of climate change and emphasises the importance of keeping a good working relationship between the wholesalers in the TGR and the private and public sector in the TGR.

Jafari (2000) highlights that the Internet plays an equally important role in creating the connection between tourists and the tourist destination, through online bookings, online marketing material and word of mouth marketing where other visitors share their views and stories about a destination. This is also an important source of connecting tourists to a destination in Vanuatu, as the following quote highlights:

> *"[The] Internet is replacing the wholesalers, generally speaking the network of wholesalers are a dying kind of dinosaurs. Generally, people search and book direct or they search online and book at a travel agent.... You have things like Wotif, Rates 2 Go and Zuji... ...so that is pretty fundamental to our industry."*[52]

4.2.1.3 Origin country, governments and communities

The climate of the origin country affects outbound tourism (Becken & Hay, 2012) and is therefore important to the overall tourism system. Origin governments also play a crucial role in the movement of people by, for example, providing travel advice or warnings (Weaver & Oppermann, 2000) and climate and weather information (Becken & Hay, 2012). This theme, however, did not come through strongly in the data for Luganville's dive tourism system. Nevertheless, as Chapter 5 highlights, changes to the direct international flights have influenced the tourism system in the past, pointing to the importance of the role origin governments play to the flow of tourism. Furthermore, tourism in Luganville in 1980 was heavily affected by external government forces, when:

> "In the week following the outbreak of the [Santo] rebellion, about 1,400 tourists, other foreign nationals, police and administration personnel were evacuated from Santo under British organisation, though the British were prevented from taking paramilitary action against the secession itself by French veto" (Gubb, 1994, p. 11).

In summary, the various stakeholders of this TGR include: the tourists from countries such as Australia, New Zealand and New Caledonia; TDR tour operators and travel agencies; Internet marketing and travel agencies within the individual tourist source country; origin governments and communities. An understanding of all these players will be crucial to comprehend their influence on tourism arrivals to the TDR.

4.2.2 Transit route (TR)

Transportation in tourism is a contributor of GHG emissions (Becken & Hay, 2012). As Figure 4-1 indicated, there are two modes of transport that tourists use to arrive to Luganville, Vanuatu - air and sea (i.e. cruise ship travel and yachting). The following discusses these two modes of transport in detail.

4.2.2.1 Air transport

Air transport will most likely be significantly affected by the introduction of climate change policies (Forsyth et al., 2007). Globally, "air transport accounts for an estimated 870 million trips from a total of 9.8 billion trips (domestic and international, same-day and overnight)" (Scott et al., 2008, p. 134). It is clear that tourism and transportation are closely linked and that the facilities and services provided by the transport sector are fundamental elements of tourism (McIntosh et al., 1995). One respondent noted:

> *"…air transport is a fundamental part of the tourism equation. Well as I said gently before, tourism is a great investment. So we certainly have people, business people coming to Vanuatu, looking to invest, wanting good areas. People, who want to trade in the country, move in and out of the country and as an island country, airport transport is pretty fundamental."*[52]

Airlines running services to and from Vanuatu include AirVanuatu, PacificBlue, Air New Zealand, AirCalin and Qantas. Air Vanuatu is government owned, but acts as a self-supporting corporation (ADB, 2002). AirVanuatu's direct flight from Brisbane to Santo was, particularly emphasised as an important airline route for Luganville's dive tourism system[32, 38, 40, 42, 43, 47]. One respondent made the following comments on the airlines and connections in Vanuatu:

> *"Our relationships here are with AirVanuatu of course - AirVanuatu is a very significant stakeholder. Qantas, we co-share with them, Air New Zealand, Virgin or Pacific Blue technically if you come here it's the Pacific Blue group, AirPacific, and AirCalin. The last two who are important stakeholders who access the long haul markets for us, 'cause you can get to most of the world. Like AirPacific you can get to Hong Kong or Los Angeles. AirCalin you can get to Tokyo and Seoul and then from there you can get to the rest of the world. Australia and New Zealand also provide that function as well, but those two airlines,*

> *although they don't come that often, are providing us with quicker gateways and places we want to go to."*[52]

4.2.2.2 Sea transport

The second transport mode is sea transport. As the public respondent continued,

> *"Sea transport is also fundamental, in the sense, for the tourism industry as the cruise ships produce as many visitors for the country, as air transport. But the cruise ships are an entirely different product generally and in terms of economic development and in the sense that they duck people into a town or various islands for a day. They pour a bit of money into the economy and then they go back to the ship..."*[52]

In terms of climate change, cruise ship tourism represents the most energy intensive type of tourism on a per tourist basis (Gössling, 2011).

Yachting is also a sea transport mode, which accounts for a miniscule component of the total international arrivals, as outlined in Table 4-3. Yachting was barely mentioned by the respondents [32, A] and received some negative comments due to their limited contribution to the local economy; it was termed *"wind bludgers"* by one private sector respondent [A]. A public respondent commented the following: *"there are some yachts, they come in and stay, [they] more often [than other tourists] go to the outer islands.... They don't spend much, but they stay longer in Vanuatu"*[32]. The Vanuatu government is starting to focus on promoting Vanuatu as a destination to 'Super Yachts' (i.e. big boats, few people), thereby further capitalising on this niche market[32]. As is stated on the VTO's website:

> "Yachts entering Vanuatu during working days (Mon-Fri) must pay 3000VT [approx. AUD$32] to quarantine, 3000VT [approx. AUD$32] to customs and 2000VT [approx. AUD$21] to immigration. Extra charges are incurred on weekends. There is no exit fee" (VTO, 2009b, n.p.).

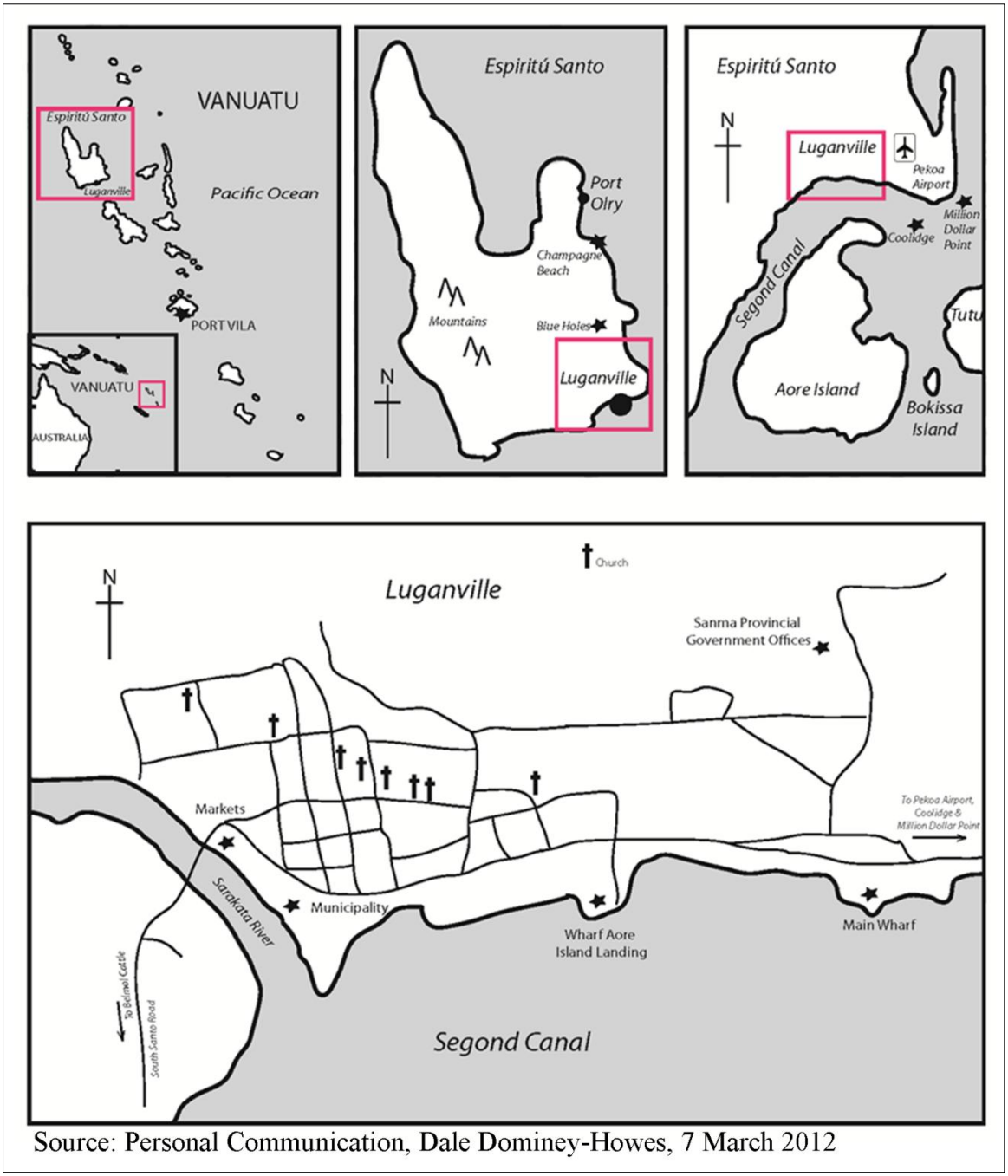
Consequently, the economic contribution to Vanuatu is limited as the yacht visitors sleep and often eat on-board their yacht. Nevertheless, there is potential to increase the economic contribution of this market segment by supplying what they want and/or need. Koth (2011) highlighted in her study the aspects that 'Blue water sailors' look for when they are in a port of call: food service and entertainment; marine services for repair and

maintenance; boat facilities and other services; local community; cost/value for money; accessible amenities; and recreation and tourism.

In terms of sea transport, changes to wind and sea surface conditions may potentially affect both the arrival of cruise ships and yachts. With tough sea conditions, cruise ships in the region have had to delay or cancel local arrivals in the past and overall satisfaction with the cruise ship experience of Vanuatu has been affected by cyclones and heavy storms (Vass, 2008). Moreover, cyclones have in the past caused flights to be cancelled or delayed (Ligo, 2012) and scuba dives to be cancelled (VTO, 2009b), thereby affecting visitor arrivals and/or visitor experiences. Consequently, with more increasing intensity of cyclones predicted with climate change, this could have a significant impact on tourism flows to Vanuatu.

4.2.3 Tourism destination region (TDR)

Having looked at the demand side of tourism and established the TGR and the TR, this section describes the supply side of dive tourism in Luganville (Figure 4-3) by defining the TGR in order to address step one of the second research objective. This section provides the description of the last geographical element of the tourism system, which is crucial to acquiring an understanding of its vulnerability. This is because vulnerability is established in the place (i.e. the destination) and is influenced by the dynamic conditions of the system (Turner et al., 2001). In accordance with Gunn (1994), McIntosh et al. (1995) and Calgaro (2010), the following covers the components of the supply side of tourism and the tourism destination through a discussion of: (1) the biophysical environment and attractions; (2) the host community (its population and infrastructure characteristics); and (3) the sectors involved in dive tourism in Luganville.



Source: Personal Communication, Dale Dominey-Howes, 7 March 2012

FIGURE 4-3: MAP OF LUGANVILLE

4.2.3.1 Biophysical environment and attractions

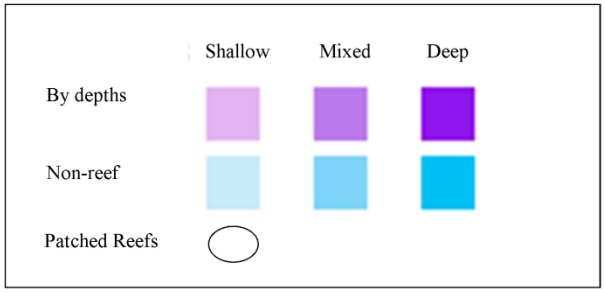
Vanuatu is situated in a sub-tropical climatic zone and experiences nine months of hot, humid and rainy weather, with the possibility of tropical cyclones followed by months of cooler and drier weather with winds coming from the south-east (VNSO, 2009a). Vanuatu lies in a tropical cyclone belt and may experience several damaging cyclones per year (ADB, 1997). Consequently, the tourism sector will be more vulnerable to cyclone intensity increases.

Santo is not only the largest island of Vanuatu, but also has the nation's four largest peaks, all more than 1,700 metres tall (Harewood et al., 2006). These peaks run along the western side of the island; where the south-eastern part of the island is much flatter, which has led to the arrival of cattle grazing and plantations (Harewood et al., 2006). The high nature of this island means that it may be more resilient to sea level rise than some of the atoll islands in Vanuatu.

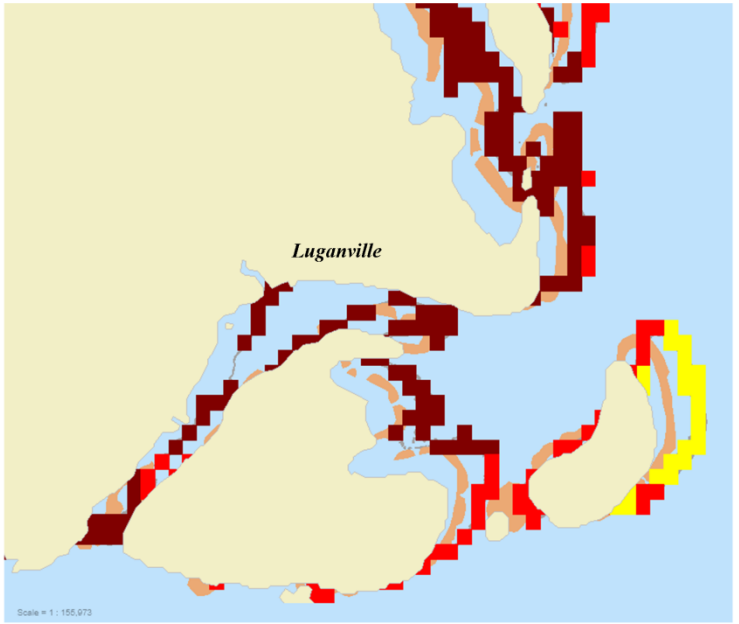
It is in the south-eastern part of the island that Luganville is located along the Segond Channel. Luganville's wide main street runs for kilometres along the coast line. This location next to Segond Channel, which is protected by nearby islands (i.e. Aore, Bokissa, Malo and Tutuba) means that the destination may be less likely to be significantly affected by a tsunami[38], although further research is needed to confirm this. On the other hand, the coastline within the town looks rugged and eroded, which may leave the destination more vulnerable to storm surges and cyclones.

"Vanuatu's marine environment includes inter-tidal sea-grass beds, mangroves, lagoons, coral reefs and open ocean" (ADB, 1997, p. 261).The reefs around Luganville are primarily fringing reefs, which act as a resource for subsistence fishing and as tourism attractions for many communities in the Pacific (Maclellan et al., 2009). There are only a few areas of patched reefs. An overview of the depths of reefs is provided in Figure 4-4:A, highlighting that the reefs occur at both shallow and mixed depths (Tupper et al., n.d.). The reef systems in Vanuatu are not as extensive as in other destinations due to deep waters often being close to shore, but they are important as a natural buffer to waves and storm surges (ADB, 2002).

A) Location of coral reefs by depths



B) Reefs at Risk—Integrated Local Threat (present)



The assessment is based on the four separate threat factors: coastal development, marine -based pollution, overexploitation of marine resources and inland pollution, including sedimentation.

	Reefs classified as under medium threat in at least one threat factor were classified as under medium threat overall
	Reefs classified as under high threat in at least one of the individual threat factors were classified as under high threat overall / three of the individual threats were rated as medium threat overall
	Reefs classified as under very high threat in at least three of the individual threats were rated as high threat overall

(Source: **Information/data/maps provided by ReefBase;** http://www.reefbase.org**, Tupper et al., (n.d.)**

FIGURE 4-4: REEFS NEAR LUGANVILLE

Figure 4-4:B provides an overview of the reefs at risk near Luganville. It shows that the majority of reefs around Luganville are under very high threat in at least three of the Reefs at Risk threat factors (i.e. coastal development; marine-based pollution; over-exploitation of marine resources; and inland pollution, including sedimentation). This will ultimately leave the reefs and other marine species that are sensitive to changes in the marine environment (e.g. acidification, sea surface temperature increases and cyclones) more stressed (Micheli et al., 2012).

The dive attractions in Luganville are based more on WWII wreckage, possibly leaving the destination more resilient to changes in the ecosystem characteristics. Furthermore, dive operators indicated that the types of corals in the area of Santo are more resilient to increases in water temperatures, compared to those around Efate[A]. Specific research needs to test this hypothesis, as sound evidence is lacking to support this argument. Nevertheless, the protection of these reefs as natural buffers will be crucial to ensuring that this in-built resilience remains.

For the land-based ecosystem characteristics, Vanuatu has a high soil fertility allowing for favourable conditions for agriculture and pastoral development (ADB, 1997). This makes the destination more resilient, as this will ensure food production for sustenance can continue, unless dramatic changes occur. Subsistence farming plays a significant role in the economy of Vanuatu and its significance may be underestimated (ADB, 1997). Subsistence farming includes the growing of coconuts, root crops and a wide range of fruits, nuts and vegetables as well as building and weaving material (ADB, 1997). Much of the original forests of Vanuatu have been cleared to cater for agricultural and logging needs (ADB, 1997). Luganville is surrounded by coconut plantations, which on many occasions also are used for cattle grazing. The combination of tourism and agricultural infrastructure allows for resilience that would not be possible within their individual infrastructures.

There is a range of natural and cultural attractions that act as pull factors in the TDR (McIntosh et al., 1995; Gunn, 1994). As Gunn (1994) pointed out, "the attractions of a destination constitute the most powerful component of the supply side of tourism" (p. 57). Figure 4-5 provides a photo collage of the various attractions that can be found in Luganville and surrounds. The following describes the main TDR attractions in Luganville's dive tourism system further.

FIGURE 4-5: A PHOTO COLLAGE OF LUGANVILLE'S DIVE DESTINATION ATTRACTIONS

The key attractions for diving in Luganville and Santo include the SS President Coolidge (a.k.a. the Coolidge), Million Dollar Point[xx], smaller wrecks, coral reef sites and blue holes. The Coolidge, an American World War II (WWII) carrier wreck located off the coast of Luganville, "is the largest shipwreck within normal diving depth anywhere in the world" (ADB, 1997, p. 219). It is considered one of the world's most accessible wrecks and is considered the 14th best dive site in the world (Garrod & Gössling, 2008). The Million Dollar Point is an "undersea junkyard" and a memory of the presence of the US military during WWII (Harewood et al., 2006). Table 4-4 presents an overview of known diving spots near Luganville.

[xx] *"...we headed to Million Dollar Point and went snorkelling. There were a few locals around but no tourists and no infrastructure whatsoever. A makeshift sign at the turn off tells you that you have arrived and how much you need to pay. It was a few hundred Vatu... ...The snorkelling was excellent. There is all sort of junk from the Americans: 1940s cars, machinery and... ...a tank... ...It is really odd to see all that stuff down there, although apparently all the pollution coming from the junk is poisoning the fish. The whole area is now a coral reef and fish have moved in. We saw a lionfish, many colourful reef species and Christmas tree worms..."* FD2, 2 October 2010

TABLE 4-4: KNOWN DIVING SPOTS NEAR LUGANVILLE, ESPIRITU SANTO, SANMA PROVINCE

Diving spot reference	Location	Brief description of attractions	Depth range (feet)	Condition	
				Current	Visibilities (feet)
President Coolidge**	Santo (off Luganville)	World War II wreck***	70-240	Moderate/ Strong	50-60
Million Dollar Point**	Santo (off Luganville)	World War II equipment dump	80-120	slight	50-60
Chails Reef*	Mid west of Tutuba Island	Hard and leather coral, fishes	25-150	Calm	100+
Tutuba Point*	Northern tip of Tutuba Island	Excellent corals/caves and diverse fish	40-100	Slight	100
USS Tucker*	South west of Malo	World War II wreck	60-70	Slight	70+
Elephant Wall*	South of Elephant Island	Sea wall, spectacular marine life	10-150	Calm/ Slight	Clear
Blue Coral Gardens*	West of Elephant Island	Pristine coral gardens***	10-50	Calm	Clear
Grand Canyon Wall*	Sea wall with teeming fishes	Coral herds, canyons, large fish	40-130	Calm/ Slight	Clear
Sakao Wall	North east Sakao island	Beautiful hard corals, sea fans/whips	30-170	Moderate/ Strong	100+

*Accessible by boat only, **Accessible by boat and shore, ***Diving expertise necessary + shore access
Source: Adapted from Republic of Vanuatu, n.d., pp 70-71 whose source was Bowdey, B. Beaty, J., Answell B., (1995) Diving and Snorkelling Guide Vanuatu

A number of land-based WWII sites also remain as relics of the US military's presence in Luganville. There are a number of plane wrecks[xxi] just outside of Luganville and a number of buildings from this period still stand in Luganville, including the old prison and some of the hangars[xxii]. Apart from the WWII cultural sites, cultural attractions in Luganville also include a visit to a local cultural village[xxiii]. Here, visitors get to experience a warm welcome from the local villagers, a kava[xxiv] ceremony where the

[xxi] *"...From here [the site of President Coolidge], we went to the plane crash site and saw the wreckage. It was interesting to see how much [of the plane] was left, but was creepy walking through the remains particularly, as six people had died there in the crash..."* FD1, 10 October 2010

[xxii] *"...We started by seeing some of the old sheds that the American had built during WWII...Then our tour guide showed us the old prison used by the Americans, which is no longer used because of human rights."* FD1, 10 October 2010

[xxiii] *"Then we went to the local cultural village, which is the only one in Luganville putting on a display of dances and other traditional activities, such as kava and weaving..."* FD1, 10 October 2010

[xxiv] Kava is a ceremonial drink made from the roots of the kava plant, which are either chewed or crunched from the dried root and mixed with water, leaving a muddy water that is ready to drink. It is known for its relaxing qualities and may leave tongue and lips numb for a short period of time.

guests have the opportunity to try the Pacific custom, observe the weaving of baskets, see local dances, and have the opportunity to taste a range of local foods before getting to experience the traditional water music[xxv].

Other attractions include the Millennium Caves, one of the largest groups of caves in Vanuatu. According to a public sector respondent, *"participants need to be fit, [and] need to have strong muscles"*[37] to visit the Millennium Caves. Other adventure activities include canoeing, using local made canoes, and kayaking. For the less adventurous nature-based tourist, visitors can also visit Vatthe (one of the largest conservation areas in Vanuatu across 2,200 ha.), the Loru protected area, or Champagne Beach, which is known for its beauty and serenity. Champagne Beach is also one of the destinations for cruise ships arriving in Santo. On cruise ship days, the beach transforms from one of natural serenity[xxvi] to that of a colourful and bustling scene[xxvii].

4.2.3.2 Host Community

Apart from the attractions, the host community also plays an important role in the TGR (McIntosh et al., 1995). In 1995, Luganville was described as a tourist centre precinct in the final report of the Vanuatu Tourism Development Master Plan, which stated:

> "As a community, Luganville is reminiscent of a frontier town with commercial and business activities sparsely strung out along a wide main street paralleling Segond Channel. There is no real town center, and most development has virtually turned its back to the waterfront. The only significant public waterfront area is Unity Park and the adjoining small peninsula at the mouth of Sarakata River…" (UNEP & UNWTO, 1995, p. 101).

[xxv] *"...we went to see the ten water songs, which for me was the highlight of the cultural tour. There was a small pool with flowers in it and a dozen girls and women stood in the water ready to play music by clapping their hands in the water. Each song had a different meaning. There were songs about the cyclones and about specific fish (e.g. the Mullet jumping out of the water). It was a really beautiful and unique experience..."* FD1, 10 October 2010

[xxvi] "*...We visited Champagne beach where all the cruise ships take their passengers. The sand is almost white and it is staggeringly beautiful with amazing water colours in all shades of blue. The backdrop is a dramatic steep wall of vegetation along the coast... ...There is a small fee to get into champagne beach and along the beach were several empty stalls where locals sell souvenirs when the cruise ship visitors come to the beach...*"FD2, 03 October 2010

[xxvii] *"...We got to the hill a little past 9am and could see the big cruise ship at anchor in the middle of the "bay". We took the turn off to Champagne Beach, paid the 2,000 Vatu [in] entrance fee and continued to the beach. We could see the cruise ship outside the local resort [that] we had visited on the Sunday after we arrived to Santo. As we drove along, we met a couple of the buses taking tourists on tours. When we arrived to the beach, it was like another world. There were cars everywhere and so much life..."* FD1, 8 October 2010

Luganville is the second largest urban area of Vanuatu. The population of Luganville has grown from 5,200 residents in 1979 to 13,167 residents in 2009 (ADB, 2002; VNSO, 2009a). Close to 40 per cent of Vanuatu's population is under the age of 15 and only 5 per cent of the population is aged above 60 years (VNSO, 2009a). The province of Sanma is the second largest province after Shefa (province of Port Vila, Efate) in terms of wages (approximately 30 per cent) and salaries (60 per cent) as part of the overall household income (VNSO, 2009a). This indicates that tourism (as one of the few paid employment options) is a key player in contributing to the economy of the population. Furthermore, sale of fish, crops and handicrafts is a significant contributor to household income in Sanma, accounting for approximately 50 per cent (VNSO, 2009a).

In recent years there has been a migration trend towards urban areas of Vanuatu (i.e. Port Vila and Luganville). Village people are attracted to the urban areas by the hope of greater material wealth and because of the decreasing amount of land available for the cultivation of crops (ADB, 1997), as a result of the increasing population. However, an increase in urban population numbers has put substantial pressure on the urban infrastructure in Luganville (ADB, 2002). Apart from inadequate water and sanitation services, it also brings with it issues of growing squatter settlements, increasing unemployment and crime levels in the urban areas (ADB, 1997). Consequently, the

> *"...government's challenge is to plan for urban development. Currently, focus is on rural development. They need to change the focus to urban development."*[28]

Climate change with its effects has the ability to cause large-scale migration both within a country and to other countries (Maclellan et al., 2009). Maclellan et al. (2009) highlight this issue of climate displacement and predict that 75 million people within the Asia-Pacific will become climate refugees by 2050. With the current issues related to ensuring sufficient sanitation and access to potable water, mentioned earlier, such large-scale climate change migration will become a real issue in the future.

Luganville, like the rest of Vanuatu, is very culturally diverse; a total of 105 languages are spoken but the overarching language of Bislama is spoken by all (ADB, 2002). A private sector respondent commented that there is a *"...good community feel [in Luganville]. We all work together and learn kastoms [Bislama word for customs] from*

different islands. We all speak Bislama"[43]. Harewood et al. (2006) describe the population of Santo in the following way:

> "Santo has an interesting mix of city slickers, who live along the southern and eastern seaboards, balanced by villagers who are quite isolated, dress in clothes woven from the leaves of the jungle, and are totally self-sufficient" (p. 127).

This shows the positive aspect of the migration to urban centres, but high levels of immigration from country areas can also pose challenges. According to another respondent, there is some tension between the Ni-Vanuatu and the expatriate community members but *"over time, hopefully, tolerance is learned in order to run a multicultural society"*[51].

The majority of the infrastructure (including electricity generation, fuel storage facilities, hospitals, police stations and schools, main commercial centres and road networks) is located in the coastal zone of the island, which is only few metres above sea level (Republic of Vanuatu et al., 2007). This is common to SIDSTs (Sem & Moore, 2009). The tourism infrastructure is also primarily coastal. Such coastal closeness causes the built environment to be more exposed to cyclones, storm surges, flooding and coastal inundation. Recent observations made in relation to sea level rises in Vanuatu show increases that are larger than at the global level (2.8-3.6mm per year) with increases of about 6mm per annum since 1993, according to satellite data (AusAID et al., 2011). This will leave Luganville "…affected by even small increases in sea levels due to the larger surges associated with increased frequency and intensity of tropical cyclones" (Republic of Vanuatu et al., 2007, p. 17).

Important infrastructure data from 2004 states that in Vanuatu: (1) 24 per cent of roads are paved; (2) there are 87.8 km of road per 1000 km^2; (3) 19 per cent of households have electricity connected; and (4) that urban areas have 90.5 per cent households with improved water supply compared to 70.8 per cent in rural areas (COA, 2009). This indicates that urban areas are less sensitive to change than rural areas, but that the level of resilience can still be improved significantly. Since 2004, Vanuatu has seen significant road works undertaken under the US Millennium Challenge Account (MCA). Vanuatu was the only country in the South Pacific to gain a US$40 million grant from the US to improve the economy of the nation through the upgrading of infrastructure (Harewood et al., 2006). The key outcomes of the US MCA project are a

road around the island of Efate and a road on Santo stretching from just outside of Luganville to Port Olry on the north-eastern coast of the island. The new US MCA road infrastructure has been received with open arms, but some respondents wondered why this was given priority when the existing road network is falling apart. As one public sector respondent mentioned, the *"new road is great, but the main town road is full of pot holes and not up to the standard. Not up to the standard in promoting Luganville, as a destination"*[45].

The materials used in the construction of buildings also greatly influence the exposure levels of Luganville's destination population (see Calgaro, 2010). The construction of buildings in Luganville reflects the different types of building methods applied in Vanuatu generally (Vanuau Disaen Limited, 2009), including:

- Traditional building methods (primarily used at the outskirts of towns and in rural areas);
- Timber framed constructions (not a dominant building method in Vanuatu, but a cheap and quick way to produce interior partitions, which is vulnerable to flood damage);
- Structural steel buildings (growing in popularity and often used when constructing agricultural buildings, airplane hangars, churches, commercial and industrial buildings, and sporting arenas—but is not applied often in the residential building market and is vulnerable to flood damage);
- Solid panel construction (used for residential buildings, but is vulnerable to flood damage unless constructed on piers);
- Steel reinforced concrete block constructions (the dominant construction system in Vanuatu, but is vulnerable to "concrete cancer"—a condition relating to moisture and oxygen seeping into cracks of the concrete and affecting the internal reinforcing steel—and have high consumption of sand); and
- Interlocking aerated concrete block construction (this more flood tolerant structure has only recently been introduced to Vanuatu, but is also vulnerable to "concrete cancer").

In the peri-urban areas of Luganville and in many of the rural villages, thatched roofs are common. Miles (2006) describes the traditional buildings of the island of Santo in the following quote, which was about his visit to the Fortsénalé village on Santo:

"Thatched roofs and grass huts impart an African-like look to the Melanesian settlement" (p. 465). Many of the buildings in Luganville are thatched with *Natengora* – a natural plant that is more sustainable than other roofing materials[20]. This material also allows for quicker rebuilding after major cyclone events.

Although there are benefits from the remaining military infrastructure (i.e. the wide main road of town and the significant WWII sites around town on land and in water), there are also some detractors, leaving the destination more exposed. Many of the buildings in the main street look run-down and are consequently affecting the first impression visitors have of the town. Whilst there are some significant green spaces along the channel, this benefit is not optimised to create an advantage and much of the coastline is left eroded and littered. Furthermore, part of the remaining infrastructure poses significant health threats, as *"...people (read local community members) are dying from food poisoning from the American dump site at Million Dollar Point."*FD1, 6 October 2010

Whilst *"tourism brings about a positive change with the generation of money"* [37], increasing tourism numbers do have negative impacts on the built and natural environment. The current infrastructure cannot properly support the increased numbers of people that rely on it. This respondent went on to say that the *"...local authority needs to improve management of waste... ...There must be enough supply of water... ...[and] we still need to improve access to rural areas (electricity), not only in Luganville."*[37]

4.2.3.3 The Sectors

The third category to be explored in the TGR consists of the various sectors involved in Luganville's dive tourism system. Gunn (1994) argued that supply is under the control of three sectors: private; non-profit organisations; and the public sector. These three sectors are also relevant to tourism in Vanuatu, but the involvement of donor and development agencies is also crucial. This section on sectors has been divided into three groups: (1) the private sector; (2) the public sector; and (3) the NGOs, donor and development agencies. A description of the relevance of each group to Luganville's dive tourism system is provided below.

4.2.3.3.1 Private Sector

The private sector consists of the businesses that provide tourists with goods and services (McIntosh et al., 1995). These cover a range of offerings including accommodation, commercial attractions, food and beverage, merchandisers of souvenirs and other tourism-related goods, transportation, and tour operators (Weaver & Oppermann, 2000). Tourism became a part of Luganville in the 1970s, with the first dive operation opening in the mid-70s[39]. It has since developed into a small-scale tourism destination, which is particularly famous with experienced divers. Santo (covering Luganville and surrounds) is now the second largest destination in terms of hotel rooms available (ADB, 2002). The local businesses that form the backbone of Luganville's dive tourism system include dive operators, tour operators, the accommodation sector, the food and beverage sector, the transport sector (in-destination) and support sector businesses. Support sector businesses in Vanuatu include the banks, Tusker Brewery and hardware stores, although their support is more indirect[52]. Internet cafes, kava bars and souvenir shops are also important support sector businesses.

In Vanuatu, the private sector is represented by a number of sector associations. Nationally, there are the Vanuatu Scuba Operators Association (VSOA), the Vanuatu Tour Operators Association (VTOA), the Vanuatu Hotels and Resorts Association (VHRA), Vanuatu Island Bungalow and Tourism Association (VIBTA) and the Duty Free Traders Association (DFTA). Many of the national sector associations are dominated by private sector businesses from Port Vila and the island of Efate. Consequently, sector associations were developed particularly for the businesses on Santo. The two key associations on Santo are the Espiritú Santo Tourism Association (ESTA) and Espiritú Santo Tour Operators Association (ESTOA). The following provides an overview of different private sector associations:

- **Vanuatu Hotels and Restaurant Association (VHRA)** – Based on a constitution, the VHRA represents the interests of more than 55 properties across Vanuatu's islands. *"Our VHRA is only hotels and resorts and we have about 60 members. Our members are not only in Port Vila it's a national body, so there's members certainly from Santo and Tanna and some members from Epi and a few other smaller Islands as well. Smaller as in less visited Islands"*[1]. Full membership can be granted to hotel and resort operators, whereas industry-

related businesses are encouraged to join on an associate membership basis (VHRA, n.d.). As their website states:

- "Our executive committee and subcommittees meet regularly to discuss and action a range of issues that affect the industry. The VHRA also represents members with positions on the board of the Vanuatu Tourism Office, Chamber of Commerce, Tourism Marketing and Development Fund (TMDF), Airports Vanuatu Limited (AVL) and HTLTC. VHRA are also represented on the Tok Tok Committee, DoT Accreditation Committee, Vanuatu Tourism Awards Committee and the Independence Celebration Committee" (VHRA, n.d.).

- **Vanuatu Island Bungalows and Tourism Association (VIBTA)** – An incorporated association for local bungalow operators, tour operators, information centres and restaurants (VTO, 2009b).
- **Vanuatu Tour Operators Association (VTOA)** – An association for licensed tour operators in Vanuatu. The Association has developed a Code of Conduct, which all their members follow (Vanuatu Tours, 2009). The VTOA primarily represents members from Port Vila, as the following quote indicate: *"Even though it's called the Vanuatu Tour Operators Association it is very Port Vila-centric, a lot of things get called Vanuatu but they really should be called Port Vila just because Vanuatu is so spread out and it's an Island nation. It's really hard to have company bodies that govern everything. We're supposed to govern the tour operators in Vanuatu but in reality it's the ones that are based in Port Vila."*[5]
- **Vanuatu Scuba Operators Association (VSOA)** – Based on a constitution and status as a registered charity, the VSOA represents the interests of scuba operators in Vanuatu. There are *"no statistics for [the] dive tourism market, but you get a feel for the type of divers and their nationality"*[31]. In order to become a member you need to be a valid operator and pay 3,000 Vatu [approx. $30 USD] per operator membership. The Association is supposed to meet every 2 months.
- **Espiritú Santo Tour Operators' Association (ESTOA)** – ESTOA largely represents the interests of Ni-Vanuatu tour operators on Santo. This association has developed a Code of Ethics and is based on a constitution[48].

- **Espiritú Santo Tourism Association (ESTA)** – ESTA represents hotels, resorts, restaurants and dive operators and is dominated by expatriate business members. It was established to protect the interests of tourism businesses in Santo, as the VHRA is biased by the many Port Vila and Efate-based members.

In addition to the various sector associations, tourism councils have also been established in recent years. As a public sector respondent noted, each province has an established tourism council that reports to the VTO[32].These councils link the private sector to the public sector. Of relevance to dive tourism in Luganville is the Sanma provincial tourism council, which was set up in 2010 to promote tourism in the province and oversee the facilitation of the Sanma tourism plan. The council works in collaboration with the public works department[37]. A further discussion of this council is provided in Section 7.7.4.

4.2.3.3.2 Public Sector

The government of a destination is a crucial component of the tourism system (McIntosh et al., 1995). The public sector can have several reasons for getting involved in tourism, including economic, socio-cultural, environmental and political reasons (Hall & Page, 2002). There are five main areas in which the public sector can be involved in tourism, including coordination, entrepreneur stimulation, planning, regulation and legislation (Hall & Page, 2002). According to the original Vanuatu Tourism Development Master plan (UNEP & WTO, 1995), the key goal of the Vanuatu government for their involvement in tourism was the sector's capacity to act as a short-term foreign exchange earner with the potential that tourism could act as a catalyst for the development of other sectors.

The public sector in Vanuatu is divided into 12 government ministries. Of these 12 ministries, three ministries (i.e. the Ministry of Public Works, the Ministry of Lands and Natural Resources, and the Ministry of Trades, Commerce, Industry and Tourism) are of significant importance to the general tourism sector's adaptation to climate change. The Ministry of Agriculture, Quarantine, Forestry and Fisheries is also important to dive tourism, as it is the parent ministry for the fisheries department and oversees the management of the aquaculture and aquarium trade. Decisions made at this level can have serious repercussions for the dive tourism sector in terms of the abundance and diversity of the marine life and the health and quality of the reefs, which in turn affect

the sensitivity levels of the sector to shocks and stressors. A further discussion of various government ministries and departments is provided in Section 6.2.1 on the policy-making environment.

Informal conversations with a private business manager highlighted the government's reliance on tourism [FD2, 6 October 2010]. This reliance is reflected by tourism's contribution to GDP (19.4 direct/ 53.7 indirect (WTTC, 2011)). Such a strong reliance may ultimately lead the nation to be more exposed or sensitive to shocks and stressors (see Calgaro & Lloyd, 2008; Calgaro, 2010). The private business manager was of the opinion that fiscal support and good governance would solve many of the issues faced by the Pacific[FD1, 6 October 2010, FD2, 6 October 2010] and went on to state that *"currently [the private sector] rely on themselves to rebuild in case of disasters"*[FD2, 6 October 2010].

4.2.3.3.3 NGOs, Donor and Development Agencies

A large number of NGOs are also represented in Vanuatu. These include OXFAM, WorldVision (Cheer & Peel, 2011), Live and Learn, Wan Smolbag (WSB), and the Foundation of the Peoples of the South Pacific International (FSPI). Each organisation undertakes significant work that will help decrease the vulnerability of communities to climate change. For example, Live and Learn is *"an environmental NGO dealing with awareness and training to communities re the environment"*[49], the FSPI branch in Vanuatu (i.e. FSPV) have been holding a number of ecotourism workshops [7] and WSB is running an environment program, which aims at *"working with local communities on environment and conservations [under the three following projects]: climate change, ecotourism, [and] turtle conservation, which is the main project."*[10]

Donor and development agencies are also significant players in the tourism system and of society in general in Vanuatu. Development agencies that operate in Vanuatu include AusAID, the European Union (EU), Japan International Cooperation Agency (JICA), NZAID, and USAID (Cheer & Peel, 2011). Multilateral agencies include the Asia Development Bank (ADB) and The World Bank (Cheer & Peel, 2011). The funding from aid and development agencies still plays a significant role in the economies of the PICTs (COA, 2009). Vanuatu ranks at the top among PICTs in terms of the highest foreign aid received per capita (Cheer & Peel, 2011).

The involvement of all stakeholders is important to ensure successful adaptation that increases the resilience (Jopp et al., 2010; Moreno & Becken, 2009). The involvement

of stakeholders needs to occur early on both in the awareness of climate change impacts and in the development of adaptation actions dealing with these impacts (Becken et al., 2011). Consequently, it is necessary to ensure that a link between the public sector, the private sector and the donor and development agencies is encouraged and nurtured. According to one private sector respondent, this link is currently lacking:

> *"...Donor and public [sector] work together. There is no link between public and donor sectors and the private sector. Private sector makes money. Public and donor spend it. Private sector is not involved in donor projects, except for consultations communication. They need more practical projects. It hurts too much that so much money is wasted in Vanuatu."*[51]

Consequently, this barrier between the three stakeholder groups may leave the overall tourism system more exposed to shocks and stressors than if a good working relationship between the three parties existed.

4.3 Chapter 4 summary

This chapter has addressed step one of the second research objective by identifying the tourism system. In summary, the main driver of the tourism system is the arrival of the tourists who arrive primarily from Australia, New Zealand and New Caledonia. The tour operators and travel agencies, internet marketing and the VTO's destination marketing, all play a crucial role in the TGR, by connecting the potential tourists to the destination of Luganville. The demand for a holiday in Vanuatu is further shaped by the origin communities and government. For the TR, the transport modes are used for travelling to Vanuatu, covering air transport and sea transport. Air transport and arrivals by cruise ships represent the majority of arrivals, with only a small minority of international tourists arriving in Vanuatu by yacht. Most of the airline tourists have Vanuatu as their only destination on their travels with only ten per cent travelling via another tourism destination. In the TDR, the tourism experienced is shaped through the involvement of several types of stakeholders, covering private businesses, sector associations, NGOs and development and aid agencies, as well as public government agencies. Tourism is also shaped by a range of attractions including natural, cultural and a combination of these. Having achieved an understanding of the elements of the tourism system, it is now possible to establish the risks and opportunities faced by the tourism system (i.e. step two of the second research objective).

5 TESTING THE KEY ELEMENTS: RISKS AND OPPORTUNITIES

"International tourism flows are subject to disruption by a range of events that may occur in the destination itself, in competing destinations, origin markets, or they may be remote from either. The consequences may be either mild and relatively short term or have catastrophic impacts on existing industry systems. Major disruptions… affect both the public and private sectors and disrupt the travel plans of intending travellers."

(Prideaux, Laws & Faulkner, 2003, p. 475)

5.1 Introduction

This chapter deals with step two (i.e. risks and opportunities) of the second research objective, as shown in Table 5-1. As identified in the literature review (Chapter 2), it is important to establish the risks and opportunities in order to gain a complete picture and plan effective adaptation action accordingly (Jopp et al., 2010). There are two ways of doing so. First, an understanding of perturbations in the form of shocks and stressors is needed. Second, an understanding of how climatic stimuli may affect shocks and stressors is required. This chapter presents the findings for these three steps for Luganville's dive tourism system (see Table 5-2 for an overview). The chapter firstly presents and discusses the findings related to the shocks and stressors. Secondly, it identifies how these shocks and stressors may be impacted by climatic stimuli. The data covered in this chapter include interviews, group discussions, secondary data and observations.

TABLE 5-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(2) Test the established key elements in the context of Vanuatu's dive tourism system.	Step 2: Risks and opportunities • Shocks and stressors. • Climatic stimuli.	• Semi-structured interviews; • Group discussions; • Analysis of secondary data; and • Observations noted in field diaries.	• Local knowledge and observations are vital for understanding the risks and opportunities of climate change and may identify impacts of climatic stimuli that are not covered in the literature. • An analysis of secondary data (there is much in the area of climate change projections and climate change impacts) is sufficient to identify risks and opportunities.

TABLE 5-2: RISKS AND OPPORTUNITIES DATA ANALYSIS – ILLUSTRATIVE EXAMPLES

Key categories	Examples of themes from primary methods (i.e. interviews and group discussions)	Examples of themes from supporting methods (i.e. secondary data, observations noted in field diaries)
Shocks	***Cyclones (Zuman)*** *– "The 1999 Zuman [Cyclone] – the entire village and Luganville was destroyed. It took one month to rebuild by all 3,000 people in the community."*[B] ***Earthquakes (volcanic activities)*** *– "Vanuatu is on the highest risky destinations with its geological description. There are extinct volcanoes on almost all the islands. Located in the Pacific Rim of fire Vanuatu is more exposed to volcanic activities."*[53]	***Cyclones*** – "Vanuatu experiences on average 2.6 cyclones per year…In the event of extreme events (tropical cyclones, ENSO related events) can set the economy of Vanuatu back by 5 years, as much of the funding and assistance is diverted towards national recovery" (GEF et al., 2009, p. 24). ***Multiple shocks affecting tourism in Vanuatu generally*** – "Factors which have caused serious downturns have included the false conception among visitors that Vanuatu was part of New Caledonia, its political problems of the mid-80s, serious cyclone damage in 1985 and 1987, and being without a direct air connection with its major market for a lengthy period" (Douglas, 1997, p. 16).
Stressors	***Coral bleaching – "****Bleaching happened every 2-3 years, but now happening all over the place. Temporary bleaching, not huge die-offs. But it is certainly a problem."*[55] ***Environmental degradation (destruction of mangroves)*** *– "Filling up the lagoon, destroying mangroves - the lungs of the oceans. The ultimate is do not touch. Now they wonder why the water is not clear any more...water quality is going down."*[51]	***Coral bleaching, cyclone damage and unsustainable fishing practices*** – "The coastal marine environment of Vanuatu also bears the scars of frequent hurricanes, isolated dynamiting, and recently, some coral bleaching" (ADB, 1997, p. 270). ***COTS outbreaks –*** *"The dive master's favourite dive site was severely damaged by crown of thorn invasion 3 years ago. Crown of thorn are also a big problem in many other sites. They are a big worry for him"* FD2, 29 October 2010

Climatic stimuli	***Sea level rise (differing impacts)*** *– "Sea level rise affecting coastal areas – that is a worry for all tourism resorts are located on the coast. Not all islands will be impacted, but this could have an effect on tourism numbers"*[53] ***Changes to weather patterns (observations of a changing climate)*** *– "The weather patterns – past patterns don't match the current. October is similar to July and August. Out there [respondent pointing at ocean], there was a rock that we could swim to in the past, but now it is all covered by water. It is also raining less than it used to."*[B]	***Sea level rise (affecting Luganville in future)*** – "Because of the extent of tectonic activity affecting Vanuatu it is difficult to attribute apparent changes in sea level to the effects of climate change. However for much of the country it is assumed that tectonic uplift of islands will proceed at a greater rate than sea level rise. Nevertheless there are concerns that sea level rise might have locally severe impacts in the Torres Group, Aneityum, East Ambae, Shepherds Islands and the two towns of Port Vila and Luganville" (Silas-Nimoho & Whyte, 1999, p. 24). ***Changes to rising temperatures and rainfall (a changing climate)*** – "Vanuatu has limited surface water and villagers on many islands and residents of both urban areas are dependent of ground water. Increased temperatures are likely to increase the demand for potable water. However increase heat, greater run-off from high intensity rainfall events, decreased rainfall and an associated increase in evaporation could reduce the rate of ground water recharge and decrease surface water flows…Higher intensity rainfall events could increase turbidity in surface waters decreasing their suitability for domestic purposes" (GEF et al., 2009, p. 17).

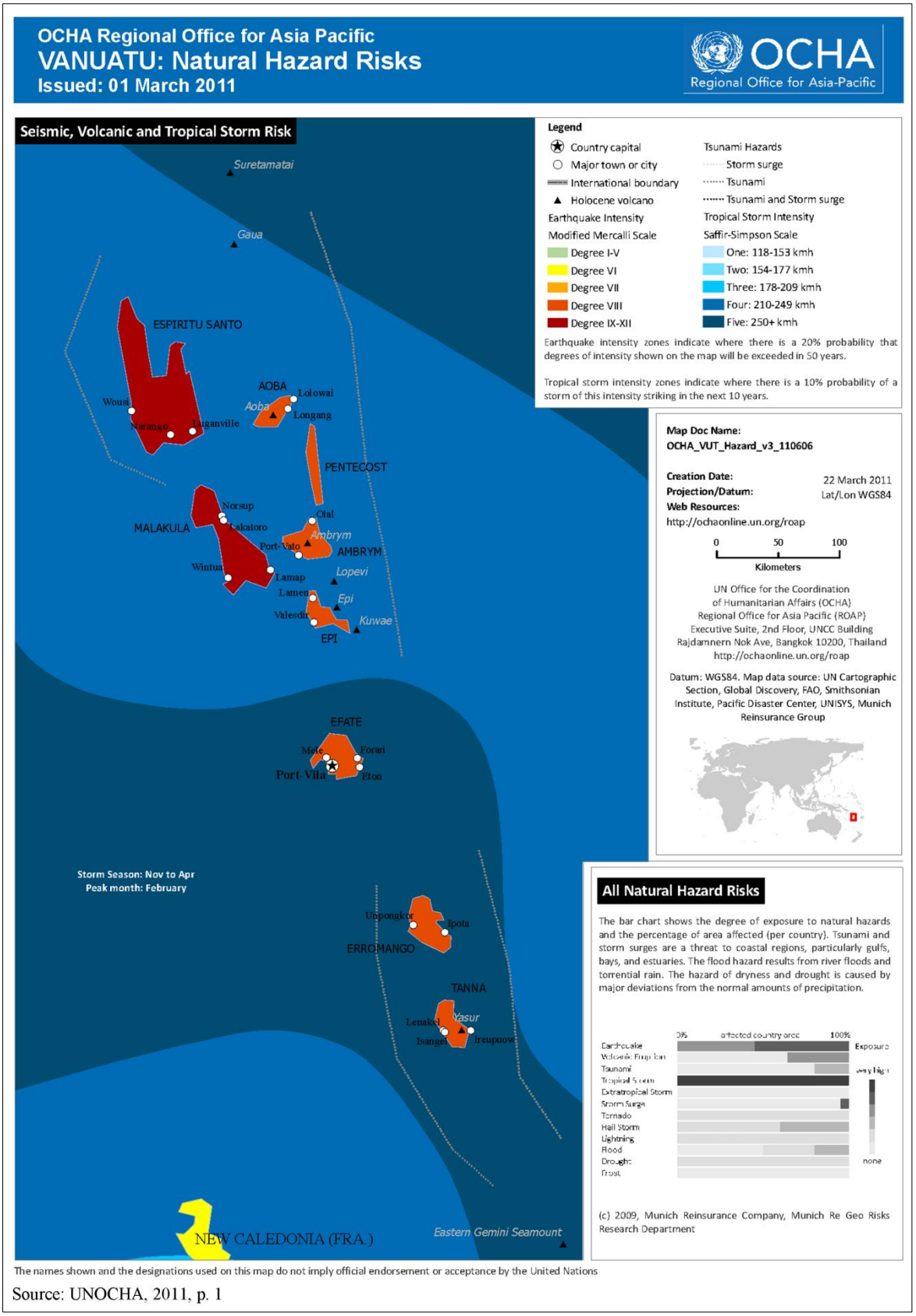
5.2 Perturbations

The first component of step two (risks and opportunities) is perturbations, which will be looked at in terms of shocks and stressors. A report by the ADB (1997) pointed out that a number of events have unsettled the tourism sector and its development in Vanuatu. The events discussed in the ADB report include political disturbances, cyclones and airline policy. The data collected during the second field visit aimed to identify a more recent understanding of what shocks and stressors have influenced the dive tourism system in the past. These are discussed below.

5.2.1 Shocks

The key shocks (more than ten source mentions) identified in the data (excluding observations made in field diaries) were: cyclones[28, 29, 31, 32, 33, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 47, 49, 51, 52, 53, 56, A, B, C], earthquakes[28, 30, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 47, 52, 53, 54, 56, A, B], effects on demand due to media footage on different events including natural hazards and local riots[32, 36, 35, 39, 40, 47, 52, 53, 55, A, C] and changes to direct international flights[39, 40, 41, 42, 43, 47, 52, 51, 53, 55, 56]. Other shocks highlighted by the data included: tsunamis[30, 32, 33, 38, 40, 41, 42, 49, 53, 54], the GFC[32, 39, 40, 44, 47, 52, 53, A, C], volcanic eruptions[35, 41, 52, 53, 55], carbon tax and trade[38, 52, 53], flooding[45, 52], landslides[36, 42] and health epidemics[52, C].

In 2011, the United Nations Office for Humanitarian Affairs' (UNOCHA) Regional Office for Asia Pacific issued an exposure map for Vanuatu for natural hazards, including seismic activity, volcanic activity and storms (UNOCHA, 2011) (See Figure 5-1). This map indicates that Luganville has a high degree of exposure to earthquakes with 20 per cent likelihood that the intensity of Modified Mercalli Scale IX-XII (i.e. ruinous to catastrophic) earthquake will be exceeded in 50 years. Furthermore, the map highlights that Luganville is in a tropical storm intensity zone, which has a 10 per cent probability of a storm of 210-249kmh (Category 4 on the Saffir-Simpson scale) striking in the next ten years. The following section presents a detailed discussion of the five key shocks mentioned by the interview and group discussion respondents: cyclones, earthquakes, negative effects of media footage on tourism demand, changes to international flights and tsunamis.



Source: UNOCHA, 2011, p. 1

FIGURE 5-1: EXPOSURE MAP FOR VANUATU FOR SEISMIC, VOLCANIC AND STORM ACTIVITY

5.2.1.1 Cyclones

The vast majority of respondents reported that cyclones had negatively impacted the tourism sector's infrastructure and tourist flows in the past[28, 29, 31, 32, 33, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 47, 49, 51, 52, 53, 56, A, B, C]. This is supported by evidence from secondary data. More than 120 cyclones have affected water resources, infrastructure (transport and health) and food crops in Vanuatu since 1939 with Cyclone Uma (1987) costing the economy an estimated AUD$25 million (approximately VT$2.3 billion), whilst Cyclone Ivy (2004) costed an estimated VT$427.6 million (approx. AU$4.6 million) (GEF et al., 2009). Since 1969/70 to 2009/2010, 108 cyclones have crossed within 500kms of Vanuatu (see Figure 5-2) (COA & Australian Government BOM, 2012).

Between 1980 and 2001, 37 tropical storms were recorded to have affected Vanuatu (McKenzie et al., 2005). Of these, three were recorded with maximum intensity of a gale (i.e. average surface wind speed reaches 34 to 37 knots), 10 were recorded with maximum intensity of a storm (i.e. average surface wind speed reaches 48 to 63 knots) and 24 were recorded as reaching a maximum intensity of a hurricane (i.e. average surface wind speed reaches 64 knots). In relation to storms, Vanuatu ranks eighth in the world in terms of relative GDP exposure in a recent Asia/Pacific Disaster report (Bhatia et al., 2010). Consequently, cyclones have affected the dive tourism system in Vanuatu in the past. Nevertheless, one expatriate interviewee from the private sector highlighted that the tourism system has experienced cyclones, but unless a major disaster hits, it generally only takes a few months to recover[44].

Of the 37 storms between 1980 and 2001, identified by McKenzie et al (2005), only two cyclones were identified by name by the respondents as having had a significant impact on the dive tourism sector in Vanuatu: Uma[29, 31, 35, 36, C] and Zuman[B] (see light blue highlight in Table 5-3). During one of the group discussions with a sector association, Cyclone Uma was indicated *as "...one of the worst cyclones in Vanuatu and here [in Luganville, Santo] in particular"*[C]. Two government respondents went on to say that Cyclone Uma was *"...a major cyclone and a recent one which did damage to the coral reefs"*[35], concluding that *"...more recent cyclones have not caused much damage"*[35]. A community member highlighted how Cyclone Zuman had left both their entire village and Luganville destroyed [B]. The community member went on to say that *"It took one month to rebuild [the community's infrastructure] by all 3,000 people in the community."*[B]

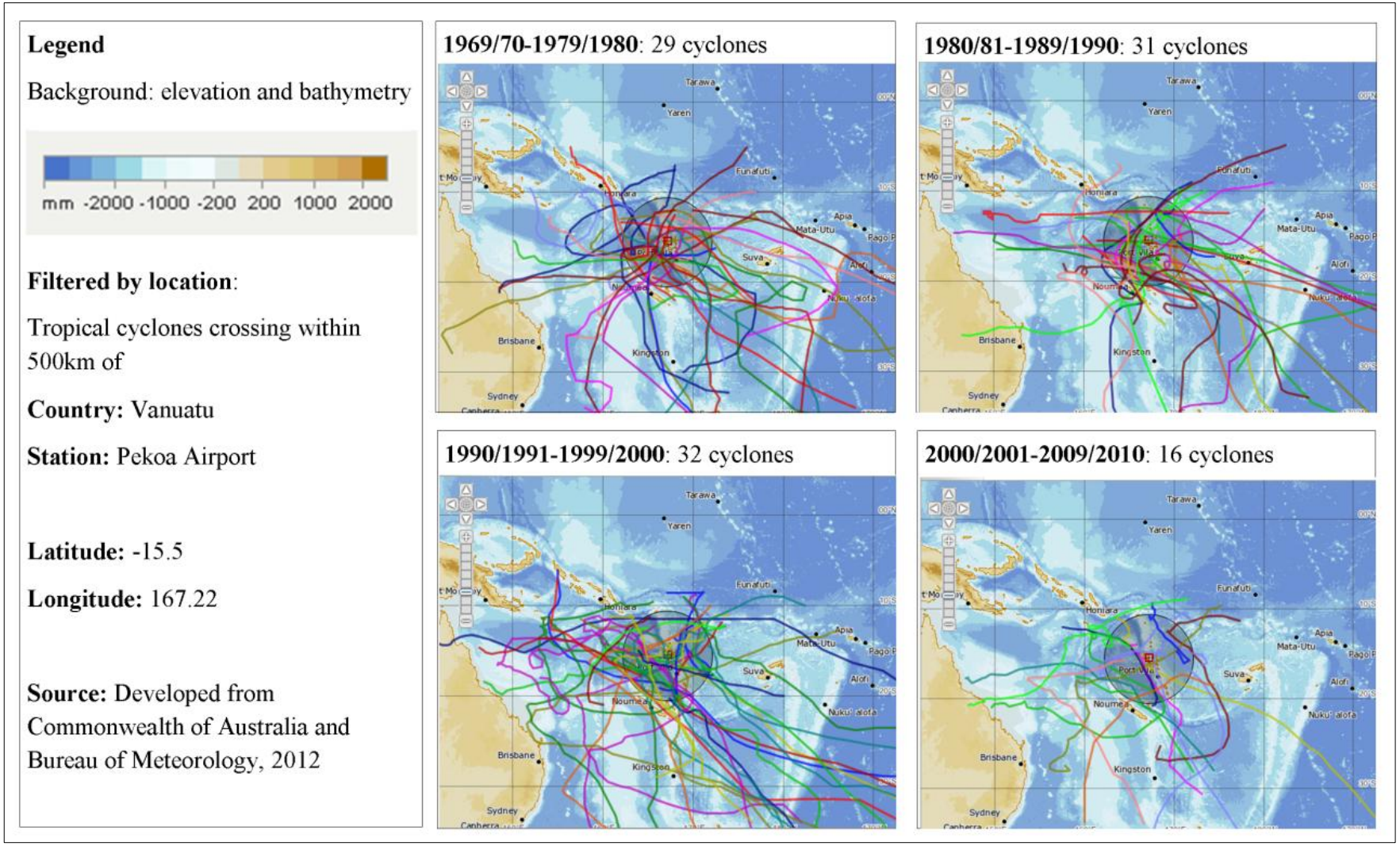


FIGURE 5-2: OVERVIEW OF CYCLONE PATHS PASSING VANUATU FOR THE PERIOD 1969/1970 TO 2009/2010

TABLE 5-3: TROPICAL CYCLONES IN THAT HAVE AFFECTED VANUATU

Season	Dates	Name	Max. intensity	Areas affected
1980-1981	8-14 Feb	Cliff	Hurricane	Vanuatu, New Caledonia
1981-1982	19-27 Dec	Gyan	Hurricane	West of Vanuatu
1982-1983	31 Oct – 7 Nov	Joti	Storm	Vanuatu
1983-1984	28-31 Dec	Atu	Gale	Vanuatu
1984-1985	14-19 Jan	Nigel	Hurricane	Vanuatu, Fiji
1985-1986	8-12 Feb	Keli	Storm	Vanuatu, Fiji, Tonga
	3-9 Feb	Lusi	Gale	Vanuatu
	6-9 Mar	Alfred	Storm	Vanuatu, Loyalty Islands
1986-1987	14-18 Dec	Patsy	Storm	Vanuatu
	4-11 Feb	Uma	Hurricane	Vanuatu
	6-11 Feb	Veli	Gale	Vanuatu
1987-1988	7-14 Jan	Anne	Hurricane	Vanuatu, New Caledonia
	25 Feb – 4 Mar	Bola	Hurricane	Vanuatu, Fiji
	8-16 Apr	Dovi	Storm	Vanuatu
1988-1989	31 Dec - 5 Jan	Delilah	Hurricane	New Caledonia, Vanuatu
	23 Feb – 2 Mar	Ivy	Hurricane	Vanuatu, New Caledonia
1989-1990	No storms recorded for Vanuatu			
1990-1991	7-13 May	Lisa	Storm	Marginally Vanuatu
1991-1992	14-21 Nov	Tia	Hurricane	Solomons, Vanuatu
	5-13 Jan	Betsy	Hurricane	Vanuatu, New Caledonia
	14-17 Feb	Daman	Hurricane	Vanuatu
	25 Feb – 5 Mar	Esau	Hurricane	Vanuatu, New Caledonia
	16-18 Mar	Gene	Storm	Vanuatu, New Caledonia, French Polynesia
	28 Apr – 2 May	Innis	Storm	Southern Solomons, Vanuatu
1992-1993	25 Mar –1 Apr	Prema	Hurricane	Vanuatu, New Caledonia
1993-1994	28 Dec - 20 Jan	Rewa	Hurricane	Solomons, Vanuatu, New Caledonia
	20-30 Jan	Sarah	Hurricane	Vanuatu, New Caledonia
	20-28 Mar	Tomas	Hurricane	Tuvalu, Vanuatu, Fiji
1994-1995	13-18 Nov	Vania	Storm	Vanuatu
1995-1996	20-28 Mar	Beti	Hurricane	Vanuatu, New Caledonia
1996-1997	20-30 Dec	Fergus	Hurricane	Solomons, Vanuatu
1997-1998	3-8 Jan	Susan	Hurricane	Vanuatu, Fiji
	17-25 Mar	Yali	Hurricane	Vanuatu
	28 Mar – 5 Apr	Zuman	Hurricane	Vanuatu
1998-1999	15-23 Jan	Dani	Hurricane	Vanuatu
1999-2000	7-10 Jan	Iris	Hurricane	Vanuatu
2000-2001	26 Feb – 4 Mar	Paula	Hurricane	Vanuatu, Fiji
	5-11 Apr	Sose	Storm	Vanuatu

Source: Adapted from McKenzie et al. (2005)

Cyclone Uma caused significant damage to infrastructure and private businesses in 1987. Damages were calculated to sums of US$50 million of which 50 per cent were

incurred by businesses and 50 per cent represented infrastructure damage (Pelesikoti et al., 2007). The recovery from Cyclone Uma left the national government of Vanuatu with a substantially larger national budget deficit (of about US$8.5 million – US$10.6 million) (Pelesikoti et al., 2007).

Cyclone Zuman reached the northern part of Santo on 1st April 1998 sustaining winds of close to 80 knots as it traversed the northern part of the island before weakening slightly as it moved across the rest of the island (Chappel & Bate, 2000). The intensity of Cyclone Zuman caused significant damage to dwellings, particularly semi-permanent dwellings (many were partly or completely destroyed by the strong winds), and coconut trees, affecting the copra industry of the island (Chappel & Bate, 2000).

Two other cyclones were mentioned—although not named—to have been major cyclones affecting Santo in 1984 and 1985. Three government representatives mentioned that a cyclone, which occurred in 1984 *"was the biggest ever cyclone in Santo"*[42]. A private sector respondent stated:

> *"When I first came here, this was cyclone alley. They could kill you. Jesus, in the cyclone season, I would see three or four cyclones coming through here one after the other. Since then, things have changed and we haven't even had a fright. In 1985, the roof of this house here went straight through the Hotel Santo. Hotel Santo wiped out three times by cyclones… Now things seems to have really settled down."*[39]

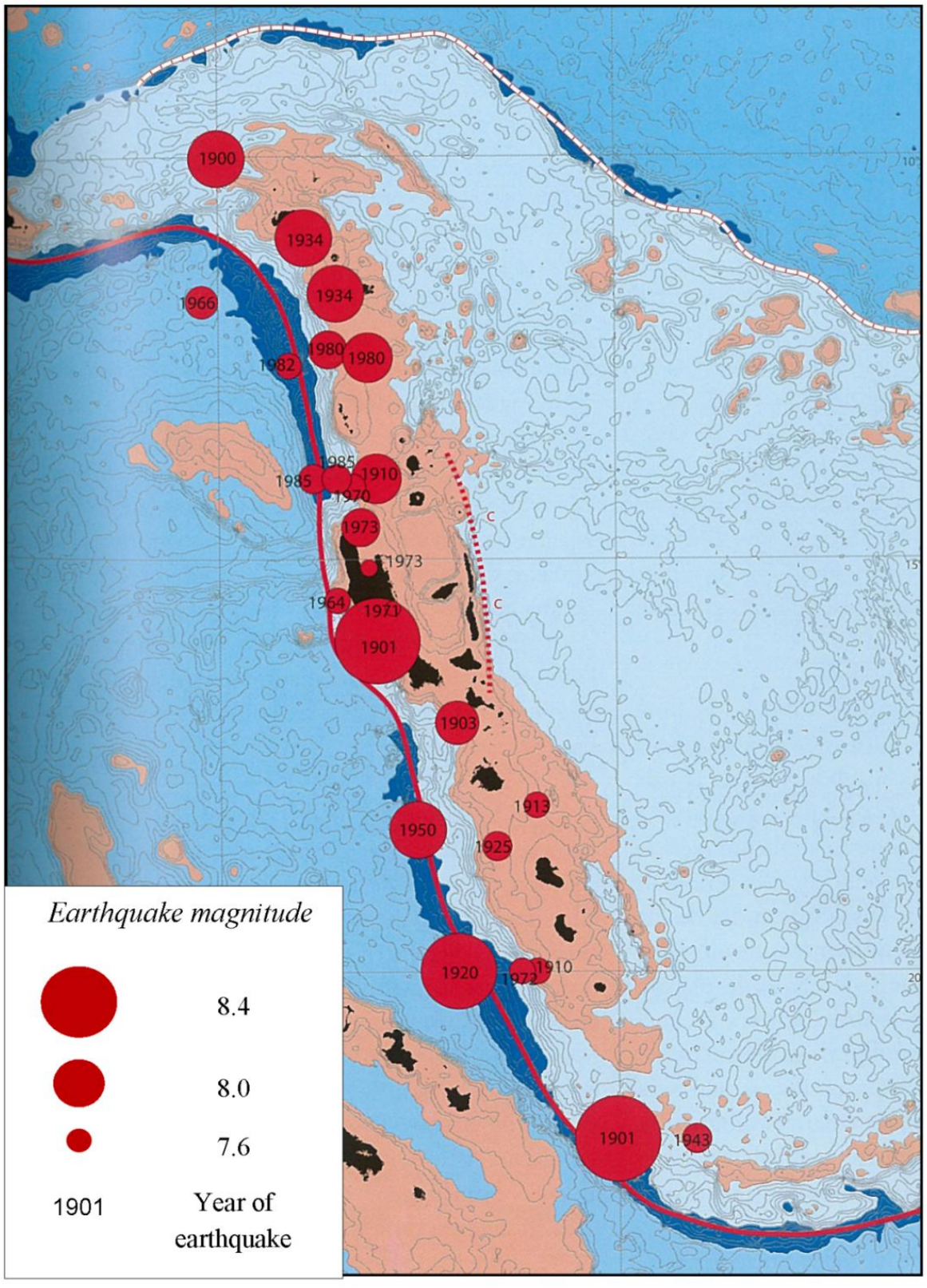
Apart from the destruction of infrastructure, cyclones can also influence tourism. As mentioned by a donor agency respondent, *"Natural disasters, such as cyclones, have affected infrastructure, which then limits the number of tourists that come here"*[23]. Another concurs, observing that tourist numbers decrease immediately after a cyclone has hit[36]. Consequently, businesses need to have a contingency plan in place to deal with this type of shock. In order to ensure contingency plans are developed and implemented, awareness of cyclones (and other hazards) needs to be improved, a point that is well recognised by many of the respondents[28, 29, 30, 31, 32, 33, 37, 41, 44, 46, 47, 51, 53, 54 B, C]. That said, the effect of a cyclone occurring in Vanuatu does not necessarily impact the entire nation. However, that is not necessarily realised by tourists or other people[32].

Consequently, the government also needs to support community members and private sector businesses in dealing with the effects of cyclones. This includes dealing with the negative impact incorrect media reports have on the risk perceptions of tourists. Currently, the assistance to grass root levels is insignificant. According to one tourism souvenir market stall owner, *"...government doesn't help – [it is] just you that have to try hard to build houses again"*[43]. A government representative highlighted that in the case of rebuilding after Cyclone Uma, the government's focus was on communities; the private sector was left to recover through their own efforts[29]. This is a concern, considering that *"...many expats have not seen a cyclone in their time in Vanuatu. Building standards have gone down as a result of this, so when a cyclone hits it will hit hard."*[31]

5.2.1.2 Earthquakes

Earthquakes are also significant shock events experienced in Vanuatu. Figure 5-3 shows the past earthquakes that have had a larger magnitude than 7.6 on the Richter scale. As the map indicates, Luganville has not experienced any major earthquakes (i.e. more than 7.6 in magnitude) since the early 1970s—around the same time that dive tourism had its first beginnings in Vanuatu. Nevertheless, Vanuatu has had many earthquakes of less than 7.6 in magnitude (Siméoni, 2009). In terms of the economic impact of earthquakes, "Vanuatu has the world's highest relative GDP exposure" (Bhatia et al., 2010) p. 10) accounting for a 60.4 per cent loss related to the GDP. This economic exposure may influence the overall vulnerability of the dive tourism system.

Although earthquakes are a significant shock event occurring in Vanuatu, the primary data (interviews and group discussions) did not indicate that the tourism sector had experienced major physical damages, apart from the Lady (a wall fresco) falling out of the Coolidge [39], infrastructure damage from an earthquake in 2002[A] and a 2009 earthquake of 6.6 that knocked things of their shelves in Luganville[38]. A more recent earthquake (2010) caused very little damage, and the only evidence of it are small cracks in the walls of some buildings[28].



Source: Adapted from Siméoni, 2009 (p. 145)

FIGURE 5-3: PAST EARTHQUAKES OF MORE THAN 7.6 IN MAGNITUDE

Public sector respondents noted that although there had been major earthquakes in the past, there had been no major damages to the sector and that tourism had not been greatly affected[35]. This may be because of building standards for earthquake standards are being followed, as one public sector respondent noted *"...infrastructure is built to withstand earthquakes. Construction companies are owned by Australians and [consequently] have high building standards"*[28]. In fact, the earthquakes in Vanuatu seems to affect the tourism sector more greatly in terms of people's risk perceptions and the effect on demand due to media footage, as the following quotes indicate:

- *"[The] recent earthquake had a real impact because of attitudes. Ten to 15 people flew home and packed up."*[A]
- *"Earthquake impacted on tourism. People comment."*[54]
- *"[it could be a] catastrophe as [an] earthquake could be a real risk to tourism in Luganville. Earlier this year Japanese TV [was] ringing to hear if things were okay. [The earthquake was] 7.5 on Richter scale."*[41]
- *"The publicity of the recent earthquake caused cancellation of bookings."*[40]

5.2.1.3 Effect on tourism demand due to media footage

Media coverage plays a key role in affecting tourism destination choice. Hall and Higham (2005) highlighted the potential role that media can play in people's perception of place. Negative media coverage such as that about terrorism or political upheaval can influence the individual's perception of a destination (Sönmez, et al., 1999).

The role media plays in destination choice also becomes clear in the case of Vanuatu's dive tourism sector, with 11 sources[32, 35, 36, 39, 40, 47, 52, 53, 55, A, C] mentioning this as having affected tourism in the past. Positive impacts from media coverage include the declaration of Vanuatu being the happiest place on Earth in 2006 (Nadkarni, 2007; Marks et al., 2006) and the world's happiest place in 2010 (Lonely Planet, 2010). Regional events can also influence tourism numbers in Vanuatu. For example, two NGO representatives highlighted the political turmoil in neighbouring countries like Fiji and the ethnic conflicts in the Solomon Islands, which have had a positive impact on tourism numbers in Vanuatu - tourists come to Vanuatu instead of the neighbouring countries. This is supported by local newspapers (Nadkarni, 2007) However, it can at the same time also negatively affect tourism arrivals in the Pacific in general (Cheer, 2010).

Similarly, riots in Luganville reported in the media present a real threat to the tourism destination. As an industry representative mentioned in regard to local conflicts: *"Once the media hits the market, it slows down the numbers and it affects our business"*[C]. A public sector representative also mentioned that

> *"...rape is a common thing happening – [and] a few have happened to tourists (1-2 cases). [We] really need chiefs and elders to help prevent this [as it is] really bad with violence being displayed in [the] media."*[47]

Another public sector representative emphasises the seriousness of media coverage with the following statement:

> *"Australia and New Zealand impacts will impact on flow of tourists, for example if media picks up incidence related to NZ or Australian visitors. [It takes only] 72 hours [to see the impact]."*[36]

Further empirical studies are needed to understand the potential impact that past or future extreme events may have on the stated travel and tourism destination preferences of prospective tourists. Nevertheless, it would be appropriate to develop effective actions dealing with the media in terms of negative events occurring, whether natural, socio-cultural, political or economic. Furthermore, Vanuatu should increase its readiness to turn negative events, such as the coup in Fiji or the riots in Solomon Islands, into an advantage to promote Vanuatu as a safe destination. The sector and the local people could then really reap the benefits of a significant opportunity, which might otherwise become a threat to tourism in Vanuatu if not appropriately managed.

5.2.1.4 Changes to international flights

Changes to international flights have impacted tourism demand in Luganville in the past. Eleven sources[39, 40, 41, 42, 43, 47, 51, 52, 53, 55, 56] mentioned these changes, but as with the effect of media coverage discussed above, changes to aviation and infrastructure have had both positive[42, 43, 47, 51, 52, 53, 55, 56] and negative effects[39, 40, 41, 43, 47] on tourist arrivals in Luganville and Vanuatu.

Changes to aviation and infrastructure policy have had a positive effect on tourism numbers, as the recent airline deregulation that ended the monopoly of AirVanuatu shows (COA, 2006). The emergence of Pacific Blue (a low cost carrier based in Australia) coincides with the rapid growth in visitor numbers that have taken place in

Vanuatu (Cheer, 2010). Another positive impact from changes to flights arriving to Vanuatu was:

> *"[around] 2008-2009, [when we] only just got the direct flight [from Brisbane to Luganville], before this [there were] only [flights arriving] from Port Vila. This has caused an increase in tourism numbers."*[42]

Yet, the Vanuatu government recently cancelled a direct flight from Brisbane, which caused a significant impact on local tourism businesses, as an expatriate business owner explained, the *"cancelled flight had a real effect [on tourism numbers]"*[40]. Dealing with these changes to international flights took a while for some businesses, as the same respondent explained: *"AirVanuatu cancelled international flights from Brisbane – it took a while to recover"*[40]. The respondent went on to state how they:

> *"Lobbied to AirVanuatu and [the Vanuatu] Government, [and how we in] Luganville and surrounding communities worked together, [we gained] support and lobbied to get [the] flight back."*[40]

This is an example of how relational scale is relevant to climate change vulnerability and resilience assessments in that understanding how relationships across scale are used to create opportunities and deal with shocks/stressors allows for an identification of a vulnerable or resilient aspect of a system. In this case, it highlighted a resilient aspect of Luganville's dive tourism system.

The after tremors of this shock (i.e. changes to international flights), however, are still felt in the community as another private sector respondent indicated:

> *"It [a decrease in tourism numbers] just happened last time when government stopped the direct flight from Brisbane. It was very difficult for business. I am afraid of flight changes in the future, the government changes every four years and this could have an impact."*[43]

Future mitigation measures implemented by governments globally may also affect tourism in Vanuatu. Nurse et al. (2009) highlight the issue of taxation schemes that can deter holiday makers from long-haul travel. Carbon policies, as a result of international climate change mitigation efforts, may affect long-haul travel to the PICTs through increased costs of travel and from implications of ethical considerations by consumers (DeLacy & Lipman 2010). A recent study also indicated that it could be possible that short-haul travel might also be impacted by the same effects (Cohen & Higham, 2011).

In order to build resilience in the local tourism sector to such potential shocks, the strong involvement of local communities in the development and diversification of the tourism sector is crucial (Payet, 2008).

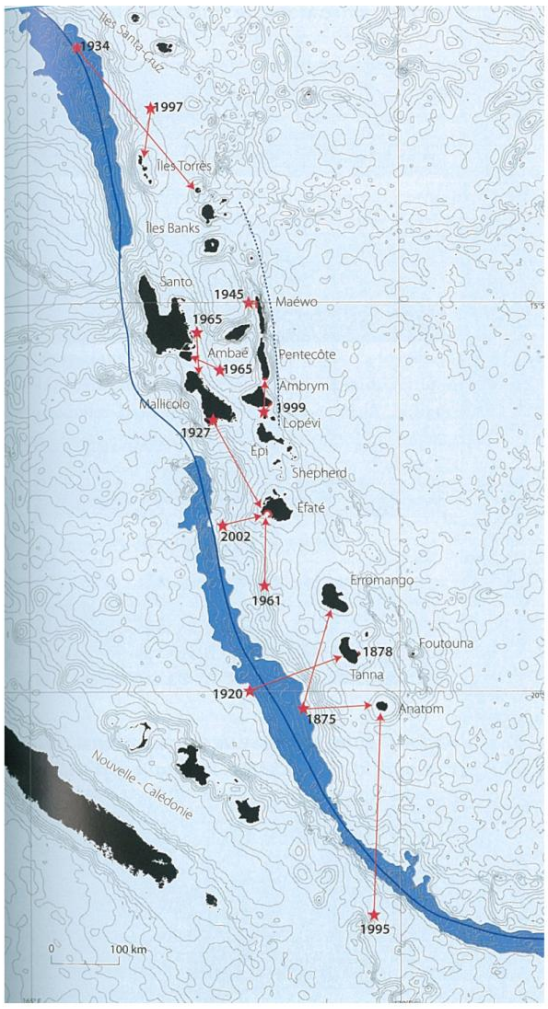
5.2.1.5 Tsunamis

Although tsunamis were mentioned by many of the interviewees[30, 32, 33, 38, 40, 41, 42, 49, 53, 54], the comments indicated that tsunamis have had a smaller negative effect on risk perceptions and tourism flows than the key shocks mentioned above. The data covered respondents that:

- Felt tsunamis were of no real concern in terms of physical damages because of the location[38, 41, 54, FD2, 6 October 2010];
- Received radio broadcasts[33, 40];
- Went to higher ground upon warnings received[41, 49];
- Felt evacuations cause more damages than the tsunamis[38, 54];
- Were concerned about the lack of awareness[30, 32, 41];
- Were concerned about an increase in tsunami warnings[42]; and
- Were concerned about the effect tsunamis may have on marine life and coastal bungalows[53].

None of the respondents covered any particular damages from previous events in detail, like they did with cyclones for example.

The data was split between respondents who were almost sceptical towards the impact of tsunamis (and felt the evacuation procedures were more harmful than the tsunami)[38, 41, 54] and those who were concerned and felt more information should be disseminated to people[30, 32, 41]. For example, one private sector representative[38] highlighted his scepticism of the amount of damage tsunami events may do to Luganville, believing that more people would get hurt by the evacuation and not the onset of the event itself. He further stated that the *"...risk of tsunami is nil. Tsunamis do damage when [they] hit head on, not sideways. The channel is 60 metres deep"*[38]. Consequently, further research should be conducted on the likelihood of a major tsunami happening in Luganville, as well as in Port Vila – the main gateway to Vanuatu. Figure 5-4 shows the direction of past cyclones, which indicate that in 1965, two earthquakes caused tsunami waves near Luganville but that Luganville was protected by its location.



Land mass

Ocean trench (from 5000 to 8800 m)

Active subduction

Area of active compression

Earthquake induced tsunami

1999 Year of earthquake

Direction of wave and region it touches

Declared affected zone

Distance between bathymetry contours: 500m

Source: Adapted from Siméoni (2009, p. 151)

FIGURE 5-4: EARTHQUAKE INDUCED TSUNAMIS FROM 1875-2009

The data, nevertheless, highlights the need for widespread dissemination of information on tsunamis. One government representative commented, *"Last year they thought they would have a tsunami and nobody knew what to do, such as the precautions they had to take. There needs to be some plans in place"*[32]. This need for information dissemination is further supported by a respondent, who stated that the "*Tsunami alert via SMS from TELCO, creates more panic than anything"*[54], and another respondent, who *said "...People will get ready to move away if warning on radio. People don't understand tsunamis will only impact some areas"*[41]. One tour operator suggested the need for the government to develop information sheets of what to do, so that employees could bring this home and share with their family and, thereby, further disseminate the information on what to do in case of a tsunami warning [30].

While conducting one of the group discussions and in the process of agreeing on a summary of the discussions, the influence of peoples' experience (e.g. are the people new to the country/area or have they lived there for long) became obvious. The group covered a broad range of experiences ranging from a newly arrived business owner, who had only arrived in Vanuatu a year before, to a long-term business owner, who had lived in Vanuatu for the last 30 years. During the group discussion, a range of experiences were shared in terms of what events had affected tourism positively or negatively in the past. When writing up a summary to be sent to the participants, the range of events were summarised with equal weighting—all views on events that had impacted tourism whether positively or negatively were included. This meant that the summary included mention of the arrival of the Chinese navy, cyclones and the presence of COTS to name a few. Furthermore, various observations were made in relation to changing weather patterns, such as fewer westerly winds.

When I sent the summary to the President of the Association for dispersal to members present at the group discussion, I faced great difficulty and discussion on the content of the summary. The president replied that there had not been a Chinese naval ship in Vanuatu and that westerly winds had not been observed to be reducing. I went back to the recordings and could confirm that the group participant, who had only been in Vanuatu for one year, mentioned that he had seen an increase in his business in Port Vila when the Chinese naval ship had arrived to Vanuatu. Further to this, a news article on China Radio International's English website (Xinhua, 2010) stated that the Chinese navy had arrived to Vanuatu for the very first time in August 2010 (a few months before the second field visit for this study). One of the other business owners in Port Vila had mentioned that he had experienced less westerly winds. I presented this view to the President. The President of the Association responded that upon further reflection, he recalled seeing seamen in town at the time of the arrival of the Chinese navy, but had thought that they were Japanese. In terms of the westerly winds, the President emphasised that there would be "different conceptions by different operators" (email sent from the President on 7 December 2010).

Furthermore, the tourism system in Luganville has not been affected by a major disaster[38]. The following observation was made during the second field visit:

> *"It seems there has not been any significant event recently and disasters are almost a thing from the past in many people's minds. The tourism*

> *sector in particular is doing well at the moment and I can't help but think that Vanuatu might be riding on a wave of success and perhaps feels invincible at this point in time."* FD2, 13 October 2010

Consequently, people's experiences of a place, their different backgrounds (educational as well as cultural), or their experiences of an event may influence the way the world is viewed (see Appendix 12.8 for the different experiences of participants where available from the primary data). In other words, such influence of place needs to be acknowledged when dealing with vulnerability and resilience of tourism systems.

5.2.2 Stressors

The stressors highlighted by respondents are primarily natural in form, but often induced by human activities. The key stressors (more than 5 source mentions) include environmental degradation[31, 33, 35, 36, 39, 42, 45, 49, 51, 53, 55, A], sea level rise[30, 31, 33, 37, 38, 52, 53, 55, 56, A], coral bleaching[31, 33, 39, 49, 55, A], and COTS outbreaks[31, 35, 39, 55, 56, A]. Drought[41, 42, 52, 56] is the only other stressor mentioned by the respondents to have impacted the dive tourism system in the past. The following presents a further discussion of the four key stressors identified.

5.2.2.1 Environmental degradation

Environmental degradation can make systems more vulnerable to climate change. As a result of one group discussion[A], the following aspects of environmental degradation in Vanuatu related to dive tourism were discussed: siltation, effluent flowing into the sea; and unsustainable aquarium trade methods. These are all environmental stressors that can lead to the destruction of reefs (Garrod & Gössling, 2008). For example, unsustainable aquarium trade methods are currently being employed, according to respondents, where aquarium trade scuba divers target rarer species, such as the colourful flame-angel fish and blue tangs and break up coral to attract and make catching easier[A]. These activities have a negative impact on dive tourism attractions.

Adding to this ecological problem is the degradation brought about by the mismanagement of the natural resource base. For example, a representative from the private sector highlighted issues in relation to construction and that:

> *"[people are] filling up the lagoon, destroying mangroves - the lungs of the oceans. [The] ultimate [is] do not touch [the mangroves]. Now they wonder why*

> *the water is not clear any more... ...Lagoons are a real issue – [and] water quality [is] going down."*[51]

This issue is further supported by an NGO representative, who stated that *"resorts developed on water front have led to coastal damage. Tourists [are] walking over corals with reef shoes."*[49]

Population pressures in Luganville (as well as in Port Vila) also place significant pressure on the infrastructure and the environment (ADB, 2002). Sewage treatment needs to be addressed together with water pollution in lagoons and harbours near urban areas of Vanuatu, as highlighted by the ADB (2002).

Climate change will be an additional pressure on current stressors, such as habitat degradation, invasive species, air and water pollution, and in some cases may lead to the collapse of ecosystems (The World Bank, 2010). This can have detrimental impacts on dive tourism, as a dive operator queried: *"Can we make a product out of dead coral reefs?"*[31]

5.2.2.2 Sea Level Rise

Sea level rise was mentioned as a potential stressor by 10 sources[30, 31, 33, 37, 38, 52, 53, 55, 56, A], but approximately half of these sources[31, 33, 37, 38, 56, A] indicated that sea level rise is not yet a real issue for Vanuatu, and may not be until 50 to 100 years from now[38]. The geomorphologic structure of most of Vanuatu's islands (many of the islands of Vanuatu have high elevations) means that it is better off than the atoll-based nations of the Pacific, in terms of exposure to sea level rise. The ADB (2002) states that Vanuatu will be less prone to damage and loss of life from sea level rise than countries like Tuvalu, Kiribati and the northern part of the Cook Islands. Nevertheless, some of the respondents discussed events that could have been caused by sea level rise, as the following quotes show:

> *"Vanuatu does have high ground. Nevertheless in Amby there are some coconut palm trees already under water.... ...If people are forced to be relocated – this may [cause them to] lose some of the values of their culture. This [impact] needs to be managed properly. For example in Tuvalu, people had to move to Australia. [There will be an] impact on culture when moving even just to higher ground."*[33]

> *"Sea level rise is affecting the nice beaches."*[30]

> *"Currents can also create changes in sea level rise. Maybe Vanuatu is placed in a good location for this."*[31]

> *"Sea level rise has impacted a number of tourism businesses, especially in low-lying islands.*"[37]

> *"Sea level rise [is] affecting coastal areas. That is a worry for all [the] tourism resorts are located on the coast. Not all islands will be impacted. This [i.e. sea level rise] could have an effect on tourism numbers."*[53]

5.2.2.3 Crown-of-Thorns starfish (COTS) outbreaks

COTS outbreaks present a real threat to coral reefs in Vanuatu. A Vanuatu Daily Post (2011) article stated the following:

> "As this venomous starfish eats its way through our reefs – it eats into our tourism sector, our marine stocks, and fishing industry. The starfish numbers are on the rise due to overfishing of its' natural predators such as the Giant Triton and Napoleon Wrasse – both commonly seen for sale in our local markets." (n.p.)

According to group discussions with local dive operators [A], the reef damage from COTS presents as a major stressor to the sustainability of the reefs surrounding Vanuatu.

This is supported by another dive operator[31] who mentioned that the population densities in Vanuatu are not sustainable. He referred to a recent CRC Reef Research Centre (RRC) report, which had looked into outbreaks. The report indicates that densities above 1.0 COTS per two-minute tow would definitely damage reefs (CRC RRC, 2003). It further states: "Incipient outbreaks are recorded when sub-adult and adult densities together reach more than 30 per hectare (10,000 square metres). Active outbreaks are defined when there are more than 30 adult crown-of-thorns starfish per hectare (10,000 square metres)" (CRC RRC, 2003, p. 6). The CRC RRC (n.d.) reports that scientists have estimated that 20-30 COTS per hectare could be supported by a healthy coral reef, which has about 40-50 per cent coral cover. The respondent discussed the current COTS population densities in Vanuatu:

> *"Here you have forty-five [COTS] on a hectare …3 years ago, 50 per cent less tourists, no boats, no EIA assessments, but also no Crown of Thorns."*[31]

This statement shows the severity of the COTS issue in Vanuatu. Another dive operator stated *"…that COTS outbreaks [are a real issue], 20-30 [COTS are] picked up a day, [we let them] dry out and bury them"*[39]. In fact, all stakeholders that were either dive operators or worked closely with them highlighted the threat of COTS outbreaks. However, COTS outbreaks are not only of concern to diver operators, but as an article by Radio Vanuatu (2010) argued, they also present a serious problem for coastal villages.

Reiterating the arguments of the Vanuatu Daily Post (2011), an expatriate tourism stakeholder highlighted an issue related to COTS and the current overfishing of reefs:

> *"if herbivores do not eat the algae off the skeleton of the coral reefs, then algae infestation occurs and corals cannot recover…there is a correlation between Crown-of-thorns and Blue Green Algae."*[31]

This correlation seems to be supported by current literature, which states "…that human-induced eutrophication might cause more frequent outbreaks of the crown-of-thorn starfish, as well as diseases such as black-band disease" (Nyström, Folke & Moberg, 2000, p. 414). Black-band disease is caused by three layers of different types of Blue Green Algae, also named cyanobacteria (Bright, 1999). As Thacker and Paul (2001) hypothesised in their research, blooms of cyanobacteria may be the result of a reduction in herbivores and an increase in coastal eutrophication. Nevertheless, this hypothesis would have to be properly tested to confirm any correlation between the two.

5.2.2.4 Coral Bleaching

Although several sources mentioned coral bleaching[31, 33, 39, 49, 55, A], it did not stand out as a significant potential stressor like that of COTS outbreaks. It is unclear as to whether its low ranking as a potential stressor is due to a lack of research and awareness of this issue or a true indication of its real significance as a potential stressor for Vanuatu. For example, one source said there was no coral bleaching, whereas another two sources indicated no awareness of any bleaching events having occurred in Vanuatu:

> *"Coral bleaching – [we have] not heard of it happening in Vanuatu. [However, there is the likelihood that with climate change,] sea surface temperature will increase and cause coral bleaching. Then this would destroy scuba diving in the long term, in the medium term it would affect snorkelling of reefs."*[33]

This concern was supported by a private sector respondent in the following comment, *"Once [the coral] reefs are bleached, you have lost your attraction, your tourism. [It will take] 5-10 years to get it back, [and] then your reputation is gone."*[31]

A donor and development agency representative advised that whilst coral bleaching does not present a significant issue today, it may become a problem for tourism in the future: *"[Coral] bleaching happened every 2-3 years, but [it is] now happening all over the place. Temporary bleaching, not huge die-offs. But it is certainly a problem."*[55]

It was not clear from the data how much coral bleaching has affected tourism numbers, but it is clearly a concern that may be exacerbated by climate change, as warming sea surface temperatures may lead to coral bleaching (Knowlton & Jackson, 2008). Nevertheless, Luganville's key dive tourism attractions are WWII wreckages and this may, consequently, be an advantage to the destination when compared to other dive attractions in Vanuatu that are primarily based on coral reef attractions.

5.2.3 Shocks and stressors summary

This section has identified the shocks and stressors in order to address the first component of step two of the second research objective. To summarise, in Vanuatu, eleven shocks and five stressors were identified as having impacted the tourism sector in Vanuatu. The key shocks included cyclones, earthquakes, effect on demand due to media footage, changes to direct international flights and tsunamis. The key stressors identified as affecting Luganville's tourism system were environmental degradation, sea level rise, coral bleaching and COTS outbreaks. The following section will address the second component of step two by discussing how climatic stimuli in the form of climate change may impact the key shocks and stressors in the future.

5.3 Climatic stimuli

This section discusses the effects of climatic stimuli. First, a discussion of climate change over time is presented highlighting the contextual sphere of time, which influences the vulnerability and/or resilience of a system. Second, the various effects of climatic stimuli are discussed in relation to Luganville's dive tourism system.

5.3.1 Climate changing over time

It is vital to consider the contextual sphere of time when dealing with climate change, as the environment is always changing and this is never uniform either across time or

space (Gössling & Hall, 2006). There can be direct as well as indirect impacts of climate change, but the effect of these impacts may vary in intensity and/or breadth over time, including differentiation between seasons, years, and decades. Figure 5-5 presents the climate change observations and projections for Vanuatu, as discussed in Chapter 2, into the time space. It is worth noting that the effect of increased cyclone intensity may vary during seasons – it is likely to have a heightened effect on tourism during peak season, but may have less impact during low season. The availability of water may be more crucial at certain periods of time, such as during tourism peak season or at agriculturally important times. Climate change is a long-term process, but the effects are being felt already. Moreover, the actions and decisions that we make today will influence and shape our future (The World Bank, 2010).

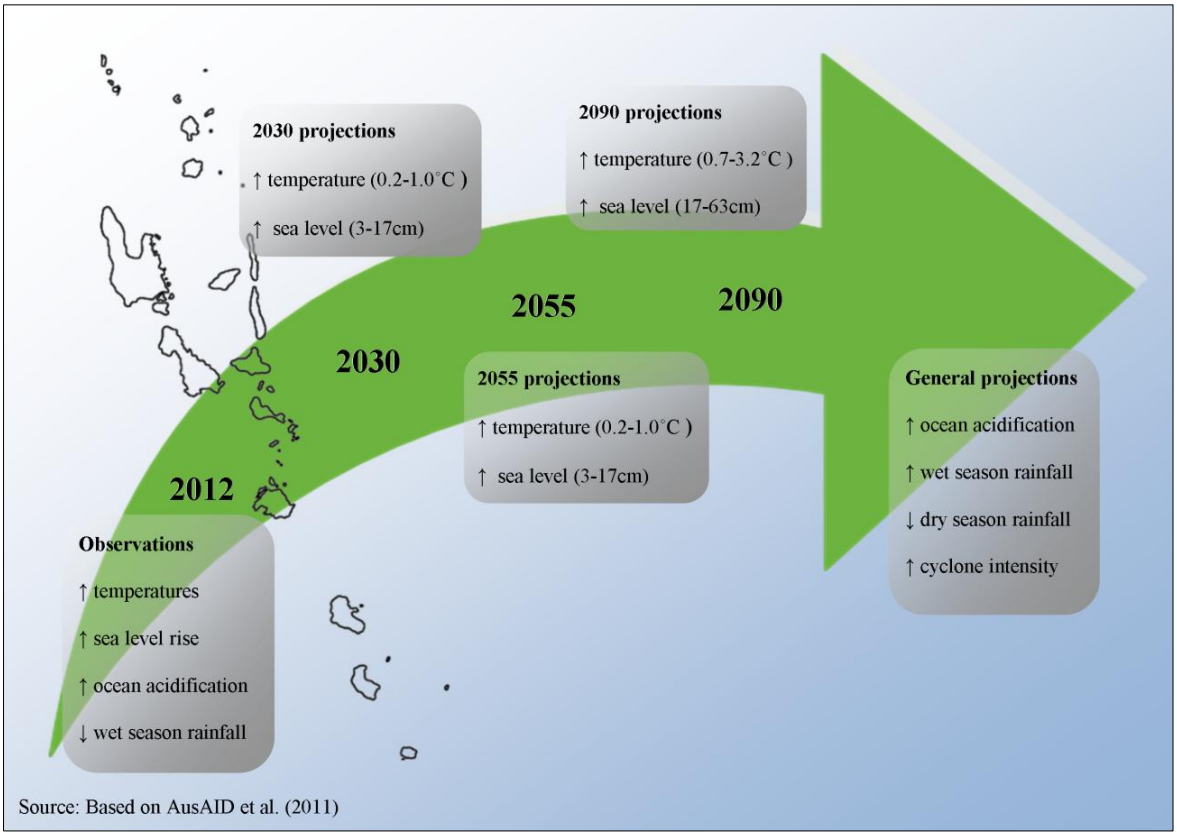


FIGURE 5-5: CLIMATE CHANGING OVER TIME IN VANUATU

5.3.2 Effects of climatic stimuli

Climate change may impact the abovementioned shocks and stressors in various ways and may lead to their exacerbation. If they are exacerbated, it will have a potentially serious impact on the tourism system. Examples of climate change's possible effect on individual perturbations are presented in Table 5-4. The following will provide a discussion of the results in relation to some of the key shocks and stressors.

TABLE 5-4: EXAMPLES OF CLIMATE CHANGE'S POSSIBLE EFFECT ON INDIVIDUAL PERTURBATIONS

Perturbations (i.e. shocks & stressors)	**Illustrative quotes**	**Climate change's effect on shocks and stressors**			
		No difference	**Exacerbate**	**Improve**	**Create**
Cyclones	• *"Natural disasters, such as cyclones, have affected infrastructure, which then limits the number of tourists that come here."*[33] • *"Extreme events have had an impact – the one that springs to mind is Cyclone Uma, which wiped out the infrastructure in 1987."*[29]		More severe cyclones (Preston et al., 2006; IPCC, 2007a; COA, 2011).	Possibly reduced frequency of cyclones (Australian Government BOM & CSIRO, 2011; AusAID et al., 2011).	
Earthquakes	• *"Major earthquake, but no major damages, tourism industry has not been affected greatly."*[35] • *"Worry about disasters as in disaster zone. Right in the fault line. Been through 15 earthquakes in the last 3-4 years."*[56]	Earthquakes are non-climatic events (Mirza, 2003) and, therefore, climate change cannot affect this shock directly.			
Effect on demand due to media footage	• *"The publicity of the recent earthquake caused cancellations of bookings."*[40] • *"Australia and New Zealand impacts will impact on flow of tourists for example if media picks up incidence related to New Zealand or Australia visitors."*[36]				Changes to the demand of tourism: (1) number of tourist arrivals, (2) seasonality and (3) types of activities undertaken (Cabrini, 2010).

Changes to direct international flights	*"It [a decrease in tourism numbers] just happened last time when government stopped the direct flight from Brisbane. It was very difficult for business. I am afraid of flight changes in the future, the government changes every four years and this could have an impact."*[43] *"AirVanuatu cancelled international flights from Brisbane – it took a while to recover."*[40]		Carbon taxes and local climate change policies may affect international flights or demand (Nurse et al., 2009; Cohen & Higham, 2011; DeLacy & Lipman, 2010).		
COTS outbreaks	*"A recent CRC (coral reef check) study stated that one to two Crown-of-thorns per hectare of reef is sustainable. Here you have four to five on a hectare… …3 years ago, 50 per cent less tourists, no boats, no EIA assessments, but also no Crown of Thorns."*[31] *"…COTS outbreaks [are a real issue], 20-30 [COTS are] picked up a day, [we let them] dry out and bury them."*[39]		Higher sea temperatures can increase COTS outbreaks through: (1) Faster development of larval COTS, and (2) The death of 'crustacean guards' (Hoegh-Guldberg, 1999).		
Environmental degradation (coral reef damage)	*"Can we make a product out of dead coral reefs?"*[31] *"Resorts developed on water front have led to coastal damage. Tourists walking over corals with reef shoes."*[49]		Possible collapse of ecosystems (The World Bank, 2010). Increases in mean temperatures and/or ocean acidification (Micheli et al., 2012).		

Cyclones are known to affect the coastal environment through storm surges and large waves (Nicholls, 2004) and have the ability to affect coral reefs in SIDSTs (Méheux et al., 2007) and with recent cyclone damages to reefs reported in Vanuatu (Morris & Mackay, 2008), any increase in cyclone intensity and/or frequency may have major implications for dive tourism. It can also have significant implications for the tourism sector more generally, because of the importance of coral reefs to the provision of seafood, the protection of shorelines including to the impact from tsunamis, the attractiveness of these for recreational services (Folke et al., 2002; Republic of Vanuatu, n.d.a) and as a natural resource base for tourism (Sem & Moore, 2009). Furthermore, critical infrastructure is often located in coastal areas of SIDST and these coastal areas form the centre of tourism activity (Sem & Moore, 2009).

With more severe and frequent cyclones predicted for the future (Nicholls, 2004; Preston et al., 2006; IPCC, 2007a; COA, 2011), cyclones are a significant shock to tourism that has a clear likelihood of being exacerbated by climate change. The World Bank (2011) claims "the numbers of category 4 and 5 storms in the Pacific region have more than doubled when comparing their frequency and occurrence between 1975-1989 and 1990-2004" (p. 4). Furthermore, climate change projections for Vanuatu (outlined in Section 2.2.2) indicate that climate change will lead to further increases to cyclone intensity, but a decrease in cyclone frequency (AusAID et al., 2011). In other words, climate change may exacerbate cyclones in terms of their intensity, but may present an opportunity for dive tourism in that cyclones will occur less frequently.

As non-climatic events (Mirza, 2003), earthquakes cannot be exacerbated by climate change. But, the overall vulnerability of the dive tourism system may be influenced by the economic and structural impact of earthquakes. As with cyclones, information dissemination will, therefore, be important in dealing with this type of shock in the future. As several community members highlight *"...there is no training available on earthquakes and cyclones."*[B]

The degradation of coral reefs has impacted the image of dive destinations negatively in the past (Cesar, 2000). Therefore, should climate change exacerbate cyclone intensity or coral bleaching then resulting media coverage poses a very real threat to the local dive tourism sector. As a private sector representative highlights: *"Climate change – it has to be something drastic. I am a bit of a sceptic. However, media could have an impact"*[40].

Such a possibility should be tested empirically via interviews with tourism clients about their stated preferences for future travel in relation to extreme events.

Although the real reason for COTS outbreaks are still not clear (Vogler et al., 2008), there is a real chance of this stressor being exacerbated by climate change. For example, climate change may increase the rate of COTS outbreaks due to sea temperature increases, which then cause the death of coral 'crustacean guards' or faster development of larval COTS (Hoegh-Guldberg, 1999). With increasing rates of COTS outbreaks, environmental degradation is increasingly likely. Furthermore, coastal and near shore environments that have been damaged by cyclones and storm surges have a presence of both COTS and ciguatera poisoning (ADB, 1997).

To summarise, many of the current key shocks and stressors will be exacerbated by climate change and, consequently, make Luganville's dive tourism system more vulnerable to climate change. This highlights a need for adaptation measures that can reduce the system's vulnerability to climate change.

5.4 Chapter 5 summary

This chapter addressed step two of the second research objective. It presented a range of risks and opportunities through a two-step analysis process (i.e. perturbations and climatic stimuli). In terms of perturbations, eleven shocks (i.e. cyclones, earthquakes, effects on demand due to media footage on different events including natural hazards and local riots' changes to direct international flights, tsunamis' the GFC, volcanic eruptions' carbon tax and trade, flooding, landslides and health epidemics) and five stressors (i.e. environmental degradation, sea level rise, coral bleaching, COTS outbreaks and drought) were identified as having impacted the dive tourism system in Luganville either directly or indirectly. Secondly, the climatic stimuli were explored in terms of how changes in the climate would impact the past and/or current shocks stressors and if new shocks and stressors would be created. The findings showed that the majority of the current key shocks and stressors may be exacerbated by climate change and, consequently, make Luganville's dive tourism system more vulnerable. Climate change may also offer some opportunities. For example, cyclones are projected to happen less frequently in the future, but at the same time also have the ability to create new shocks and stressors. The following chapter presents step three (i.e. policy analysis) of the second research objective.

6 TESTING THE KEY ELEMENTS: POLICY ANALYSIS

"To create a climate-resilient society, adaptation as a process needs to be integrated into policy formulation, planning, programme management, project design and project implementation of the agencies that are responsible for human and economic development, finance, agriculture, forestry, land use, land conservation, biodiversity conservation, water, energy, public health, transportation, housing, disaster management, and other sectors and activities."

(Leary et al., 2008, p. 16)

6.1 Introduction

The purpose of this chapter is to undertake a policy analysis that enables an understanding of the policy-making environment and mechanism, the identification of policies that are pertinent to climate change adaptation for the tourism sector and highlight any policy gaps (see Table 6-1).

TABLE 6-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(2) Test the established key elements in the context of Vanuatu's dive tourism system	Step 3: Policy analysis • Policy-making environment. • Policy-making mechanisms. • Policy inventory. • Adaptation conduciveness. • Policy gaps.	• Semi-structured interviews; and • Analysis of secondary data.	• Not all policies have been documented yet, which meant that an analysis of secondary data would not be sufficient. • Semi-structured interviews will help identify important information about policy environment and relevant policies. • Existing policies may impact on the dive tourism-climate system.

6.2 The policy analysis

Based on the literature review (see Section 2.8), the policy analysis involved five key objectives: (1) to observe the policy-making environment; (2) to examine the policy-making mechanisms and implementation; (3) to create an inventory of policies pertinent to PICTs tourism climate adaptation; (4) assess the conduciveness of the policy environment; and (5) to identify policy gaps. The following presents the findings for each of the policy analysis objectives (see Table 6-2 for an overview).

TABLE 6-2: POLICY ANALYSIS – ILLUSTRATIVE EXAMPLES

Key sections	Examples of themes from primary methods (i.e. interviews and group discussions)	Examples of themes from supporting methods (i.e. secondary data, observations noted in field diaries)
Policy-making environment	• ***Provincial policy-making* environment** – *"There are six provinces in Vanuatu (Torba, Sanma, Penama, Malampa, Shefa and Tafea)."*[13] • ***Tourism policy-making environment*** – *"Tourism sits in the Ministry of Trade and Tourism for instance but they're interested in building businesses and building the industry, but they don't really overlap with environmental concerns."*[1]	• ***Parliamentary democracy*** – "Westminster-style parliamentary democracy is sometimes described as a foreign imposition, alien to Vanuatu's own traditions. Many Ni-Vanuatu regard *politik* with some distaste, contrasting it to the realm of *kastom* (including traditional governance) where social hierarchies follow a different logic. Yet at the same time, it is clear that the form of democratic politics that has evolved in Vanuatu has been deeply influenced by pre-existing cultural norms, values and practices, and that public expectations of public figures are a key driver of political behaviour" (Cox et al., 2007, p. 20). • ***Parliamentarian process***– "Vanuatu has a unicameral 52-member Parliament, elected to a four-year term by universal adult suffrage. The President of the Republic (Constitutional Head of State) is elected for a five-year term through secret ballot by an electoral college comprising Parliament and the Presidents of Vanuatu's six provincial governments" (Australian Government Department of Foreign Affairs and Trade (DFAT), 2012).
Policy-making mechanisms	• ***Effective policies require a collaborative approach*** – *"The Sanma Province tourism plan was documented by the Tourism Department and an Australian Consultant Ross Hopkins, which is a big consultant in the Pacific... Ross Hopkins, the National Tourism Office and the Sanma Tourism Department had consultations with chiefs, woman, tourism resorts and hotels, tour operators and other local businesses. In the stakeholder consultation several areas were found that needed to be addressed: infrastructure and communication to be improved, airport upgraded and an emphasis on attracting more investments, as investments will help the growth of the province."*[13] • ***Consultation process*** – *"In terms of the Sanma Tourism Plan*	• ***Patronage-based political system*** – "The unstable policy environment can be quite disruptive for the private sector, which complains of not being adequately consulted or informed. Government has a poor record on commissioning analysis or conducting scenario planning, and often produces policies that are poorly suited to the environment. Policy studies commissioned by donors usually have little ownership in the administration, and the information often remains within donor circles. All of these conditions are symptomatic of a patronage-based political system. (Cox et al., 2007, p. 38). • ***Issues of transparency or implementation of policies*** – "Poor implementation is also a problem that afflicts reform. Often, implementation is slow because reforms are externally imposed. Equally, reform programs can remain unimplemented because governments know that donors will continue to provide them with aid regardless of performance" (COA, 2006, pp. 62-63).

	process there were 3 stages of the consultation process, 3 workshops with public and private stakeholders (50-60 people)…the first workshop was brainstorming areas of interest for the plan, the second workshop was drafting the plan and the final workshop was development of the final plan. A similar process took place in Tafea province [for the development of their provincial tourism plan]."[21]	
Inventory of policies	• ***Explicit policies*** *– "The National Adaptation Plan of Action (NAPA) highlighted the 5 most urgent areas needing action, including Sustainable Tourism."*[9] • ***Implicit policies (tourism plan)*** *– "The Sanma Province tourism plan sets out various issues that need to be addressed in the Sanma Province, including infrastructure recommendations and human resource recommendations…having a plan is important as it sets the direction."*[13]	• ***Explicit policies*** – "The Republic of Vanuatu ratified the UN Framework Convention on Climate Change (UNFCCC) on 09 March 1993, and submitted its Initial National Communication (INC) to the UNFCCC on 30 October 1999. Following the preparation of its INC, Vanuatu has initiated efforts to create an institutional set-up that seeks to mainstream climate change issues into the national legal frameworks" (Republic of Vanuatu et al., 2007, p. 7). • ***Implicit policies*** – "Whilst the potential for tourism is immense, and the unique natural and social characteristics of SANMA undeniably provide the basis for the development of strong appeal to particular markets and segments around the world, and subsequently a high yielding tourism industry, it is clear that such potential will not be realised without a clear and focused strategy to guide its development" (Republic of Vanuatu, 2009, p. 6).
Conduciveness of policy-making environment	• ***Commitment of stakeholders to the policy agenda*** *– "The Government is not focused on climate change, but in staying in power for the next 3 months."*[17] • ***National tourism sector plan*** *"In early 1980s it was decided by the national planning officer that a sector plan should be written to guide further development of tourism and to further grow this sector. Agriculture is a very important sector, but with high population it cannot support the economy in the long term. Therefore, the idea of the tourism sector plan was developed. It is the first one and perhaps the only sector plan in Vanuatu."*[21]	• ***Commitment of stakeholders to the policy agenda*** – Governments need to develop and implement coherent tourism policies to ensure cross-sectoral coordination and to provide forums in which sensitive but legitimate concerns such as the impact of tourism on the environment and local culture can be debated" (COA, 2006, p. 52). • ***Presence of enabling policy mechanism*** – "Actions should involve policies, tools and strategies to address climate change mitigation and adaptations in the natural environment, built environment and human health" (Tang et al., 2010, p. 44).
Policy gaps	Outcome of analysis of policies, see Section 6.2.5	

6.2.1 The policy-making environment

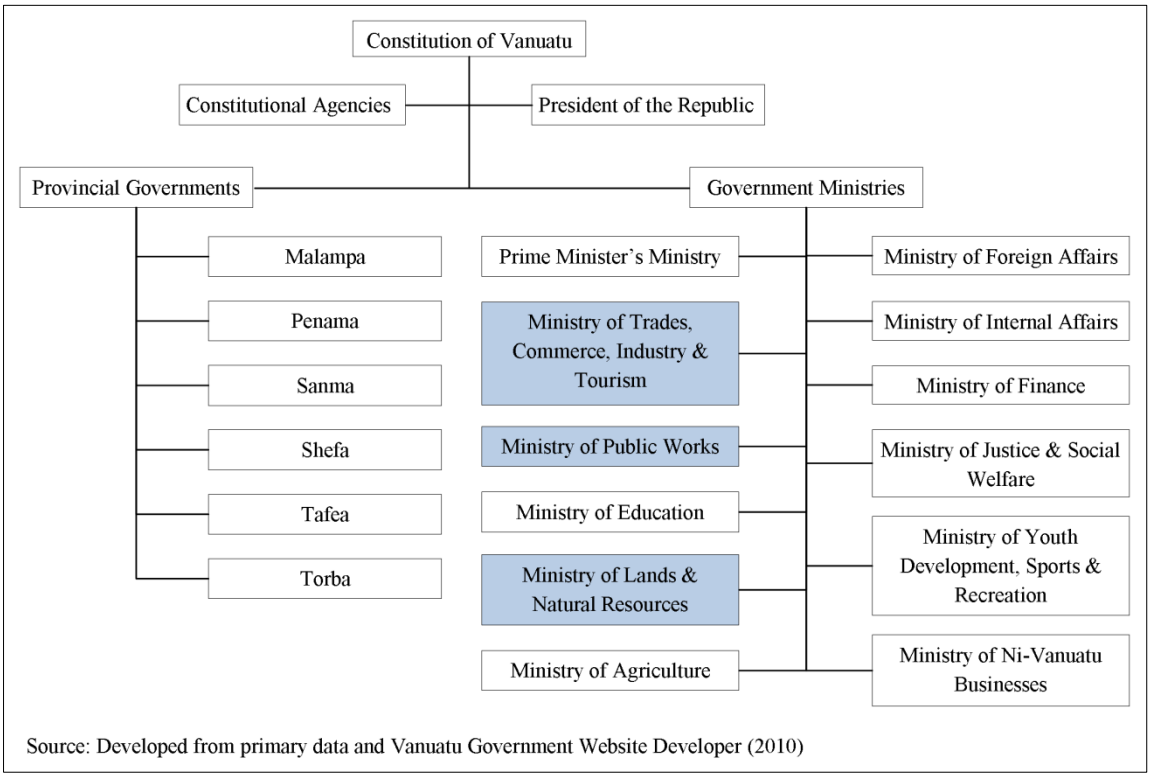
Hall and Jenkins (1995) argued that to understand public policies in tourism requires an understanding of the institutional arrangements. In other words, understanding the policy-making environment of Luganville's dive tourism system requires an understanding of the political structure of Vanuatu, and how this structure assists in driving the climate change agenda in Luganville as well as Vanuatu. More broadly, the following provides a brief overview of the political structure in Vanuatu followed by a discussion of how the primary data relates to this political structure and the policy-making environment.

Vanuatu is governed by the Constitution of Vanuatu. Established in 1980, the Constitution sets out that 'The Republic of Vanuatu is a sovereign democratic state' (The People of Vanuatu, 1980, p. 4). This means that the country is ruled for the many by the many, a form or rule that has been titled the 'mob rule' by Aristotle (Landman, 2000). The nation's government structure is based on the Westminster model of Government (Parliament of Vanuatu. 2009). The main figure head of Vanuatu is the President, who is elected for a 5-year term and has mainly ceremonial powers, whereas the Prime Minister is the head of Government, and together with the elected ministers they represent the executive Government of Vanuatu (Parliament of Vanuatu, 2009). The President is elected by a two-thirds majority of the Electoral Council, which consists of members of the Parliament and the Chairman from each of the Local Governments, and can at signs of gross misconduct or incapacity be removed by this same council. The parliament that is selected by the people and the Prime Minister, who "is elected by a majority vote of a three-fourths quorum of the Parliament" (Parliament of Vanuatu, 2009), selects the Council of Ministers.

One of the key objectives of the Vanuatu Government is to be transparent and involve its people in Government through decentralisation (The People of Vanuatu, 1980). Therefore, Vanuatu has been divided into local Government regions, which are administered by a local council. The Government of Vanuatu is divided into 12 government ministries and six provincial governments [xxviii] (see Figure 6-1). Each province is governed by a provincial council, which is made up of a local parliament.

[xxviii] The names of the provinces are derived from the first letters of the main islands that the individual provinces cover: Torba (i.e. Torres Islands and Banks Islands); Sanma (i.e. Santo and Malo); Penama (i.e. Pentecost, Ambae and Maewo); Malampa (i.e. Malakula, Ambrym and Paama); Shefa (i.e. Shepherds Groups and Efate) and Tafea (i.e. Tanna, Aniwa, Futuna and Erromango).

Their main directives are to collect local taxes and develop by-laws on provincial and local island matters (Vanuatu Government Website Developer, 2010). These ministries and governmental departments each form what could be titled the 'centrepiece of modern bureaucracy' (Hague, Harrop & Breslin, 1998) in Vanuatu.



Source: Developed from primary data and Vanuatu Government Website Developer (2010)

FIGURE 6-1: OVERARCHING GOVERNMENT STRUCTURE IN VANUATU

There are three ministries of key importance to the tourism system's adaptation to climate change, as highlighted in blue in Figure 6-1. First, the Ministry of Public Works is of key importance to climate change and tourism due to incorporating the Meteorological Department, the Ports and Harbours Department and the statutory bodies of AirVanuatu Ltd. and Airports Vanuatu Ltd. The Meteorological Department plays a key role in the National Advisory Committee on Climate Change (NACCC), whereas the policies of the Ports and Harbours Department together with Airports Vanuatu Ltd. and AirVanuatu Ltd. will influence the tourism sector in terms of accessibility and other issues. Second, the Ministry of Lands and Natural Resources is mostly important to tourism due to the presence of the Environment Department within it. However, the activities of the Department of Lands and the Energy Unit could potentially also impact on the tourism sector. Finally, the Ministry of Trades, Commerce, Industry and Tourism is the most important Ministry for the tourism sector,

as it includes the National Tourism Development Office (NTDO), the VTO and the Vanuatu Investment Promotion Authority (VIPA).

How the image of the tourism sector is portrayed is a highly political and contentious issue addressing questions such as "what is marketed, who does the marketing, and how 'attractions' are presented" (Harrison, 2004, p. 21). A tourism statutory body was established in Vanuatu under the VTO Act in 1982. The main strategic directives of a tourism statutory authority are aimed at commercial activities and marketing (Dredge & Jenkins, 2007). In line with this, the VTO is mainly oriented towards marketing of Vanuatu in domestic and overseas markets and, thereby, aims to promote and encourage the sustainable development of tourism in Vanuatu. The NTDO is the ministerial department for tourism planning and policy-making and works closely with the VTO. As sustainable tourism must be planned, organised, implemented, and monitored (Harrison, 2004), the level of success of this collaborative approach is vital to the tourism sector in Vanuatu. The VIPA is the body controlling and promoting foreign investment in Vanuatu and consequently also plays a significant role in the tourism sector, which involves a large percentage of foreign investors. One interviewee from the industry group mentioned that 50 per cent of the VTOA's members are foreigners, thereby highlighting the importance of the involvement of VIPA.

The effectiveness achieved by the governance depends on factors such as the institutional structures (as outlined above), the institutional processes in place and how effective these are (Beaumont & Dredge, 2010). It is important to understand these institutional arrangements, as they help determine the ways in which the state operates within the tourism policy arena (Hall, 2011). Furthermore, destinations with effective governance are more likely to succeed in promoting a sustainable tourism destination than destinations where effective governance is not present (Bramwell, 2011). With an understanding of the government structure, under which policies are developed, we move to exploring the policy-making mechanisms.

6.2.2 Policy-making mechanisms: From conceptualisation to implementation

As an analysis of the contextual factors in Vanuatu and how they have influenced policy making has already been reported (see Cox et al., 2007), this thesis builds on this knowledge rather than duplicates it. This section has been divided into three themes that stood out in the data, as follows: (1) policy-making as a process; (2) issues of

transparency or implementation; and (3) effective policies require a collaborative approach.

6.2.2.1 Policy Making as a Process

In the majority of the interviews[1,3, 5, 7, 8, 11, 12, 16, 17, 18, 19, 20, 23, 26], there seemed to be a lack of awareness within the tourism industry of the policies relevant to the sector, with comments such as *"policies and strategies are lacking, [of existing policies] many are focused on boosting [the] economy"*[7], *"I am not aware of any policies"*[26], and *"there is no awareness of policies"*[20]. Furthermore, government officials raised concerns with regard to the drafting of policies[9, 27]. As an example, an interviewee from the government group indicated that the climate change policy had been in the drafting stage since 2002 and had not been completed due to a disagreement as to whether the policy document and the implementation strategy should be in one or two documents[9]. Another government official was of the opinion that the government departments are *"still lacking overall policy directions, which would include climate change"*[27]. With a limited understanding of the current policies, it was difficult to identify the events or issues that have caused the various policies to be developed in the first place.

Nevertheless, there was a good example of where an event had taken place and influenced the policy making, which is indicative of policy making as a process. An interviewee from the NGOs group explained:

> *"A researcher from Western Australia, Rick Fletcher, did research in the early 90s upwards and found that the population of these crabs had declined significantly and rapidly. I used to work as the Sanma Environmental Officer—a provincial post focused on marine biodiversity, terrestrial biodiversity and freshwater biodiversity. I cooperated with Rick Fletcher in forming the Coconut Crab Taskforce and involved other agencies, including Fisheries Officers, Land Officers and NGOs . . . Previously the Government had an open and close season for crab-fishing. However, insufficient resources to monitor that only quota (2000 crabs in open season) was caught resulted in people consuming more than this. Therefore, consultation was held with local communities to ensure conservation of crabs. As a result, the Provincial Fisheries Act allowed for a ban of the Coconut Crabs being caught. A New Zealand lawyer, Donna Lowell helped with this."*[14]

This statement is an example of the policy-making process, as highlighted by Dredge and Jenkins (2007): (1) the events in the form of a researcher's study and the limited capacity of governmental monitoring of fishing quotas resulting in overfishing of the coconut crab; (2) the different stakeholders include the researcher, the government official, the local community, and the New Zealand lawyer, who all were concerned enough by the decline in coconut crab populations to act on this; and (3) these stakeholders had enough influence to enforce a ban of the coconut crab under the current provincial fisheries' legislation. This is one example of the policies identified (and discussed later in this chapter), which is pertinent to climate change adaptation.

6.2.2.2 Issues of Transparency or Implementation of Policies?

As indicated, from an analysis of the primary data collected, it becomes obvious that there is a limited knowledge of the government policies within the tourism industry. One interviewee claimed that they are *"not aware of any policies, as they are completely inactive"*[26]. Another interviewee from the industry said that *"policies are in place, but not implemented"*[18], and a third industry player said that *"nothing ever happens – it just gets shelved"*[19] when discussing policy guidelines developed by international donor organisations. Although there seems to be some awareness of the presence of documents, either the implementation of these is not transparent or the policies are not implemented. If it is a lack of awareness, it could have a significant effect on stakeholder collaboration and the actual implementation of the policies. As suggested by Bramwell and Sharman (1999), the stakeholders' awareness of positive benefits of a given policy may entice participation in the policy-making process. For example, if stakeholders do not see the need for the particular policy, 'there is little likelihood of action taking place only because a study and report were prepared' (Gunn, 1994, p. 110).

If it relates to a lack of implementation or involvement in the earlier phases of the policy-making, this may result in adversarial stakeholders (Bramwell & Sharman, 1999) that, depending on their power, may impact the success of the implementation stage of policy. The level of power to influence the policy process is influenced by factors such as access to financial resources, expertise, public relations, media, knowledge, and amount of time available (Hall, 2009). Further studies are required in order to assess: (1) what causes this general lack of awareness of policies within the tourism industry;

(2) the successfulness of policy implementation; and (3) if this will facilitate or hinder climate change adaptation.

Stakeholders' awareness and perception of climate change is crucial to the development and implementation of effective adaptation measures. As Mataki et al. (2006) argue, climate change actions in the Pacific will be influenced by the public's perception, and in particular by the perceptions of decision makers. This highlights the importance of the public and private sectors awareness of their vulnerability towards climate change (Richardson & Witkowski, 2010).

The data presented in Table 6-3 shows a major divergence between the expatriate community and the Ni-Vanuatu community in relation to the perception of climate change risk. For example, an expatriate tourism sector respondent mentioned: *"I believe climate change is just like the big millennium panic. The climate has changed for centuries"*[39]. A Ni-Vanuatu respondent from the tourism sector, however, stated the following: *"I am afraid of climate change, it is hot every day and there will be water issues, some places will lose the underground water [supply]. Now with drought and long times of sun it is a real issue."*[43]

TABLE 6-3: BROAD OVERVIEW OF PERCEPTIONS ABOUT CLIMATE CHANGE, EXPATRIATE VERSUS NI-VANUATU VIEWS

Expatriate perceptions of climate change
• *"Cyclone, damage to coral and boats. 1980s-1990s – a lot more cyclones then than now. Can't blame climate change for everything."*[A] • *"Climate change – it has to be something drastic. I am a bit of a sceptic."*[40] • *"I don't know much about climate change, I don't see the change here. It is something that happens overseas. 5 years – no cyclones. Not mentioned at any sector association meetings."*[51] • *"Climate change's impact – I'm not really concerned. It is a constant debate whether human or natural. If sea level rises, this will impact some coastal areas, but many Ni-Vans live inland, high ground (not like Kiribati)."*[52] • *"Climate change – I don't think there is enough ramifications."*[54] • *"Private sector nominated by expats, they have a sceptical view of climate change. Quite difficult to bring up the topic without negative comments."*[55] • *"Tourists do not talk about climate change..."*[31] • *"I am concerned about climate change's impact. We're all concerned. Don't have enough information about climate change. This should be provided by governments, schools, and media (i.e. radio)."*[41] • *"Worried about climate change – a worry for everyone."*[44]

Ni-Vanuatu perceptions of climate change
• *"Climate change is a global thing and involves the economy… …Policies may affect their investment sector, so we need to be involved in climate change adaptation. Climate change is everybody's business."*[28] • *"Climate change is an issue that is very challenging and therefore we are starting to diverse our activities"*[34] • *"For small island states, climate change will impact tourism development... ... I am scared of carbon taxes' impact. We still don't have a policy in place to look into this."*[36] • *"In education department they tend to teach more about geography and animals. They should teach about climate change."*[B] • *"Vanuatu is vulnerable to climate change and natural disasters."*[37] • *"We do take climate change as a serious concern. When investors come we advise them to build 50 metres away from the high water mark."*[42] • *"Climate change – I am worried to a certain degree, especially along coast line and low lying areas."*[45] • *"I am worried about climate change, seeing changes... ... I am worried about the environment, climate change – I do worry a lot about it."*[46] • *"I am concerned about climate change's impact on tourism. If climate change happens it will impact the entire community, will impact spending and saving of money and then my job in the end."*[47] • *"Yes, I am concerned about climate change's impact. It impacts the livelihood of people as they depend on tourism to pay for school and bring food on the table. I am worried about cyclones, tsunamis, and the effect on marine life. People put their life in building bungalows in coastal areas. If wiped out in cyclone or tsunami – it is a real concern."*[53] • *"I am afraid of climate change, it is hot every day and there will be water issues, some places will lose the underground water [supply]. Now with drought and long times of sun it is a real issue"*[43] • *"… I am worried about climate change, there are signs of erosion; it is a big issue for diving and snorkelling."*[32] " • *Our islands are big enough to be resilient to climate change compared to other nations. They can sustain more compared to Tonga."*[50]

Interviewees were not asked what they thought about climate change, but questions under the climate change and adaptation section of the semi-structured interview question outline, such as *'are you concerned about climate change's impact on tourism (including diving) activities'*, helped identify the respondents perception of climate change. Consequently, the reason for this divergence in perceptions of climate change is unclear and should be studied further. For example, is this caused by the Ni-Vanuatu respondents having a greater historical knowledge of climatic changes amassed through personal experiences gained throughout their lifetime as opposed to the expatriates, who may only recently have arrived to the country?

With an identified scepticism towards climate change, parts of the tourism sector in Luganville (i.e. expatriate business owners) would most likely not consider climate change adaptation as a priority, as perceptions related to the scale (significance as well as timing) of a threat (e.g. climate change) influence our response to environmental problems (Belle & Bramwell, 2005). This will have significant ramifications for the implementation of adaptation measures, and thereby influence the sector's vulnerability. Consequently, the data highlights the importance of disseminating information about the impacts of climate change on tourism to ensure some common ground between stakeholders and the need to provide possible adaptation strategies.

6.2.2.3 Effective Policies Require a Collaborative Approach

Development of effective climate change policies requires enormous coordination across the government and considerable sophistication in implementation. The implementation of policies is complicated by the complexity of government structures, the interplay of dynamic social and economic factors, and the involvement of multiple government agencies (Dredge & Jenkins, 2007). An example of this complexity can be seen within the government, as one interviewee highlighted the need for all government departments to work together, as

> *"Everything will be impacted by climate change. It can be difficult, if other departments do not consider climate change adaptation. For example, tourism and coastal development; they [the relevant departments] need to work together."*[27]

This same interviewee provided examples of current projects involving the government where cross-sectoral dialogue had not involved all governmental stakeholders [27]. For example, a current major MCA road infrastructure project involved the consultation with an Environmental Impact Assessment (EIA) officer from the Environment Department, but did not involve consultation with the Department of Fisheries. The respondent queried the design of the road in relation to waste and run-off water stating, *"There is no area on the side of the road to contain waste water. Thus, this [i.e. waste and run-off resulting from the road] will impact on pristine and high quality corals"* [27]. The completion and implementation of the national climate change policy may help encourage the cross-sectoral dialogue, as *"the main purpose of the policy is to mainstream climate change in the decision-making process of all sectors."*[9]

The policy-making mechanisms in Luganville and Vanuatu in general do involve participatory processes. One interviewee[26] from the tourism industry highlighted workshops as part of the policy-making process, but then raised issues related to the consultation of the industry and the general public prior to the policy development. The interviewee mentioned that short notice is being given (approximately 3 days), and *"speeches and food seem to be the main focus"* and as *"the private sector is not paid to be there they feel they are wasting their time"*[26]. It is important to ensure that stakeholders are given the opportunity to debate directly on the topic for policy (Bramwell & Sharman, 1999). If very little time is allocated for actual stakeholder debate and discussion and the workshops focus more on information dissemination, then this may well affect future collaborations negatively, and it may raise questions as to why these workshops were held. "Is it government involving the community simply to legitimise its policies?" (Bramwell & Sharman, 1999, p. 399).

After a policy has been implemented, the policy solutions should be evaluated (Dredge & Jenkins, 2007). However, as suggested by an interviewee from the tourism industry, this phase of policy-making is affected as *"meeting minutes are not followed through"*[26]. The lack of stakeholder engagement in the entire policy-making process was brought up by two interviewees from the industry groups[5, 26], who highlighted that there is a lack of transparency. Ensuring transparency and accountability is one parameter for ensuring good local governance (Beaumont & Dredge, 2010). This brings to the fore a concern that the consultation process seems to be based on process rather than on performance and may have an influence on the effectiveness of achieving the goals set out.

Nevertheless, it could be that apathy and a lack of involvement by industry players contribute to the difficulties in implementation. One example of this was mentioned by an industry player, who said that *"only two expatriate operators [were] at the launch of the [Sanma] tourism plan"*[20]. The question is whether policy implementation should take place through top-down approaches or bottom-up approaches—a topic which has received much debate in the literature (Dredge & Jenkins, 2007). An interviewee from the industry group believed that the current focus is on disaster risk management and that most industry players feel that the impacts of climate change are out of their hands and should be the focus of Government:

> *"The tsunami is nothing to do with climate change of course but it's made us all revisit our specific emergency response plans. To do tsunami, earthquake is another issue for us, nothing to do with climate change again, cyclones are. I think the operators feel as operators there's not a lot we can do. Most of people think it's out of our hands; it's a government initiative."*[1]

This quote suggests the need for a top-down approach, but it is possible that this view is based on a limited knowledge of climate change and climate change adaptation.

This lack of awareness was further backed up by an interviewee from the government, who identified 'a lack of awareness' in relation to policies in the following areas: *"(1) what is out there; (2) what are the impacts of climate change on tourism; (3) what needs to be done; (4) what are tourism 'tides'; and (5) what are the skills within tourism"*[3]. It is not surprising to find a limited awareness of climate change adaptation among tourism operators, as awareness on climate change adaptation has been identified as low in many cases (Scott et al., 2008). Perhaps with improved information dissemination and stakeholder collaboration, a sense of shared ownership can be promoted and make the various stakeholders willing to help government implement policies (Bramwell & Sharman, 1999), thereby taking a bottom-up approach. It is, therefore, strongly suggested that future directions taken by the government should include strategies on how to empower the tourism sector and build community spirit and support for government policies.

Another issue related to the sense of ownership is the involvement of foreign consultancies in the policy-making process. Reliance on external consultants in the policy development process can result in a community losing control over tourism development (Moscardo, 2011). An interviewee from the industry mentioned that, *"They [the Government] often hire consultants in Australia, but the policy says to hire local consultants. This is not enforced either"*[24]. The question is whether the local people are involved enough in these types of projects to develop a sense of ownership and support for these policies. It is of key importance to base policies on local knowledge to ensure that they have leverage (Bramwell & Sharman, 1999). Perhaps this lack of local knowledge in policies is why it seems, as suggested by several industry players[18, 19, 24, 26], that most of the international donor agency-developed policies end up on the shelf and are never implemented. As one interviewee highlighted, *"it is*

disheartening to see all the good work end up as white paper"[26]. Consequently, government should enforce the policy of hiring local consultants, or at least ensure that policy processes involving foreign consultancies make use of effective participatory processes, including questionnaires and working groups, allowing enough time for debate on appropriate issues related to the policies. This leads to a discussion on the inventory of policies identified in this study.

6.2.3 Inventory of policies that are pertinent to climate change

Improving the welfare of the people of Vanuatu has been a long-standing goal of the Vanuatu Government. As can be seen in Figure 6-2 below, the Government of Vanuatu developed the Comprehensive Reform Program (CRP) in 1997 to set the framework for achieving their main goal of increasing welfare levels. Five years later, the Department of Economic and Sector Planning organised an Economic Policy Forum with representatives from Government, NGOs, the private sector, civil society and church groups. They all worked together to develop the first Priorities and Action Agenda (PAA) complementing the CRP (Government of the Republic of Vanuatu, 2006). After another three years, the Government felt the need to review and update the PAA and to further build on the Millennium Development Goals (MDGs). The result was the Priorities and Action Agenda 2006-2015, in which the Government of the Republic of Vanuatu has set out their key priorities and actions for the period 2006 to 2015.

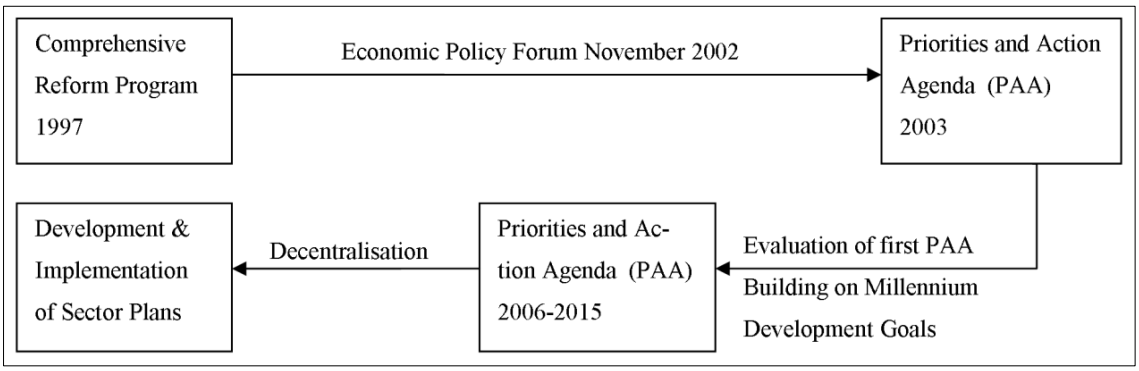


FIGURE 6-2: TIMELINE FOR THE DEVELOPMENT OF THE CURRENT PAA IN VANUATU

This policy document sets out the overarching policies in Vanuatu at the state level[13] and provides a guiding policy document for the individual ministries, departments and other government bodies (Government of the Republic of Vanuatu, 2006). The implementation of the Priorities and Action Agenda is the responsibility of the each

minister and their ministry and should occur through the development and implementation of formal sector plans (Government of the Republic of Vanuatu, 2006).

A range of relevant policies were identified through primary and secondary data collection. Given obvious space limitations, the policy analysis intended to include policies in the broad policy areas of climate change, tourism, environment and disaster risk management. These were selected on the basis of the climate sensitive nature of tourism, tourism's close connection to the environment and the vulnerability of tourism to disasters. Other policies were included because they were identified during the interview process as having an impact on the dive tourism system's capacity to adapt to the risks of climate change. As it was not possible to get copies (neither hard copy nor soft copy) of all the policy documents identified, not all policies identified during the data collection were analysed. In addition, the following policy documents were still in drafting stage when this research was undertaken and, consequently, have not been included in the detailed policy analysis: national cruise ship strategy; destination marketing plan; and provincial tourism plans for the provinces of Torba, Penama, Malampa and Shefa.

Once the policies have been identified, understanding the progress of the policy was vital to ensure that policies had been implemented. If policies are not implemented, they cannot ensure successful climate change adaptation measures and may, as a consequence, influence the vulnerability of the system. Table 6-4 highlights an indication of the progress of each of the policies identified; a thorough evaluation of the progress of each policy is outside the scope of this thesis. The majority of policies pertinent to climate change adaptation for the dive tourism sector in Vanuatu have either just been put into action, are in progress or have been delayed. Meeting the objectives of these policies will be of key importance to the tourism sector. However, as stated by one interviewee from the industry: *"policies are in place, but not implemented"*[18]. This is further supported by an interviewee from the Government, who questioned whether there will *"…be enough funding to implement the plan within the given timeframe?"*[13]

TABLE 6-4: INDICATION OF PROGRESS OF POLICIES ANALYSED

Policy	Objectives met?			
	Met	**In progress**	**Delay**	**Not successful**
National Adaptation Program for Action (NAPA) 2007		✓ i		
Pacific Adaptation to Climate Change (PACC) 2009		✓		
Pacific Islands Framework for Action on Climate Change 2006 – 2015		✓ ii		
Priorities and Action Agenda 2006-2015		✓		
Disaster Risk Reduction and Disaster Management National Action Plan 2006-2016		✓		
Vanuatu Tourism Development Master Plan 2004-2010			✓	
Vanuatu Tourism Action Program (VTAP) 2008		✓		
Tafea Province Tourism Plan 2009-2019		✓		
Sanma Province Tourism Plan 2009-2019		✓		
National Investment Policy 2005		✓		
Fisheries Act No 55 of 2005		✓		
National Marine Aquarium Trade Management Plan 2008		✓		
Aquaculture Development Plan 2008-2013		✓		
Revised Tuna Management Plan 2008		✓		
Ban of the collection and fishing of coconut crabs in the Sanma Province 2007-2012		✓		
WSB Environment Program 1995	✓			
Environmental Management and Conservation Act 2002		✓ iii		
National Biodiversity Conservation Strategy 1999		✓		
Registering of the Vatthe Conservation Reserve under the Environmental Management & Conservation Act in 2004		✓		
Vanuatu Land Sector Framework 2009-2018		✓		
Vanuatu Millennium Development Goals		✓		
MCA Vanuatu 2006-2010		✓		
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 1: 2009-2011		✓		
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 2: 2009-2011		✓		
ADB Country Partnership Strategy 2010-2014		✓		
Action Plan for Managing the Environment of the Pacific Islands Region 2005-2009			✓ iv	
A Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu		✓		
The Forest Policy 2010-2020		✓		

i: Funding for individual projects to be applied for through GEF.
ii: Replacing the Pacific Islands Framework for Action on Climate Change, Climate Variability and Sea Level Rise 2000-2004.
iii: Restrictions to implementation includes limited staffing resources and funding.
iv: This is a broad action plan and not all objectives of the plan have been achieved due to a lack of funding and resources to implement and enforce national legislations, plans, policies and assessment reports.

Of all the identified and accessible policies, 28 policies were identified as being pertinent to climate change adaptation of the Vanuatu tourism sector. These policies were divided into 'explicit' and 'implicit' policy processes (Hall & Higham, 2005). Out of these 28 policies identified, only five explicit policies were identified, the remaining 23 policies were implicit policies. The following will provide a discussion of the explicit policies followed by a discussion of the implicit policies.

6.2.3.1 Explicit policies

In partly addressing step three of the second research objective, there are two types of policies: those that explicitly deal with climate change and those that implicitly deal with climate change. This section focuses on the explicit policies identified that are relevant to the adaptation of the dive tourism system in Luganville.

The five explicit climate change policies identified in Vanuatu (Table 6-5) were: (1) *National Adaptation Program for Action* (NAPA) 2007; (2) *Pacific Adaptation to Climate Change* (PACC) 2009; (3) *Pacific Islands Framework for Action on Climate Change* (PIFACC) 2006 – 2015; (4) *A Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu*; and (5) *The Forest Policy 2010-2020*. The PIFACC is a regional policy, whereas the other policies are national policies of Vanuatu. These policies are the most important policies in Vanuatu in regards to the tourism sector's adaptation to climate change. Therefore, each of these will be discussed in detail below.

TABLE 6-5 EXPLICIT POLICIES PERTINENT TO CLIMATE CHANGE ADAPTATION FOR THE TOURISM SECTOR IN VANUATU

Policy	Types of adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
National Adaptation Program for Action (NAPA) 2007		✓		✓	✓
Pacific Adaptation to Climate Change (PACC) 2009	✓		✓	✓	
Pacific Islands Framework for Action on Climate Change (PIFACC) 2006 – 2015	✓			✓	✓
A Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu		✓		✓	✓
The Forest Policy 2010-2020	✓			✓	✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

The NAPA policy began in 1993 with Vanuatu's ratification of the UNFCCC. This was followed by the Initial National Communication to the UNFCCC in October 1999.

During the UNFCCC Seventh Conference of the Parties (COP7), a resolution was made to support the development of a work program for the LDCs (Republic of Vanuatu et al., 2007). This led to the development of the NAPA for Vanuatu, which was approved in 2003 and activities commenced in 2004. The NAPA project included four phases, with the final stage being the completion of the final NAPA report (Adaptation Learning Mechanism, 2009). The project was fully implemented when the NAPA report was submitted to the UNFCCC in December 2007. One of the main project concepts of the NAPA is a sustainable tourism development project. The time line of the development of the NAPA 2007 policy has been outlined in Figure 6-3.

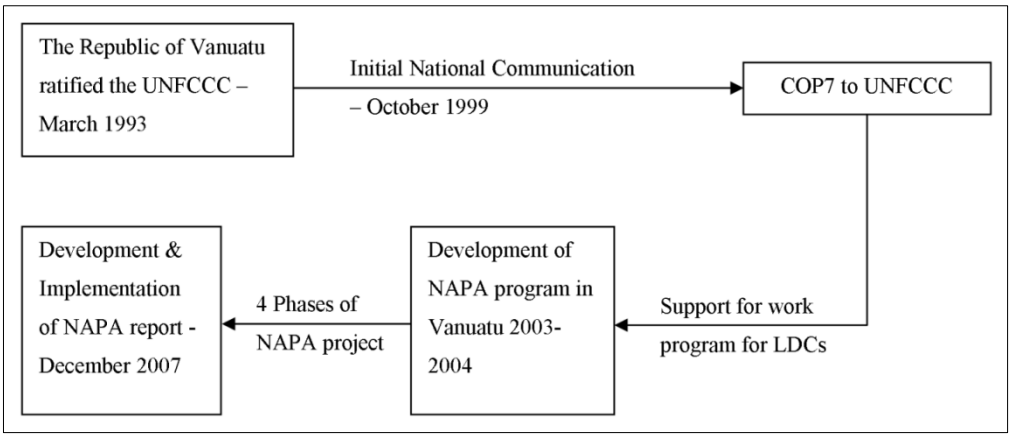


FIGURE 6-3: TIME LINE OF THE DEVELOPMENT OF THE NAPA 2007 POLICY

A GEF funded project in the *Pacific is the Pacific Adaptation to Climate Change* (PACC) project. The implementing agency of this project is the UNDP and PACC project entails the "implementation of adaptation measures in 11 countries of the region" (GEF et al., 2009 p. 5). The PACC report was the outcome of in-country consultations held from 1st to the 4th August 2006, where nine ministries, agencies and institutions were consulted. Although tourism benefits from the adaptation measures of the PACC project, the tourism sector is not at the core of this project. Instead, the PACC project focuses on infrastructure and coastal zones and building the resilience of these coastal communities. The implementing parties include the Ministry of Public Works and the Public Works Department, which will become the primary implementing agency of the PACC project.

The *Pacific Islands Framework for Action on Climate Change 2006-2015* (PIFACC) was established as a result of the recognition that Pacific Islands must act on climate change. The main goal of this policy is to ensure that the people of the Pacific Islands

can build their resilience to the effects of climate change. It was adopted by the leaders of the Pacific region in 2005 (SPREP, 2010). It provides a framework for action for 22 nations within the Pacific region and entails the implementation of several action outcomes under six principles. These six principles are: (1) implementing adaptation measures; (2) governance and decision making; (3) improving understanding of climate change; (4) education, training and awareness; (5) contributing to global GHG reduction; and (6) partnerships and cooperation.

The *Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu* will be a vital step in developing the first draft of the overarching national policy for climate change. The discussion paper has three main purposes: (1) to give a summary of climate change development in Vanuatu; (2) to determine issues that have been raised over the years and may form the basis of the climate change policy; and (3) to develop a preliminary framework for the national policy on climate change. The establishment and implementation of this policy will be an important turning point for climate change adaptation in Vanuatu and a crucial step in integrating climate change into whole of Government policy, filtering down to sector, provincial and local policies. For example, the proposed policy framework will encourage the revision of current policy and legislative frameworks and the inclusion of climate change considerations in a range of sectors (particularly in environment and development sectors). The proposed climate change policy framework highlights the critical sectors (i.e. agriculture, human health, water resources, coastal environment, and coral reefs) that are directly impacted by climate change, but neglects to mention the tourism sector. Nevertheless, as shown in this study, the tourism sector is both vital for the economy of Vanuatu and for growing local livelihoods. It is, therefore, crucial that a national policy on climate change also recognises the impact of climate change on the tourism sector and proactively works towards implementing climate change considerations in this sector's policies.

The draft *Forest Policy 2010-2020* was developed as a result of the review of the outdated 1997 National Forest Policy of Vanuatu. This draft policy has taken into account issues and challenges faced by the Republic of Vanuatu and a large part of the policy deals with climate change. The policy proposes 206 policy directions and was the only sector policy reviewed that had a strong focus on climate change.

To briefly summarise the explicit policies identified, Vanuatu ratified the UNFCCC in 1993 and the Kyoto Protocol in 2001 (see Figure 6-4 below). Both of these ratifications have helped the nation in putting climate change on the country's agenda. The NACCC was re-formed in 1997, as a result of the implementation of the Pacific Islands Climate Change Assistance Program (PICCAP). It was first established in 1989 (Silas-Nimoho and Whyte, 1999). In 1999, the Initial National Communications were submitted to the UNFCCC and following this a number of explicit climate change policies have developed in the region and within Vanuatu. The *PIFACC 2006-2015* provides a guiding framework for Vanuatu in acting on climate change, whereas the *NAPA, PACC, the Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu,* and *the Forest Policy 2010-2020* will help the country implement actions required to address climate change.

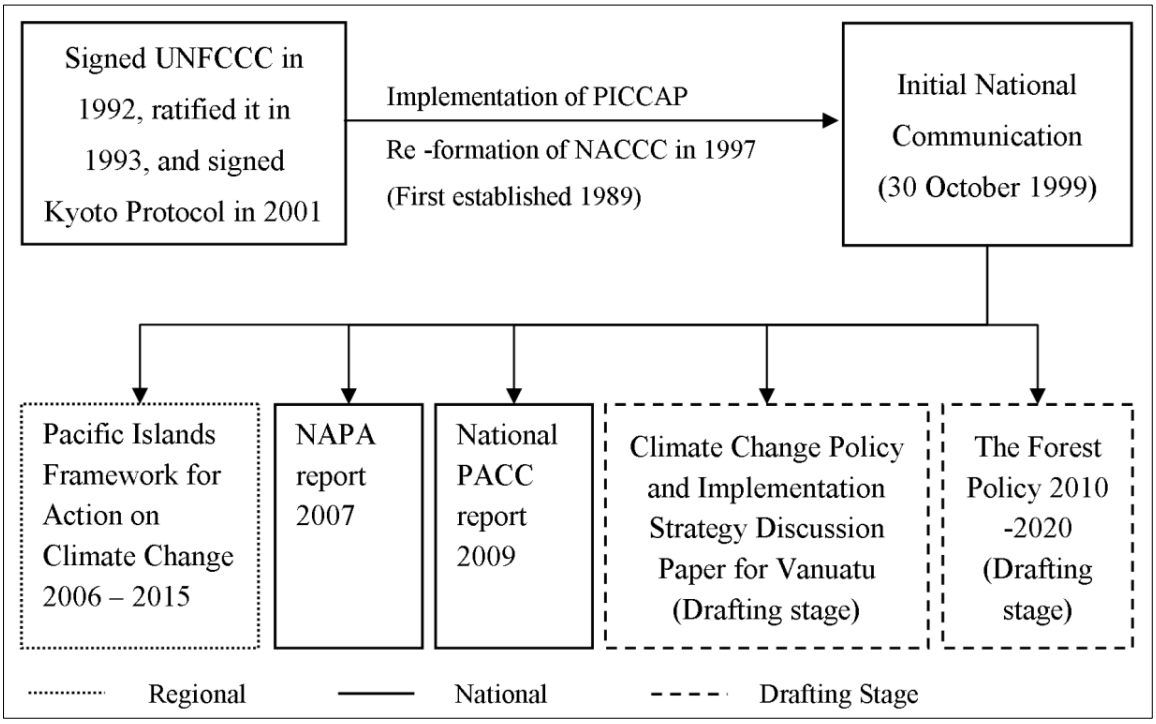


FIGURE 6-4: MAPPING OUT THE EXPLICIT CLIMATE CHANGE POLICIES IN VANUATU

6.2.3.2 Implicit policies

This section focuses on the second type of policies (i.e. implicit policies) that are pertinent to climate change adaptation in order to further address the third step of the second research objective. From the analysis of the explicit policies, it is found that none of the identified explicit policies are tourism policies. In other words, climate change adaptation has not entered the tourism policy arena, as there are no tourism

policies that explicitly deal with climate change adaptation. Nevertheless, a number of generic climate change policies do implicitly address the tourism sector's adaptation to climate change. Furthermore, a number of other sector policies and tourism plans may assist the tourism sector in addressing climate change. These are also described in this section. In total, 23 implicit policies were identified as pertinent to climate change adaptation in the tourism sector. These are outlined in Tables 6-6 – 6-10.

ABLE 6-6: IMPLICIT TOURISM POLICIES

Policy	Types of adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
Vanuatu Tourism Development Master Plan 2004-2010	✓	✓	✓	✓	✓
Vanuatu Tourism Action Program (VTAP) 2008	✓	✓		✓	✓
Tafea Province Tourism Plan 2009-2019	✓		✓	✓	✓
Sanma Province Tourism Plan 2009-2019	✓			✓	✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

TABLE 6-7: IMPLICIT ENVIRONMENT AND DISASTER RISK REDUCTION POLICIES

Policy	Types of adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
Disaster Risk Reduction and Disaster Management National Action Plan 2006-2016	✓	✓		✓	
WSB Environment Program 1995				✓	✓
Environmental Management and Conservation Act 2002	✓			✓	
National Biodiversity Conservation Strategy 1999				✓	✓
Registering of the Vatthe Conservation Reserve under the Environmental Management & Conservation Act in 2004				✓	✓
Action Plan for Managing the Environment of the Pacific Islands Region 2005-2009				✓	✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

TABLE 6-8: IMPLICIT FISHERIES POLICIES

Policy	Types of Adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
Fisheries Act No 55 of 2005				✓	
National Marine Aquarium Trade Management Plan 2008			✓	✓	✓
Aquaculture Development Plan 2008-2013				✓	✓
Revised Tuna Management Plan 2008		✓		✓	✓
Ban of the collection and fishing of coconut crabs in the Sanma Province 2007-2012				✓	✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

TABLE 6-9: IMPLICIT INFRASTRUCTURE POLICIES

Policy	Types of adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
Vanuatu Land Sector Framework 2009-2018	✓			✓	✓
MCA Vanuatu 2006-2010	✓			✓	✓
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 1: 2009-2011				✓	✓
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 2: 2009-2011					✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

TABLE 6-10: IMPLICIT ECONOMIC AND SOCIAL DEVELOPMENT POLICIES

Policy	Types of adaptation (Scott et al., 2008b)*				
	1	2	3	4	5
Priorities and Action Agenda 2006-2015	✓	✓		✓	✓
National Investment Policy 2005				✓	
Vanuatu Millennium Development Goals	✓			✓	✓
ADB Country Partnership Strategy 2010-2014	✓			✓	✓

*1= Technical; 2=Business management; 3= Behavioural; 4= Policy; and 5= Research and education

None of these policies acknowledge climate change or include explicit climate change adaptation measures. However, elements of these plans may help the tourism sector adapt to climate change. For example, the VTAP 2008, which is currently in the process of being implemented, involves a range of technical, business management, policy, and research and education adaptation types of measures. One example is the support of the geographical spread of tourism by incorporating provincial tourism products and icons into the VTO marketing. The diversification of the product offering will enhance the overall resilience of the tourism sector. In a similar vein, the implementation of an international aviation strategy is another example of policies 'implicitly' contributing to climate change adaptation in the tourism sector.

6.2.3.2.1 Tourism policies

In recent years, the Vanuatu Government has acknowledged the importance of the tourism sector to secure economic growth and has developed a number of policies related to tourism. Figure 6-5 highlights the organisational structure of the tourism policies and policy documents within Vanuatu.

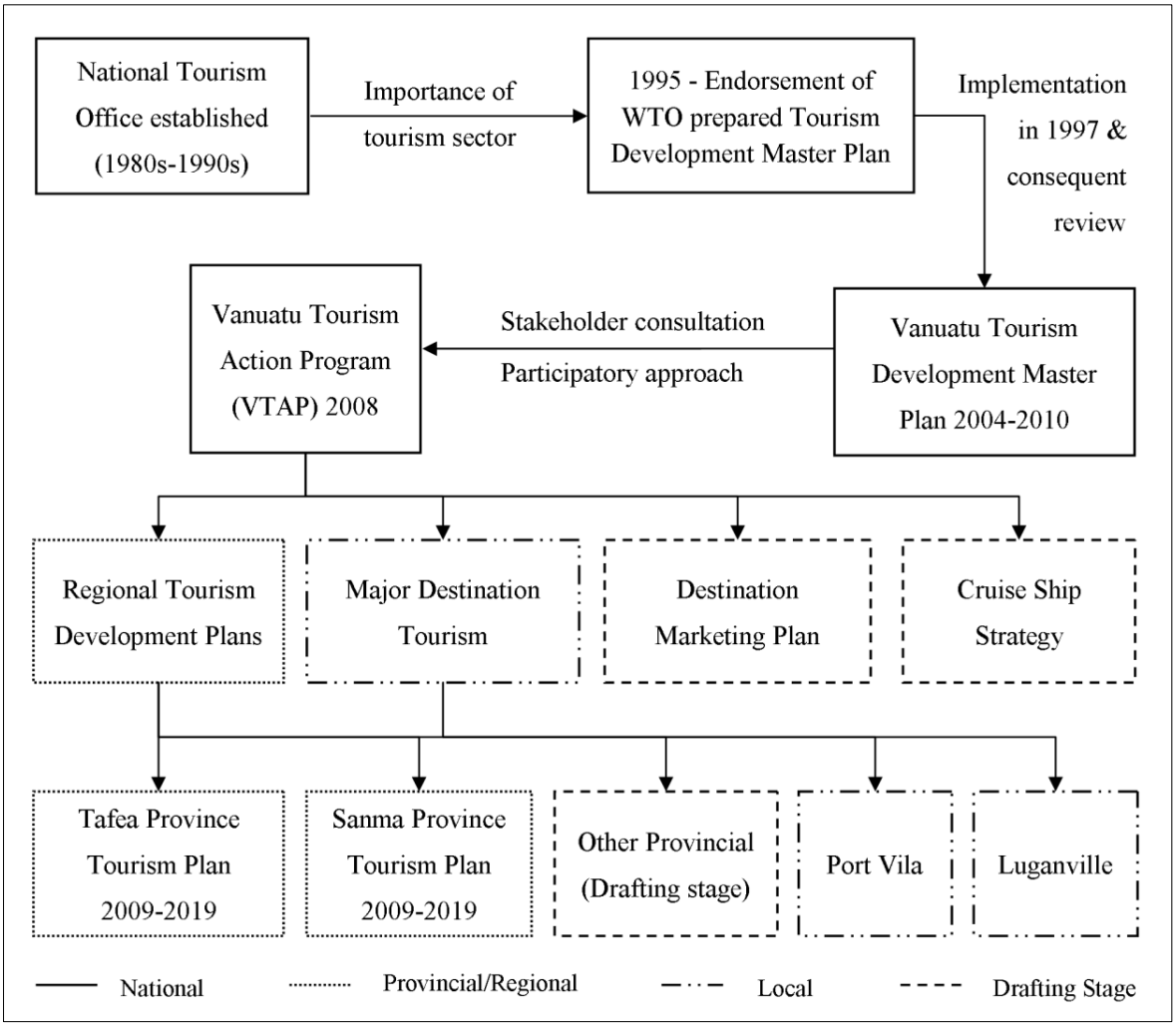


FIGURE 6-5: OVERVIEW OF TOURISM SECTOR POLICIES.

According to an interviewee from the Government, *"the national tourism office was first established"*[21] during the 1980s and 1990s and "in *the early 1980s, it was decided by the national planning office that a sector plan should be written to guide further development of tourism and to further grow this sector."*[21]

This plan was brought into life in 1995 when the UNEP and the UNWTO prepared a *Tourism Development Master Plan* for Vanuatu, which was endorsed by the Government (VNSO, 2007). This plan was implemented in 1997 and was subsequently reviewed a number of years later. It was then concluded that a new master plan was to be developed, as too many changes had occurred in the sector. The *Vanuatu Tourism Development Master Plan 2004-2010* sets out the overall policy for the tourism sector, and is to be implemented through the *Vanuatu Tourism Action Program (VTAP) 2008* and its sub-sector plans, as highlighted in Figure 6-5.

6.2.3.2.2 Environment and disaster risk management policies

Environment and disaster risk management policies will have an impact on the tourism sector. Seven implicit policies were identified within the environment and disaster risk management policy area. Each of these will be briefly described below.

The *Priorities and Action Agenda 2006-2015* highlights four overarching policy objectives within the environmental and disaster management area: " (1) Promote sound and sustainable environmental practices, (2) Ensure sustainable management and conservation of Vanuatu's biodiversity, (3) Integrate Hazard and Risk management concerns into policies in order to reduce environmental risk, and (4) Promote traditional and cultural disaster management know-how and self-help within the community" (Government of the Republic of Vanuatu, 2006, p. 7). These 'motherhood' statements have been applied to policies at the sector level in differing ways.

In the policy area of disaster risk management, only one policy was identified: the *Disaster Risk Reduction and Disaster Management National Action Plan 2006-2016*. This was developed as a result of the endorsement of regional policies. Figure 6-6 provides an overview of how the policy document was developed. Figure 6-7 provides an overview of how the overarching government policies have been applied to this sector policy.

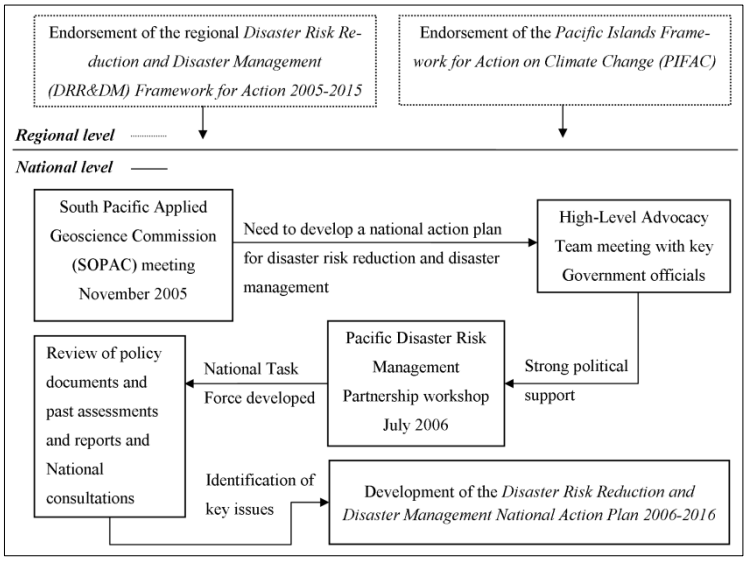


FIGURE 6-6: TIMELINE OF THE DEVELOPMENT OF THE DISASTER RISK REDUCTION AND DISASTER MANAGEMENT NATIONAL ACTION PLAN 2006-2016

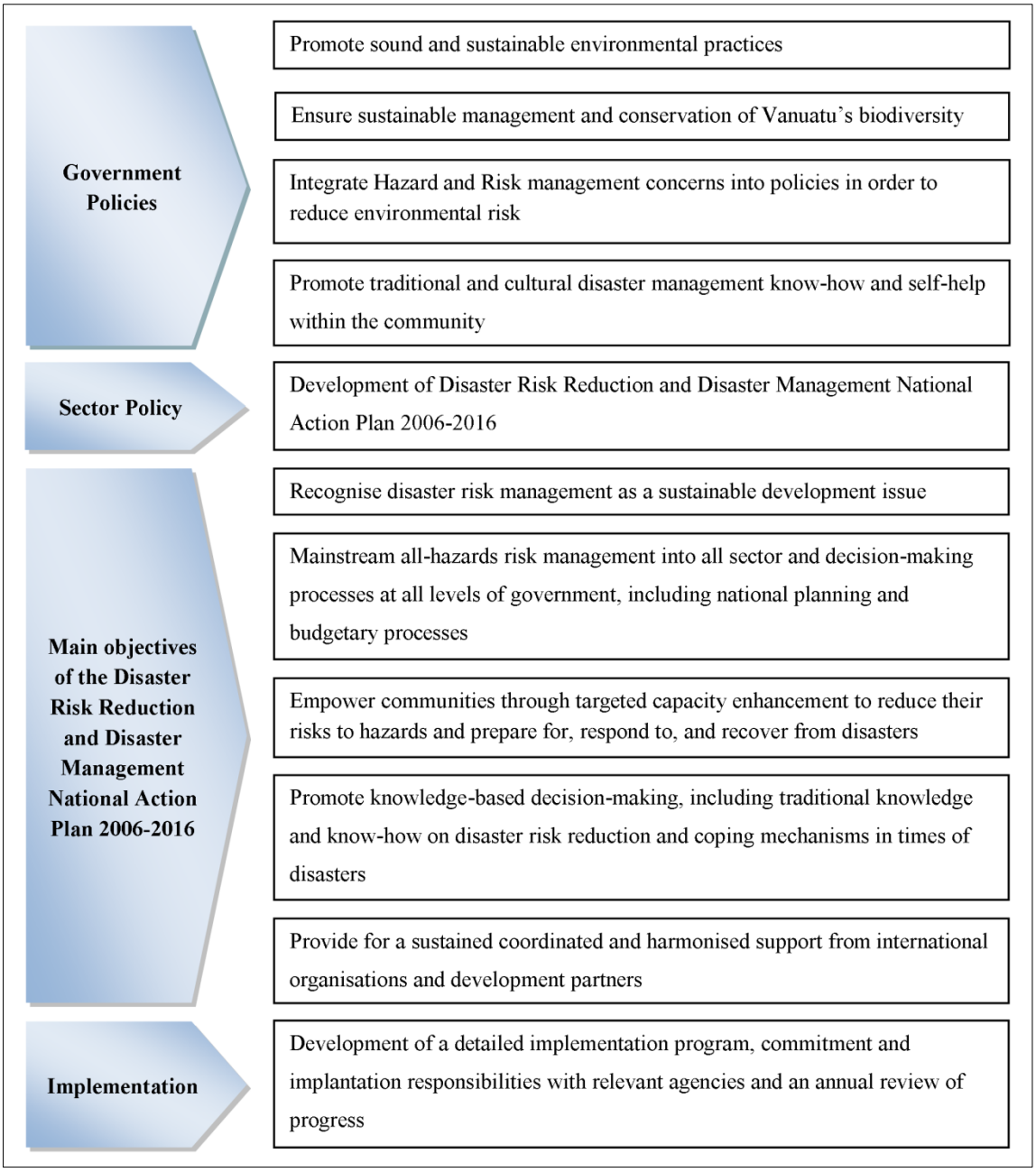


FIGURE 6-7: NATIONAL POLICY IN ENVIRONMENTAL AND DISASTER MANAGEMENT AREA DEVELOPED INTO A NATIONAL ACTION PLAN

There were six implicit policies identified within the environment area. One policy is regional, two are national, and the remaining three are provincial/local of nature. The *Action Plan for Managing the Environment of the Pacific Islands Region 2005-2009* is a regional policy providing direction for the individual nations. The *National Biodiversity Conservation Strategy 1999* and the *Environmental Management and Conservation Act 2002* are national policies providing the legislative framework for the environment as well as directions for conservation actions. At the local and provincial level, the *WSB*

Environment Program 1995, the *Ban of the Collection of Coconut Crabs in the Sanma province 2007-2012* and the *Registering of the Vatthe Conservation Reserve* under the *Environmental Management and Conservation Act 2002* are examples of community driven or run policies.

The *WSB Program 1995* has proven very successful and has expanded considerably. A notable sub-program of this is the Turtle program, where turtle warriors are assigned within local communities and trained to undertake monitoring of the turtle populations. The program also runs valuable community awareness programs through performances run by their theatre group.

As briefly touched on earlier (Section 6.2.2.1), the coconut crab taskforce is a community-oriented program that started in 2004. The consequent development of the *Ban of the Collection of Coconut Crabs in the Sanma Province 2007-2012* was driven by the community with the assistance of a lawyer from New Zealand. The initial ban was two years in length, but it proved so successful that the ban was extended another five years by the Minister, resulting in the current policy.

The *Registering of the Vatthe Conservation Reserve* under the *Environmental Management and Conservation Act 2002* was also strongly lobbied by the local community. The community was aware of the global requirements to have national reserves and parks to ensure that these important natural environments remain for future generations, and they approached the Government to ensure that this would be implemented. However, this policy has its limitations in that there is no established management plan for the reserve.

6.2.3.2.3 Other policies

Twelve implicit policies did not fit into the three key policy areas identified, but they are also pertinent to the Vanuatu tourism sector's adaptation to climate change. With the exception of the *National Action and Priorities Agenda*, discussed earlier in this chapter, these 'other' implicit policies can be divided into three policy areas: fisheries, infrastructure, and economic and social development, as follows.

Fisheries are an important sector in Vanuatu and due to the significance of dive tourism in Luganville and Vanuatu in general, the policies of this sector will influence the tourism system heavily. The *Fisheries Act No. 55 of 2005* provides the legislative

framework for the sector, whereas the three individual sub-sector plans (*National Marine Aquarium Trade Management Plan 2008*, *Aquaculture Development Plan 2008-2013* and *Revised Tuna Management Plan 2008*) provide more detailed management and development plans for the sector.

Infrastructure-related policies: *Vanuatu Land Sector Framework 2009-2018* and *the MCA Vanuatu 2006-2010* are also relevant implicit policies. The *Vanuatu Land Sector Framework 2009-2018* aims to "provide an enabling environment for multi-stakeholder participation in the effective use, management and stewardship of Vanuatu's land resources" (Vanuatu Ministry of Lands & Natural Resources & AusAID, 2009, p. 7). The *MCA Vanuatu 2006-2010* is a large-scale infrastructure project funded by the US Government.

The final five relevant implicit policies can be classified within economic and social development and are: The *Vanuatu Millennium Development Goals*, the *National Investment Policy 2005;* the REEEP partnership projects (i.e. *Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 1: 2009-2011*, *Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 2: 2009-2011*); and the *ADB Country Partnership Strategy 2010-2014*.

This section has dealt with the policy inventory of policies pertinent to climate change and the individual policies adaptation conduciveness. To summarise, five explicit policies and twenty-three implicit policies are pertinent to Luganville's dive tourism system's adaptation to climate change. Another important element to consider for effective action on climate change is the conduciveness of the policy environment to climate change adaptation (Leary et al., 2008).

6.2.4 Conduciveness of the policy environment to climate change adaptation

As discussed in Section 2.8.1.4, the conduciveness of a policy environment to climate change adaptation can be assessed based on the level of commitment of key stakeholders to the policy agenda, resource availability, and the presence of an enabling policy mechanism (Wong et al., 2011a, 2011b). The following presents the findings for each of these assessment criteria.

6.2.4.1 Commitment of stakeholders to the policy agenda: A sense of ownership in the policy process?

Although climate change is considered important in some sections of the government, there is little awareness of its importance in the tourism sector especially 'on the ground'. This may leave the sector less prepared for the challenges ahead. Consultation processes with local communities and industry players seem to be more process than performance oriented, which again weakens the effectiveness of the enabling policy mechanisms. Not all policies are implemented or enforced due to a lack of financial as well as human resources and skills. This is a real issue and may, as a consequence, result in Vanuatu being unprepared to cope with the adverse effects of climate change (Belle & Bramwell, 2005).

The national climate policy together with any tourism sector's explicit climate change policies if and once developed and implemented may partly address this gap. The national climate change policy will encourage the whole of government approach required to address the issue of climate change (Dredge & Jenkins, 2007), whereas the tourism sector's explicit policies will build on the opportunity of showing leadership through the development of a coherent policy agenda entailing perspectives of both development and climate change, as identified by Scott et al. (2008a).

The following quotes prove that there is some cynicism in the tourism industry in Vanuatu, which may hinder the success of stakeholder collaboration in the policy-making process. An interviewee from the industry group showed the interviewer a piece of paper and said, *"a person once told me that if you take a piece of paper and say this is the environment, then climate change is just a tiny little corner of the paper"*[20]. Another interviewee from the industry said that there is *"no back-up or funding from the Government to deal with climate change and that it is the rest of the world that will have to pull up the Pacific countries."*[18] Although this is a very cynical view of the situation, there is some truth in the matter as Vanuatu, an LDC, cannot afford to allocate sufficient resources (Republic of Vanuatu et al., 2007; Sem & Moore, 2009) to undertake the many adaptation measures that may be required to make its tourism sector more resilient. This is supported by an interviewee from the government, who mentioned that there was a real issue in relation to the implementation of plans - *"will there be enough funding to implement the [Sanma tourism] plan within this timeframe?"*[13].

The commitment by the key stakeholders of Luganville's dive tourism system to the policy agenda is in the developing stage; climate change has entered the policy arena, but is not yet a key focus. A vital example of this gap is the lack of explicit policies in the tourism sector. With the completion and implementation of the national climate change policy, this gap may be bridged by mainstreaming climate change in all sector policies.

6.2.4.2 Resource availability and the cost of adaptation

Financial resources as well as technical knowledge have been identified as limited in SIDSTs and LDCs (Scott et al., 2008a) and will impact on the adaptive capacity. This certainly applies to Vanuatu, where resources available for climate change adaptation in tourism are somewhat limited. This can be seen in the example of the reduction of the VTO budget, which has recently been cut by a third from 150 million Vatu (approximately US$1.6 million) to 100 million Vatu (approximately US$1 million) (Nadkarni, 2007), thereby reducing the sector's ability to plan long-term and be flexible. On the other hand, Vanuatu received funds from the LDCs fund, and a number of aid agencies (e.g. AusAid, ADB, and the MCA) fund climate change-related projects in Vanuatu as well as in the greater Pacific region.

There will be some costly technical adaptations needed to address the impacts of climate change on the natural resources and ecosystems crucial to tourism. Nevertheless, not all policies have to be costly to implement. Basic community-run or -driven projects and policies can be very effective. Two excellent examples in Vanuatu were provided by interviewees from the NGO group[10, 14]. One interviewee spoke of the NGO's community outreach programs and how a theatre group would perform when a new committee was set up and, consequently, provide awareness through their performance[10]. The other interviewee explained how the understanding of the life cycle of a specific species leads to a better caring of that species[14].

The Government of Vanuatu has also implemented a climate change adaptation initiative that has proven to be successful. A government interviewee explained that *"a Giant Clams farming project was developed to stop locals from exporting wild clams"*[27]. As mentioned by the interviewee, this project not only helps address the issue of a declining population of clams (limited natural resources), but also *"will provide*

another option and revenue system for these communities"[27], including viewing for divers (tourists).

6.2.4.3 Presence of an enabling policy mechanism

The presence of an enabling policy mechanism (see Table 6-11) can be seen in terms of the number of explicit and implicit policies identified in this analysis; the presence of consultation processes; and the growing inclusion of climate change in the policy arena. However, in many cases, foreign consultants are hired to develop the plans and strategies, which may prevent a sense of ownership of these policy documents, thereby weakening the successful implementation rate. Tourism stakeholders are involved in the policy process via workshops, but this consultation process can be significantly improved to make stakeholder collaboration more successful.

TABLE 6-11: PRESENCE OF AN ENABLING POLICY MECHANISM

Facilitating factors	Hindering factors
• 5 explicit policies. • 23 implicit policies. • Consultation processes in place. • Climate change entering policy arena.	• Foreign consultants hired to develop policies. • Consultation processes are process-based instead of performance-based.

6.2.5 Policy gaps: are the identified policies addressing the SIDSTs characteristics?

As suggested in Chapter 2, SIDSTs have characteristics that can make them more vulnerable to climate change. The following provides an overview of how the identified mix of explicit (Table 6-12) and implicit (Table 6-13) policies address the characteristics that make Vanuatu more vulnerable to climate change. Through such an overview, it is possible to highlight climate change adaptation policy gaps. This is part of step three of the second research objective.

The SIDSTs' characteristics that contribute to Vanuatu's vulnerability are being addressed overall through the mix of explicit and implicit policies with the two most addressed being *limited funds and human resource skills* (25 out of 28 policies) and *limited natural resources* (24 out of 28 policies). The least addressed SIDSTs' characteristics are the *limited size* (2 out of 28 policies) followed by *limited water supply* (6 out of 28 policies) and *population growth and density* (6 out of 28 policies). Although it is not always possible for policies to address all of the SIDSTs'

characteristics, it is important to acknowledge that these characteristics as contributing to vulnerability, address them where appropriate, and build on the strengths and opportunities of the nation. A further discussion of these individual policies and their adaptation actions is presented in Section 8.2 in Chapter 8.

TABLE 6-12: EXPLICIT POLICIES ADDRESSING SIDST CHARACTERISTICS

Policy	**Climate change adaptation addressing SIDSTs characteristics* that highlight vulnerability** (Sem & Moore, 2009)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
A Climate Change Policy and Implementation Strategy Discussion Paper for Vanuatu		✓		✓	✓			✓
The Forest Policy 2010-2020		✓			✓		✓	✓
National Adaptation Program for Action (NAPA) 2007		✓	✓	✓	✓		✓	✓
Pacific Adaptation to Climate Change (PACC) 2009		✓			✓		✓	✓
Pacific Islands Framework for Action on Climate Change 2006 – 2015		✓	✓		✓			✓

***** 1= limited size; 2= limited natural resources; 3= natural hazards; 4= limited water supply; 5= low economic resilience; 6= population growth and density; 7= infrastructure; and 8= limited funds and human resource skills

TABLE 6-13: IMPLICIT POLICIES ADDRESSING SIDST CHARACTERISTICS

Policy	**Climate change adaptation addressing SIDSTs characteristics* that highlight vulnerability** (Sem & Moore, 2009)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Priorities and Action Agenda 2006-2015	✓	✓	✓	✓	✓	✓	✓	✓
Disaster Risk Reduction and Disaster Management National Action Plan 2006-2016			✓				✓	✓
Vanuatu Tourism Development Master Plan 2004-2010	✓	✓	✓		✓	✓	✓	✓
Vanuatu Tourism Action Program (VTAP) 2008		✓			✓		✓	✓
TAFEA Province Tourism Plan 2009-2019		✓		✓	✓	✓	✓	✓
Sanma Province Tourism Plan 2009-2019		✓					✓	✓
National Investment Policy 2005		✓			✓			✓
Fisheries Act No 55 of 2005		✓						
National Marine Aquarium Trade Management Plan 2008		✓						✓
Aquaculture Development Plan 2008-2013		✓						✓
Revised Tuna Management Plan 2008		✓			✓			✓
Ban of the collection and fishing of coconut crabs in the Sanma Province 2007-2012		✓						
WSB Environment Program 1995		✓						✓
Environmental Management and Conservation Act 2002		✓						
National Biodiversity Conservation Strategy 1999		✓	✓	✓			✓	✓
Registering of the Vatthe Conservation Reserve under the Environmental Management & Conservation Act in 2004		✓						✓
Vanuatu Land Sector Framework 2009-2018		✓	✓			✓	✓	✓
Vanuatu Millennium Development Goals					✓	✓	✓	✓
MCA Vanuatu 2006-2010					✓		✓	✓
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 1: 2009-2011		✓						✓
Renewable Energy & Energy Efficiency Partnership (REEEP) - Project 2: 2009-2011								✓
ADB Country Partnership Strategy 2010-2014		✓			✓	✓		✓
Action Plan for Managing the Environment of the Pacific Islands Region 2005-2009		✓	✓	✓	✓			✓

***** 1= limited size; 2= limited natural resources; 3= natural hazards; 4= limited water supply; 5= low economic resilience; 6= population growth and density; 7= infrastructure; and 8= limited funds and human resource skills

6.3 Chapter 6 summary

This chapter discussed the policy-making environment, the policy-making procedures, and the current policies in relation to climate change adaptation for Luganville's dive tourism system. The main conclusions from the policy analysis were: (1) a number of explicit and implicit policies do address climate change issues that will enable Vanuatu generally, and its tourism sector more specifically, to adapt to climate change; (2) however, only one policy is explicitly concerned with both tourism and climate change: (3) none of the tourism plans identify climate change as a risk and do not set out actions to adapt to it (the Vanuatu tourism master plan and the current two provincial tourism plans do not consider climate change at all); and (4) the implementation of policies is a real issue. Adaptation policies, like all policies, are only effective if implemented and reviewed on a regular basis. It has been highlighted that climate change does not rate highly on the Vanuatu political agenda and financial resources to implement policies are strained. This may result in Vanuatu being left unprepared to cope with the effects of climate change and may increase the likelihood of severe consequences.

7 TESTING THE KEY ELEMENTS: SENSITIVITY AND ADAPTIVE CAPACITY

"Vulnerability to environmental change is not the same for different populations living under different environmental conditions or faced with complex interactions of social norms, political institutions and resource endowments, technologies and inequalities."

(Adger et al., 2001, p. 20)

7.1 Introduction

This chapter identifies the sensitivity and adaptive capacity of the dive tourism system (step four of the second research objective; see Table 7-1), both important aspects of assessing vulnerability.

TABLE 7-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(2) Test the established key elements in the context of Vanuatu's dive tourism system.	Step 4: Sensitivity and adaptive capacity • Sensitivities. • Adaptive capacity.	• Semi-structured interviews; • Group discussions; • Observations noted in field diaries; and • Analysis of secondary data	• Assessing the vulnerability (function of exposure (covered in steps 1, 2 and partly 3), sensitivity and adaptive capacity) of a system requires a multi-facetted data collection. This has been based on previous research undertaken (Calgaro, 2010).

7.2 Luganville's Overall Sensitivity and Adaptive Capacity

The decisions made by the tourism sector today will influence the vulnerability of the sector to climate change tomorrow (GEF et al., 2009). Consequently, having an understanding of the sensitivities that can hinder climate change adaptation or heighten the tourism system's vulnerability will be crucial to build the resilience of the Luganville dive tourism section. An awareness of the current adaptive capacity and possible opportunities can facilitate adaptation of the dive tourism sector. Table 7-2 provides an overview of the key analysis themes and illustrative quotes.

TABLE 7-2: SENSITIVITY AND ADAPTIVE CAPACITY DATA ANALYSIS – ILLUSTRATIVE EXAMPLES

Key themes	Examples of themes from primary methods (i.e. interviews and group discussions)	Examples of themes from supporting methods (i.e. secondary data, observations noted in field diaries)
Tourism specific	• **Destination marketing** – *"We have a very limited marketing budget. You compare Vanuatu to our neighbours on either side which is New Caledonia and Fiji and both those guys have at least six to 10 times the marketing budget that Vanuatu has…"*[1] • **Destination image** – *"Luganville is affected by ethnic problems, fights in the streets. This comes up in the papers and scares the tourism community. People coming from the outer islands, [they are] coming here with no job and then start robbing and stealing. It is a real issue at current!"*[C]	• **Destination marketing** - "Despite the rise in tourist numbers, government funding support for promotion has faced a cut from 150 million vatu to 100 million and VHRA member establishments plan to come up with up to a third of the annual budget by charging a 100 vatu per room night levy on customers" (Nadkarni, 2007, n.p.) • **Destination image** – "Holiday visitors are primarily motivated by 'sun and sand'… There is a significant dive market, which is largely focussed on Santo, where the wreck of the President Coolidge is one of the world's most accessible wreck dives" (SPTO, 2003, p. 6).
Economic	• **Livelihood portfolios** – *"there are more expatriates in accommodation than Ni-Vanuatu. Ni-Vanuatu operate small scale businesses. [The] difference is the capital available. Expatriates have much, Ni-Vanuatu [people] have very little, so they start small."*[37] • **Credit history** – *"…Good financial management and good strategic planning, one should always have a buffer, a cash buffer or a reserve to see through what we go against…I am not aware of any business here that has gone broke. We have had businesses changing hands but that is more for commercial benefit than anything else. There are no resorts that have had to close down…"*[38]	• **Livelihood portfolios** – "Two economic systems operate side by side in Vanuatu: the subsistence economy and the cash economy. Over 70% of the population live on their traditional lands, growing food crops and harvesting forest and marine resources for personal consumption, exchange and gifting….There is a gradual merging of the two economies as interest grows in small-holder business activities, most notably in transport, agriculture, livestock and tourism" (Silas-Nimoho & Whyte, 1999, p. 14). • **Liquid and fixed assets** – "Based on the 2000 Census, 86.9 per cent of ni-Vanuatu received income between zero and VT79,999 a month, while 83.5 per cent of expatriates received VT99,999 or more" (Ratuva, 2010, p. 55).
Human and social	• **Knowledge and skill levels** – *"Schooling, to get them through high school to start with, then if this place grows it will be through tourism. The money should be spent on specialised tourism courses and that's when you'd get people interested in environment here through tourism,*	• **Kinship networks and groups** – "For countries such as Vanuatu, where about 80 per cent of the population exists within the informal economy, systems of informal social protection are very much part of their daily lives and they are readily available to respond to

	saying that people aren't going to come here if the reef's dead, if the island disappears under water. So education is the most important thing…"[5] • **Information of risks** – *"We're all concerned [about the impacts of climate change]. We don't have enough information about climate change. This should be provided by governments, schools, and media (i.e. radio)"*[41]	market-generated calamities such as sharp increases in food or fuel prices" (Ratuva, 2010, p. 43) • **Knowledge and skill levels** – "Many tourism businesses - particularly in the accommodation sector – are owned and operated by foreign interests. There are a number of training initiatives designed to increase the flow of ni-Vanuatu supervisory and management personnel…" (SPTO, 2003, p. 3).
Physical and environmental	• **Biophysical alterations and changes** – *"I see the biggest problem here is not so much the expat or investor community, it's actually the new Vanuatu community who don't seem to be taking pollution in all its forms seriously at all. They've lived with biodegradable all their lives and they don't seem to be able, even over the last 100 years to adapt to the western world where things are not biodegradable, so they throw everything everywhere. If you walk up and down here you'll see rubbish everywhere…"*[26] • ***Infrastructure*** *– "[We have] got [our] own running water here, but [it is] not working 100 per cent. Occasionally, [we experience] difficulties with the pump, [and] maintenance of the engine pump. We require a maintenance program, which require funding. If it breaks down, we have nothing to fix it with, so [we] need to buy [a] new engine."*[B]	• **Biophysical alterations and changes** – "During the 1960s, there was an acceleration in agricultural development, with more bush cleared for cattle ranches and more ni-Vanuatu evicted from their traditional lands. Then a major land boom began in the 1970s, with land for the first time subdivided for expatriate residential development" (Cox et al., 2007, p. 9). • **Infrastructure** - "…waste is generally disposed of by illegal storm water connections, direct discharge into waterways, or poorly designed and maintained septic systems that leach containments into groundwater" (ADB, 2009, p. 21).
Governance processes	• **Government responsibilities** – *"...the government need to do more for Luganville – we seem to be forgotten. Most of the expats come from here, but very little comes back."*[45] • **Cultural governance processes** – *"[There are] some things that local people here will embrace. For example eating turtles was a common thing, then they kind of made it taboo... ...Now it is quite rare to see, probably still happens maybe up north but I don't know, but you don't see as often as you used to turtles being slaughtered on the beaches or eaten in the villages as a whole. That was their own decision to do it."*[A]	• **Cultural governance processes** – "*…This chief was still fairly new and still had to move up the hierarchical ladder. More pigs killed and more wives, the more respected, and enemies suddenly want to become allies"*FD1, 03 October 2010 • **Cultural governance processes** – "Cultural factors may also inhibit individual entrepreneurship. Individuals who enjoy financial success are expected to redistribute the benefits among their clan and community, or (in the retail sector) to extend credit to friends and family (Cox et al., 2007, p. 14).

Sensitivity and adaptive capacity can present itself in a range of socio-cultural, economic and environmental factors. In line with Calgaro (2010), these factors are divided into five categories, each of which will be explored in this chapter: (1) tourism specific; (2) economic; (3) human and social; (4) physical and environmental; and (5) governance processes. Many other authors highlight similar contextual factors as influencing social vulnerability (UNISDR, 2009; O'Brien et al., 2008; Smit & Wandel, 2006; Turner et al., 2003; Adger et al., 2001; Klein et al., 1998) and local livelihoods (Gaillard et al., 2009) by constraining the capacity to adapt (O'Brien et al., 2008). Furthermore, these categories cover the necessary social processes and products (e.g. social capital, human capital, financial capital, decision-making, and trust), which are required to enhance adaptive capacity (Matthews & Sydneysmith, 2010).

The factors in each of the categories were analysed in terms of the primary data (i.e. group discussions and interviews) from the second field visit and the ability of this data to be constraining (i.e. increasing sensitivity), neutral or enabling of adaptive capacity. Table 7-3 below provides an overview of the analysis and highlights any constraining, neutral and/or enabling factors for each of the sensitivity indicators demonstrating the overall sensitivity and adaptive capacity of the dive tourism system in Luganville.

This analysis approach was adapted from Leith and Haward (2010), who undertook a Rapid Collaborative Vulnerability Assessment (RCVA) of the oyster industry. The reason this analysis approach was adapted to this research was that some aspects within the various categories came across as highly enabling of adaptive capacity, whereas other comments indicated significant sensitivity. The analysis presented in Table 7-3, therefore, allows a hint of this 'sensitivity to adaptive capacity' spectrum to be told. This was considered important, as robust and more flexible climate change adaptation actions are achieved through taking into account the various perspectives of stakeholders (Jäger & Moll, 2011).

TABLE 7-3: OVERVIEW OF THE ANALYSIS OF THE SENSITIVITY OF LUGANVILLE'S DIVE TOURISM SYSTEM IN RELATION TO NUMBER OF SOURCES CODED AS BEING CONSTRAINING, NEUTRAL OR ENABLING TO ADAPTIVE CAPACITY

Categories	Factors	Sensitivity/adaptive capacity (number of data sources coded)		
		Constraining (sensitive)	Neutral	Enabling (adaptive capacity)
Tourism specific	Tourism seasonality	11	4	2
	Markets and marketing strategies	10	7	9
	Destination history and positioning	17	18	18
	Destination image sensitivity	9	6	4
Economic	Livelihood portfolios	15	12	7
	Liquid and fixed assets	2	0	6
	Credit history and insurance	4	0	8
	Job security and welfare safety nets	12	6	12
Human and social	Knowledge and skill levels	12	3	14
	Labour capacity	4	7	4
	Information on risks and trends	24	5	20
	Kinship networks and groups	2	1	12
Physical and environmental	Access to natural resources	16	1	5
	Infrastructure and transport options	17	7	12
	Biophysical alterations and changes	13	5	5
Governance processes	Government responsibilities	21	14	15
	Laws, policies and rights	1	2	10
	Cultural governance processes	4	3	5
	Tourism business networks	1	0	2
	Levels of stability and change	1	0	1

Source: Adapted from Leith and Haward (2010)

As indicated, the results presented in Table 7-3 are based on my analysis of the available data and a generalisation of these findings, but some aspects of the tourism system may (for some stakeholders) come across as more sensitive or have a higher

adaptive capacity than presented here. This is because adaptive capacity can vary across the different stakeholders, as well as across time and may even differ in regards to different hazards (Dazé et al., 2009). A difference that is identified by two distinct aspects of social vulnerability: individual and collective vulnerability. Adger et al. (2001) explain:

> "Individual vulnerability is determined by access to resources and the diversity of income sources, as well as by the social status of individuals or households within a community. The collective vulnerability of a social grouping is determined by institutional and market structures, such as the prevalence of informal and formal social security and insurance, and by infrastructure and income. While these individual and collective aspects can, for convenience, be disaggregated, they are, of course, intrinsically linked through the political economy of markets and institutions" (p. 22).

Acknowledging this limitation to the study, it is suggested that the findings presented in Table 7-3 are tested further with all key stakeholders in a future study. Nevertheless, the benefit of Table 7-3 is that it allows for an indication of the specific factors needing to be addressed and those that should be further encouraged.

7.3 Tourism Specific

Based on Table 7-3, the tourism specific category has been divided into four factors in accordance with Calgaro (2010): (1) tourism seasonality; (2) markets and marketing strategies; (3) destination history and positioning; and (4) destination image sensitivity.

7.3.1 Tourism seasonality

Tourism seasonality is a factor that influences tourism destinations' sensitivity to changes in the climate (Scott, Lemieux & Malone, 2011) and around the world tourism and recreation are, to some extent, conditioned by seasonal weather variations (Moreno & Amelung, 2009; Hall & Page, 2002). Furthermore, seasonality has been established as a factor that influences destination vulnerability (Calgaro, 2010, Mirza, 2003). An evaluation of seasonality in Vanuatu supports this argument in part. Tourism seasonality was mentioned in eleven[28, 30, 32, 36, 39, 40, 41, 44, 45, 47, 54] of the data sources. The first months of the year are the slowest times of the year in terms of tourism numbers[36, 41]. This could be due to the fact that this is the height of the summer in Australia and the potential tourists prefer to stay at home[41]. The fact that this is the height of the cyclone season,

which runs from November to April, may also play a significant role. During this time, it is hotter and wetter in Vanuatu and in this time of the year "cyclones build up across the warm waters of the Pacific Ocean" (Harewood et al., 2006, p. 177). It was noted by many respondents that tourism numbers increase from March through to October and then again from November to December. Furthermore, as a private sector respondent highlighted in terms of seasonality, *"We still have tourists coming although there are ups and downs, but it gets busier during the Australian school holidays"*[30].

The graph in Figure 7-1 shows the seasonality of tourism for 2010-2011. It shows that the peak season is around July (for tourists arriving by air), but that tourism numbers do not decrease significantly across the rest of the year. As a private sector respondent noted after briefly highlighting the peak season (i.e. April to September) of her business, "*business is all year around*"[44]. A similar conclusion was made by the ADB (1997): "Seasonality is not a major factor and in only 3 months of the year are tourist arrivals less or greater than 10 percent of the monthly average" (p. 213). As a result of this, individual employees are employed all-year round and not asked to leave in the non-peak season.

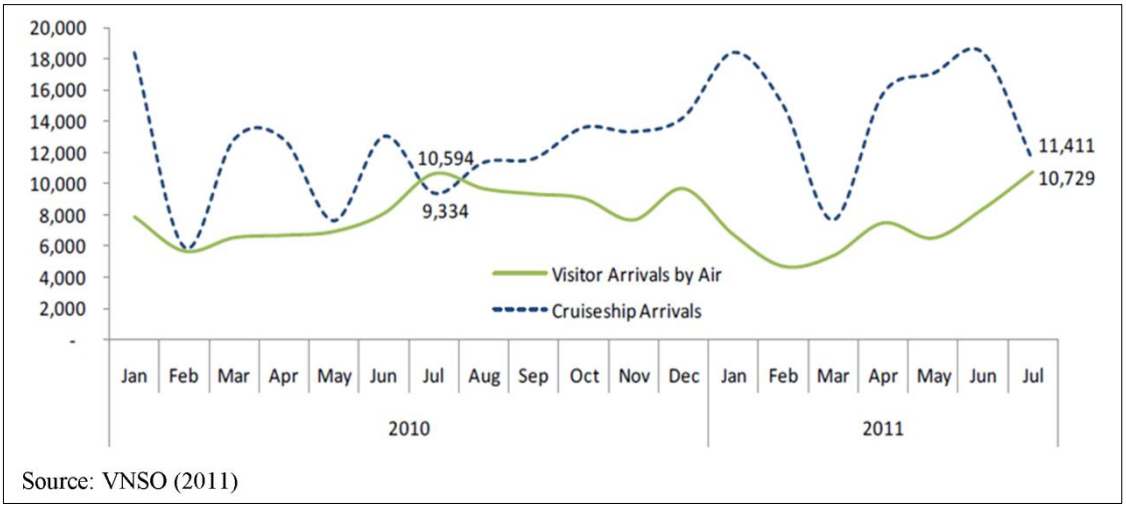


FIGURE 7-1: OVERVIEW OF TOURISM SEASONALITY FOR 2010 AND PART OF 2011

Seasonality staff shortages in Luganville are instead managed through the provision of annual leave and allocation of staff hours and days off. Furthermore, efforts are being made by destination stakeholders to diversify the types of visitors that come, which in turn helps to spread tourist arrivals across the whole year. As one public sector respondent explained, the national tourism stakeholders are: "*...inventing something*

together, moving advertising to other markets: i.e. couples that are older and have no kids. [We are] trying to find niche markets to cater for"[36]. The private sector in general is also developing new marketing strategies to increase low season tourist flows. For example, the "*Iririki Resort have a marketing strategy to attract tourists during low season*"[28].

Although seasonality is not currently a major constraining issue (ADB, 1997; Republic of Vanuatu, 2008), it may become more sensitive in the future. This is because changes to the weather patterns in terms of precipitation as well as temperatures are more likely to be a deterrence to travel to destinations than changes to the beach characteristics, according to Coombes et al. (2009). Research shows that the presence of sunshine is crucial to beach destinations/holidays and that the preferred temperature for these types of holidays are between 25-28°C, with some tourists preferring even warmer conditions (Scott, Gössling & Freitas, 2007). The current average temperature during the hot season (i.e. 29°C (VTO, 2009b)) therefore already exceeds the generally preferred temperature for beach destinations. Consequently, any future increases in day temperatures may affect the tourism numbers negatively during this hot season.

7.3.2 Markets and marketing strategies

The vulnerability of a tourism system is influenced by a destination's tourism markets and marketing strategies (Calgaro, 2010; Calgaro & Lloyd, 2008), as marketing of a destination influences its destination competitiveness (Dredge & Jenkins, 2007). In Vanuatu, the current marketing strategies focus may constrain the adaptive capacity of the dive tourism system in Luganville. For example, the high dependence on two tourism markets (i.e. Australia (58.4 per cent), and New Zealand (16.8 per cent)) creates a significant sensitivity to not only shocks and stressors in the tourism destination region, but also in these origin countries (i.e. Australia and New Zealand). For example, if the carbon tax in Australia significantly influences the disposable income of individuals and families, this may influence their ability to travel to a medium or long-haul destination like Vanuatu. At first thought, Vanuatu might not appear to be a long-haul destination from the origin countries of Australia and New Zealand. Nevertheless, Brisbane, Sydney, Auckland, Christchurch and Melbourne range from medium to long-haul connections, according to the definitions provided by Burns & Vishan (2010) (See Table 7-4). This may mean that carbon taxes and changes to ethical behaviour in these origin cities/countries may affect the number of tourists flying to Vanuatu, as the

current literature suggests (DeLacy & Lipman 2010; Nurse et al., 2009). Furthermore, the vast majority of visitors purchase their holiday through a wholesaler, which leaves operators and businesses in Luganville with little control over the tourist arrivals, unless these businesses also promote their business in guidebooks or via websites (Calgaro & Lloyd, 2008).

TABLE 7-4: FLIGHT CONNECTIONS FROM ORIGIN CITIES TO LUGANVILLE

Tourism Generating Regions (TGRs)		**Flight Connections***		
Country	***Origin city***	***Short-haul <1000km***	***Medium haul 1000km-3000km***	***Long-haul <3000km***
Australia	*Brisbane*		1975.10km	
	Sydney		2595.80km	
	Melbourne			3303.54km
New Zealand	*Auckland*		2490.50km	
	Christchurch			3161.36km

* Distance from origin city to destination calculated using distance calculator: http://www.distancefromto.net/

Limited data exist on the different types of markets arriving to Vanuatu. Nevertheless, this will be important information, as the sensitivities of the different markets may differ. For example, a private sector respondent highlighted the need to further separate the Luganville and Port Vila markets. He described Luganville as the 'adventure based' tourism market primarily for divers and Port Vila as the 'Fly and Flops' market for tourists who stay at the pool[38]. The respondent was of the opinion that the adventure tourism markets "*are less likely to be influenced by negative press*"[38]. Although this requires further empirical testing, there is an indication that this may be true, as research on the adventure tourism market highlights that risk is an essential part of the adventure (Cater, 2006; Kane & Tucker, 2004).

Many of the businesses rely on word-of-mouth marketing and are limited in their opportunities for collaborative marketing approaches. According to one private sector respondent, his marketing tools are word-of-mouth and his website, stating that *"it is up to yourself to promote the business"*[39]. Another private sector respondent used a more diverse range of marketing tools, including Internet marketing, wholesalers, and magazine marketing[40]. Nevertheless, the reliance on word-of-mouth remains the most effective tool for them[40]. A resort manager mentioned that he promoted the resort

through his previous contacts in Australia, wholesalers (since they have become a bigger resort they deal more and more with wholesalers), and the internet. He went to further state that

> *"…40, maybe 30-40 per cent of our business is commercial…we've got four of the road people living here (they've been here for six weeks now), politicians, business people, and one guy is here for a week, no he stays here for a month, he is teaching at the Naratong College and there is another guy here for a month and he is doing a course at the Naratong College"*[38].

He concluded *"that gives us a very nice tourism and commercial mix, which gives us a bit of a buffer for the lower season"*[38]. In other words, this leaves his business less sensitive to large drops in tourism numbers, as the tourists only represent a portion of his clientele.

Vanuatu has a very small national marketing budget when compared to their neighbours, as one respondent noted:

> *"We have a very limited marketing budget. You compare Vanuatu to our neighbours on either side which is New Caledonia and Fiji and both those guys have at least six to 10 times the marketing budget that Vanuatu has. That's a result of a few things. It's the result of government budgeting procedure but really it's a reflection of visitor arrivals. As visitor arrivals increase, so too does the private industry contribution to destination marketing and with an increase in that how good they sorted it out. As we get more arrivals we're going to have more money coming from the private sector into the destination fund and you would expect the government will increase budget in time as well. We hoping they'll increase our budget again, they're due to release budget sessions in parliament hopefully in November or due to, November/December. So we're hoping there will be an increase in the VTO budget again just to keep it in line with the arrivals number. So we're kind of competing in a crowded market place for the Australia travelling dollar and New Zealand travelling dollar against Thailand, Bali, Vietnam, Fiji, New Caledonia all those sorts of places."*[1]

The limited funding provided for national destination marketing to the VTO represents a significant sensitivity, as a public sector respondent noted on the issue of having a limited monthly-based budget to market tourism:

> *"We try to market as much as possible, but the limited budget makes it very difficult to make use of the opportunities, when there are downturns in other countries. It depends on the budget – if we don't get much it is limited what we can do."*[32]

Apart from being limited in size, the budget has also fluctuated in recent years (Nadkarni, 2007) making it difficult to plan for the long-term. For example, it may significantly impact the sector's readiness to respond to opportunities created by external events, such as political instability or social riots in neighbouring nations. A tourism marketing fund has been established, which is a private-public partnership (PPP) to increase the marketing budget, but the sector still needs a much larger marketing budget to compete with the better established tourism destination of Fiji, as an example. This PPP is discussed further in Section 7.3.6.

A new tourism slogan for Vanuatu 'Experience what matters' was launched in 2010. The branding strategy aims to address the issue that *"Nobody really knew what Vanuatu was"*[32]. According to a public sector representative, the idea behind the branding was to use a different colour scheme, show the diverse things to do, and in doing so invoke an emotional connection with the travelling public through the promotional material instead of relying solely on the products they offer [32]. The focus was on showing images that people would relate to, thereby, creating a desire to travel to Vanuatu. This branding strategy cost a considerable amount of money (it is part of an AusAid grant of AU$500,000 for marketing support in order to deal with the GFC (Cheer & Peel, 2011)), but only the future will tell if this marketing strategy will have a positive influence on the dive tourism system in Luganville.

It is also important that the employed marketing strategies portray the reality. As one public sector respondent observed, it is vital to not be *"Sitting in an industry which is pricing it out of context. It is not a reality of what is there, 4-star when only 3-star. Pricing too far can be damaging"*[36]. Consequently, the sector needs to ensure it is not over-promising and under delivering. The following provides an extract from one of the field diaries, which discusses one person's thoughts on the service provided in Vanuatu:

> *"I just read my notes from the first days, especially the comments on the service. In Luganville, the service is of a much lower standard overall. Most people try very hard but the service that is delivered is often not ideal. I personally don't care usually but it was obvious that it could have an effect on tourists. In Port Vila, most tourism staff [members] are visibly better trained"*FD2, 13 October 2010.

7.3.3 Destination history and positioning

This section focuses on the third factor within the tourism-specific category of step four (i.e. sensitivity and adaptive capacity) of the second research objective. Although, Vanuatu is a fairly new tourism destination (about 40 years), many positive aspects have helped position the destination in a good light. For example, Vanuatu has been named twice as the 'happiest place on Earth' (Lonely Planet, 2010; Nadkarni, 2007; Marks et al., 2006). Directly related to Luganville's dive tourism system, a private sector respondent commented that the:

> *"town hasn't grown, but there are now concreted foot paths, [although] the road was here from the US navy. [There is also a] positive feeling towards investors now, [and] good looking buildings are now being built."*[38]

Furthermore, Luganville has got some real potential to establish itself in the marine tourism and adventure tourism markets because it has the advantage of having the world's 14th best dive site at its doorstep (Garrod & Gössling, 2008). A private sector respondent pointed out during the first field visit that in "*Santo basically the industry revolves around dive tourism, they've got other stuff there of course but that's sort of their brand position"*[1].

The Coolidge is a key attraction (particularly for experienced divers) which, as a wreck, is less sensitive to rising sea surface temperatures and consequent coral bleaching than a dive destination based on coral reefs only. Consequently, each business will have different levels of vulnerability to the variety of shocks and stressors affecting the tourism system. For example, a dive operator whose entire operation relies on the health of the marine life and the famous wreck is more sensitive to cyclones and earthquakes than a tour operator, who has a wider range of attractions to base their products on. The accommodation, food and beverage sector businesses can also be extremely vulnerable

to shocks and stressors depending on their location and the type of shock and or stressor due to their fixed assets (Zhang, Lindell & Prater, 2008).

A number of negative events elsewhere have also positively impacted the positioning of Vanuatu as a tourism destination. The terrorist attacks in Bali[51, 52], the coups[38, 40, 41, 48, 51, 52, 53, 55] and flooding events [52] in Fiji and the ethnic conflicts in the Solomon Islands [33, 55] and PNG [55] have all caused an increase in tourist numbers to Vanuatu. Furthermore, the open sky policy (ADB, 2009), the emergence of Pacific/Virgin Blue[32, 52, 51, 55] (Cheer, 2010) and the opening of direct flights from Australia (Cheer, 2010), in particularly the direct flight from Brisbane to Luganville[32, 38, 42, 43, 45, 47], have had a significant influence on tourism numbers to Luganville and Vanuatu in general. Nevertheless, the strong reliance on tourism and dive tourists in Luganville does mean that the destination is somewhat sensitive to climate change and other events that disrupt tourist flows. Another sensitivity of the tourism system is that it is still small-scale when compared to Fiji tourism, which accounts for more than five times as many tourists than Vanuatu (Republic of Vanuatu, 2008). Consequently, Luganville has not yet established itself in the coastal and marine tourism and adventure tourism markets to maximum effect.

7.3.4 Destination image

Directly related to destination image, a belief that Vanuatu was part of New Caledonia has caused a serious downturn in tourism numbers in the past (Douglas, 1997). Past evidence also shows that the destination image sensitivity of Luganville to shocks is high, such as flight changes and riots covered in the media, as discussed in Chapter 5. For example, the tourism sector was heavily affected by the tarnishing of Vanuatu's image after riots took place in the early 1980s (shortly after independence), with a private sector respondent noting that the town *"kind of died"* around the time of the Santo rebellion[44], when 1,400 tourists were evacuated from Santo (Gubb, 1994). The political situation of Vanuatu in the mid-1980s has also been identified as a factor that caused serious downturns of tourism numbers to Vanuatu in general (Douglas, 1997).

Since then, tourism has continued to be affected by media events, but to a lesser extent. A private sector respondent points out,

> *"There was a recent conflict in July 2010. This year, it was the country's 30th year anniversary and there were some drunken guys – people from Ambae fighting. Police, for the first time, used their shotguns. We believe*

Vanuatu is a happy place and so this would destroy our image."[C]

Consequently, the destination may be more sensitive to shocks and stressors affecting the destination image than other more developed and established destinations. Comparative research is required to further test this hypothesis.

This section has partly addressed the fourth step of the second research objective by dealing with the tourism specific factors that may create sensitivity or adaptive capacity. In summary, seasonality is not yet a major issue for dive tourism in Luganville, but may become so in the future if increasing temperatures affect optimal tourism temperatures. Seasonality is currently dealt with through staff management, market diversification and marketing. Luganville's dive tourism system has a strong dependence on Australian and New Zealand markets leaving them sensitive to events affecting tourist demand from these nations. Moreover, holidays are often purchased through wholesalers leaving business owners with less control over tourist arrivals. Research on the different market segments is lacking, there are limited collaborative approaches to marketing and a limited and fluctuating budget for national destination marketing. Furthermore, businesses rely heavily on word-of-mouth marketing. Luganville's tourism system does not have a long history, but has been affected positively by Vanuatu being ranked the happiest place on Earth, the presence of the Coolidge, an open sky policy, and disruptive events occurring in neighbouring countries. Nevertheless, tourism in Luganville has been affected in the past by riots and rebellions and, due to its small-scale nature and the limited marketing budget, has seen some sensitivity to past shocks.

7.4 Economic

The second group of factors in step four of the second research objective is economic. The economic factors of a tourism system have been divided into four categories: (1) livelihood portfolios; (2) liquid and fixed assets; (3) credit history and insurance; and (4) job security and welfare safety nets, in accordance with Calgaro (2010).

7.4.1 Livelihood portfolios

Livelihood portfolios in Luganville are highly constrained and limited. Many of the respondents noted the importance of tourism as an employer. A public sector respondent noted that the greatest job opportunities derive from *tourism*-related businesses

including restaurants, hotels and subsidiary businesses and sectors; *government*, which is seen as the biggest employer in Vanuatu; and *agriculture* and *forestry* sectors, including the copra, coconut oil, timber and kava industries[45]. Other public sector respondents noted that *"Most of residents in rural areas are farmers and employ other community members to help them"* [42], but then moved on to say that *"to some extent the community relies on tourism, especially on east coast of Santo"*[42]. Consequently, tourism represents one of the few options for employment in the nation. As a donor and development respondent said *"very few are employed in the formal sector, but a very large part are employed in tourism"*[56]. A private sector respondent went further and stated that *"Tourism and hospitality will be the saviour of this nation in years to come [in terms of being an] employer; and [as a source of] foreign exchange"*[38]. With climate change predictions of the increasing intensity of cyclones and changing precipitation patterns (AusAID et al., 2011), the agriculture and forestry sectors may be affected through physical damage to crops and trees (Republic of Vanuatu et al., 2007). Consequently, as there are limited livelihood options, tourism may in the future become an alternative source of income for people that currently work in the agriculture and forestry sectors.

A study in Vanuatu pinpointed some key barriers to Ni-Vanuatu people wanting to establish tourism enterprises that are strongly related to economic factors. These included a lack of financial capital, limited business experience and a lack of linkages to global travel intermediaries (Cheer & Peel, 2011). Closely linked to these barriers is that the growth of local livelihoods in Luganville is constrained by the fact that the hospitality and tourism sector is predominantly run by expatriates from Australia and New Zealand[31, 37, 41, 45] and there is little integration between the expatriates and the Ni-Vanuatu[52]. A public sector respondent highlighted that

> *"There are more expatriates in accommodation than Ni-Vanuatu. Ni-Vanuatu operate small scale businesses. [The] difference is the capital available. Expatriates have much, Ni-Vanuatu [people] have very little, so they start small."*[37]

A public sector respondent reflected that a lack of familiarity with the expectations of tourists amongst the Ni-Vanuatu people could be hindering greater local involvement and success in tourism ventures:

> *"[When] comparing tourism with [the] primary sector – [the] primary sector is culturally related, whereas tourism is a new concept for the Ni-Vanuatu community."*[28]

The respondent went on to say that:

> *"Locals need to know what is required to invest in tourism businesses [to cater for tourists]. Tourism is often seen as an immediate benefit, but for locals to invest in tourism [will] take some time, [as it is] new to them [and very] different from growing crops, and [it] needs to meet certain standards and quality."*[28]

Consequently, there is also a strong level of expatriate ownership within the tourism sector.

Nevetheless, a government imposed reserve list tries to ensure Ni-Vanuatu involvement in tourism. The reserve list is a government initiative under the National Investment Policy that aims to preserve particular investment areas for citizens of Vanuatu only. The reserved investment areas include:

> "kava bars; open air vendors; mobile shops; door to door sales; taxis and bus services; private security services; professional services covered under Category F of the Business Licences Act No.19 of 1998 if turnover is less than VT 5 million; retail shops if turnover is less than VT 30 million; coastal shipping for vessels less than 80 tonnes; and electricians, electro-technicians and building constructors" (Government of Vanuatu, 2005, p. 7).

The reserve list has its pros and cons. While ensuring the involvement of the Ni-Vanuatu people in the tourism sector, it may also hinder the benefits in the form of skills, expertise, and investment that expatriate business people may bring. Furthermore, it limits the livelihood portfolios for the expatriates, as one private sector respondent pointed out, *"for expatriates, it is very difficult to get other jobs because of the reserve list"*[38].

A reliance on aid intervention within Vanuatu may also influence the economic sensitivity of the tourism sector. The Pacific SIDSTs are highly reliant on foreign aid, highlighting the role that donor and development agencies may play in tourism to try to eliminate poverty (Cheer, 2010). Nevertheless, the success of aid interventions in

supporting local livelihoods will depend on a range of factors, including "the quality of governance, extent of economic resilience, socio-cultural factors, and the frequency of natural disasters and protracted conflict" (Cheer & Peel, 2011, p. 255). Hughes (2010) argues that aid has been a major component of the decline of the Pacific, as very little of the benefits reach local villagers and shantytown dwellers. Tourism industry players in Vanuatu have also expressed concern about the real benefits of donor and development projects, with many projects never being implemented, as discussed in Chapter 5.

7.4.2 Liquid and fixed assets

The presence of liquid assets (e.g. cash, accounts receivable and savings in the bank) and fixed assets (e.g. buildings, equipment, fittings, and vehicles) influence the vulnerability of tourism systems, particularly by affecting the adaptive capacity of individual businesses (Zhang et al., 2008). With limited support from the government for the unemployed, these assets become crucial for the survival of a business and its employees.

Liquid and fixed assets stood out in the data as being enabling to adaptive capacity. This finding may be somewhat skewed as the majority of respondents discussing liquid and fixed assets were expatriate members of the community. For example, there were no Ni-Vanuatu dive operators in Luganville or Vanuatu, unless one counts pure snorkelling businesses within this definition (i.e. there are small-scale Ni-Vanuatu operators running snorkelling tours in Santo and in Aneitum)[31]. As a private sector respondent suggested when asked why there were no Ni-Vanuatu dive operators in the country:

> *"I think there is a number of Ni-Van dive masters and instructors, but it is in relation to the entrepreneurial experience. It's fairly capital intensive, ours [the respondent's business] is fairly small but it still cost us $50,000 to get it started."*[31]

Consequently, it is unclear how sensitive the Ni-Vanuatu population are in terms of access to liquid and fixed assets, as very few Ni-Vanuatu tourism business owners were interviewed.

This suggests that even if the skills to set up a business were present, the financial resources to do so are not available. As Cheer and Peel (2011) highlight, around 40 per cent of the population of Vanuatu earn less than $1 per day. Furthermore, six per cent of the households in Vanuatu live below the poverty line in terms of expenditure levels

(ADB, 2009). Although lending facilities have rapidly expanded since 2006, there are still further improvements to be made to ensure the availability of bank loan opportunities for small businesses (ADB, 2009). Alternative financial schemes do, however, exist.

Vanwoods is one such initiative. Established in 1996, Vanwoods is a women's micro-credit organisation that helps women start their own businesses, thereby, enabling them to meet the daily requirements (Ratuva, 2010). Three female, Ni-Vanuatu, respondents who had benefited from this scheme advised that an initial start-up loan of VT$10,000 was provided to them, requiring monthly repayments of VT$200 [43].

Another example is a microfinance program run by the National Bank of Vanuatu, which is called Vanuatu Women in Development Scheme, again enhancing the credit availability for women (ADB, 2009). There are also other micro-finance schemes available, which provide opportunities for both male and female applicants. For example, the Ni-Vanuatu Micro Finance Scheme offers two types of loans:

> "The two types of loan it offers are a micro-loan of VT30,000–100,000 for six to 12 months and small loans of VT100,000 up to VT2 million for a term of 12–36 months. The loan conditions include a 10 per cent interest rate per annum on small loans and cash deposits for security. About 190 projects have been funded since 2001 with an average loan value of VT400,000" (Ratuva, 2010, p. 51).

Another factor that may influence the availability of liquid assets is the high dependence on imports for certain tourism products. This may heighten the economic sensitivity of Luganville community members. As described by a private sector respondent, *"...fresh [ingredients] (meat, fish, vegetables) are all local – everything else is imported; rice, sugar, flour, cleaning products, hotel supplies."*[44]

7.4.3 Job security and welfare safety nets

The data indicates a lack of financial or social support from the government to help the unemployed re-enter the work force in Luganville and in Vanuatu in general. There is, however, a Vanuatu National Providence Fund (the VNPF is a pension scheme) and some banks can provide assistance in times of need. The VNPF is the only super fund and was set up in 1987 but only 3000 of the 5000 employers in Vanuatu actively contribute to the fund[50]. Two government representatives confirmed that *"since 2008,*

through amendment of the VNPF Act, the VNPF has started a member loan scheme"[50]. However, there is no pension service, so members are paid the lump sum after the age of 55, or earlier if special considerations are granted [50]. A lack of a decent pension scheme, therefore, heightens the economic sensitivity of the community. Without proper financial planning, this may indirectly influence tourism through the creation of tensions within the community. A private sector respondent noted how the locals have poor investment knowledge: *"They sell the land to buy a car"*, thereby they *"sell something of real value and invest in a depreciating resource"*. The respondent went on to highlight that *"this will create a social problem."*[51]

7.4.4 Credit history and insurance

The data shows that a good credit history and insurance enable adaptive capacity of tourism the sector. One of the respondents had savings in the bank[39], others had good relationships with their bank managers and an overdraft facility[44], or had fixed capital in terms of owning property[31, 40]. For those who did not mention savings in the bank, good banking relationships or ownership of property, access to financial schemes, funds and grants, micro-finance and/or school-fee loans were highlighted[28, 43, 47].

A private sector respondent noted the importance of having good financial and strategic planning in place combined with financial reserves in the bank for when there is a downturn in tourism numbers,

> *"…Good financial management and good strategic planning, one should always have a buffer, a cash buffer or a reserve to see through what we go against…I am not aware of any business here that has gone broke. We have had businesses changing hands but that is more for commercial benefit than anything else. There are no resorts that have had to close down. No, so yes there is some good planning, and then we haven't seen any major disasters here. I guess if everybody stopped coming tomorrow or in the next six months, then we might end up with a few things, but there hasn't been any major disaster of people going broke or anything like that. We don't have any major resorts."*[38]

The respondents who mentioned insurance[30, 31, 36, 37, 39, 40, 42, 47, 50, A] were all covered in one way or another. One male, Ni-Vanuatu, respondent, however, pointed out that *"Not all have insurance cover. This will impact on the tourism sector, if something*

happens"[36]. Furthermore, it is general knowledge in Vanuatu that not all of the taxis and buses have insurance coverage, which can become a real issue for tourism should an accident occur. This is confirmed by Ratuva (2010) who stated that Ni-Vanuatu people rely much more on informal social protection systems, whereas expatriates rely heavily on private insurance as well as other formal social protection systems. Access to both formal social security and informal social protection plays a role in determining the vulnerability and/or resilience of a system, as does the presence of insurance (Adger et al., 2001).

There is no regulatory framework to ensure that businesses have employee injury insurance[42], and businesses are unable to insure against cyclone damages[39]. One private sector respondent confirmed that when economic times are tough, insurance is one of the first things that businesses will cut back on:

> *"The first things that go? Uhm insurance that would be one thing and I have already started cutting back on that a little bit. I know that people talk about that too as people pay very high insurance premiums. So if you are feeling the squeeze, you might start risking things a little bit more without paying the insurance. You let service go on engines, which is not a good idea, but if you don't have, you know, the 200 bucks to put in for a service... Often enough that could be become a safety issue and it could cost more money in the long run. But you tend to seek out these short term things where you do not spend money on, because you're really feeling the pinch. Purely from a financial view, right. What else would I cut back on? I'd like to think that I wouldn't cut back on service. I like to service the motors, cars and boats and such because it is such a safety issue. But I think it could be something on average in the industry those can go by the wayside because there is absence of regulation requiring it..."*[31]

This section has further dealt with step four of the second research objective by discussing the economic factors influencing the sensitivity and adaptive capacity of Luganville's dive tourism system. In summary, the data showed that livelihood portfolios are limited, the dive tourism system is strongly dominated by expatriates, the reserve list encourages Ni-Vanuatu involvement, but hinders the benefits arising from expatriate involvement in the economic sector. There is a general reliance on aid

intervention, but the real outcomes of aid projects are questioned. Expatriate members of the system have access to both liquid and fixed assets, but the same access for Ni-Vanuatu members of the system is questionable, although several micro-financing opportunities exist. Support from the government is lacking, a pension fund with a member loan scheme exists, but there is no pension service. There is good credit history and insurance coverage for businesses run by expatriates, but that may not be the case with Ni-Vanuatu stakeholders. Furthermore, with limited regulation, it is argued that insurance protection may be neglected when businesses are in financial difficulties.

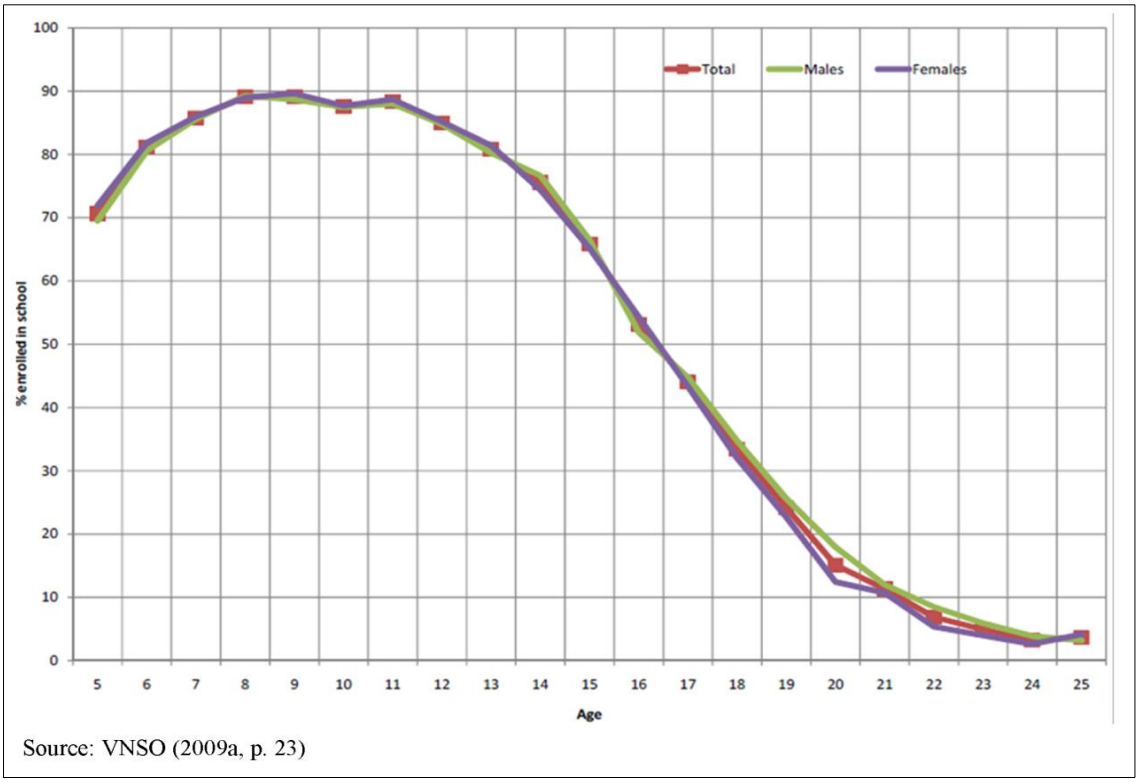
7.5 Human and social

In accordance with Calgaro (2010), the human and social factors have been divided into four themes: (1) knowledge and skill levels; (2) labour capacity; (3) information on risks and trends; and (4) kinship networks and groups. The following provides a discussion of the results for each of these themes.

7.5.1 Knowledge and skill levels

On a national level, knowledge and skill levels can be improved. According to the 2009 Census (VNSO, 2009a), 70 per cent of the population aged five are enrolled in school, this increases to approximately 90 per cent from age eight till eleven, after that it starts decreasing dramatically (see Figure 7-2). The graph indicates that less than half of young people in Vanuatu finish secondary school (data explicitly for Luganville is not accessible), and less than five per cent go on to tertiary education. A private sector respondent emphasised the importance of education, saying that funding for education should go first of all to schooling, then to specialisations:

> *"Schooling, to get them through high school to start with, then if this place grows it will be through tourism. The money should be spent on specialised tourism courses and that's when you'd get people interested in environment here through tourism, saying that people aren't going to come here if the reefs dead, if the island disappears under water. So education is the most important thing. An educated person is also harder to fool, they won't be happy with a wheelbarrow; they will ask questions of the people they elect, whereas a grassroots person won't."*[5]



Source: VNSO (2009a, p. 23)

FIGURE 7-2: PROPORTION OF TOTAL POPULATION AGE 5 TO 25 YEARS OLD WHO ARE CURRENTLY ATTENDING SCHOOL

This means that it is difficult for tourism business managers to hire skilled personnel, and much training needs to take place in-house[40]. A private sector respondent argued, *"Ni-Vans go elsewhere when well educated. Ni-Vans have the highest unemployment rate in the South Pacific"*[38]. This means that the level of skill for management roles is really lacking within the tourism sector. A public sector respondent noted, we are *"still lacking knowledge, training is needed; lowest level is trained, but we need training one level further up"*[36]. This is supported by a recent climate risk and adaptation country profile of Vanuatu that states that the impacts of natural hazards are exacerbated by an increasing number of competitive international markets for tourism and investment and "a social and cultural system with limited understanding and experience with business concepts and practices" (The World Bank, 2011p. 7).

Efforts to improve the skill levels related to tourism on a national level have in recent years been initiated through the establishment of vocational training schools. There is the Australia Pacific Technical College (APTC) in Santo and the Hospitality School in Port Vila. One private sector respondent mentioned that his staff received exposure to external training through the APTC in Luganville, which has been funded by AusAID[40].

A resort manager emphasised the importance of training, saying *"Training is everything"*[38] and also highlighted the role of the APTC in this area. This college has five different schools (ranging from health and community services to construction and electrical) with only the training of the school of tourism and hospitality being offered in Vanuatu (Australia-Pacific Technical College, 2011). The main purpose of the hospitality school (in Port Vila) is to train students in the various areas of food and beverage and hospitality in general and, thereby, enabling a better quality service in the tourism sector (ADB, 1997). Furthermore, courses in tourism and hospitality management have been offered twice yearly in the past by the Tourism Council of the South Pacific (ADB, 1997).

7.5.2 Labour capacity

Given that there is not a great fluctuation in tourism numbers across the seasons, employees are able to retain employment for the entire year. An employee also noted that *"It is hard to get a job, so once you have it you often tend to stay in it"*[30]. Working in tourism is sufficient and employees do not need to seek other part-time jobs to provide for their families. This was highlighted by a number of respondents[30, 31, 40]. One private sector respondent explained how he had 45 employees, of which some were casual (23) and some full time (22)[54]. He noted that these employees get four weeks annual leave and 20 days sick leave and that there are 15 days of public holidays[54]. A business owner explained how he has two full-time gardeners, a dive master (who also worked as a freelancer) and a part-time cook [31]. Another business owner employs 20-25 full-time staff in his shop and two staff members helping out in his motel[41]. Other accommodation providers employed staff ranging from 12[40] to 21[44] full-time employees.

Nevertheless, with growing urbanisation and limited job opportunities (Cox et al., 2007), labour capacity may become a more sensitive issue in the future. For example, unemployment is still a problem in urbanised areas due to population growth and limited employment options. In 2000, the formal sector (wage-earning) accounted for 18 per cent of the population or approximately 14,000 employees for all of Vanuatu (ADB, 2002). This data was confirmed by two public sector representatives, who stated that only 20 per cent of the population were formally employed[50]. In the 2009 census, less than 40 per cent of household incomes came from wages or salaries (VNSO, 2009a).

7.5.3 Information on risks

Lacking information and awareness may lead to increased vulnerability of a community, system or asset (UNISDR, 2009). Information on risks is available within Vanuatu, but is limited primarily to radio announcements and a couple of workshops that reach rural communities in outer islands. Several awareness campaigns are already in place, but they focus on the most vulnerable; the rural communities[29, 36, 42]. Consequently, limited information, particularly in regards to climate change, is made available to people living in urban areas and surrounds or who are involved with the tourism sector[29, 30, 32, 33, 37, 41, 46, 47, 51, 53, 54, B, C]. This is a real issue, which may be linked to the availability of resources. As one NGO representative mentioned, *"There is only 3 people [working] in climate change in Vanuatu."*[55]

The data showed that disaster risk awareness is provided to communities across Vanuatu through a range of mechanisms, including posters, PowerPoint presentations, workshops, radio announcements, awareness campaigns, through collaborations with a variety of groups (church, women and youth groups), by the government[29, 36] and by NGOs[36, 49, 55]. A private sector respondent stated that the information provided on the radio by the National Disaster Management Office and Environment Unit was quite comprehensive and gave an example of the information covered for cyclones[44]. The information provided on the radio will detail *"…the strength of cyclone, closeness, the tides and amount of rain…"*[44], thereby providing warnings to people on the coast in relation to boats and *"…is broadcasted nationally, but focussed on where the cyclone will hit, its path…"*[44]. Nevertheless, the line of communication is not always upheld during the disaster event, leaving communities unaware, for instance, of whether the risk is going to affect them or, at a later stage, if the risk is still present. As a local community member mentioned, *"There is no clear communication that the disaster is over."*[B]

A local community member also noted a concern related to the dissemination of disaster risks at a national level,

> *"Normally, the warning comes through the radio. This will inform everybody as it goes in radio and reaches all of Vanuatu, which means all of Vanuatu is affected, although only a small area is affected by the natural disaster."*[B]

Furthermore, a private sector respondent highlighted that he had *"staff weeping because of the fear of cyclone warnings"*[38]. This indicates that the communication of disaster warnings can be improved to ensure that the message is received loud and clear by individuals, communities and businesses. These businesses are ultimately responsible for the safety of their visitors and, therefore, they need clear guidelines to help them manage disasters. An example of how this affects the tourism sector was provided by a tour operator who mentioned that the limited information of risks caused widespread panic at a recent earthquake event[30]. She further highlighted that *"Tourists wouldn't know [about the disaster warnings or risk procedures], unless hotel managers tell them."*[30]

Nevertheless, a highly enabling factor is that communities, businesses, and governments are all keen to learn more about climate change, its impacts, and what can be done to address these[30, 32, 33, 37, 41, 44, 46, 47, 63, 54, B, C]. A local chief highlighted that his community *"would like more training on climate change"* [B] and went on to state on behalf of the community that *"In education department, they tend to teach more about geography and animals. They should teach about climate change"*[B]. This was echoed by respondents from a development agency[33]. This keen interest to learn more about climate change also resonated within the private and public sector respondents. For example, one stated, *"I would like to see more info about climate change to understand the impact. Not enough people in industry or government understand"*[32]. The willingness of community members to partake in climate change awareness programs opens up a great enabling opportunity to build the resilience of the dive tourism system. As one private sector respondent mentioned, *"I'd be happy to learn more about climate change through info sessions"*[54].

7.5.4 Kinship networks and groups

The fourth factor within the human and social category is kinship networks and groups. Disaster victims in the developing world often rely extensively on kinship networks and groups (Linnerooth-Bayer & Mechler, 2007). Consequently, an understanding of the power relations is crucial to understanding the adaptive capacity (Matthews & Sydneysmith, 2010).

In Vanuatu, the kinship networks and groups present a highly enabling aspect of life. Those identified for Luganville's dive tourism system include family networks, the church and powerful and influential groups.

The government was not mentioned as an institution that community members would approach for help when the need arises. One private sector respondent explained that she would turn to family first when in need, as *"the government doesn't care about us"*[30]. A male, Ni-Vanuatu, public sector respondent agreed, stating that when in need people turn to the family for help, but the church plays a significant role in maintaining unity in the family:

> *"You would turn to your family first. The church it builds...to maintain unity in that family, and then it is the family who take care of the needs of the people around, but then because of this family treaty, family is very strong, family is being cared for that is why we are so instead...I don't know how to tell you...but it just is...huh. Every single people is part of a family, and I understand that the family is not in the sense of a father and a mother and kids living together, but in terms of a clan, a clan and a tribe. If you feel your mother and father have prevented something against you, you can go to your uncle or your granddad, so you can go to your people who live around, so yeah."*[28]

This highlights a strong resilient characteristic of the communities in Vanuatu (i.e. the strong family ties), which ensures that, even when in strife, there will always be help and food on the table. The family play a significant supportive role to both Ni-Vanuatu[28, 30, 32, 33, 34, 36, 40, 47, 56] and expatriate[31, 33] respondents. This was succinctly pointed out by one public respondent who said, *"Family is a safety net"*[34]. Another public sector respondent was in agreement stating that the *"Family network is really important – if [people have] no job they still have their families to support them"*, further emphasising that there is *"no money needed for the gardens."*[32]

The data reveals that individuals can access support in times of strife from their family and market garden. For example, although there is no real formal social security in place, Vanuatu has a strong emphasis on subsistence agriculture, which ensures that although a paid job might not always be available, the inhabitants of Vanuatu will not be at the point of starvation, unlike many developing countries (e.g. in Africa) where

food insecurity is a high risk (The World Bank, 2010). This is discussed further in Section 7.6 on physical and environmental factors.

The strong family ties are closely linked to an important ideology of the Melanesian nations: wantok. Wantok (one talk) has the literal meaning of people speaking the same language as you, your family and your clan (Forster, 2005). It is, consequently, part of a terminology used to encapsulate socio-cultural networks that have the capacity to bind people together (Ratuva, 2010). It is a philosophical concept or ideology (Ratuva, 2010) that encourages local community members to look after each other. In other words, there are both privileges and responsibilities of a wantok system. As Forster (2005) argued, "In a country without a social security system, the wantok system provides for material care, a sense of identity and support during difficult times" (p. 288). This point is further supported by White (2006). Consequently, the wantok ideology can increase the resilience of the tourism system.

Nevertheless, when looked at this from a "western" ideal of good governance, wantok can undermine the democratic process through being a source of nepotism and conflict of interest (Izard & Dugue, 2003). This was brought up by a private sector respondent:

> *"Unfortunately my take on the government is that anybody that gets into power is there to look after themselves, unfortunately they forget about Vanuatu and the people. I'm very proactive with my staff, every time there's an election that they vote in a person that they think will look after them, not someone who gave them a wheelbarrow because that wheelbarrow will break down. If they vote somebody in that has the people's interest but unfortunately people are swayed by wheelbarrows and water tanks and all this other stuff they give out before elections and then I think you get the wrong people in power. It's very very sad that all that money that gets collected through the VAT system and then gets squandered, like they go on overseas trips to China, the money is squandered and education, environment, stuff like that that's where the money should go to but it doesn't."*[5]

Consequently, it is vital to understand how ideologies can be used to facilitate climate change adaptation, while at the same time dealing with their propensity to hinder adaptation measures.

The church is also a strong kinship network that members of the community can rely on in times of need. The church was mentioned in nine of the interviews and in one of the group discussions during the second field trip. Six of the interview respondents were Ni-Vanuatu and indicated the significant role religion plays in the community. As a male, Ni-Vanuatu public respondent stated:

> *"Vanuatu is a Christian country... yes. Our national emblem, motto what it is, is in God we stand, so we are a very Christian country and there are a lot of churches around here...hi. The wonderful thing about that is that they [the churches] contribute a lot in this... helping people being united, stay together, move forward together. As well as the stability and peace, harmony in our social community, they do that. It is a good experience... They live here just because of this...Our experience is because of this..., our culture and religion, there are strong beliefs here, Christian beliefs. It is our experience.... and you'll go around here and you'll see people go to churches on Saturday and Sunday. We believe, [in] our beliefs as a Christian, we believe the Church has contributed a lot in maintaining peace in our living, in society, all of society of Vanuatu, so...the church is definitely important."*[28]

Vanuatu's official motto 'In God we stand' is a testament to the significance of the church in Vanuatu's culture and every day operations (George, 2010). Consequently, religion is a significant aspect of life in Vanuatu, particularly for the Ni-Vanuatu people.

The influence of religious doctrines in the vulnerability and resilience of systems (place-specific) is seen in the quote above. Several strands of the Christian religion are represented in Vanuatu, as Figure 7-3 shows. The most prominent strands of the Christian religion in Vanuatu are Presbyterian, Anglican, Seven Day Adventists, and Catholic. As six of the seven religions represented in the graph below are of collective Christian belief, it is no surprise that the church plays a significant role in the community, life and culture of Vanuatu (George, 2010). As migration to urban areas create a gradual disconnect with traditional support structures, the church will increasingly play an important role in the health sector through its ability to act a social support network (Forster, 2005). Furthermore, it is vital in its capacity as an informal mechanism of local

governance, providing a significant linkage for dispersed communities (White, 2006). Consequently, the church will be an important organisation in facilitating climate change adaptation.

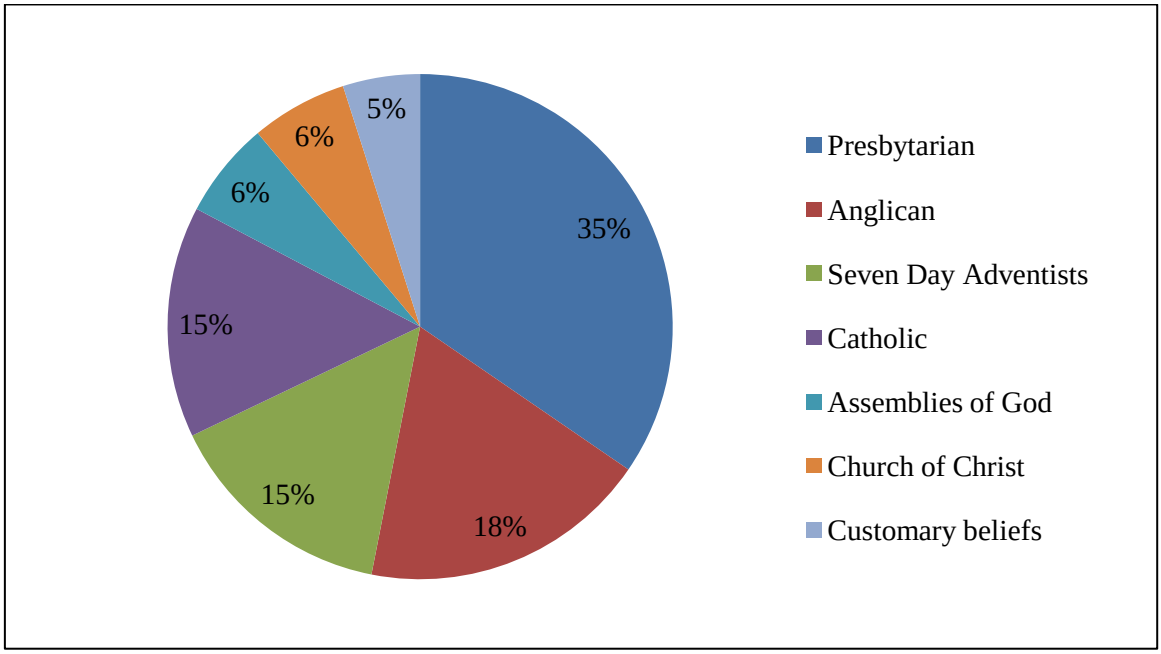


FIGURE 7-3: RELIGIONS REPRESENTED IN VANUATU IN TERMS OF PERCENTAGE OF THE POPULATION (VNSO, 2009C)

Other powerful and influential groups include NGOs, such as WSB and Youth to Youth, the Chinese Association, a particular Vietnamese family, Ralph Regenvaue (MP), PeaceCorp, and donor and development agencies, such as AusAID and JICA[31]. Overall, the community works well together and there is a good community feel[33, 38, 40], as the following quote indicates: *"Community works well together, some pockets, hot-headed expats as well as Ni-Vans, but they are a minority. The rest; we work well together"*[38]. Nevertheless, kinship networks and groups are not in their own right a viable strategy for dealing with disasters (Linnerooth-Bayer & Mechler, 2007).

This section has further dealt with the fourth step of the second research objective through an identification of human and social factors influencing the adaptive capacity and/or sensitivity of Luganville's tourism system. In summary, knowledge and skill levels need to be improved as it is currently difficult to find skilled personnel. Nevertheless, many businesses undertake in-house training and efforts at a public sector level have been initiated to improve the skills and knowledge through the establishment of vocational training. Currently, tourism jobs are more secure and provide sufficient

income for employees, but with growing urbanisation, ensuring an appropriate labour capacity may become an issue in the future.

Although some disaster risk awareness is provided, there is still a significant paucity of information and awareness. On the other hand, many of the stakeholders of Luganville's tourism system are interested in learning more about climate change. Finally, the strong family ties and kinship networks and groups present a highly enabling factor of adaptive capacity in Luganville.

7.6 Physical and environmental

The physical and environmental category is divided into three factors: (1) access to natural resources; (2) infrastructure and transport options; and (3) biophysical alterations and changes, in line with Calgaro (2010).

7.6.1 Access to natural resources

In terms of access to natural resources, Vanuatu has one important enabling factor: the market garden. Referring to a recent 'Poverty levels article', one private sector respondent said that the majority of people in Vanuatu *"don't earn $10 a day, but look at the crops that they can grow. There are no-one starving or hungry"*[38]. According to Cheer and Peel (2011), 'hard core' poverty (i.e. widespread starvation, disease and conflict) is non-existent in Vanuatu. This is one aspect that makes Vanuatu more resilient compared to some developing nations, such as those in Africa, where food security will likely worsen due to projected climatic changes (Sem & Moore, 2009).

Stefanova (2008) argues that after the independence of Vanuatu (i.e. 1980), "land alienations have emerged again on a scale that threatens the livelihoods of Ni-Vanuatu and the country's stability as a whole" (p. 2). Land access disputes were also raised as an ongoing problem for respondents. As two donor and development respondents highlighted:

> *"Ocean front beach resorts take up land and limits access to people. Places that have been fenced off for resort development, exclusively for tourists. These are places where Ni-Vans got their food from in the past."*[33]

Consequently, tourism development has impacted community members' access to land, which in some cases has led to disputes that have taken years to settle[49].

Nevertheless, not all disputes are between investors and community members. Two development agency respondents stated that disputes occur *"mainly in relation to ownership between Ni-Van tribes of land due to having traditional rights"*[33]. As a private sector respondent highlighted in relation to land issues, the *"sale and lease of land with the locals becoming more resentful; retaliation can make it difficult to go to some places, if they choose to."*[44]

Some activities have already been affected by land disputes. According to a private sector respondent, dive activities have been stopped by land owners (Aese Island) and access to the Golden Beach was stopped by the kastom landowner[40]. Kastom is "the hybridized mixture of beliefs, practices and social structures perceived as traditional" (Cox et al., 2007). Also nearby kayaking activities (in a river on the Eastern part of Santo) were impacted by land access disputed in 2009[37]. In summary, tourism can both contribute to land access disputes and be affected by them.

7.6.2 Biophysical alterations and changes

To date, biophysical alterations and changes have not greatly impacted upon Luganville's tourism sector and the natural environment upon which it depends. However, this is a rising concern for community members. This concern is voiced by three public sector respondents, in Santo and Luganville, who state that there has been "*minor environmental changes, but in future there will be major changes in coastal areas, especially as investors show great interest in this area"*[42]. Another two public sector respondents believe that, *"...there has been an impact from tourism development. Most of the coastal land has been sold off to tourism development"*[35]. In order to address this, future development plans need to be subjected to mandatory environmental impact assessments and have an environmental management plan in place.

Corruption presents as a significant determinant of unequal access to natural resources, particularly coastal land. One private sector respondent commented, "*...expats can get away with ecological murder. Corruption – you can always pay someone off: cars, education, free trip and cash*"[51]. A more comprehensive analysis of corruption is offered later in this chapter. Another two public sector respondents confirmed that, "*since 2002, so many developments have taken place without advising the Environment Unit*"[35]. Consequently, fines are written and regulations on development produced to ensure that preliminary EIAs are implemented, followed by EIAs undertaken by an EIA

consultant, which is sent to the Ministry for final approval or disapproval of the development. Nevertheless, as mentioned in Section 6.2.2, policy implementation and enforcement are real issues; the Environment Unit is lacking in capacity and is under-resourced in many aspects, including staffing resources, expertise and funding[35].

Littering and inefficient waste management are also a real concern, as they affect the appeal of the tourist destination. During the first field visit, a private sector respondent noted the following:

> *If you walk up and down here you'll see rubbish everywhere. They just live in a very blessed country, an amazing country where everything grows; they can fish and so on. There's apathy towards environmental discipline and environmental controls. The government doesn't do anything, so we just go and do it ourselves. We do everything we can, the private sector because we're getting no support from the government."*[26]

During the second field visit, this same theme came through in interviews:

> *"...[There is a] self-denial of what is going on, [as] we live in such a pristine environment. It's sad – very sad, [that there is] not enough care. It won't take long to destroy what we have"... Ni-Vans [are the] greatest polluters in this country. They throw everything on the ground. In old days, things were biodegradable, but they do know now that they are not. It's not their island, so they don't care. They don't think about Vanuatu as a nation. Government should work to distil as national approach, look after."*[51]

This person further stated:

> *"...sewerage [is] going straight into the harbour, rubbish bags flowing in the water. You must have collection after big [rain] events, but nobody shows up. So rubbish goes straight into the harbour. [This is the] municipality's responsibility. In Port Vila, this is a real issue as there is only one truck to collect the garbage with."*[51]

Coastal erosion and the health of the marine environment are also of concern, as they impact on the destination attractiveness. A public respondent said "*the coastline continues to be eroded"*[45]. Furthermore, the COTS outbreaks (mentioned in Section

5.2.2.3) are a significant issue for coral reefs in Vanuatu and anthropogenic stressors have caused many corals to die. Furthermore, several cases of seafood poisoning have occurred and play a major health risk in local communities.

7.6.3 Infrastructure and transport options

Infrastructure is vital for the sustained growth of tourism, but the current infrastructure is inadequate to support future growth. This sensitivity was highlighted in one of the group discussions:

> *"You have a product here, which hasn't even bloody scratched the surface yet. You got, you know 80,000 non-tourists coming in here, that's more - you got more people going to the football grand final next week in Australia. It's just ridiculous. We could be earning half million tourists here. Then you're talking business. At the moment everyone is scratching for a bloody living. You gotta have all the infrastructure to get the thing going, but you need the volume to make it all work. But we don't get the volume. Look at Fiji, 500, half a million tourists a year they can have coup, they can kill half their people and still beat tourism here. We have a long way to go. Tourism growth, there are some great opportunity here for tourism to happen. We have all been waiting for it to really kick off. We sat for ten years on about 50,000 over the last three or four years it has slowly gone up, but it still hasn't kicked in yet. When it does, let's hope we are still, not too thick out of the grave so we can make some bloody money out of it, 'cause we've been spending a bloody long time waiting for it. And there's just, there's so many things which are beyond our control to control it and we haven't got the big need to finally be able to do it. But when it does happen, this place could take off."*[A]

The majority of Vanuatu's population, particularly in rural and peri-urban areas, suffer from poverty of opportunity (ADB, 2009; Cox et al., 2007). This poverty of opportunity is caused by a range of socio-economic factors including limited transport infrastructure (ADB, 2009). Transportation to outer islands is poor and very difficult, and transportation options within the destination are also quite limited. The ADB (2002) highlighted the lack of adequate infrastructure in terms of road transport and air service between the islands for the key tourist destination islands. Cheer and Peel (2011) raise the concern of domestic air travel being costly. That said, there have been some positive

improvements to transport infrastructure. As an accommodation provider mentioned: *"The major impact on tourism is the road, upgrading of the airport to take 347s and the direct flight from Brisbane. All of this means, we are gaining more bed nights."*[38]

It is important to ensure that the benefits of transportation improvements also reach the local communities. Although, a recent construction boom in Vanuatu, primarily on the island of Efate (e.g. "about 90% of coastal Efate Island is reported to have been alienated, with foreign investment properties enclosing the foreshore and blocking coastal access for communities" (Stefanova, 2008, p. 2)), saw GDP growth exceed the population growth, the distribution of the benefits are accrued generally by an elite part of society and very little goes to changing the life in the villages for better (Hughes, 2010). Whether this is also the case with the construction of the new road requires further testing.

Water availability and pollution are two further key issues faced by small islands (Sem & Moore, 2009). With already stressed resources, this will be a factor which will leave Luganville's tourism system more sensitive to changes in the climate, particularly in relation to precipitation. Climate change predictions for Vanuatu indicate that precipitation will increase in the wet season, but decrease in the dry season (AusAID et al., 2011), possibly increasing the risk of drought (Republic et al., 2007). Issues that were raised by a rural community on Santo (a key attraction for tourists in Luganville) included a dependence on the storage of rain water in the dry season along with a lack of human resources (skills), maintenance, and funding to support the infrastructure. As mentioned by the local chief:

> *"[We have] got [our] own running water here, but [it is] not working 100%. Occasionally, [we experience] difficulties with the pump, [and] maintenance of the engine pump. We require a maintenance program, which require funding. If it breaks down, we have nothing to fix it with, so [we] need to buy [a] new engine."*[B]

Climate change will present a major challenge to water supply (Maclellan et al., 2009). A local community member highlighted that water supply is already an issue during the dry season. As Sem and Moore (2009) highlight, precipitation changes will affect rainwater availability and the thickness and quality of the freshwater lenses available for groundwater retrieval. Growth in tourism arrivals and population density will add to this

stress on the water supply. Consequently, water supply may leave the tourism sector as well as local communities sensitive to climate change.

Whilst water is a major concern to rural areas, water quality may also become a concern for urbanised populations in Vanuatu due to a lack of effective sanitation infrastructure. There is a lack of treatment systems for sewage and wastewater, which means "waste is generally disposed of by illegal storm water connections, direct discharge into waterways, or poorly designed and maintained septic systems that leach containments into groundwater" (ADB, 2009, p. 21). A recent report by the Secretariat of the Pacific Community Applied Geoscience Commission (SOPAC, 2007) identified three main threats to Luganville's water supply: increases to coliform counts due to the increasing number of toilets in areas caused by subdivisions of land; hydrocarbon contamination of water sources due to increased traffic; and contamination from surface activities from both illegal and legal settlements.

Like the anecdote of the frog in a pot[xxix], sometimes the eyes do not detect a change even though it is occurring. In line with this thought, the following is a quote from a private sector respondent in relation to water quality:

> *"...But water quality - It feels like anywhere, you still see kids jumping off the promenade in front of the market in the water, just like they did five years ago. Looking out into the water it looks the same as it did 5 years ago. So from a tourism point of view it probably hasn't changed that much, but chemically you could be wrong. Crown of Thorns, so there is probably a bit more nutrient in the water, no doubt about it, so I'd say it's probably changed a little bit. But overall in Vanuatu, there hasn't been much, Port Vila is like any capital city, and also it will be a little cleaner outside of the city."*[31]

Sewage and wastewater runoff may also influence the marine environment. Sampling of water quality in Port Vila harbour and the nearby lagoon system has indicated high pollution loads (ADB, 2002). For example, "Total coliform counts from the Port Vila harbour sampling sites were high (60 per cent "too numerous to count"), while faecal coliform counts were variable, but with almost all being above acceptable levels"

[xxix] The anecdote goes something like this: if a frog is put in a pot of cold water and then slowly the water is heated up, the frog will not notice the change in water temperature and it will eventually die, but if the frog is put directly into a pot of hot water it will immediately jump out.

(ADB, 2002, p. 181). Although the example on water quality is from Port Vila, similar pressures on the marine environment are present in Luganville (ADB, 2002). Run-off of sewerage and wastewater can cause pollution, nutrient loading and sedimentation that are all anthropogenic stressors affecting coral health negatively (Riegl et al., 2009). For example, an excess of nutrients promotes algal growth, which can lead to a smothering of corals that can lead to its eventual death. Sediments can lead to a silting and cloudiness of water that affects the levels of sunlight reaching the coral reefs with a possibility of killing the coral (Hall, 2001). Furthermore, unmanaged waste affects the tourism image negatively and poses serious health issues, thereby increasing the sensitivity of the dive tourism system.

The smell of smoke welcomes the visitor to Vanuatu, as they drive from the airport[FD1, 26 September 2010]. As a community member highlighted, *"Plastic is being burned and people get sick from the smoke. We take all rubbish home, but need more help in getting the litter collected"*[B]. Burning is a common way of disposing of waste in Vanuatu, but the fumes can be extremely poisonous. "The toxins [from to the burning of plastic] are known to be linked to respiratory diseases, birth defects, cancer and immune system disorder." (Live & Learn, n.d., n.p.). Consequently, developing or implementing current policies for waste management is essential to deal with the health-related issues of burning plastic.

Waste is also an issue that can affect the marine environment and in turn the viability and attractiveness of the destination that relies upon it. Plastic bags are a real problem, as the following quote indicates:

> *"But the government itself, when you go into town you'll see open gutters and sewerage going straight into the harbour, that's just so ridiculous. The harbour is beautiful and yet there is plastic bags being thrown. Every time after a big show or they got a fair or the church gathering or whatever, you have these rubbish bags just floating around, being wind swept into the harbour. Why would you anybody say so - this would be part of setting up a show in the park there of setting up a set of rules that you must have collection afterwards. There should be someone from the government whatever an inspector or so to come afterwards and make sure the place is kept clean. They've used the grounds, but nobody shows up, so the people doing the venue just walk away and all the rubbish is*

> *just there, so where does it go? The wind is going this way, south-easterly and straight into the harbour. The other day I was sitting there next to all these tourists and we're just looking at all these plastic bags floating away into the harbour... So if the government doesn't care, the people don't either."*[51]

Consequently, the infrastructure and transport options in Vanuatu present some sensitivities. Limited government funds only exacerbate this problem, which in turn, increases sensitivity levels to shocks and stressors. In the words of three respondents from the public sector:

> *"[we are] very limited financially so this is a big issue. We don't have the financial capacity to build infrastructure and buildings that consider climate change."*[42]

This section has dealt with the physical and environmental factors affecting the adaptive capacity and sensitivity of Luganville's dive tourism system, thereby partly addressing step four of the second research objective. In summary, the market gardens of Vanuatu lead to adaptive capacity, but in more recent years land alienation caused partly by tourism development has reduced the community members' access to land and has led to land access disputes in some cases. Corruption is a real issue that has influenced the biophysical environment. Biophysical alterations and changes are not yet major issues affecting Luganville's tourism. Nevertheless, littering and efficient waste management do affect the appeal of the destination and influence the tourism system indirectly by creating increases, for example, in COTS outbreaks associated with waste. Infrastructure cannot sustain the potential future growth of tourism; this creates issues of poverty of opportunity. Potable water is an issue already faced by rural communities surrounding Luganville and may become a major issue with an increasing population, growing tourism numbers, changes to precipitation and increasing temperatures. Pollution is a real issue for the health of the coral reefs and inappropriate waste disposal and sanitation infrastructure affects both the health of communities and the attractiveness of the place.

7.7 Governance processes

The last category of factors in the fourth step of the second research objective is the governance process. Matthews & Sydneysmith (2010) highlighted the importance of understanding the local governance processes to ensure effective adaptive capacity and Mataki et al. (2006) identify government capacity, government versus individual priorities, institutional framework, and governance as crucial challenges to the implementation of adaptation measures. In accordance with Calgaro (2010), the governance processes were divided into five factors: (1) government responsibilities; (2) laws, policies and rights; (3) cultural governance processes; (4) tourism business networks and representative organisations; and (5) levels of stability and change.

7.7.1 Government responsibilities

Six themes were highlighted under government responsibilities: limited amount of governmental assistance; tourism budgetary constraints; government's responsibility in regards to climate change; support of women in tourism; capacity of the Environment Unit; and corruption.

The first strong theme that came through in the government responsibilities category is the limited amount of governmental assistance to the private tourism sector, which in turn hinders their ability to expand and adapt. This came through strongly in the data obtained from the group discussions and interviews with public sector and private sector respondents. One public sector respondent mentioned that *"...the government need to do more for Luganville – we seem to be forgotten. Most of the expats come from here, but very little comes back"*[45]. Recalling the recovery process from Cyclone Uma that had wiped out the infrastructure, another public sector respondent commented that *"it was left to private sector to recover, Government mostly involved with recovery in communities especially. Not sure about their [government's] role in helping private sector recover"*[29]. A private sector respondent said there is *"...nothing from Government regarding climate change. Our government has no money – they can't support us because of this."*[43]

Linked to this was the issue of tourism budgetary constraints on government. Whilst the government concedes that the tourism sector is one of the nation's biggest earners, very little budgetary support is provided to the relevant government departments. The example of the budgetary limitations to the key tourism marketing office, VTO, was

presented under the tourism sensitivities section earlier in this chapter. As one private sector respondent observed: *"[our] biggest drawback is lack of government understanding of tourism, not understanding what is needed. Government is our biggest liability"*[51]. A public sector respondent agreed, believing that the lack of support received from the government was hindering the growth of tourism and its advancement to the next level [36]. According to this respondent, tourism plans existed before independence in 1980, but the country still lacks the skills and knowledge, particularly at higher levels up to management, to advance tourism significantly [36]. Consequently, the responsibility of the public sector is constrained by budgetary limitations and a good governmental understanding of tourism. As a public sector respondent argued *"...government need to make the right policies. [Consequently, they] need to educate the policy makers."*[32]

A third theme was the responsibility of the government in relation to climate change. One private sector respondent said *"climate change and what has to be done needs to come from the Government"*[51]. A public sector respondent highlighted:

> *"...various ministries do consider climate change, [including the] meteo[rology unit], agriculture, livestock, forestry, health, education and the environment unit... ...the "Environment Unit [has ensured that] climate change info has been distributed well across the different sectors."*[46]

Nevertheless, as the policy analysis discussed in Chapter 4 showed, climate change is only just entering the policy arena and very few policies explicitly deal with climate change adaptation. Two public sector respondents emphasised that there is:

> *"...not enough awareness or education about climate change. Not many islanders understand, some hear it on radio, but real awareness of implications is not widespread. Government needs to increase awareness."*[53]

Consequently, some respondents feel it is the responsibility of the government to educate and increase awareness of the impacts and implications of climate change.

On the other hand, some respondents recognise that dealing with and adapting to climate change is everybody's business. As one public sector respondent remarked:

> *"I would like to see tourism and climate change be covered by some adaptation projects not only through NAPA implemented by government,*

> *but also by other sectors, such as NGOs and donor aid agencies, which government would be happy to collaborate with."*[29]

Another public sector respondent was of the opinion that *"government, NGOs and representatives from private sector should provide info and support on how to adapt to climate change"*[47]. Thus, climate change awareness is definitely seen as a responsibility of the government, but these efforts also need to be supported and replicated by the private sector if effective adaptation is to become a reality in Vanuatu.

The fourth governance theme related to the support of women in tourism. A private sector respondent said *"...government should build a centre for all ladies to do the selling, here they have to pay rent (very expensive – 12,000 Vatu for the room). In Vila, they only pay 6,000 Vatu"*[43]. This was supported by another private sector respondent, who said government should *"give money to ladies and mothers to support them in their business."*[43]

A fifth theme was in regards to the capacity of the Environment Unit. An outcome of the group discussion was that the Environment Unit was viewed by government as an inferior unit and, consequently, it has 'no teeth'. Building plans are going through that should not have gone through; environmental and building regulations are contravened, made possible by the lack of capacity in terms of funding, staffing, and skills to manage and monitor all environment issues on all 83 islands. During the first field visit, when asked 'Does the government help in any way to make your businesses environmentally sustainable?' a private sector respondent replied:

> *"When we developed the hotel here, there are some rather basic but they do exist, requirements that come through the Port Vila Municipal Council. To get building approval you have to satisfy them of some very basic criteria. One of those is that you have a reasonable sewage system, it's not just a sceptic that's going to leak through the coral, there is actually some sort of treatment process and that's only a new requirement. We weren't required to write any EIA for the development here, but larger scale developments are and that's becoming more of a requirement but I really don't know what the specific policy is on it. I believe it's a legal requirement but it's not very well policed or enforced."*[1]

This is a major coastal development issue that has the potential to negatively affect the quality of the built and natural environment and the future of tourism. Good intra-organisational collaboration can, however, reduce some of these limitations. For example:

> *"The Environment Unit is lacking in capacity, but shares the work load with other arms of government. Monitor and make sure they do this. Facilitate the process. Implementation is outsourced to other government offices."*[35]

The final governance issue that arose from the data is corruption. Corruption was already mentioned in interviews during the first field visit, when a private sector respondent said:

> *"The other one is the Chinese fishing cannery that we've got. The governments allowed that to happen. They're just grabbing the money, we know there are payoffs everywhere, under the table, we're quite aware of it, that's nothing new. The Corruption International keeps an eye on them and got reports on that. It's an awareness problem, very large awareness and responsibility problem. The expats are certainly not doing enough to force the government on these issues. They just invest and obviously want a return on their investment not looking long term. The response that I've had even when I've created surveys and so on about sustainable tourism has been a negative response, it's been awful."*[26]

Corruption has also long been identified by development agencies as a key contributor to the erosion of sound governance in Vanuatu. Cox et al. (2007) describe the political system as:

> "...unstable and fragmentary, with political competition based on patronage rather than competing policy platforms. It has been characterised by fierce infighting within unstable coalitions, with no fewer than 16 changes in government in the 13 years leading up to the 2004 elections. Patronage drives corruption at the highest levels, while leading to chronic 'short-termism' that undermines any sustained approach to development" (p. ii).

A group discussion also highlighted the issue of corruption and noted a recent example where government officials had tried *"to stop fishing, but got booted out at the next election"*[A]. This is a significant issue that will leave Vanuatu's dive tourism system particularly sensitive to shocks and stressors in the future. Corruption enables building standards to be ignored by some, causing owners to encroach on public coastal foreshore land. It also allows businesses to ignore environmental regulations, which in turn causes greater environmental degradation. A private sector respondent noted:

> *"New resorts open up and they don't bring the same consciousness as running a business in Australia. They have a pioneering spirit and don't like regulations. Vanuatu attract people that don't want to abide to overregulation in Australia. Many are not sentimental about the environment."*[51]

Consequently, a lack of enforcement of regulations and the issue of corruption presents a significant sensitivity, allowing damaging tourism construction and/or activities that have a negative effect on the natural environment.

7.7.2 Laws, policies and rights

Although much of the laws, policies and rights were covered to some extent in the policy analysis, discussed in Chapter 5, some new findings came out from the data.

Regulations are in place to ensure that open access to land and fishing grounds remains. According to one public sector respondent:

> *"...public access is from high water mark and out... [but the] law says within high water mark and inland you can own. So people can't have access to the sea and their fishing ground."*[35]

This is due to a lack of awareness and understanding of the regulations. Consequently, owners block off access completely despite not owning the foreshore land that extends from the high water mark out to the water. This is reaffirmed by another public sector respondent who said that there is a:

> *"...misunderstanding in relation to access to resources. Tourism development [occurs] along the coast. According to the zoning and planning laws, the front part of the beach is supposed to be access for all. Nevertheless, some owners think they own the beach and the water in front too."*[28]

The same respondent went on to say that :

> *"It is the responsibility of the relevant agency to advise of these regulations. This is an issue – someone will have to advise business owners about this. [This] issue is related to fishing when locals fish in front of the resorts. Mainly because of a misunderstanding! Or a different approach thinking [that] they own what they see, but this is not the case. It should be the Lands Department and the Department of Provincial Affairs to deal with this issue of access. [The] Physical planning zone - This needs to be clarified to people."*[28]

Luganville's tourism community identified the following adaptive capacity enabling factors relating to policy:

- ***Climate change is not only the responsibility of the government*** - everyone should acknowledge their responsibility in dealing with the effects of climate change. As highlighted by a public sector respondent, *"policies may affect their ... sector, so we need to be involved in climate change adaptation. Climate change is everybody's business."*[28]
- ***Local involvement in tourism is encouraged*** - two respondents pointed out that there has been a *"big policy move to encourage local people to invest in tourism. Incentives include: micro finances; and a hospitality school has been set up."*[33]
- ***New legislations are being developed*** – according to two public sector respondents, the government is *"looking at two new legislations going through: Waste and ODS [Ozone Depleting Substances]...[and a] draft management plan for solid waste should come out soon"*[35]. The Environment Unit has received assistance from the South Pacific Regional Environment Program (SPREP) in developing these legislations and strategies. Furthermore, in-house consultations were undertaken with relevant stakeholders in government.
- ***Current projects aim to mainstream environment and climate change into policies*** – a current German Agency for Technical Cooperation (commonly referred to as GTZ) project is collaborating with Internal Affairs in order to mainstream climate change and environmental issues into policies for coastal areas and for marine protection. Sectors and areas looked at include the Foreshore Development Act, Fisheries and the Land Department. To further

marine protection, a holistic ecosystem approach is being encouraged involving the Fisheries Department and Environment Unit[55].

- ***Regulations apply to everyone*** – in terms of setting up business in Vanuatu, all have to register their business name and get a business license. According to one public sector respondent, *"all regulations apply to everyone. [We] do not discriminate – everyone is the same."*[28]

The only constraining factor identified in the data is that *"some policies/laws are not in the right place. [And that] they should be in one place as to not cause confusion"*[34]. This links back to the need for further awareness of policies, highlighted in the policy analysis discussion in Chapter 6.

7.7.3 Cultural governance processes

Cultural governance processes include the importance of kastom in Luganville and the rest of Vanuatu. At the local level, your descent will determine the landowner group to which you belong, at village levels, chiefs are the leaders, and at national levels, the church plays a significant role (White, 2006). Furthermore, the family plays a significant role in society. A group discussion respondent argued that *"They [Ni-Vanuatu people] have high cultural values that we as Westerners do not have"*[A]. This is linked to the ideology of Wantok, which was discussed in Section 7.5.4 on kinship networks and groups. As Cox et al. (2007) argue, these cultural processes may constrain entrepreneurship by individuals, as they have to redistribute the benefits within their family, clan or village. The notion of reciprocity is so strong in Vanuatu that if the financial success is not redistributed by sharing the benefits among the community, then "those who fail to do so may be subject to social sanctions, in the form of malicious gossip, jealousy or even destruction of property" (Cox et al., 2007, p. 14).

The chiefs are also an important part of community life and cultural governance processes, as they are the head of the village [23]. As described in observations:

> *"He [name removed for confidentiality purposes] showed us the nakarmal, which is where the chief meets with the Elders to discuss relevant matters. The number of pigs you have killed improves your status in the community and you may end up having more than one wife, if you choose so. Of course only one legally married in Church, the other [wives] through local ceremonial traditions. This chief was still fairly*

> *new and still had to move up the hierarchical ladder. More pigs killed and more wives, the more respected, and enemies suddenly want to become allies"*FD1, 03 October 2010.

White (2006) describes the chiefs as intermediaries of the traditional and the modern. Their role becomes obvious when a public sector respondent stated that the chiefs and elders really need to address the issue of rape[47].

One positive element of the cultural governance processes that may enhance the adaptive capacity of Luganville's dive tourism system is the use of *taboo* as an effective management tool. "A taboo can signify that practically anything is off limits to use, discussion, harvest, entrance or negotiation" (Bartlett et al. 2010, p. 1010). Bartlett et al. (2010) also highlight the value of taboo in relation to spatial closures of both marine and terrestrial areas. Most commonly, taboos in Vanuatu are viewed as temporary closures or off-limits, although some sacred taboos are seen as permanent off-limits (Bartlett et al., 2010). Taboo is one way the Ni-Vanuatu people have shown to adapt to changing conditions and the encouragement of this cultural governance process should continue.
As was suggested by private sector respondents (in the group discussion), expatriates are not able to make big changes. It is up to the local Ni-Vanuatu people to make these changes. As one of the participants of the group discussion stated:

> *"You come and live in Australia you should have to live like they live. It is the same with us when we come here. We can only suggest things, we can show things, but we can't cause things. We can't make them do this or that they have to do it themselves... If you don't like it, just bugger off; go home to your own country."*A

7.7.4 Tourism business networks and representative organisations

As described in Chapter 4, more than ten tourism business networks and representative organisations (including sector associations and provincial tourism councils) have developed over the years in Vanuatu with some of these covering Luganville's dive tourism system. These organisations have the capacity to help the tourism sector adjust and adapt to shocks and stressors. There are many benefits of sector association memberships. The VTOA Committee (in VTO, 2012) promote membership of their sector association as follows:

> "Please see following a few benefits of being a VTOA member: Website exposure for all operators small or large, As an organization more possibilities to effect positive change. Protected by the constitution. Display VTOA Logo - Giving credibility, Hotel support - Only VTOA members to have brochures in Resorts, Informative General Meetings- Industry Based guest speakers. Networking with fellow Industry Members. VTOA is a class "B" TMDF member, giving us input to the Tourism Sector at large (See explanation of what TMDF is in coming newsletters), Have an input into where tourism marketing destination funds are directed. Automatic entry into the Vanuatu Tourism Office website at no charge. Join us to discover what matters in tourism" (n.p).

Listed below are some of the initiatives that the various organisations are implementing to help their members and the wider Luganville tourism community cope, adjust, and adapt to changes that influence the quality of the tourism product and tourist flows.

The VIBTA association runs a couple of management workshops for bungalow managers each year (ADB, 2002). The saying *"one broomstick cannot clean the floor alone, but many can together"*[48] forms the foundational basis of the development of the ESTOA. This association is currently developing standard operational procedures and looking at providing first aid training and fire extinguishing. This has been identified as a real need with the opening of the new highway. Both of these associations' initiatives will increase skill levels and reduce sensitivity to change.

The larger sector associations have representatives on the VTO board of management, and can, thereby, influence the governmental planning decisions to some extent:

> *"We have the president or the chairman sits on the VTO board, so once a month we attend a meeting and the VTO Vanuatu Tourism office is the tourism Minister's or the tourism departments. The VTOA gets its say to the government through the VTO meetings."*[5]

Consequently, being represented by an association, such as the VSOA, gives the individual operators a space to discuss management issues, such as COTS outbreaks or the promotion of dive tourism. It gives them a collective voice, which can influence government decisions, as an operator noted, *"So the board meeting today, we were to represent the other operators and we could pass on our ideas and concerns through the*

board, which hopefully might get to the government."[A]

Another benefit of sector association memberships is insurance. A male, expatriate, private sector respondent noted that "*Public liability insurance is really pushed as part of sector associations"*[52]. This is confirmed by one of the presidents of a sector association:

> *"VTOA members in general help each other out. In general we encourage tourists to use VTOA members tours. Members of the VTOA have public liability insurance, they have their business licenses and they run their business professionally. There are a lot of other tours that don't carry such things and if somebody was at the Sebel and they booked a tour through a non VTOA member and the person was injured and that was sold through that desk, there would be no public liability insurance for that company so then you would imagine that the tourist if he was serious enough, that they would then sue the hotel. Since I've been at the helm of the VTOA I've tried to professionalise ourselves so that the VHRA take notice of who are members."*[5]

There are some sensitive aspects of the running of these associations. For example, members of sector associations are placed on the VTO website as part of the membership, but non-members are not included. This can alienate business owners, who have made the decision not to be a part of a sector association for whatever reason. A news update from the VTO on 4 May 2012 confirms this tourism sector website policy:

> "The VTO will be cross checking all accommodation and activities listing with the latest membership list received from VHRA, VTOA, ESTA, Tafea Tourism, and Malampa Tourism. On the note, the VTO advises all operators and accommodation providers to ensure that they have renewed their memberships because by Wednesday of next week, accommodation and products that have not renewed their membership fees will have their website listings temporarily suspended until fees are paid, as required by their tourism association" (VTO, 2012, n.p.).

This statement shows that not only are non-members excluded from the national tourism marketing website, but that not all sector associations are recognised by the

VTO. As one private dive operator pointed out, the *"VSOA is not recognized [by the VTO]. VTO is 3 years old and has 10 members. VSOA is 10-15 years old!"*[31]. Again this may create some resentment within the tourism sector and works against collaboration between the private and public sectors. The VTO should consider the benefits to the tourism sector as a whole and may want to rethink this strategy.

The Sanma provincial tourism council will be able to strengthen the resilience of the Luganville tourism community by ensuring the timely implementation of the Sanma tourism plan, and the discussion of management issues on a regular basis. This will ensure that appropriate action is taken by all relevant stakeholders.

Chapter 4 of this thesis covered some of these elements of scale in looking at the TGR, TR and TDR. This section differs from Chapter 4, as it identifies aspects of relational scale, which is another important concept for vulnerability/resilience assessments (Calgaro, 2010). The first instance where the concept of relational scale becomes apparent is in the evolution of the sector associations. A number of national sector associations exist (e.g. VHRA, VTOA and VSOA), but a number of local and provincial sector association were also developed to create opportunities for members that felt they were not sufficiently represented in the national sector. The sector associations were developed to represent the interests of members represented at the governance level. In other words, they try to get backing from the government[39]. As an individual business owner, whether a small hotel or resort, a dive operator, a tour operator or a support business, it is difficult to achieve representation at a national level, unless other power relations are in play. With a proactive sector association[11] that represents many individuals' interests, it is much easier to get outcomes and be heard. Nevertheless, the membership of the associations also reflects the interests being represented and this can become an issue if the membership numbers are skewed to one group, as against another (e.g. Port Vila versus Luganville)[5].

Other associations are much smaller but more balanced across geographical scales, such as VSOA with its four members in Santo and six members in Port Vila[17]. The VSOA is only for dive operators, as VTOA is only for tour operators. Other sector associations, such as ESTA with its approximately 40 members/businesses,[17] covers three to four dive operators, two land-based tour operators and hotels and resorts[18] and have had to combine multiple sectors to ensure their voice will be heard:

> *"Santo has ESTA. Down here on Efate we have the VHRA, which is the Vanuatu Hotel and Resort Association, and the VTOA, up in Santo they combine, they have an organisation that looks after them both called ESTA the Espiritu Santo Tourism Association and in that association the resort owners and the tour operators and the dive operators form one association."*[5]

Individuals then get involved across the scale through these networks to create opportunities for themselves. Further research into this process of how and why the businesses choose to get involved in sector associations; the barriers they have experienced; and the opportunities that arise through these relationship will provide more in-depth knowledge of these relational scales. However, this was not in the scope of this thesis.

7.7.5 Levels of stability and change

Levels of stability and change received very little attention from respondents—possibly because Vanuatu as a nation is seen as a fairly stable country, compared to other less stable nations in the Pacific, such as Fiji and the Solomons. One respondent noted an enabling factor of adaptive capacity in that the people of Vanuatu are very peaceful, creating stability in the nation and allowing for security for investments[51]. Another respondent noted the fluctuations in the tourism budget, which makes it hard to seize the opportunities of instability and change in neighbouring countries, such as Fiji[32].

7.8 Chapter 7 summary

This chapter has presented an examination of the sensitivity and adaptive capacity of Luganville's dive tourism system in terms of: tourism specific; economic; human and social; physical and environmental factors; and governance processes, in order to address step four of the second research objective.

Some tourism sensitivities exist, including a high reliance on Australian and New Zealand markets, a limited and fluctuating national tourism marketing budget, limited opportunities for collaborative marketing approaches, a possible mismatch between the level of quality marketed and that offered, being a small-scale destination with limited bed-capacity, and destination image sensitivities. Seasonality does occur to some extent in Luganville, but business occurs all year round. The tourism businesses are, therefore, able to deal with the issues of seasonality through marketing strategies and diversifying

the customer base. Other tourism-related factors enable adaptive capacity of the system, including the open sky policy, the presence of the 14th best dive site in the world—the Coolidge, new tourism branding, and the double-status of being the 'happiest place on Earth'.

Economic sensitivities include the limited livelihood portfolios, strong expatriate ownership, work reserve list, no regulations to ensure business and employee insurance coverage is taken out, reliance on aid agencies, a high dependence on import and a lack of social security and support from the government. Nevertheless, expatriate business owners have access to liquid and fixed assets in times of need; there is a presence of some financial schemes to support people in need; and most businesses of the tourism sector have taken out insurance regardless of the lack of regulations of the same.

Human and social sensitivities include a lack of management skills, limited tertiary education completion, increases to urbanisation leading to limited job opportunities, and lacking disaster risk awareness. The strong kinship and networks, including family networks, the church and powerful and influential groups, play a crucial role in creating informal support in times of need.

The market garden is one of the most enabling factors within the physical and environmental factors. Nevertheless, there are many sensitive aspects arising from the data, including:

- Land access disputes due to construction in coastal areas;
- Rising concerns of biophysical alterations and changes occurring in the future;
- Inefficient waste management;
- Declining environmental health (i.e. COTS outbreaks, seafood poisoning and eroding coastline);
- Insufficient infrastructure to deal with sustained growth of tourism;
- Poverty of opportunity;
- Water availability and quality; and
- Pollution.

Some aspects of the governance processes are enabling of adaptive capacity, including the presence of kastom and wantok, cultural governance processes, taboo, tourism business networks and representative organisation, and the development of new

legislations. However, some sensitive aspects appear in terms of the presence of corruption, institutional capacity, and a limited prioritisation of climate change issues.

More succinctly, there are presently some prevalent capacities of the tourism system to deal with the effects of climate change, but there are still many aspects of everyday life (e.g. skills, water supply, waste and sewerage, institutional capacity) that can be improved to build the resilience of the dive tourism system—the focus of the next chapter. Chapter 8 discusses steps five (i.e. adaptation) and six (i.e. evaluation) of the second research objective.

8 TESTING THE KEY ELEMENTS: ADAPTATION AND EVALUATION

"Adaptation in small island [developing] States [and Territories] must therefore be about resilience building."
(Nurse & Moore, 2005, p. 107)

"Adaptation strategies may increase the vulnerability of other systems, sectors, or groups if they increase emissions of greenhouse gases, disproportionately burden the most vulnerable, have high opportunity costs, reduce incentives to adapt, or set paths that limit the choices available to future generations. These five pathways to maladaptation offer a basis by which adaptation decisions can be screened for their possible adverse effects."
(Barnett & O'Neill, 2010, p. 212)

8.1 Introduction

As summarised in Table 8-1, this section focuses on the tourism system's current and future adaptation actions (step 5) and highlights the importance of evaluation (step 6). This chapter first provides a discussion of the current and proposed adaptation actions that relate to Luganville's dive tourism system. Then, five adaptation actions are proposed to help build the resilience of Luganville's dive tourism system, based on the current vulnerability and resilience factors. Next, the chapter emphasises the importance of evaluating adaptation actions to ensure successful adaptation (Jopp et al., 2012).

TABLE 8-1: EXTRACT OF RESEARCH FRAMEWORK

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(2) Test the established key elements in the context of Vanuatu's dive tourism system	Step 5: Adaptation • Types of adaptation.	• Analysis of all data (i.e. semi-structured interviews, group discussions, observations noted in field trip diaries and secondary data).	• Builds on existing knowledge. • Takes the local context into consideration. • Involves appropriate stakeholders to ensure sustainability. • An analysis of all data will highlight the areas of vulnerability within the system and, thereby, identify areas requiring adaptation.
	Step 6: Evaluation • Successful • Unsuccessful/ Maladaptation	• This study will be unable to test the proposed adaptations, but highlights the importance of evaluation.	• In coming years, the proposed resilience-building actions need to be tested with the local stakeholders to ensure successful implementation.

8.2 Current and proposed adaptation actions

Once a disastrous shock or stressor has occurred, the tourism system needs to deal with the effects of the impacts of the shock/stressor. This occurs on a DRR continuum from when the disaster hits, followed by adaptation actions in the short-term response/relief phase that is overlapped by the long-term recovery and later development phases. As there is no clear-cut distinction between these DRR continuum phases, this section has been divided into the five types of climate change adaptation related to tourism, in accordance with Scott et al. (2009). Table 8-2 presents an overview of the key analysis themes (i.e. types of adaptations) and illustrative quotes from each.

TABLE 8-2: ADAPTATION AND EVALUATION DATA ANALYSIS – ILLUSTRATIVE EXAMPLES

Key themes	**Examples of themes from primary methods (i.e. interviews and group discussions)**	**Examples of themes from supporting methods (i.e. secondary data, observations noted in field diaries)**
Technical adaptation	• *"The [National] Disaster Management Office will pronounce a warning on the radio. The Meteorological Unit also provides warnings. [However,] we need to have more information. At the last earthquake the people were running around. They have never had a big earthquake. [It caused] panic and running around."*[30]	• "Mainstream climate change considerations into infrastructure design and planning (modern & traditional, EIA)" (Republic of Vanuatu el al., 2007, p. 32). • "There exists a large potential for rural renewable energy development, including, *inter alia*, mini hydro power schemes, geothermal, solar and PV [photovoltaic] Systems, wind power generation and ocean thermal" (Republic of Vanuatu, n.d., p. 20).
Business management adaptation	• *"…I have three first aid kits…as far as emergency procedures are concerned…, that's, that's in my booklets, I'm talking about a staff for the guides on course of action…"*[38]	• "Environmental management in tourism operations (e.g. water-saving)" (Republic of Vanuatu el al., 2007, p. 41).
Behavioural adaptation	• *"It is best to do a bottom-up approach to policies, as this suit the People of Vanuatu best. A top-down approach does not work very well in Vanuatu. Thus, ask and talk to the locals – what is their feel about it, what do they feel they can do."*[4]	• "Conduct community awareness of the need to protect the environment including through reduction of risks from natural hazards" (Government of the Republic of Vanuatu, 2006, p. 29). • "The consumption of local products was promoted through assistance to an "*Aelan kakaï (Year of Island Food) stall"* at Luganville, run by local women's groups, who organized local training sessions on creating wholesome food using manioc flour as a main ingredient" (Republic of Vanuatu el al., 2007, p. 36).

Policy adaptation	• *"The expected impacts means there is an improved awareness in Government for the need to work together."*[27]	• "There is an urgent need to implement existing policies and strategies and where necessary, put in place mechanisms, that will not only prevent the effects on the coastal areas but will also encourage the sustainability of the tourism sector" (Republic of Vanuatu et al., 2007, p. 18). • "There is a need to revisit existing relevant pieces of environment and development policies, such as the code of logging practices, building codes, foreshore development act and land use act, to make necessary amendments, as well as developing new policies, such as food security policies, in order to promote active sectoral responses to the impacts of climate change" (Republic of Vanuatu, n.d.a, p. 22).
Research and education adaptation	• *"Awareness of possible effects of climate change and sea level rise is becoming a real issue for Government to deal with."*[23]	• "Improve climate change understanding at provincial and community levels" (Republic of Vanuatu et al., 2007, p. 24). • "Develop programmes to raise public awareness and education, particularly in the area of formal and non-formal curriculum development, on climate change issues" (Republic of Vanuatu, n.d., p. 14).
Evaluation	• *"They experienced erosion around the island [of South Mistrel] and most of the airport (runway) had gone due to the construction of a jetty. It was not sea level causing the extensive erosion, but the infrastructure put in place."*[27].	• "The first part of the consultations entailed evaluation of the potential NAPA activities in light of national perspectives. Stakeholders went over the list of adaptation strategies suggested for various sectors and different regions, and rationalized these into a list that reflected the priority climate change issues in the country. The discussions were expanded to include any other strategies that may have been proposed as part of other national documents…" (Republic of Vanuatu et al., 2007, p. 41).

8.2.1 Technical adaptation

As the first type of adaptation, technical adaptation actions were identified in both the data collected from the primary methods (i.e. interviews and group discussions) and from the supporting methods (i.e. secondary data and observations in field diaries). This section first discusses the technical adaptation action of the provision of disaster warnings. Then, an observation related to the standard of the road infrastructure within Luganville is discussed relevant to proposed actions from the policy documents. After this, the provision of sufficient infrastructure is discussed in relation to the growing population and density. Finally, a brief overview of the technical adaptation actions identified in the policy documents is presented.

The provision of disaster warnings does exist in Luganville and generally within Vanuatu, but further awareness of the processes following such warnings are required. Disaster warnings, particularly in relation to cyclones and tsunamis, are provided via radio and there are discussions about using SMS to advise people of warnings. As a private sector respondent advised:

> *"The [National] Disaster Management Office will pronounce a warning on the radio. The Meteorological Unit also provides warnings. [However,] we need to have more information.*

The issue of retaining a sufficient standard of infrastructure is of key importance to the economic development of a country and the growth of the tourism sector. Currently, the roads and pavements in Luganville could be improved significantly. When you walk down the street, you have to be extra conscious of the different levels in the pavements to prevent an accident from happening. The majority of roads have also seen better days. Consequently, an adaptation measure like maintaining and improving roads and pavements used by tourists will provide a safer environment for tourists as well as locals.

Sufficient infrastructure is required to support national development in Vanuatu (Government of the Republic of Vanuatu, 2006). Actions implemented to improve the provision of these essential services (e.g. electricity, water supply and sanitation) will, if successfully implemented, deal with the SIDSTs' characteristic of increasing population growth and density. An industry interview respondent mentioned that *"septic and sewerage systems need to be improved"* [17]. Vanuatu is experiencing a considerable

growth in population and density in urban areas (i.e. Luganville and Port Vila) is expanding rapidly having grown from 40,094 people in 1999 to 57,207 in 2009 (VNSO, 2009a). Climate change adaptation measures mentioned in six of the policies identified will help the tourism sector and the Vanuatu Government in addressing these characteristics. For example, supporting "the provision of affordable, sustainable, and effective sanitation and drainage services" (ADB, 2009, p. 11) will address sanitation issues related to population growth and densities, but will also allow for a healthier environment for local communities and tourists alike.

There are a range of technical adaptation actions proposed that may influence Luganville's dive tourism system by addressing different SIDSTs' characteristics, as noted in the policy documents identified in the policy inventory (Section 6.2.3). These actions relate to transport infrastructure (aviation and roads); basic infrastructures (e.g. sewerage and sanitation services, electricity and water supply, telecommunication); health services; urban beautification; tourist facilities; and the construction of a provincial tourism training centre. Upgrades to transport infrastructure, basic infrastructure and health services will leave Luganville more prepared in case of disaster. Urban beautification, tourist facilities and a provincial tourism training centre may make Luganville more attractive as a destination and provide the tourism system with a stronger advantage should climate change cause a decrease in the natural attractiveness of the place.

8.2.2 Business management adaptation

As the second type of adaptation, business management adaptation actions were both identified in both the data collected from the primary methods (i.e. interviews and group discussions) and from the supporting methods (i.e. secondary data and observations in field diaries). This section first discusses the business management adaptation action of business emergency plans. Then, private sector involvement in the response phase is briefly discussed before business management adaptation actions identified in the policy documents are explored.

Emergency plans are incorporated into private sector businesses, albeit not always in written form. Private sector respondents do not seem to have official written emergency plans in place, but they do have their own emergency procedures. Nonetheless, the regular testing of these procedures is questionable. A public sector respondent observed

that the, *"private sector need to have this [emergency plans and procedures] themselves or if [they do have it] in paper it is not tested a couple of times a year, as it should be"*[36]. A resort manager outlined their emergency procedures but did not mention any testing or practice-runs of these procedures:

> *"…I have three first aid kits…as far as emergency procedures are concerned…, that's, that's in my booklets, I'm talking about a staff for the guides on course of action, you can't have an earthquake plan because it's unpredicted when it's going to hit or what you are going to do…tsunamis, we take everybody out of the house and up the hills for a BBQ breakfast depending on what time of the day it hits—that's nicely done. For cyclones we all know about cyclones so it's about advising people, but it all depends on the severity of it, just on what to expect. We have our own procedures of course…. and in most cases of cyclones, we advise our guests to stay inside. Earthquakes we do head-counts, but again it really depends on the severity and everything else. There is not, you can't really prepare for an earthquake. I guess you know if you have a high rise building you would have an earthquake plan, but we know who is in what building…"*[38]

In terms of the response to social shocks, such as the mentioned AirVanuatu flight changes, the collective community have proven to be a powerful force by successfully lobbying the government to re-instate the cancelled flight. However, they have little influence on the media coverage, which makes them sensitive to how the destination and risks are portrayed in the media. Furthermore, there was no mention of a coordinated approach in dealing with media coverage after a disastrous event.

More than ten actions were identified in policy documents linked to the business management adaptation category. These related to: identification of funding opportunities; financial support for small businesses; tourism and industry accreditation schemes; tour-guiding standards; marketing tools; cost-benefit analyses of adaptation; incentives for locals to be involved in tourism activities; encouragement of stakeholder involvement in policy development; response systems for the tourism system; diversification of tourism services; and products and tourist satisfaction monitoring.

Key challenges for a country with LDC and SIDST status are limited funds and human resource skills. As mentioned by a NGO respondent, *"many of them [communities and businesses] are finding it difficult to adapt to existing challenges"*[7]. It is, therefore, vital that the government and its policies can help these communities and businesses in the challenges they currently face, as they will only be greater with the impact of climate change. The majority of policies (23) addressed this characteristic through various adaptation measures. For example, the *Vanuatu Tourism Action Program (VTAP) 2008* (Republic of Vanuatu 2008) aims to achieve a long-term assistance program that can support small guest house development in the outer islands. The *Vanuatu Tourism Development Master Plan 2004-2010* (Republic of Vanuatu, n.d.b) also entailed a number of tourism-related actions that will facilitate climate change adaptation, including the provision of tourism studies scholarships, incentives for public sector staff in pursuing short courses in tourism, and the development of a training program on the basics of tourism business operation. In terms of building the climate knowledge, the *ADB Country Partnership Strategy 2010-2014* (Government of the Republic of Vanuatu, 2006) includes a strategy for providing regional training courses on weather forecasts and warning systems and cyclone disaster mitigation. This will be particularly relevant to the local tourism businesses by making reliable information about the weather accessible.

8.2.3 Behavioural adaptation

As the third type of adaptation in step five of the second research objective, behavioural management adaptation actions were identified in both the data collected from the primary methods (i.e. interviews and group discussions) and from the supporting methods (i.e. secondary data and observations in field diaries). This section first discusses the behavioural adaptation action of involving the local people. Then the few adaptation actions identified in the policy documents will be discussed.

Involving the local people in solving the issues of population growth and density will be of key importance[4]. Several of the identified climate change adaptation measures are based upon involving the local people in the solution, such as promoting a participatory approach to land governance or providing communities with greater access to land information. As mentioned by an interviewee from the NGO group: *"communities are one of the major stakeholders in tourism and climate change"*[7]. Nevertheless, as mentioned by three development respondents, it is vital to involve the local/provincial

government in climate change adaptation projects[23]. Thus, a balance of both top-down and bottom-up approaches would be an ideal solution for Vanuatu.

Only two adaptation actions were identified in the policy documents. The *Vanuatu Tourism Development Master Plan 2004-2010* (Republic of Vanuatu, n.d.b) sets out to reduce economic leakage by encouraging the use of local produce and materials within the tourism sector. The second behavioural adaptation strategy and measure was noted in the PACC (GEF et al., 2009) with the following specific action item:

> "Promote and support dialogue, exchange of information and coordination amongst early warning, disaster risk reduction, disaster response, development and other relevant agencies and institutions at all levels, with the aim of fostering a holistic and multi-hazard approach towards disaster risk reduction" (p.32).

It is this action item's focus on supporting dialogue between agencies and institutions that makes it a behavioural adaptation, as the awareness of policies (across sectors) seemed to be lacking not only in the private sector, but also within the public sector, indicating that dialogue between agencies and institutions can be improved significantly.

8.2.4 Policy adaptation

As the fourth type of adaptation, policy adaptation actions were identified in both the data collected from the primary methods (i.e. interviews and group discussions) and from the supporting methods (i.e. secondary data and observations in field diaries). This section first discusses the policy adaptation action of an emergency evacuation plan at the national and local level. Then, aid provisions are discussed in relation to the response phase of the DRR continuum and the current Australian and New Zealand aid agency efforts identified in secondary data. Next, the government funding for tourism marketing and the VTO is discussed. This is followed by a discussion of stakeholder involvement and traditional knowledge, before an overview of the policy-related adaptation actions is provided.

Once a crisis hits, the escalation of the crisis event into a disaster can, in the short-term, be prevented through effective emergency management (UNISDR, 2009). As the dive tourism system in Luganville has not as yet experienced a major crisis, the data did not provide a lot of depth into the knowledge of emergency management in Vanuatu.

However, it was clear from the data that current emergency management includes the development of a national emergency evacuation plan[xxx]. As three public sector respondents mentioned, there is:

> *"...panic when people are not organised, as no focal point for information. This has led to the development of an evacuation plan. This includes proactive measures. Now they [i.e. the National Disaster Management Office] are doing awareness in relation to preparedness and reaction."*[42]

This plan is currently in the drafting stage and there is limited awareness of what the individual emergency procedures are. As two representatives commented, there is *"...quite low awareness of who does what and when at [national] organisational level, then there most likely will also be this at the community level"*[49]. Apart from the lack of an implemented national level emergency evacuation plan, there is currently no official emergency plan for the municipality of Luganville, as highlighted by a public sector respondent, but the:

> *"...community in town takes care of [the] situation during cyclones. The National Disaster Management Office is a part of this. [The] police, mobile force, national government, provincial government, and municipality take people to higher ground."*[45]

Aid provisions are important to assist in the temporary relief of an emergency, but at the same time fail to strengthen the resilience of individuals to cope with dramatic changes in the future (Gaillard et al., 2009). Yet, there was nothing in the primary data to indicate how immediate aid provisions have been or will be distributed and managed in the event of a shock or disaster. This might be because immediate aid provisions are supplied to specific disasters and this thesis looked at an array of shocks and stressors, none of which in recent times had caused a major disaster or crisis. Consequently, this requires further attention in order to understand what immediate aid provisions are made available to local communities, local businesses, NGOs, and government, who provide these provisions, and how is the distribution of aid managed.

Vanuatu, and consequently Luganville, has a high reliance on aid provisions in general. There are many aid agencies involved in Vanuatu and Luganville, as outlined in Section

[xxx] This plan is yet to be announced by the Government, and I have unfortunately not been able to get a copy of the draft plan.

4.2.3.6, but this section only focuses on some of the efforts provided by Australia and New Zealand. Australia represents the largest aid donor in Vanuatu (Australian Government DFAT, 2012) with AUD$70.1 million donated by Australia in the year 2011-12. Part of this support is provided to the Vanuatu Police Force (VPF) in the form of professional development and infrastructure-based projects. Vanuatu Australia Police Project will help build the capacity of the VPF who, as mentioned in Section 8.2.4., take part in emergency response.

Caritas Australia[xxxi] initiatives will help build the resilience of the Port Olry community to drought through ensuring access to safe drinking water—an issue that was highlighted as a sensitivity in this study—and the general communities of Luganville and surrounds by providing awareness of school emergency plans and advising school children and parents on what to do in case of an emergency. New Zealand also provides aid assistance to Vanuatu through support of NZ$7 million for economic development, education and governance (New Zealand Aid Program, 2012). The New Zealand Aid Program (2012) supports forestry training and tree nurseries; vocational training of rural youth; inter-island shipping services' improvements; and improvements to the processes of dealing with tenure and land disputes. As access to land and land disputes have impacted tourism in the past, as discussed in Section 7.6.1, any support to the Ministry of Land can only aid in the process of dealing with this sensitivity. The support provided to the forestry department may help in the mitigation of climate change and possibly provide some buffer to natural hazards like flooding or cyclones, whereas vocational training of youth will further enhance the skills and technical expertise available within the communities.

A key adaptation action for the tourism sector relates to the government funding of tourism marketing and the VTO. The *Vanuatu Tourism Action Program, 2008* (Republic of Vanuatu 2008) states in action 2.2: "Provide government funding for VTO based on clear targets and UNWTO standards for destinational marketing expenditure" (p. 20). However, the current tourism marketing budget for the VTO is small and easily affected, as a resort manager reported, the "Minister of Tourism[xxxii] wanted a ½ million

[xxxi] A Catholic Church based international aid and development organisation that runs a number of projects in Vanuatu. Recent 2010-11 Caritas' projects include: 1) a water security project in Port Olry; and 2) a disaster risk management project that targets early childhood educators (Caritas, 2012).

[xxxii] The respondent is here referring to the Minister for Trades, Commerce, Industry and Tourism.

Vatu for a conference in Paris - this is one third of the marketing budget for all of Vanuatu"[20]. Furthermore, as mentioned by an interviewee from the NGO group *"there is no [singular] Minister of Tourism in Vanuatu, yet it is the main economy and the most important"*[26]. As a local operator concurred, the minister involved with tourism is:

> *"…also the minister for trade [, commerce and industry]. He's got a lot on his plate, he doesn't really get involved in the details. So we are left to our own devices. Pretty much each operator does his own thing. We combine some small advertising efforts as a cooperative, but on the whole everybody does their own thing."*[A]

Given the current fluctuation of the tourism marketing budget, as discussed earlier, government funding for tourism marketing will be an important adaptation that will support the tourism sector in seizing new opportunities arising from change internally (in Luganville and Vanuatu) as well as externally (overseas). As a result, actions to grow the tourism sector sustainably will build Vanuatu's economic resilience and help reduce its overall vulnerability to climate change risks.

In terms of engaging stakeholders and incorporating traditional knowledge, the *Priorities and Action Agenda 2006-2015* (Government of the Republic of Vanuatu, 2006) aims to engage stakeholders in policy formulation and implementation and the *Disaster Risk Reduction and Disaster Management National Action Plan 2006-2016* (Pelesikoti et al., 2007) aims to include traditional knowledge and practices in plans. As discussed by a public sector respondent, there is also a need to work together across government departments and to share responsibilities on projects, such as providing awareness campaigns to local communities. He said, *"the expected impacts means there is an improved awareness in Government for the need to work together"*[27], so now the processes just need to be in place to support this. This might include the implementation of the following adaptation measures: (1) climate change considerations mainstreamed into national policies, planning processes, plans and decision-making at all levels and across all sectors; and (2) cooperation and coordination between all relevant national institutions involved in enforcement. An overview of the current and proposed policy-related adaptation actions, as identified in the policy documents, are presented in Table 8-3.

TABLE 8-3: POLICY-RELATED ADAPTATION ACTIONS

Adaptation actions	**SIDSTs' characteristic addressed**
• Integrate climate change consideration into key development sectors • Promote significant international support through advocacy • Expand existing tax base • Improve marketing of Vanuatu • Conduct monetary policy • Promote an open sky policy • Pool human and financial resources in production of cohesive marketing tools • Formulate incentive schemes to stimulate tourism development • Develop and support provincial tourism plans • Provide and increase funding to VTO • Provincial tourism tax used on tourism development solely • Government to consult on legislations, such as minimum wage • Encourage foreign investors in tourism sector • No sectoral licenses required for investments in tourism sector • Offer of residency status to investors living in Vanuatu • Concession on trade taxes for goods imported for several sector activities, incl. Tourism development projects • Establish fisheries development and management fund • Provide framework for sustainable growth in agriculture and tourism • Reduce transportation costs for tourism and agricultural producers • Increase tourism employment • Fostering use of sustainable energy sources Development of national sustainable development strategies/frameworks	Low economic resilience
• Integrated drainage and sanitation master plan • Support provision of affordable, effective and sustainable drainage and sanitation services • Develop a Port Vila development plan (incl. zoning and spatial plans) • Formulate national planning policy and guidelines • Develop integrated primary health care and public health care strategy • Increase number of women in wage-employment in the non-agricultural sectors • Promoting participatory approach to land governance • Ensure basic Government services reach all rural communities • Improve economic activities through REDI schemes in all provinces • Support sustainable and proactive land use planning	Population growth and density
• Development of matrix to identify most appropriate adaptation projects • Mainstream climate change risk considerations into planning procedures • Review and develop sector regulatory and planning processes for disaster risk reduction (i.e. building codes)	Infrastructure

• Develop and implement an international aviation strategy (and ensure it is linked to airports development plan) • Develop domestic aviation strategy • Policy framework for the maintenance and operation of maritime facilities • Prepare long-term plan for wharf facilities to cater for cruise ships • Strengthen physical planning law and development controls • Monitor impacts of developments and ensure compliance with environmental impact assessments (EIAs)	
• Develop a scheme to encourage public sector staff to pursue short courses in tourism; • Develop destination marketing strategy; • Provide scholarships for tourism studies; • Encourage public-private sector partnerships; • Mainstream disaster risk management into national macro-economic policy; and • Develop and fund an ongoing tourism market research program. • Develop individual sub-sector strategies; • Incorporate tourism and local species knowledge into school curriculum; • Develop product development guidelines; • Reserve certain tourism investment activities to Ni-Vanuatu investors; • Establish scientific research council; and • Promoting a blend of formal and traditional (customary) systems for land governance.	Limited funds and human resources
• Identification of vulnerable priority areas/sectors and appropriate adaptation measures • Integrate appropriate adaptation measures into development strategies • Climate change considerations mainstreamed into national policies, planning processes, plans and decision-making at all levels and across all sectors • Develop and implement Clean Development Mechanism (CDM) initiatives • Include traditional knowledge and practices in plans • Develop international access to Tanna • Establish niche tourism markets • Establish multi-sector tourism council • Establish a Department of Tourism to replace the National Tourism Development Office (NTDO) • Establish Provincial Tourism Councils in all provinces • Ensure local transport operators carrying tourists are insured; and • Cooperate and coordinate between all relevant national institutions involved in enforcement	Other country characteristics

8.2.5 Research and education adaptation

As the fifth type of adaptation, the need for research and education adaptation actions was identified in the data collected from the primary methods (i.e. interviews and group discussions) and ten adaptation actions were identified from the supporting methods

(i.e. secondary data and observations in field diaries). This section first discusses the need for research and education adaptation. Then, a brief summary of the current and proposed research and education adaptation actions is presented.

Central to the ability to respond and adapt to (climate) change, is the ability to learn (Barnett, 2001). In other words, education and awareness is a key element in ensuring a more sustainable future. However, the policy directions within tourism have changed in recent years away from training. As highlighted by public sector respondent: *"In 1997, the focus was on training, now the main focus is on product development"*[21]. Although it is of importance to continue product development to ensure market competitiveness, it is also vital to ensure that tourism businesses, staff and the local communities are aware of climate change issues and trained accordingly. This is supported by development agency respondents, as the following quote indicated: *"Awareness of possible effects of climate change and sea level rise is becoming a real issue for Government to deal with."*[23]

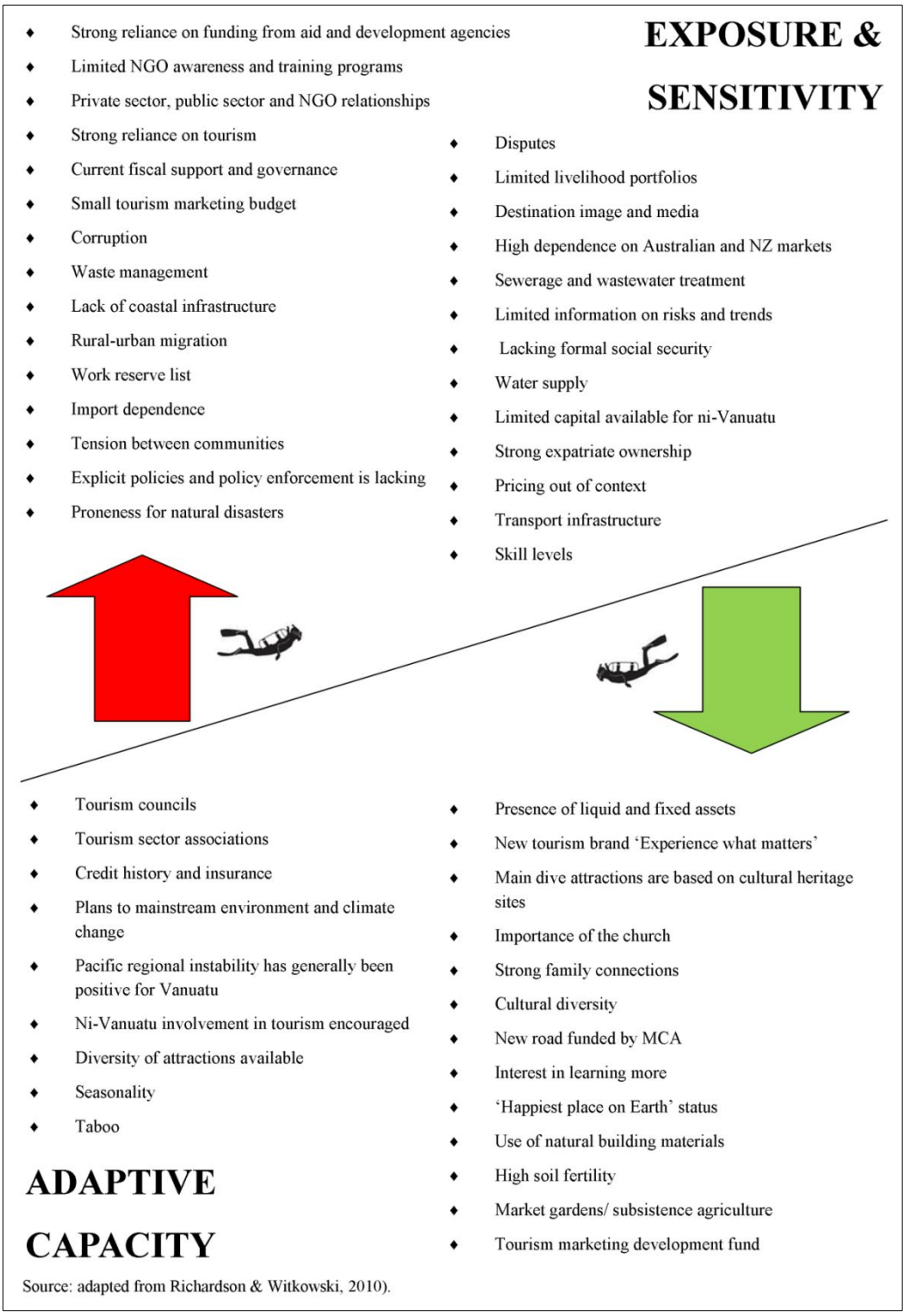
Ten adaptation actions were identified in the research and education adaptation category. These actions entail: strengthening human capacity; developing a local cultural and handicraft centre; conducting solid waste disposal studies; providing access to land information; developing coastal planning toolkits; increasing climate change awareness; and improving access to education and training.

8.3 The way forward - Proposed adaptation actions

The information contained in this thesis has provided a better understanding of the larger social, political, and environmental processes that need to be considered in order to enhance adaptive capacity in the dive tourism system and build resilience (IPCC, 2007b). As part of addressing step five of the second research objective, this section proposes five key adaptation actions that will address current vulnerabilities of Luganville's dive tourism system and build its resilience to climate change. An overview of the factors that increase vulnerability and those that increase resilience of the system is presented in Figure 8-1.

Adaptation and resilience building actions help to address existing sensitivities identified in the dive tourism system. Taking the current sensitivities and adaptive capacity of the dive tourism system in Luganville into account, five key adaptation

actions are proposed: (1) provide further climate change awareness and disaster risk training at the local level; (2) improve environmental awareness of marine ecology and provide adequate infrastructure; (3) strengthen institutional coordination and encourage public-private partnerships (PPP); (4) build government capacity at local, national and regional levels; and (5) mainstream adaptation in national development plans and strategies.



Source: adapted from Richardson & Witkowski, 2010).

FIGURE 8-1: OVERVIEW OF VULNERABILITY AND RESILIENCE FACTORS

8.3.1 Provide further climate change awareness and disaster risk training at the local level

Communication, education and capacity building may improve public awareness and thereby reduce the vulnerability of the system (Richardson & Witkowski, 2010; Turvey, 2007). The data showed that although some evacuation and emergency procedures are in place, many members of the local community are not completely clear about how they work and some had very little awareness of these procedures in general. The data also showed that whilst emergency and evacuation plans may exist at the business and organisation's level, they do not exist at the local and national government levels. Some sources highlighted that a national evacuation/emergency plan is in the process of being developed, but disaster warnings are provided by the national government. In Luganville there are people, including staff from the police, mobile force, and from all levels of government, organised to take people to higher ground. In other words, there is limited awareness of how to deal with disasters in the community.

A strengthening of disaster risk and climate change awareness is required, particularly at the local level, to increase trust in the system and ensure less panic and confusion during the disaster that might lead to injuries during the evacuation/emergency. It is recommended that the government consider different types of media and technological outlets that can be used to disseminate the disaster warnings. SMS has been used in other Pacific countries, including Samoa and Tonga, and may be a valuable additional tool for government in reaching members of the community. Three specific initiatives are proposed that when combined will provide further climate change awareness and disaster risk training at the local level: (1) develop and implement climate change awareness campaign; (2) develop and distribute small brochure; and (3) undertake hazards training. These initiatives are described below.

8.3.1.1 Develop and implement climate change awareness campaign

The data brought to light the need to disseminate information about the impacts of climate change on tourism. This would ensure some common ground between stakeholders and the need to provide possible adaptation actions. Consequently, I propose that an awareness campaign entitled 'Climate change - Everybody's business' is created to provide valuable information about the projected impacts of climate change

for Vanuatu and how these may influence daily life and the tourism sector. The emphasis on the fact that climate change is everybody's business and responsibility should be a key theme in any awareness campaigns. The information should be delivered in a non-threatening manner and each of the climate change awareness and disaster risk training products should be developed through a collaborative approach. Each product will need to be culturally sensitive, convenient to use and effective, interesting and innovative, but most of all, appropriate to the identified needs and containing regional and local information making it both effective and professional.

8.3.1.2 Develop and distribute small brochure

A small brochure could be developed highlighting the different natural (and social) hazards that are likely to occur and presenting valuable information on how to deal with it. A brochure of this type was developed in Hawaii. The Hawaii County 'All Hazards Information Card' (Johnston & Dudley, 2009) was developed with the purpose of increasing public awareness of natural hazards that can be life-threatening and occur on the island, and present an overview of appropriate responses and resources available. Since its first introduction, this card has been distributed to residents, visitors, school kids and university students. The card folds into a pocket size brochure (approximately the size of a business card) and covers a range of valuable information about the natural disaster. For example:

> "The card describes the risk from each of the main hazards encountered on Hawaii Island (tsunamis, earthquakes, volcanic hazards, hurricanes & windstorms, storm surge, rainfall flooding, and high surf), explains "How to avoid becoming a victim," lists emergency telephone numbers and emergency radio stations, describes a family disaster kit, and shows on a map the location of certain hazards, including tsunami evacuation zones, and the locations of emergency medical services including hospitals and fire stations with medics." (Johnston & Dudley, 2009, p. 59)

Mirroring the one used in Hawaii, the Vanuatu brochure could be aimed at both tourists and residents alike. The brochure could cover the following information: various natural hazards; traditional signs and stories related to the hazards; information on how to avoid becoming a victim; a map of the destination; important emergency contact information; important things to remember; and basic disaster supply kit information.

8.3.1.3 Undertake hazards training

Taking a different approach, private businesses could be involved in hazard training through their enrolment in online training courses. For example, the University of Hawaii at Hilo is currently developing a range of training courses related to tsunamis that will be made available as online courses, as well as a hands-on field course (Johnston & Dudley, 2009).

A number of lessons have been learned from research on responses in other nations, such as Pakistan, Ethiopia, Sudan and Malawi (Linneroth-Bayer & Mechler, 2007; The World Bank, 2009). These lessons include:

- Partnership approaches to disaster safety nets can be mutually beneficial;
- Communities and individuals undertake much of the life-saving and relief activities after shock events themselves but are assisted by wider public institutions;
- Effective relief assistance needs to be targeted to the local context;
- Participatory community-based approached are often effective in producing good results;
- Communities are valuable sources of information and resources during the implementation phase; and
- The use of traditional community structures may bring long-term benefits.

With the limited awareness and local ownership of the emergency procedures in Vanuatu, a community-based approach to emergency management may well create a more effective response to disasters in the future. Such an approach to emergency management can also benefit from the provision of hazards training.

8.3.2 Improve environmental awareness of marine ecology and provide adequate infrastructure

A Ni-Vanuatu dive master noted that *"Local people only know about land, but not about the underwater environment. This is a real issue"* [A]. The lack of focus and awareness of the marine environment is of significant concern to dive tourism, as the focal attraction of this form of tourism may be neglected or could be negatively

influenced by policy decisions in other areas. This concern was echoed by a dive operator:

> *"From a marine point of view, I don't think there is anything specific. I mean it is such a land-based society, it is incredible. There is no marine-based NGO."*[31]

The insufficiency of the utility services (e.g. waste water and sewerage treatment and garbage disposal) has created significant issues for the marine environment. A dive operator commented that all the coral reefs from Million Dollar Point to his business in town had died completely[39]. COTS outbreaks are a considerable issue for dive tourism in Vanuatu and as climate change will exacerbate current stressors on coral reefs, the sources of these human-caused stressors, therefore, need to be dealt with. If the inadequacies in infrastructure and waste management are not handled appropriately, this could have serious consequences for the health of marine environments. There are several steps to deal with this: (1) increase the environmental awareness of the marine ecology; (2) provide training on 'best practices'; (3) encourage sustainable fishing practices; (4) establish marine protected areas; (5) ensure appropriate infrastructure is in place; and (6) implement and enforce monitoring systems. Each of these steps is discussed in more detail below.

8.3.2.1 Increase the environmental awareness of the marine ecology

Awareness programs about the sensitive nature of the marine ecology will stress the importance of good management, and detail the damage that inexperienced divers can do to the reef. As Davis and Tisdell (1995) state:

> "better trained and more experienced divers who can control their buoyancy will have a lesser impact than will learner, resort and other inexperienced divers. This is because most experienced divers become adepts at achieving 'neutral buoyancy', and avoid uncontrolled contact with fragile corals and other organisms" (p. 27).

A Thai study by Worachananant et al. (2008) found that the majority of divers would make contact with substrata during their dive, with damage from fins being the highest form of damage caused. The study concluded that an awareness of this damage will allow park managers and dive operators to match diver competence or experience levels with site resilience and encourage dive operators to be proactive in the promotion of

minimal impact diver behaviour. Moreover, pre-dive briefings were emphasised as a useful tool of communication.

8.3.2.2 Provide training on 'best practices'

Training should be provided to community members, business owners, managers and staff on best practice in dealing with solid waste, wastewater and the use of sustainable resources. This training should also introduce measures that decrease resource consumption. One of the respondents suggested that a glass re-cycling program should be implemented in Vanuatu:

> *"In this country, glass is a real problem because there is no recycling. It can't be send to Australia, as it is too expensive to export. So they could collect all the glass and smash it up, like on a conveyor belt smash into fine particles, like sand and then it could be reused as for aggregate sand to mix in concrete. Instead of buying sand which is you know ridiculous as they collect it from the beaches; sand. So no one destroying the beach... and at the same time, the glass is being thrown into the water all over the place and kids will be walking over it, it's like a mine field. One day it will really be a problem, because it's there. Instead of doing that, we should be smashing the glass up and selling it. So local people could go around collecting it and giving it a value and then it could be bought by myself or anyone building to be mixed with concrete and it's a win-win situation. You take the glass out of circulation, because all the hotels and restaurants you know, if you go to the back of any hotel or restaurant at Breakers you should see how much glass is being thrown out, and that is just filling up the tips. Bad, because it's filling it up. Two it's not providing any employment where both someone could be making it and providing employment, you know recycling. Some could be making money selling it and others could be using it. I'd be happy to use the glass. We could get rid of all the glass in this country as bags of concrete mixing. Perfect."*[51]

8.3.2.3 Encourage sustainable fishing practices

Unsustainable fishing practices can cause significant environmental damage to the marine environment. Destructive fisheries that make use of dynamite and cyanide have caused tremendous damage of coral reefs in the past (Van Treeck & Schuhmacher,

1998). Aqua trade fishing in Vanuatu has anecdotally caused a decline in specific species, such as the Flame Angel Fish, which is almost extinct [A]. Group discussions also revealed that many corals are broken and crushed by aqua trade fishermen, as they try to get to the small fish. This harms the dive tourism attractions. Consequently, encouraging the practicing of sustainable fishing will not only be beneficial to the fishery industry, but will also be of significant value to the dive tourism system.

8.3.2.4 Establish marine protected areas

Recent research into marine protected areas indicate that these areas can increase the resilience of populations in coastal areas and that "networks of marine reserves may be the most effective tool that local communities and nations worldwide have to combat the negative impacts of global climate change on marine ecosystems and livelihoods" (Micheli et al., 2012, p. 6). It is, however, important that marine protected areas are established in collaboration with the local communities and businesses to ensure they are effective. As Bartlett et al. (2010) assert, "there is a legitimate concern that externally imposed management approaches will be socially disruptive and/or locally inappropriate, alienate stakeholders from active management, not recognize the complexity of local knowledge or derive from an incompatible world view" (p. 102). The use of Taboos and locally established marine protected areas could also be an important component of a national policy of establishing marine protected areas to enhance the resilience of the marine environment to the effects of climate change.

8.3.2.5 Ensure appropriate infrastructure is in place

As the water quality study from Port Vila harbour identified (see Chapter 6), insufficient sewerage and waste water treatment infrastructure can have a significant negative impact on water quality. Both pollution and sediment input from terrigenous run-off put significant pressure of coral reefs (Van Treeck & Schuhmacher, 1998). The anthropogenic pressures can easily be eliminated or minimised by ensuring that appropriate infrastructure is in place. Solving this issue requires a two-pronged approach, namely the introduction and enforcement of managed legislation accompanied by education and awareness programs. One of the eight areas dealt with by the NGO Live and Learn is waste management. A recent project run by Live & Learn was the 'Green Cities' program, which aimed to "create ownership and sense of responsibility regarding waste produced by all areas of the community including major retail-outlets and decision-makers" (Live & Learn, n.d.).

Monitoring systems are implemented and enforced

It is vital that monitoring systems are implemented and enforced. Monitoring the health of the marine environment does not need to be the sole responsibility of the government. But the responsibility of regulation enforcement does lie with the government, falling under the jurisdiction of the various government departments and authorities. Currently, the enforcement of policies is a real issue in Vanuatu and stakeholders have lost faith in the system. Work by the NGO, WSB, highlights the possibility of sharing the responsibility of monitoring and conservation of species and areas. WSB has already established local-based monitoring systems, where:

> "A network of villagers, initially called Turtle Monitors, was established to directly link community representatives to WSB. Now known as the Vanua-Tai network, this organization serves as a major conduit of conservation information and discourse to remote communities" (Bartlett et al, 2010, p. 100).

Consequently, the responsibility of ensuring that monitoring systems are implemented is one that should be shared by all stakeholders, including communities, private sector businesses, NGOs and public sector departments and authorities. Nevertheless, the government of Vanuatu needs to ensure that a sufficient budget for regulation enforcement is incorporated into the annual budget for each of the government departments and authorities.

8.3.3 Strengthen institutional coordination and encourage public private partnerships (PPP)

Institutional strengthening is an adaptation action that is relevant to tourism when there is a shortfall in the institutional capacity to coordinate appropriate climate responses across all tourism-related sectors (Becken & Hay, 2007).

Multi-level governance is required to build the capacity to deal with shocks and stressors, whether these are natural or man-made, and the governance systems that are in place need to be effective (Adger et al., 2005). This is where PPP can play a crucial role in ensuring that the tourism system can cope with change in the long-term. "These extended partnerships can comprise the government, private sector businesses, NGOs, international financial institutions and other donors" (Linnerooth-Bayer & Mechler, 2007). The World Bank (2009) emphasises that involving NGOs in partnerships

between the public and private sector can bring about great transparency and accountability through information sharing and public consultations.

Research suggests that PPP initiatives that have provided disaster safety nets have the potential to reduce the flow-on effects of a disaster (Linnerooth-Bayer & Mechler, 2007) and that PPP can contribute to climate change adaptation in the Pacific (Wong et al., Forthcoming). "PPP is a relationship based on a shared aspiration between the public sector and one or more partners from the private and/or voluntary sectors to deliver a publicly agreed outcome and/or public service" (Wong et al., Forthcoming, p. 1). Linnerooth-Bayer and Mechler (2007) presented three extended partnership initiatives within the insurance sector in India, Malawi and Turkey – in different ways, each initiative made insurance affordable for low-income households, businesses and individuals thereby providing disaster security and safety nets. Wong et al. (Forthcoming) examined how PPP can help Pacific tourism adapt to the effects of climate change and came to the conclusion that PPP can be particularly beneficial in technical, behavioural and education and research types of adaptation. An example of a PPP for hazard awareness is The Coca Cola Foundation Thailand, which provides intensive training on disaster-relief basics and first aid (Roeth, 2009). Lieutenant General Dr. Amnat Balee, M.D., Director of the Thai Red Cross Society's Relief and Community Health Bureau stated the following about the lessons learned from this PPP:

> "Experience has taught us not only that public-private sector partnerships can play a substantive role in disaster response but that the best time to start planning is before the next disaster occurs…" (cited in Roeth, 2009, p. 27).

Linnerooth-Bayer and Mechler (2007) argue that to develop partnerships to provide disaster security, good governance and a stable institutional setting is required. There are four basic elements to sound governance: (1) accountability; (2) participation; (3) predictability; and (4) transparency (ADB, 1997). Furthermore, a strong and improved leadership within the various management agencies is crucial for the governance of human-environment systems in coastal areas (Adger et al., 2005). Consequently, two-way communication is required, and all parties need to show trust and accountability to ensure successful governance. The primary data indicates a lack of trust and accountability between the private and public sectors. Some consultation does takes

place, but it is fragmented and process-based rather than performance-based, and transparency is lacking.

Ensuring that communication is effective and that a mutual understanding between all parties is reached is vital to ensure the success of PPP. For example, with regards to the Vanuatu destination and development marketing fund, the VTO collects 50 per cent of the fund from the private sector associations and pays the remaining 50 per cent itself. Nevertheless, in recent years, there have been some changes to this partnership, which have not been clearly negotiated between the parties. For example, the sector association membership has now been linked to the VTO website creating some confusion and a feeling of being forced to pay a sector association membership to be linked to the VTO website. One private sector respondent expresses his resultant frustration:

> *"I wish that the VTO could separate out their destination marketing partnership with the private sector from their offering of having or being linked to their website. Why do the two things have to be linked? As a tour operator in Vanuatu you should be able to have your website linked without having to be a member of the Vanuatu Tour Operators Association for example."*[31]

8.3.4 Build government capacity at local, regional and national levels

The data showed a limited capacity of government departments at local, regional and national levels to implement policies, enforce regulations and to undertake effective consultation with the private sector. In particular, the Environment Unit, the National Tourism Development Office (NTDO), and the VTO have limited capacity to deal with change. These offices are understaffed and have limited budgets that can fluctuate greatly from one quarter to the next, as the case of the VTO has shown (Nadkarni, 2007). The identified lack of policy implementation in Luganville and Vanuatu seems to be a general problem of the Pacific. A Pacific 2020 project (COA, 2006) identified that implementation as "a function of ownership" (p. 4) is a serious constraint in PICTs. Policy makers at all levels in Vanuatu, therefore, need to focus on building a sense of ownership of projects and policies through putting in place realistic reform plans, prioritising these and encouraging governance in a Pacific context (COA, 2006). The limited capacity of the government departments is further highlighted by Bartlett et al. (2010) who raise the issue of overlapping mandates between ministries and government departments in Vanuatu and the implications that this has on the management of

protected areas. They further state that there is little coordination across the different organisations and when intra-organisational coordination does occur, it is ineffective. Consequently, significant efforts need to be made to build the capacity at all levels of government.

The Government of Vanuatu needs to localise the impacts of global climate change (Tang et al., 2010) and then involve a range of stakeholders, including at the senior management level and those involved with the implementation of policy. A range of participation techniques (e.g. questionnaires and working groups run by a facilitator that allow for debate and interaction among stakeholders) could be used to highlight the perceived benefits of the policy. This would allow for different styles of dialogue and communicate and acknowledge that agreement may not always be achieved and that there may be systemic limitations (Bramwell & Sharman, 1999). Through these actions, a sense of ownership can be developed, which will heighten the implementation rate of policies, ensure stakeholder commitment to these policies throughout the policy process, and more importantly, as a result of this, reduce the vulnerability of the tourism sector to climate change.

8.3.5 Mainstream adaptation in national development plans and strategies

As highlighted by Sem and Moore (2009), it is not enough for a few sectors to focus on adaptation. The building of adaptive capacity and resilience requires the integration of adaptation measures with other policies, such as disaster preparedness, land use planning, coastal planning, environmental conservation and sustainable development plans (IPCC, 2007b). Consequently, although the development of NAPA is a step in the right direction, adaptation needs to be mainstreamed in national development, environment, sustainability and conservation plans and strategies within Vanuatu. The drafting of the National Climate Change Policy will be an important step in achieving this, but as the policy analysis in Vanuatu shows, there is very little awareness of policies in general in Vanuatu. Therefore, the government of Vanuatu must ensure that stakeholders both within government departments and private sector businesses are made aware of this holistic policy.

Moreover, in order to ensure effective adaptations are mainstreamed into national development plans and strategies, more studies will also be required in relation to the effects of climate change in Vanuatu and on the tourism sector. For example, more

studies are needed to fully understand the local and regional distribution of sea level rise or the extent of coral bleaching and COTS outbreaks and the effect this will have on important dive sites.

8.4 Evaluation of adaptation actions

It is known that inappropriate adaptation actions may cause more harm than good, and so, as Kelman and West (2009) state, "the right choices must be made" (p. 10). The existence of supportive institutions, increased levels of financial support, and greater access to information and technological support will increase the likelihood of adaptation measures being successful (IPCC, 2007b). It is therefore important to evaluate the adaptation actions. This section does not seek to undertake detailed evaluation of the current adaptation actions, but aims to highlight the importance of evaluation and monitoring, as it became evident from the data. This section is divided into two: (1) successful adaptation; and (2) maladaptation.

8.4.1 Successful adaptation

Six examples of successful adaptation actions became evident from the analysis of the data. The first two were community-run or community-driven projects, the third and fourth were run by the private sector, whereas the fifth was a government action. The sixth was a public-private sector partnership.

Basic community-run or -driven projects and policies can be very effective. Two excellent examples in Vanuatu were provided by interviewees from the NGO group. One interviewee [10] spoke about the NGO's environment and community outreach programs and how a theatre group would perform when a new committee was set up to provide awareness through their performance[7]. The NGO respondent identified the successful growth of its environment programs:

> *"The Environment programs started in 1995 with the need for turtle conservation. Membership [then consisted] of 15 foreigner turtle warriors - now there is 400 turtle warriors around the islands, all living in communities"*[10]

The NGO provides training to the Turtle Warriors and conservation information is provided by turtle warriors [10]. They work with other NGOs, government departments (including Fisheries and the Environment Unit) and attend many of the same meetings as the VTO, although a close partnership with them has not yet been established[10].

The other interviewee[14] explained how the understanding of the life cycle of a specific species has led to a better caring of the species (i.e. the Coconut Crab). The NGO representative mentioned that whole communities, which have Coconut Crab habitats within their community, were involved with the Coconut Crab taskforce and its initiatives and that in the Sanma Province approximately 50 Coconut Crab habitat sites had been identified on Santo, Malo and other close by islands[14]. The Coconut Crab taskforce was also discussed in Section 5.2.4.1.

Dive operators have done much to keep the COTS population down and improve the overall health of the marine environment. For example, dive operators undertake significant work in removing COTS from the coral reefs [1, 6, 39]. As stated:

> *"I know the scuba divers do a clean up the Crown of Thorn Starfish campaign, where they've actually been going and diving and try to physically remove them. But it's very reactionary. Obviously that's an indicator of stressed ecosystems and all the rest of that!"*[1]

Each dive operator seems to have organised their own actions to deal with the COTS issue. One dive operator explained how they had looked into using poison but that did not seem to be the best solution. Consequently, they had developed what they believed was a much safer option in which they lure the COTS into rice bags with a lace string at the top, tie them and leave them at the bottom[6]. The operator mentioned how important it is not to stress the COTS, as *"If you spear them or otherwise give them a shock they will disperse many eggs"*[6]. Once, the COTS are all dead, the divers release the COTS and possible eggs back into the water and they become a food source for nearby fish [6]. Another dive operator had a different initiative in place, in which they collect many COTS a day, bring them back to the surface where they leave them to dry out before they bury them[39]. A dive operator commented on another private initiative designed to improve overall health of the reefs. The project entails:

> *"…setting up coral beds, which will bring the corals closer together, cages [are] covered with plastic mesh, which will act as a sanctuary for the smaller fish and result in a higher survival rate and thus an improved fish stock."*[6]

A similar initiative has been implemented by another dive operator, who has planted a coral garden near a popular wreck dive site[39].

The Government of Vanuatu has also implemented a climate change adaptation initiative that has proven to be successful. A government interviewee explained "*a Giant Clams farming project was developed to stop locals from exporting wild clams"*[27], as the Giant Clams population was declining due to over-fishing caused by an active aquarium trade. Giant Clam breeding trials in Vanuatu were carried out successfully in 2002 (Secretariat of the Pacific Community (SPC) Aquaculture Portal, 2011). As mentioned by the interviewee, this Giant Clams farming project not only helps address the issue of a declining population of clams (limited natural resources), but also *"will provide another option and revenue system for these communities"*[27], including viewing for divers (tourists). Nevertheless, it is not only the government that has implemented initiatives that deal with the declining population of Giant Clams. Small Giant Clam reserves have also been developed by community groups in Vanuatu, such as the 'Malekula Ringi Te Suh Marine Conservation Giant Clam Sanctuary' (Tellus Consultants, 2011).

An important *private and public partnership (PPP)* is the development of the Tourism Marketing Development Fund (TMDF)[31, 32, 52] that allows the private sector to have more involvement in the national marketing of Vanuatu[52]. This partnership includes Airports Vanuatu, AirVanuatu, Sector associations (including VHRA, VTOA and VSOA), the Dutyfree Association, and banks[52]. The fund was established three years ago whereby "the VTO pays 50%, the private operator pays 50% [50,000 Vatu] and the fund goes to marketing"[31]. This provides a significant contribution to promotion of the destination.

8.4.2 Maladaptation?

Three adaptation actions were highlighted indicating that sometimes adaptation is not as successful as is hoped for. As Barnett and O'Neill argue (2010), unsuccessful adaptation does not necessarily lead to maladaptation; it can just be an action that did not work, but if it increases the vulnerability of other groups or sectors (in the future), then it is maladaptation. However, more research is required to fully comprehend whether the three adaptation actions identified in the data, which are presented next, are maladaptation or just unsuccessful adaptation.

First, the success of the adaptation to the GFC funded by a government and donor/aid agency is yet to be comprehensively evaluated. In 2009, AusAID awarded a grant to the

government of Vanuatu to assist with the international marketing of Vanuatu in response to the GFC (Cheer & Peel, 2011). This grant helped fund the new tourism slogan in Vanuatu. As a response to the global financial crisis, this brand was perhaps not so successful due to the long period of time it took from design phase to its official launch. However, the tourism sector may see other indirect benefits of this campaign in years to come.

Second, a technical adaptation project at the South Mistrel Island caused significant changes to the natural environment. In relation to this, an interviewee from the government noted that it is not always climate change that is causing the impact, but that it can also be due to the type of infrastructure put in place:

> *"They [the government] experienced erosion around the island and most of the airport (runway) had gone due to the construction of a jetty. It was not sea level causing the extensive erosion, but the infrastructure put in place."*[27]

To address the issues, they re-constructed the jetty using poles instead of concrete.

Finally, a public sector interviewee highlighted the lack of consultation between sectors on the MCA roads project, which had consequences on his sector. The interviewee was concerned about the possible impact of waste and run-off of the project and said *"there is no area on the side of the road to contain waste water. This will impact on pristine and high quality corals"*[27]. This emphasises both the need for extensive stakeholder involvement in the planning process of adaptation actions, but also the importance of evaluating these once implemented. This would ensure that vulnerability is reduced, resilience is enhanced and that it is not maladaptation.

8.5 Chapter 8 summary

This chapter has dealt with steps five and six of the second research objective. All four sources of data (i.e. semi-structured interviews, group discussions, observations noted in field trip diaries and secondary data) informed this chapter, with the majority of current adaptation actions being identified in formal policy documents and through interviews. Throughout all DRR phases, the tourism-related adaptation actions occur across five types of adaptation: (1) technical, (2) business management, (3) behavioural, (4) policy, and (5) research and education (Scott et al., 2009).

For Luganville's dive tourism system, the technical adaptations include the provision of disaster warnings, improvements to essential services and infrastructure, urban beautification and improvements and constructions of tourist facilities and a provincial training centre. The business management adaptations include: emergency plans; financial support and funding opportunities; accreditation schemes and industry standards; marketing tools; involvement and training of local people in tourism; diversification of tourist product and services; and tourist satisfaction monitoring. The behavioural adaptations include involvement of local people in climate change adaptation, encouragement of the use of local produce and materials and supporting dialogue between agencies and institutions. The policy adaptations are many and include emergency evacuation plans and procedures, aid provisions and aid agency initiatives aimed at professional development, infrastructure improvements, economic development, governance and education, VTO marketing funding allocations, and engagement of local stakeholders and the inclusion of traditional knowledge. The research and education adaptations include strengthening human capacity, development of a local cultural and handicraft centre, solid waste disposal studies, provision of access to land information, development of coastal planning toolkits, climate change awareness, and provision of access to education and training.

Based on the current vulnerabilities, five key adaptation actions are proposed in order to facilitate future climate change adaptation: (1) provide further climate change awareness and disaster risk training at the local level; (2) improve environmental awareness of marine ecology and provide adequate infrastructure; (3) strengthen institutional coordination and encourage PPP; (4) build government capacity at local, regional and national levels; and (5) mainstream adaptation in national development plans and strategies. These actions are designed to enhance climate change adaptation and build the resilience of the overall dive tourism system in Vanuatu, once successfully implemented.

This chapter also emphasised the importance of evaluation by discussing six successful adaptation actions and identifying projects that may be unsuccessful or maladaptive. The following chapter evaluates the testing of the key elements of a V/R framework that have been presented in Chapters 4 to 8 in order to address the third research objective by proposing a new climate change V/R framework for tourism.

9 THE VULNERABILITY/RESILIENCE FRAMEWORK

"Climate change adaptation can only been [sic] implemented effectively in an integrated policy framework."
(Scott et al., 2008, p. 7)

9.1 Introduction

Chapter 2 provided an overview of the current V/R frameworks reported in the literature. Based on this current knowledge and through addressing the identified gaps of that knowledge, the past five chapters (Chapters 4 to 8) have tested the six key steps of a V/R framework and identified the dive tourism system; the risks and opportunities arising from climate change; the sensitivities and adaptive capacity; adaptation measures that will help build the resilience of the dive tourism system; and the importance of evaluation. In addressing the third research objective, this chapter will draw upon the knowledge gained from these previous chapters and will present a newly developed V/R framework. This chapter has been divided into three key sections: (1) testing of the key elements of a V/R assessment; (2) the new climate change V/R framework for tourism; and (3) stakeholder involvement in application of framework.

Research objective	What information is needed?	How information will be gathered?	Why the method is appropriate?
(3) Propose a new climate change V/R framework for tourism based on an evaluation of the effectiveness of the established key elements	• Effectiveness of key elements of V/R framework. • Applicability of framework. • Limitations to framework. • Proposed applicability of framework to other contexts.	• Overview of the analysis of primary and secondary data.	• The key elements of a V/R assessment were tested in the second research objective and provide an indication of the effectiveness of these steps in a V/R framework. • The development of theory from case studies involves the reflection on data collection and analysis (Carroll & Swatman, 2000).

9.2 Testing of the key elements of a V/R assessment

The second research objective, which involved the testing of the key elements of a V/R assessment, aimed to answer two underlying research questions: (1) Why, if at all, is Luganville's dive tourism system vulnerable to climate change? and (2) How can the

resilience of Luganville' dive tourism system be built? In answering these questions, this section discusses the findings from all six steps, as presented in Chapters 4 to 8. This is followed by a critical analysis of the application and the lessons learned.

9.2.1 Why if at all is Luganville's dive tourism system vulnerable to climate change?

The first four steps of a climate change V/R assessment (i.e. tourism system, risks and opportunities, policy analysis, and sensitivity and adaptive capacity) identify the current vulnerability of a tourism system, by defining factors of exposure, sensitivity and adaptive capacity. Applying these four steps to the case study of Luganville's dive tourism system helps to answer why, if at all, Luganville's dive tourism system is vulnerable to climate change.

The first step entailed defining the tourism system. The focus was on the system and not the destination itself. The reason for this was that climate change has the ability to not only impact on the destination but also impact on the flow of tourists (Hamilton et al., 2005) by impacting the tourist markets either directly or indirectly (Scott et al., 2008; UNWTO, 2003). This influence on the demand for the resource upon which tourism is based (Hall & Higham, 2005) may occur through impacts to: (1) destination attractiveness (Becken & Hay, 2007; Hall & Higham, 2005; Payet, 2008); (2) consumers' ethical choice from a greater awareness of the impacts of travel (DeLacy & Lipman, 2010); and (3) increasing price of travel through the introduction of climate change policies, such as carbon taxes (Becken & Clapcott, 2011; DeLacy & Lipman, 2010). In other words, the impact of climate change and its effects in one part of the system reverberates throughout the entire system (Jopp et al., 2012; Calgaro, 2010).

Luganville's dive tourism system was effectively defined in terms of the TGR, the TR and the TDR, while incorporating all five elements of Leiper's tourism system (i.e. tourists, TGRs, TRs, TDRs and tourism industries) (Leiper, 2004). Representing the TGR, the main tourists come from Australia, New Zealand and New Caledonia, accounting for close to 80 per cent of the tourists to Luganville. These tourists purchase their travel primarily through wholesalers, but are also influenced by internet marketing and VTO's destination marketing. Indirectly, the origin governments and communities also play a role in destination choice through, for example, governmental policies that may influence the cost of travel (e.g. carbon taxes). Disposable incomes are also

important. Representing the TR, the tourists travel primarily by air or cruise ships with a few tourists arriving in yachts. Only ten per cent of visitors travel via another mode. As Australia and New Zealand represent medium to long-haul destinations, the introduction of climate change mitigation policies may have a real impact on dive tourism in Luganville. The TDR consists of a range of attractions (e.g. the Coolidge, Million dollar point, Champagne Beach, Millennium Caves and local villages) that pull visitors to Vanuatu. Private sector businesses (e.g. dive operators, accommodation, food and beverage, tour operators, transport and support businesses) and the sector associations provide tourism products and services, supported by the public sector (including local, provincial and national levels of government, education providers and research institutes) and NGOs (e.g. FSPI/FSPV, Live & Learn, WSB and the Coconut Crab Taskforce). Given Luganville's location in a cyclone-belt (Jayaraman, 2004) and its location on the coastline, it is exposed to storm surges and possible tsunamis. Luganville's dive tourism system is embedded within a wider context related to natural resources, cultural resources, organisational leadership, finance, labour, entrepreneurship, community, competition and governmental policies (Gunn, 1994), which in turn influence the provision of the tourism product.

The second step of the climate change V/R assessment concentrated on highlighting the risks and opportunities from understanding what current perturbations (i.e. shocks and stressors) have impacted on the tourism system and how climatic stimuli will impact the system in the future (e.g. climate change projections and effects of these).

Applying this step to Luganville's dive tourism highlighted the complexity of the vulnerability of a tourism system. Although tourism in Luganville has not yet experienced a critical disaster, eleven shocks and five stressors have impacted Luganville's tourism system over the past decades. The key shocks that stood out in the data were cyclones, earthquakes, effect on demand due to media footage and changes to international flights. Key stressors were environmental degradation and COTS outbreaks. These perturbations have impacted on Luganville's dive tourism system in different ways. For example, cyclones have affected water resources, infrastructure (e.g. wiping out accommodation infrastructure) and food crops in Vanuatu (GEF et al., 2009); earthquakes have primarily impacted tourism through people's risk perception and media coverage; changes to international flights have caused a decrease in visitor arrivals; and COTS outbreaks affect the natural resource of dive tourism in Luganville.

The most recent climate change projections (for years 2030, 2055 and 2090) for Vanuatu (including Luganville) include temperature increases, sea level rise, ocean acidification, changes to precipitation (e.g. wet season rainfall will increase, dry season rainfall will decrease) and increased cyclone intensity (AusAID et al., 2011). The climatic stimuli, consequently, have the ability to exacerbate many of the current perturbations and cause new perturbations. Although it was primarily risks that were identified in this assessment, one identified opportunity arising from climatic stimuli is that cyclones will occur less frequently, which may open up more tourism in the cyclone-prone season.

The third step involved a policy analysis in which the policy-making environment, the policy-making mechanisms and implementation, the policies, and policy gaps were observed or identified. The purpose of the policy analysis was to gain an understanding of the pertinence of policies to climate change adaptation and the conduciveness of the policy-making environment to climate change adaptation.

Several conclusions were reached after having applied the policy analysis to Luganville's dive tourism system. First, a number of explicit and implicit policies are pertinent to the climate change adaptation and will enable Luganville's dive tourism system adapt to climate change. Second, only one policy was explicitly concerned with both climate change and tourism. Third, none of the tourism policies dealt explicitly with climate change and, therefore, did not set out specific actions to adapt to climate change. Fourth, the implementation of policies was a real concern and may hinder future climate change adaptation. Fifth, climate change does not yet rank high on the policy agenda, although it has entered the policy arena in recent years. Sixth, financial resources to implement actions more broadly are strained. With few explicit policies, implementation concerns and financial constraints, Vanuatu may be left unprepared, or at least less prepared, to cope with the effects of climate change.

The fourth step involved identifying factors of sensitivity and adaptive capacity that help define the vulnerability of Luganville's dive tourism system. Multiple factors of sensitivity and adaptive capacity were identified in five different categories: (1) tourism specific; (2) economic; (3) human and social; (4) physical and natural; and (5) governance processes.

In terms of the sensitivity, a range of factors were identified, as the following examples highlight. In terms of the tourism specific sensitivity, the high dependence on two source markets (i.e. Australia and New Zealand) creates a significant sensitivity not only to shocks and stressors in the TDR, but also in the TGRs. In terms of economic sensitivity, there is limited capital available for Ni-Vanuatu, hindering their direct involvement in dive tourism and results in strong expatriate ownership. Human and social sensitivity was present in the lack of management skills and limited completion of tertiary education for the population in general. Physical and natural sensitivity entails insufficient waste management that has resulted in declining environmental health. Sensitivity related to the governance processes in Luganville in terms of corruption and limited institutional capacity.

In terms of the adaptive capacity, a range of factors were also identified, as the following examples indicate. Tourism specific adaptive capacity was present in the ability of businesses to undertake their own marketing, control staffing of their business (e.g. more hours during peak season and less during off season) and by diversifying their clientele (e.g. accommodation providers catering for business people and not only tourists) to deal with effects of seasonality. This is not uncommon, businesses commonly undertake product and market diversification in order to adapt or cope with pronounced tourism seasonality (Scott et al., 2008). Economic adaptive capacity was heightened by the presence of liquid and fixed assets and financial schemes. Social and human adaptive capacity is strongly related to the strong family ties, as shaped by the ideology of wantok. The market garden was one of the most enabling factors of adaptive capacity in terms of the physical and natural. Finally, adaptive capacity of the governance processes included the presence of cultural governance processes, such as taboo, and the establishment of sector associations.

In applying all of these four steps, a good broad understanding of Luganville's vulnerability to climate change was gained. This knowledge guided the answer to how the resilience of Luganville's dive tourism system may be built in the future.

9.2.2 How can the resilience of Luganville's dive tourism system be built?

The resilience of Luganville's dive tourism system may be built through the application of the final two steps (i.e. step five: adaptation and step six: evaluation) of a V/R assessment.

Step five aimed to: (1) identify current and proposed adaptation (including technical, business management, behavioural, policy, and research and education types of adaptation); and (2) propose further adaptation actions that are designed to build the resilience of the tourism system.

In applying step five to Luganville's dive tourism system, it became obvious that there were already a number of current or proposed adaptation actions that, if successfully implemented, will help build the resilience of Luganville's dive tourism system. For example, upgrades to the transport infrastructure, basic infrastructure and health services may improve Luganville's preparedness and resistance to the effects of a disaster hitting. Urban beautification, and the construction of tourist facilities may make Luganville more attractive as a destination should a decrease in the natural attractiveness of the place occur.

A further five adaptation actions were proposed to deal with the current vulnerabilities of the system. For example, the data highlighted a limited environmental awareness in relation to marine ecology. With the dive tourism sector's strong reliance on the health of the marine environment and the anthropogenic pressures already stressing this sensitive ecosystem, this was a significant area to focus on in terms of adaptation. The present insufficiency of infrastructure dealing with waste, sewerage, and waste water may be significantly exacerbated by the increasing rural-urban migration. This accentuated the need to provide adequate infrastructure to ensure the health of the marine environment. Consequently, two of the proposed actions are to improve environmental awareness of the marine environment; and provide adequate infrastructure. Several steps to improve awareness levels and providing adequate infrastructure were suggested, including: (1) increasing the environmental awareness of marine ecology; (2) providing training on 'best practices'; (3) encouraging sustainable fishing practices; (4) establishing marine protected area; (5) ensuring that appropriate infrastructure is in place; and (6) implementing and enforcing monitoring systems.

Step six focused on the importance of evaluation. It acknowledges that not all adaptation is successful and that some may end up being maladaptation. A detailed evaluation was not undertaken for Luganville's dive tourism system, but a discussion of current successful adaptation and possible unsuccessful or maladaptation was presented. As an example of the six identified successful adaptation measures, the TDMF action

had been successful in creating more money to promote the destination. As an example of the three possibly unsuccessful or maladaptive adaptations, the current MCA road infrastructure was highlighted as having neglected broad enough stakeholder engagement. The result is an indirect impact on the fisheries sector through run-off and siltation.

9.2.3 Critical analysis of the application of steps

This section seeks to analyse the application of the steps critically. It should be noted that there have been no major catastrophes or disasters in Luganville and, consequently, some themes are not as strong, as they might have been had a major crisis been experienced. A major disaster will disrupt normal flows of the system and force people to rethink what caused them to be more vulnerable or more resilient. For example, in terms of the theme of credit and insurance then the real value of this is not understood until after an event has occurred. This has luckily not yet occurred in Luganville. This means that the framework is successful in identifying the many factors and influences that shape the vulnerability and resilience of a system. However, in terms of being an accurate measure of vulnerability and resilience, further testing and appropriate contextualised indicators developed by the local stakeholders in collaboration with experts are required.

The framework is attempting to present a very complex issue in a simple schematic form. This means that at times it was difficult to assess in which chapter a finding should be presented. This is because of the dynamic and interconnectedness of the system. I acknowledge the point made by Howitt (1993):

> "Research which concentrates on creating conceptual boxes and correctly classifying things into their appropriate box is missing the point that it is often understanding the relations between things which is most important in understanding, responding to, and intervening in reality" (p. 34).

It is therefore not of importance in which step different factors are placed, but that the connection across these steps, and the scale, time and place are recognised. Consequently, some of the findings presented in Chapters 4 to 8 overlap and this interconnectedness was shown and highlighted by referring to where the specific theme was discussed in more detail. The scale, time and place factors were discussed in relation to the individual steps, as these factors permeate the very fabric of society and, therefore, heavily influenced the themes discussed in Chapters 4 to 8.

To summarise, the application of the steps is a good starting point for exploring the vulnerability and resilience of a tourism system, but if applied to a system that has not experienced a critical disaster it may not accurately reflect all aspects of vulnerability or resilience of that tourism system. Some factors of vulnerability and resilience may only truly be highlighted through a complete disruption to the normal flow of the system. In other words, the consequence of a major disaster makes people more aware, more understanding of what previously has happened and how resilient or vulnerable the system is. This enables them to become more resilient for future events. Finally, the vulnerability and resilience of a tourism system, like any other system, is complex and is difficult to explain in a simple schematic form. The following section presents the new climate change V/R framework for tourism which is designed to be a guide more so than a complete representation of the real world.

9.3 The new climate change V/R framework for tourism

There are many benefits of a conceptual framework, including the encapsulation of shared knowledge, the identification of knowledge gaps, the extracting of knowledge from various stakeholders, the provisioning of innovation and rethinking, and the informing and extending of knowledge (Patterson et al., 2006, p. 339). Larsen et al. (2011) highlighted the two key approaches related to vulnerability and resilience research. They argued that resilience research has tended to take a systematic approach (i.e. understanding the dynamics and feedback loops of a system), whereas vulnerability research has tended to be from an actor-oriented approach (i.e. understanding how the social groups or people exposed to the perturbation are able or enabled to address the shocks and/or stressors). The framework presented in this chapter combines these two approaches. It applies these to the tourism system as the unit of analysis, thereby identifying how this system responds to shocks and stressors and how (current and future) adaptations are hindered or facilitated by the various factors influencing the system. At the same time it is based on a synthesis of narratives from the different stakeholders of this system.

A six-step framework has been proposed (Figure 9.1). This is based on data from 56 interviews, three group discussions and three field diaries. It also builds on the strengths of the current V/R frameworks and bridges the gap of a climate change focused policy analysis identified in these current frameworks.

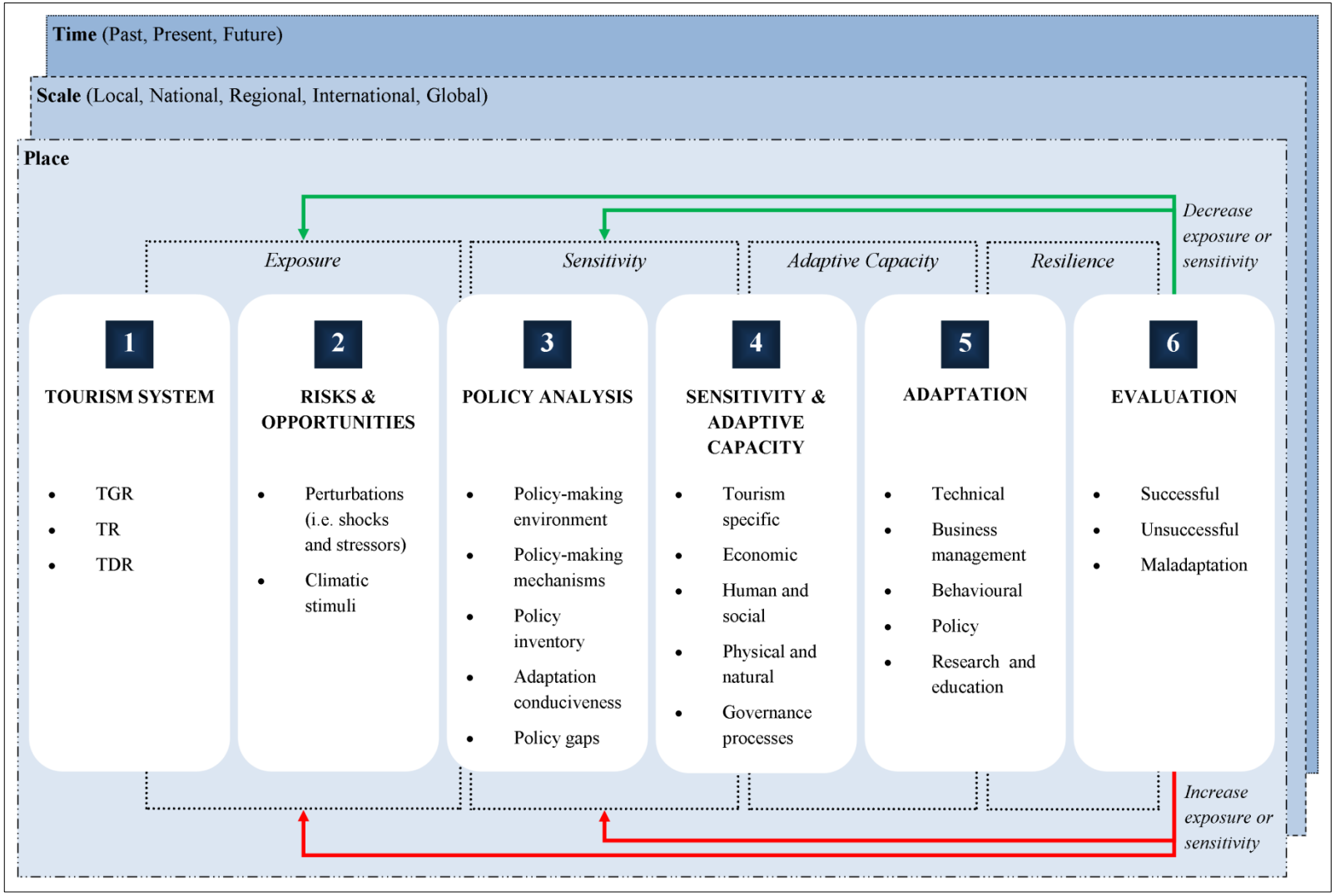


FIGURE 9-1: THE PROPOSED CLIMATE CHANGE V/R FRAMEWORK FOR TOURISM

It is acknowledged that at no time will a framework diagram be able to encapsulate the complexities and dynamics of real life (Calgaro, 2010) but applying the framework may assist destination managers, policy makers and researchers, amongst others, to identify multiple factors and processes that cause vulnerability or enhance adaptive capacity. This will open up opportunities for where adjustment and transformation can be made to the system through adaptation action to build its resilience to climate change.

The following presents a discussion of each of the steps of the proposed climate change V/R framework for tourism.

9.3.1 Step 1: The Tourism System

The purpose of step one of the climate change V/R framework for tourism is to identify the TGRs, the TRs and the TDRs. This step was common across all three vulnerability frameworks for tourism as each of them start out by identifying the systems characteristics. This step identifies the unit of analysis and provides the foundational context for further analysis.

Understanding the elements and specifics of the tourism system—the unit of analysis—is crucial to further assess the exposure to shocks and stressors and identify factors and processes that influence the system's response capabilities and, consequently, the effects shocks and stressors have on the system. There are three reasons why it is important to identify the whole functioning tourism system and not just the destination.

Firstly, a range of factors within the TGR will help facilitate the push of tourists to the TDR through a range of TRs. Tourists have the highest adaptive capacity in terms of addressing climate change (Cabrini, 2010; Jopp et al., 2012), as they decide where they want to go and when they go "(depending on knowledge, money and time)" (Cabrini, 2010, p. 60). Increased awareness of climate change may affect destination choice and travel mode through environmental considerations (Cabrini, 2010; DeLacy & Lipman, 2010). Consequently, having an awareness of where the tourists come from, the marketing agencies, and the tourists' countries, origin governments and communities will become important knowledge when later establishing the risks and opportunities (Step 2 – see Section 9.3.2) and assessing the tourism specific sensitivity and adaptive capacity (Step 4 of the framework – see Section 9.3.4).

Secondly, understanding the different transit modes that are used by tourists on their TR will be crucial for understanding the risks and/or opportunities that climate change may pose to the tourism destination (see Section 9.2.2). As the literature reveals, the TR can consist of several types of transit modes: air, road, rail, water and other modes, such as foot, snow-mobile, bicycle, and horse-drawn vehicles (McIntosh et al., 1995). In industrial countries, the car presents the most important type of land-based transportation mode, whereas tourism in SIDSTs is highly reliant on long-haul aviation travel (Scott et al., 2008). However, mitigation policies can affect the cost of travel and consequently will affect the demand for long-haul travel (Cabrini, 2010; DeLacy & Lipman, 2010; Nurse et al., 2009) and may even affect the demand for short-haul travel (Cohen & Higham, 2011).

Lastly, it is within the TDR that the effects of perturbations, exposure levels, sensitivity and adaptive capacity factors are felt. Consequently, in order to be able to later assess the exposure levels to shock and stressors, a thorough understanding of the components of the TDR is required. To start with, a destination is moulded by the biophysical environment in which it is located (Calgaro, 2010) underlining the importance of an understanding of the natural terrain and the supporting flora and fauna ecosystems (Turner et al., 2003; Calgaro, 2010). These biophysical features combined with the characteristics of the built environment, in terms of development types and patterns, greatly influence the degree of damage from natural hazards, such as tsunamis (Calgaro, 2010; Dominey-Howes & Papathoma, 2007). The importance of the host community to tourism has long been determined in tourism research (Weaver & Oppermann, 2000) and also plays an important role in understanding vulnerability (Calgaro, 2010). A description of the destination community can then incorporate a discussion of the individuals, households, the different firms and companies covering both tourism businesses and tourism support businesses, localised tourism associations and government departments (Turner et al., 2003; Calgaro, 2010). In terms of the tourism businesses and tourism support businesses, this involves a range of sub-sectors including accommodation, attractions, food and beverage, retail, transportation, travel agents and other supporting services, such as insurance (Scott et al., 2011). Furthermore, understanding the competition amongst other TGRs can also be beneficial (Cabrini, 2010). As already indicated, Fiji represents an important competitor that has a

stronger adaptive capacity to deal with perturbations due to its greater marketing budget.

9.3.2 Step 2: Establish risks and opportunities

Once the tourism system is defined (i.e. tourists, TGR, TR, TDR and tourism industries) (Leiper, 2004), the possible effects of climate change should be explored. This is done in two parts: (1) an identification of the perturbations (i.e. shocks and stressors) that have affected the tourism system; and (2) an understanding of how the climatic stimuli have an effect on these. This step incorporates elements of all the current tourism frameworks. In Moreno and Becken's (2009) framework, the key hazards are identified. Calgaro's (2010) framework looks at the exposure in terms of shocks and stressors and destination characteristics, and in Jopp et al.'s (2009) framework the focus is not only on the risks, but also on the identification of opportunities arising from the effects of climate change.

The first part is to look at what the system is impacted by in terms of the shocks and stressors. This part was identified explicitly in two of the frameworks (Calgaro, 2010; Moreno & Becken, 2009) and implicitly in the third framework (Jopp et al., 2010). This part is crucial as it identifies the events that have caused the system to be destabilised (Calgaro, 2010) in one form or another. Although the framework can be used to assess the vulnerability and resilience to a singular event (shock or stressor), shocks and stressors often compound over time (Cutter, 2003). As Kappes, Papathoma-Köhle and Keiler (2012) argue, "Hazards exhibit very different characteristics such as, time of onset, duration, extent and the resulting impact on humans and elements at risk which have to be considered for a multi-hazard vulnerability assessment" (p. 578). Consequently, understanding the magnitude, frequency and duration of these shocks and stressors (Calgaro, 2010; Birkmann, 2007) will be valuable in establishing the risks and opportunities, a key step of the RAF (Jopp et al., 2010). An identification of the shocks and stressors that have impacted the tourism system in the past is not enough in a climate change V/R framework. It is also vital to understand how the effects of climate change will impact on shocks and stressors, leading to the second aspect of this step.

The second part of establishing the risks and opportunities entails establishing the climatic stimuli (in the form of climate change). This was an explicit part of both Jopp

et al.'s (2010) and Moreno and Becken's (2009) frameworks, but an implicit part of Calgaro's (2010) framework. The current climate change projections act as a starting point for understanding the climatic stimuli and how the climate will change in the long-term. Although climate change predictions are limited for some regions (Cabrini, 2010), there were two reports that predict how climate change will affect the Pacific region (i.e. Preston et al. (2006) and Australian Government BOM and CSIRO (2011)) and for Vanuatu specifically the most recent predictions are presented in a report by AusAID et al. (2011). Once an understanding of the climate change predictions is gained, the effect of climatic stimuli can be assessed.

As the case study of Luganville's tourism system showed, climatic stimuli may affect shocks and stressors by: (1) making no difference; (2) exacerbating; (3) improving current; or (4) creating new shocks or stressors (see Figure 9-2). The effects of climatic stimuli can lead to an exacerbation of current stressors. For example, cyclones have been predicted to become more intense in the future. This can have an impact on the tourism system by causing disruptions to the system by affecting the TGR infrastructure and/or destination attractiveness (e.g. damage to coral reefs and coastal erosion). At the same time, changes in the climate might improve current perturbations (e.g. reduction in cyclone frequency). Other opportunities may also arise. For example, a changing climate at the TGR may reduce any seasonality by extending the peak and shoulder seasons or open up new types of activities. Other perturbations, such as earthquakes, are not affected at all by climatic stimuli, whereas climatic stimuli may cause new perturbations to occur.

This framework is designed to incorporate both starting point and end-point vulnerability to climate change (Kelly & Adger, 2000). In the climatic stimuli part, the climate change projections and the effect of these changes are taken into account (end-point), whereas step four of the framework focuses on the past and current vulnerability to perturbations (start point). This framework, therefore, attempts to marry the two types of vulnerability assessments.

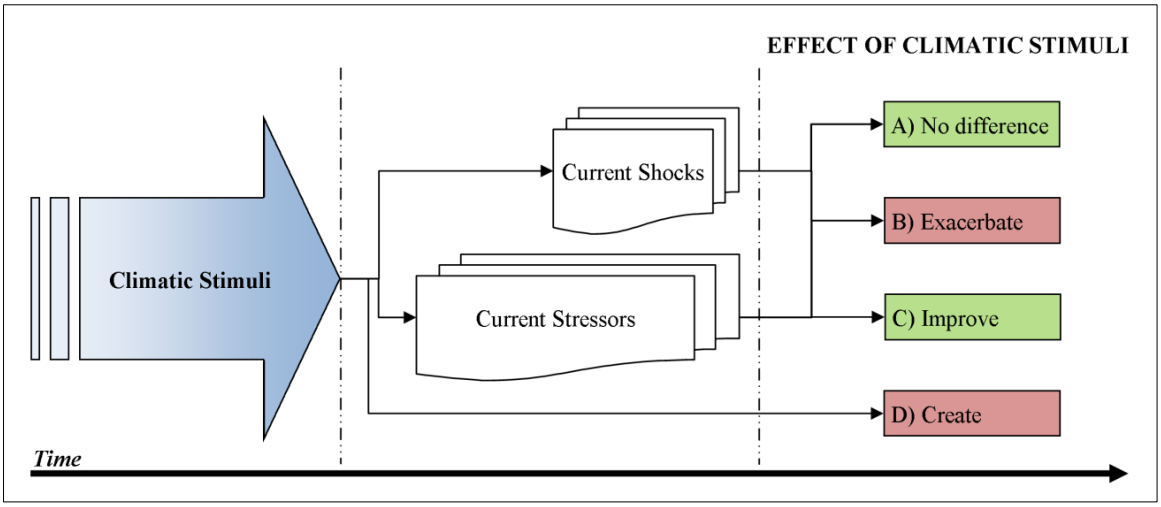


FIGURE 9-2: POSSIBLE EFFECTS OF CLIMATIC STIMULI

9.3.3 Step 3: Policy analysis

The policy analysis is an addition to the current frameworks and attempts to address this identified gap, as discussed in detail in Section 2.8. The purpose of this step is to identify the pertinence of policies and the conduciveness of the policy environment to climate change adaptation. This step involves five parts: (1) the policy-making environment; (2) the policy-making mechanisms; (3) a policy inventory; (4) conduciveness of a policy environment; and (5) policy gaps.

First, policies are developed and implemented within a policy-making environment. Understanding the policy-making environment provides a foundational knowledge for how policies are developed and shaped.

Second, the policy-making mechanisms also influence the policies. For example, if policies are developed by external consultants, then the sense of ownership of the policies may decrease and this then influences the implementation of such policies. Stakeholders outside of the formal political system may also be able to influence the policy-making process, as was seen in Luganville with the Coconut Crab ban.

Third, a policy inventory will help identify the policies that are pertinent to climate change adaptation and assess whether these are explicit or implicit policies. Such an assessment helps identify if climate change adaptation has entered the policy arena (e.g. the presence of explicit policies) and what types of climate change adaptation are prevailing.

Fourth, an assessment of the conduciveness of the policy environment to climate change adaptation is beneficial by identifying whether policy mechanisms will hinder or facilitate climate change adaptation (Urwin & Jordan, 2008). It can be assessed through an understanding of the level of commitment of key stakeholders to the policy agenda, resource availability, and the presence of an enabling policy mechanism (Wong et al., 2011a, 2011b).

Fifth, an understanding of the last four parts will enable policy gaps to be identified, which consequently can guide the development of climate change adaptation action.

9.3.4 Step 4: Sensitivity and adaptive capacity

Once the exposure of the tourism system is understood (based on the analysis of steps 1, 2 and partly 3), the overall vulnerability of the system can be identified through an understanding of the factors that either make the system sensitive or enhance the system's adaptive capacity.

Smit and Wandel (2006) highlighted a range of factors that can influence the ability to undertake adaptation at the local level, including access to resources (financial, technological and information), infrastructure, institutional environment, kinship networks, managerial ability and political influence. These factors are covered suitably within the five main sensitivity categories of the DSF (Calgaro, 2010), which provides a comprehensive overview of the factors that influence the level of vulnerability of a system to shocks and stressors. Calgaro (2010) presented a comprehensive review of the literature in terms of factors that heighten vulnerability at a destination (Figure 9-3) and then divided the identified factors based on the literature and her study findings into the five main themes discussed above. These key themes and groups of factors were applied to Luganville's dive tourism system and the study confirmed that these themes/factors influence vulnerability to climate change in various ways. Consequently, this step entails the identification of the following five themes: tourism specific; economic; human and social; physical and environmental; and governance processes. Table 9.1 presents the key themes, their specifics and references supporting the different factors and whether these have been successfully tested in Luganville's dive tourism system.

FIGURE 9-3: FACTORS THAT INCREASE DESTINATION VULNERABILITY

TABLE 9-1: KEY THEMES OF STEP FOUR AND THEIR SPECIFIC FACTORS

Key themes	Specific factors	References	Tested
Tourism specific	• Tourism seasonality, • Markets and marketing strategies, • Destination history and positioning • Destination image sensitivity	(Britton, 1982; Calgaro, 2010, Craigwell, 2007; Crocombe, 2008; Dredge & Jenkins, 2007; Forsyth et al., 2007; Hillhorst & Banhoff, 2004; Ritchie, 2009; Scott et al., 2008; Shaw & Williams, 2004).	✓
Economic	• Livelihood portfolios • Liquid and fixed assets • Job security and welfare safety nets • Credit history and insurance	(Adger et al., 2001; Beatley, 2009; Calgaro, 2010; Gaillard et al., 2009)	✓
Human and social	• Knowledge and skill levels • Labour capacity • Information on risks • Kinship networks and groups	(Adger et al., 2001; Beatley, 2009; Calgaro, 2010; Chambers, 2006; Cutter et al, 2009; Gaillard, 2009; Gunderson & Folke, 2005; The World Bank, 2009)	✓
Physical and environmental	• Access to natural resources • Biophysical alterations and changes • Infrastructure and transport options	(Barnett, 2011; Calgaro, 2010; Calgaro & Lloyd, 2008; Crabtree, 2007; Klein et al., 1998)	✓
Governance processes	• Government responsibilities • Laws, policies and rights • Cultural governance processes • Tourism business networks and representative organisations • Levels of stability and change	(Adger et al., 2001; Calgaro, 2010; Forsyth et al., 2007; Hall & Higham, 2005; Matthews & Sydneysmith, 2010)	✓

✓ Successfully tested in Luganville's dive tourism system

Each of these adaptive capacity and sensitivity factors and themes will influence the vulnerability of a tourism system in different ways. In other words, the vulnerability in one context will differ from that of another. Identifying the adaptive capacity and sensitivity of a tourism system enables an understanding of the factors that make the system sensitive, so that these can be addressed through adaptation and the factors that heighten adaptive capacity. These can be further supported when building resilience of the system.

9.3.5 Step 5: Adaptation

Adaptation can, if implemented successfully, reduce the vulnerability of a system to climate change impacts and make the system more resilient (Becken & Hay, 2007). The climate change adaptation focus within this step is two-fold in that it highlights the capacity of current or proposed adaptation actions to address specific characteristics of the nation that has been identified as particularly vulnerable. It then proposes new adaptation actions that aim to deal with the current vulnerabilities, identified in the previous steps. This step is, in other words, based on the knowledge gained from the outcome of the previous phases.

When building resilience to climate change, adaptation measures will naturally be explicit in nature. Nevertheless, when assessing current adaptation actions, it is worthwhile also incorporating the implicit policies that are pertinent to climate change and may either hinder or facilitate climate change adaptation. It is vital for tourism destinations to incorporate a combination of all types of adaptation actions in addressing the effects of climate change. These five climate change adaptation types (Scott et al., 2009) should be applied when assessing the current pool of adaptation measures (proposed or implemented). Furthermore, these adaptation types can guide the development of further adaptation actions to build the resilience of the system to the effects of climate change.

9.3.6 Step 6: Evaluation

Currently the climate adaptation research lacks a focus on the implementation of adaptation (Smit & Wandel, 2006). This step aims to partly bridge such a gap by aiming to understand what adaptation action has been implemented and if these have been successful. Evaluation is a key component of building resilience. The amelioration of risk may not be immediate, but this does not mean that the adaptation action was inappropriate (Jopp et al., 2010). Consequently, evaluation needs to be continuous to ensure that any necessary amendments are made to the adaptation action to ensure the suitable effect when implemented. Unsuccessful adaptation action does not necessarily lead to maladaptation but may result in maladaptation.

Barnett and O'Neill (2010) identifies five types of maladaptation, including adaptation actions that: 1) increase GHG emissions; 2) disproportionately burdens the most vulnerable; 3) have high opportunity costs (more costly than alternatives); 4) reduce the

incentive to adapt; and 5) have a high path dependency (which consequently reduces flexibility). Through evaluation, maladaptation can be detected and changes can be made to ensure the successful implementation of adaptation measures that will help build the resilience of the system and grow local livelihoods. Consequently, evaluation of the adaptation measures is crucial.

The evaluation element of this phase was outside the scope of this thesis, but the five types of maladaptation present a starting point for evaluating the successfulness of climate change adaptations. Previous research highlights the importance of actively involving local communities and tourism stakeholders in the adaptation process from planning to implementation and monitoring (Mataki et al., 2006). The capacity to engage stakeholders at the community level in the management of resources will, in fact, determine whether the response to climate change is successful or not (Tompkins & Adger, 2003).

9.3.7 Place, scale and time

9.3.7.1 Place

A detailed understanding of place is crucial, as some elements[xxxiii] of the socio-cultural fabric may either increase or decrease the sensitivity of the system.

> "The term 'place' has basic and mutually constitutive geographical dimensions like location, size of area and physical environment where human beings co-exist, based on biophysical, economic and political systems of interactions" (Turvey, 2007, p. 246).

Massey (1995) argues that place is articulated in the social relations that take place locally, regionally and globally, influencing the characteristics and identify of the place. As Massey (1995) argues:

> "Places as depicted on maps are places caught in a moment; they are slices through time. Yet, not only does that particular articulation of social relations which we are at the moment naming as that place have a history (as we have seen, it is the product of the historical accumulation and combination of numerous layers of such articulations over time) but

[xxxiii] Calgaro (2010) highlighted eight different place related elements that can influence the vulnerability/resilience of a social-ecological-system: power systems, agendas and expectations, experiences, risk perceptions, values, cultural interpretations, ideologies, religious doctrines and cultural norms.

> also any claim to establish the identity of that place depends upon presenting a particular reading of that history" (p. 188).

Place, therefore, covers a wide range of contextual factors including: power systems, agendas and expectations, experiences, risk perceptions, values, cultural interpretations, ideologies, religious doctrines and cultural norms (Calgaro, 2010). All of these factors permeate the very fabric of society. It is through an understanding of how these socio-cultural factors are being conceptualised that we can understand how tourism space is created, abandoned and recreated (Shaw & Williams, 2004). These factors feature as an all-encompassing influence on every action that stakeholders take at the individual, institutional, or social level. Consequently, the vulnerability of a system is very much specific to system and place (Smit & Wandel, 2006). Furthermore, identifying the limitations of the system in terms of scale may also have an effect on the outcomes of the study.

The adaptive capacity of any community is context-specific (Smit & Wandel, 2006) and is influenced by power relations and systems, which as a result will influence the capacity to deal with climate change (Matthews & Sydneysmith, 2010). The power relations and systems become obvious in Vanuatu with the local governance process of the local chiefs and their responsibility in dealing with negative events. Nevertheless, this is not the only form of power relations. Massey (1993) developed the term *power-geometry*, which acknowledges that in the time-space continuum, individuals and social groups have different capabilities in relating to the flow and interconnectedness of power. In other words, some individuals or social groups are highly capable of achieving outcomes through the use of power, where others are not able to achieve the same control:

> "Power can take many forms. It can be obtained through coercion, or it can be achieved through knowledge. It can be realized through force, or it can be granted through legitimate political processes that are institutionalized in a society" (Matthews & Sydneysmith, 2010, p. 233).

Consequently, understanding how these power relations are used within the system and how they function will influence the overall vulnerability and/or resilience of a system.

Furthermore, the experiences of individuals as well as the combined community influence the vulnerability and/or resilience of a system. The experiences of individuals are closely linked to their skill sets that ultimately will influence how sensitive they are to effects of shocks and stressors. In Vanuatu, very few of the expatriate business owners have experienced a real disaster, like the cyclone events of the 1980s and this may leave them less prepared for more intense cyclones, which are predicted to occur in the future. These experiences can be seen as part of the past, and it is the past that helps shape the present (Massey, 1995). As Gardner (2009) highlights, climate change adaptation is highly context-specific and the understanding of an individual, group or system's vulnerability can be retarded or prevented by misinformation, uncertainty and scepticism about climate change. Consequently, knowing that past and current experiences help shape our vulnerability and/or resilience is crucial to the development of more effective adaptation measures.

Risk perceptions may influence actions taken to prepare, mitigate or adapt to risk events. For example, lacking awareness and public information, and a limited recognition of risks and possible preparedness measures may lead to vulnerability of a community, system or asset (UNISDR, 2009). In Vanuatu, the expatriate community may be less likely to prepare for the effects of climate change and adaptation actions may not be recognised due to their scepticism towards climate change.

Values, cultural interpretations, ideologies and cultural norms shape the way we do things. As Fraser (2003) highlights "Culture, as an informal set of norms and standards, may have a serious effect on vulnerability" (p. 7). As discussed in Section 7.5.4, the ideology of the Wantok is linked to the strong family ties that represent a resilient aspect of the communities in Vanuatu. This is supported by research in other fields, such as psychology (Forster, 2005), economy (Ratuva), and teaching and learning (Doyle, 2005). In Vanuatu, Christianity and its religious doctrines lead to unity in the family and acts as a source of support in times of need. This highlights the importance of kinship networks in encouraging cohesion, connectedness, reassurance and stability (Calgaro, 2010). Nevertheless, the Wantok ideology also influences the political side of things, which may lead to inefficient governance that ultimately could increase the vulnerability of the system. Furthermore, the cultural differences between the Ni-Vanuatu and the expatriate members of the community can at times hinder the running

of a business, with Ni-Vanuatu employees having a different concept of time than the expatriate business owners or managers.

In summary, place represents more than a physical location or a politically defined area; it symbolises a landscape of socio-cultural and political nature that is permeated with many layers of meaning, communal identities, experiences and understandings (Calgaro, 2010). Furthermore, place does not occur in a vacuum. It is a constantly evolving concept, which relates to spatial and temporal aspects (Turvey, 2007). The next section discusses the spatial concept of scale followed by a discussion of temporal aspects.

9.3.7.2 Scale

Human communities constantly face features of change and interaction (Howitt, 1993) and scale is an important dimension of economic, political, social and environmental change (Jonas, 2006). However, a discussion of social change that links these local, national and global dimensions of scale has been lacking in much of the research focused on specific localities (Howitt, 1993). Consequently, understanding the risks associated with climate change and planning for adaptation requires an understanding of spatial scales (Lu, 2011). There is a strong link between scale and the concept of vulnerability (Cutter, 2003) and the concept of resilience is also shaped and occurs across multiple geographical scales (Beatley, 2009). One of the reasons for this is that causal processes often operate in dimensions of scale (Jonas, 2006). Jonas (2006) argues that "…scale is a lens through which to think and act upon change" (p. 400), linking scale to adaptation to climate change.

Scale can refer to the scale of which the assessment or investigation is undertaken. For example an assessment or investigation could focus on a city/town (such as Luganville), region (within a country, such as Sanma province), nation (such as Vanuatu), regional (such as South Pacific) or on an international or global scale. Patterson et al. (2006) provide a table of scale descriptions covering the following scales: individual, site, destination, national, trans-national and global. An example of how scale applies is seen in the policy-making process. In Vanuatu, some of the policies were developed locally or within the province (e.g. the ban on the Coconut Crab, which does not apply to the nation); whereas other policies applied at the national level (e.g. the VTAP 2008); or at the Pacific regional level (e.g. the PACC 2009). In other words, policy making happens

at many different scales (Gibbs, 2009). As Beatley (2009) argued, at each scale much can be accomplished, but to ensure effective coastal resilience, action needs to be concerted at all scales, preferably bringing about a multi-scaled and interlocked resilient region.

Scale is important, as policy decisions and changes to consumer behaviour and choices at a global, regional and national level will all have an influence on the tourism system. For example, the tourism sector in Vanuatu will be particularly vulnerable to changes in Australia and New Zealand, as these source markets represent the majority of international tourists in Vanuatu. Furthermore, climate change is a global environmental phenomenon, whereas the impacts of a changing climate will be felt locally.

Linking to concerted action across scale and different to a simple geographical representation of scale, Calgaro's framework (2010) emphasised the importance of relational scales. Relational scale is a human geography term that acknowledges that processes, institutions, forces and relationships take place simultaneously, are multi-directionally and occur within, and between different levels of scale (Howitt, 1993). An understanding of relational scale is crucial to the Pacific Islands, as "social interaction across space, at a variety of scales, is integral to past and present coping strategies in Pacific Islands" (Barnett, 2001, p. 986). Networks and scale, in other words, are interconnected. On the one hand, the connection of these networks creates scalar dimensions, whereas on the other hand, networks are products of the processes of scale (Sadler & Fagan, 2004). An example of how these networks were shaped by scale is seen in Vanuatu in the evolution of the sector associations. In this case, the VHRA (a national sector association) became too Port Vila-based due to the high number of members within the urban area of Port Vila. This caused members from Luganville to establish ESTA—a Santo-based tourism association (i.e. a localised tourism sector association). Scale is thus entrenched in the fabric of social life (Howitt, 1993) and needs to be considered in a V/R assessment.

9.3.7.3 Time

It is crucial to acknowledge that the vulnerability and resilience of a system fluctuates across time in order to ensure the most effective measures are implemented to further increase a system's resilience. Adaptation is also not a measure which happens instantaneously, so the link between vulnerability and adaptive capacity relies very

much on the timescales of the hazards concerned (Brooks et al., 2005). As there are a number of constructs of time, including physical time and social time (including space-time and time budget) and as tourism stretches over space and time, it is vital to identify the boundaries of the investigation in relation to time and space (Hall, 2009).

The environment is always changing and this is never uniform either across time or space (Gössling & Hall, 2006). In the period of time that life has existed on Earth, human beings have only appeared in the last 0.001 per cent of time and, in more recent decades, have become a geological force that has the capacity to alter "the physical, chemical and biological makeup of the planet as no other species has ever done" (David Suzuki cited in Flannery, 2009, p. vii). As established in Chapter 2, there can be both direct and indirect impacts from climate change. Equally important, the effects of these impacts may vary in intensity and/or breadth over time, including differentiation between seasons, years, and decades. Time horizons also affect the responses of stakeholders. For example, if an investor only looks at getting a profit within the next 5-10 years, then anything after those ten years is not seen as relevant to what they want to achieve.

An understanding of how the vulnerability and resilience of a system fluctuates across time is, therefore, crucial to ensure the most effective measures are implemented to further increase a system's resilience.

9.4 Stakeholder involvement in application of framework

Stakeholders, including local communities, the private sector, NGOs, and government should be involved throughout the entire V/R process. Tourists should be involved in the final phase of the framework to ensure that adaptation actions do not negatively affect destination appeal or tourist satisfaction (Jopp et al., 2010). Furthermore, traditional knowledge is critical to successful and effective adaptation and disaster risk management (The World Bank, 2009). As Mercer et al. (2007) argue, the indigenous people of SIDSTs should be the first to be contacted to discuss or develop disaster risk reduction actions. Haque and Burton (2005) and the World Bank (2009) also stress the importance of an interactive and participatory process that involves the local communities in order to achieve the best preparedness and recovery outcomes. Although increasingly recognised in the literature, more work needs to be done in

practice to incorporate Western and Indigenous knowledge in hazard management (Mercer et al., 2007).

A good example of the incorporation of these two knowledge spheres is from the island of Ambae in Vanuatu. Cronin et al. (2004) report on a study that effectively used participatory rural appraisal (PRA) methods to develop more appropriate hazard maps and emergency plans that incorporated local indigenous knowledge with scientific knowledge. This is in line with the conclusions of Bartlett et al. (2010) that "Pacific islanders can most effectively build management regimes when they have access to multiple knowledge systems, customary and Western scientific" (p. 102).

9.5 Chapter 9 summary

This chapter has addressed the third research objective of this thesis. A six step framework was proposed grounded in current V/R frameworks, bridging the knowledge gaps and guided by the testing of the key elements of a climate change V/R assessment for tourism in Luganville's dive tourism system. This framework represents this thesis' contribution to knowledge. The purpose of step one was to identify the tourism system in terms of the tourist generating regions, the transit routes and the tourism destination region. The aim of step two was to establish the risks and opportunities through identifying past and current shocks and stressors that have impacted on the tourism system, and highlighting how the climatic stimuli may affect the system. Step three was aimed at undertaking a policy analysis to discover if the current policy-making environment, policy-making mechanisms and policies hinder or facilitate climate change adaptation. Step four aimed to assess the vulnerability of the system by identifying factors of sensitivity or adaptive capacity with an understanding of the current exposure of the system (i.e. steps one, two and three). The aim of step five was to build on the knowledge gained in the previous steps in order to increase the resilience of the system through implementing appropriate climate change adaptation measures. Step six aimed to ensure the resilience of the tourism system through a continuous evaluation of the adaptation process.

10 CONCLUSION AND FUTURE DIRECTIONS

"The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous [sic] structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day."

Albert Einstein (quoted in Calaprice, 1996, p. 199)

10.1 Introduction

The tourism sector in Vanuatu has seen immense growth in recent years and the town of Luganville has real potential of becoming a popular and well-established dive tourism destination with one of the world's most accessible wrecks on its doorstep; the Coolidge. Nevertheless, located in a SIDST and LDC that is inherently vulnerable to climate change and with important changes to the climate projected for the next decade, the dive tourism system in Luganville will experience some significant challenges in years to come. This inherent vulnerability and the challenges faced highlight the importance of understanding the tourism system's vulnerability to change and the crucial need to adapt to a changing tourism environment both locally, regionally and globally in order to build the system's resilience. Consequently, the question of how best to reduce the vulnerability and build the resilience of tourism systems will remain of substantial interest to researchers, policy makers and tourism managers alike.

This thesis has presented an in-depth understanding of the vulnerability and resilience of the dive tourism system in Luganville, Vanuatu. Adaptation measures to further build the resilience of Luganville's dive tourism system have been proposed (e.g. provide further climate change awareness, improve environment awareness of marine ecology, provide adequate infrastructure, and build government capacity at local, regional and national levels). In this final chapter, a review of how the research aim and its objectives, as outlined in Chapter 1, were achieved is presented. This is followed by a section on lessons learned. Then a detailed discussion about the contributions of this

study and its implications is presented, before future research directions are suggested, thereby concluding this thesis.

10.2 Revisiting research objectives

This research was motivated by the lack of research on dive tourism and climate change, the particular climate change vulnerability of SIDSTs and the climate sensitive nature of tourism. In endeavouring to close the gaps in the tourism and climate change research, I set out to achieve three research objectives in this thesis with the main aim of developing a conceptual climate change V/R framework for tourism, with particular reference to Luganville's dive tourism system. The following provides a discussion of how these objectives have been achieved (Figure 10-1).

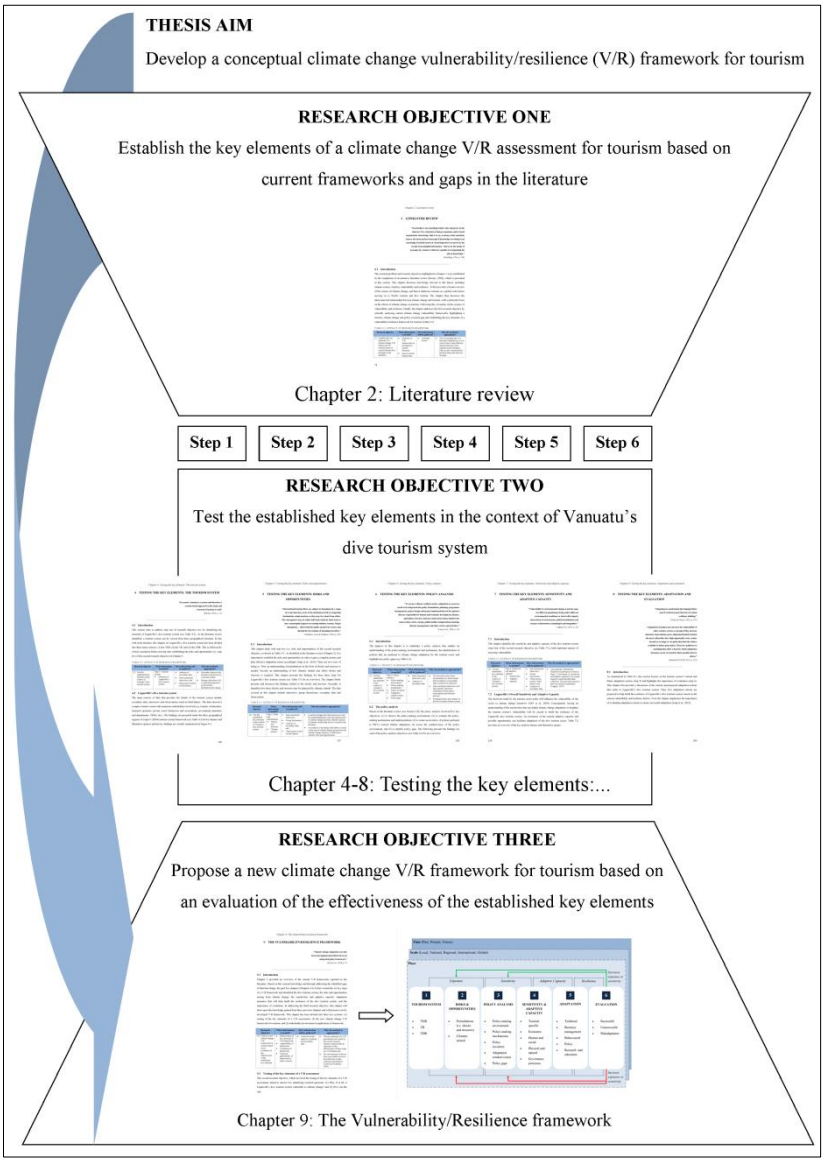


FIGURE 10-1: OVERVIEW OF HOW RESEARCH AIM AND OBJECTIVE HAVE BEEN ACHIEVED

The first objective of the thesis was to establish the key elements of a climate change V/R tourism framework based on current frameworks and gaps in the literature. An extensive literature review was carried out in Chapter 2. I critically analysed each of the key frameworks identified in the literature for disaster and risk management (Section 2.7.1), sustainability science (Section 2.7.2) and tourism (Section 2.7.3). Finally, I undertook a gap analysis of current vulnerability frameworks, which was presented in Section 2.9. The research objective was achieved by proposing the key elements of a climate V/R assessment for tourism based on existing knowledge within vulnerability and resilience literature, particularly grounded in the three vulnerability/resilience frameworks for tourism (Moreno & Becken, 2009; Calgaro, 2010, Jopp et al., 2010), and by addressing the knowledge gaps. The proposed key elements of a climate change V/R framework were presented in Section 2.9 and entailed six steps: (1) the tourism system; (2) risks and opportunities; (3) policy analysis; (4) sensitivity and adaptive capacity; (5) adaptation; and (6) evaluation.

The second objective was to test the key elements of a climate change V/R assessment in the context of Vanuatu's dive tourism system. I have provided a V/R assessment of the dive tourism sector in Luganville, Vanuatu in Chapters 4 through to 8. The dive tourism sector in Luganville was chosen due to the importance of dive tourism in the region, the sector's identified vulnerability to changes in the climate, the nation's recent growth in tourism, the destination's accessibility, and English being an official language of the nation. Chapter 4 identified the dive tourism system in Luganville in terms of the TGR, TR and the TDR. Chapter 5 established the risks and opportunities facing Luganville's dive tourism system. Chapter 6 presented the results of a policy analysis and identified the pertinence of relevant policies to climate change adaptation. In order to increase the resilience of Luganville's dive tourism system in a time of constant change driven by natural and anthropogenic causes, it was vital to have an understanding of the sensitivity and adaptive capacity factors that contribute to the dive tourism system's vulnerability. These factors were discussed at length in Chapter 7. Through this V/R assessment, a range of current and currently proposed adaptation actions relevant to Luganville's dive tourism system were presented and I proposed a further five new adaptation actions to build the resilience of Luganville's dive tourism system in Chapter 8.

The last objective was to propose a new climate change V/R framework for tourism based on an evaluation of the effectiveness of the established key elements. The steps of the framework were operationalised using a case study of dive tourism in Luganville, Vanuatu (second research objective) and proved fairly easily applicable within the context of dive tourism. A critical analysis of the testing of the key steps of a climate change V/R assessment was presented in Section 9.2 and guided the proposition of a new climate change V/R framework for tourism, which was presented in Section 9.3. Section 9.4 highlighted the importance of stakeholder involvement when applying the framework.

10.3 The new framework - Contributions of the study

This thesis makes both a theoretical and practical contribution to knowledge. The theoretical contributions are several. Firstly, this research contributes theoretically to knowledge through the development of a climate change V/R framework for tourism. There is currently no such framework reported in the literature in the context of dive tourism. While the new climate change V/R framework was developed for a dive tourism system in Vanuatu, this does not mean that aspects of the framework could not be applied in other contexts. The framework builds on current knowledge, has been tested and evaluated, and can in its entirety or in parts be applied to other tourism systems (e.g. cultural tourism and wildlife tourism) and/or destinations (in Vanuatu or other parts of the world). For example, dive tourism systems in other parts of the Pacific or in SIDSTs may experience similar perturbations and are equally impacted by climate, or have similar characteristics to that of Luganville's dive tourism system. With many nations taking action on climate change, this framework may be of interest to tourism researchers, governments, NGOs and donor and development agencies in other SIDSTs such as the Caribbean (e.g. Bahamas) and Indian Ocean (e.g. Maldives) who wish to build resilience and reduce vulnerability of (dive) tourism in their parts of the world.

Lincoln and Guba's (1985) four criteria for judging research of a qualitative nature (i.e. credibility, confirmability, dependability and transferability) have served as a guide for this research. Credibility entails that the results are credible or believable to the range of study participants. I believe that the findings of this thesis are credible as I have analysed multiple sources of data that represent different stakeholders (i.e. the private sector, public sector, NGO and donor/development agencies) views to find commonalities and differences across these views. Confirmability refers to the biases of

the researcher. To reduce the subjectivity of this research, the data covers multiple sources of data (i.e. interviews, group discussions, observations noted in field diaries and secondary data) and presents different views of the participants in order to confirm the various findings. Dependability relates to the stability of the data findings. In other words, if the study was undertaken again would the same findings occur? Human-environment systems are dynamic and both the systems and their contextual elements change over time, therefore a complete replication of this study cannot be achieved, but it is argued that similar factors would arise if another researcher analysed the raw data using the same methodological framework. Finally, transferability entails the ability to refer the results or outcomes of the study to other contexts. The framework, apart from step one, addresses more generic issues such as perturbations, factors of sensitivity and adaptive capacity, adaptation and evaluation that are likely to apply to most human-environment systems affected by climate change. This means that the framework may be applicable to other economic sectors (e.g. fisheries or agriculture) with some adjustment to the framework. For example, step one (i.e. tourism system) of the framework would need to be adapted to reflect the key elements of the given sector's system.

Secondly, the framework presented in this thesis, brings a new dimension to the knowledge of climate change, vulnerability and resilience science by making policy analysis a separate step of the framework. The core reason for this emphasis on policy analysis as a separate step is that policy is one of the key approaches in dealing with climate change, and none of the existing frameworks has involved a policy analysis as a separate step or phase.

Thirdly, the framework explicitly incorporates a step in which the effect of climatic stimuli is evaluated. In Calgaro's (2010) DSF framework, it can be argued that the effects of climatic stimuli may be reflected in the DSF "time sphere", However, I wanted to emphasise in the newly proposed climate change V/R framework for tourism that it is necessary to explicitly look at how climate change may affect us in the future. This will help guide our decisions of today when aiming to building resilience. Furthermore, climate change projections are amended over time, as a result of increased knowledge and research on the topic, so it is important to identify them now and then understand how these projections change over time.

Finally, by applying the framework to Luganville's dive tourism system, an important gap in the literature related to tourism and climate change has been partly bridged. Through the case study, a detailed overview of the factors that make the dive tourism sector in Luganville vulnerable to (climate) change and those that increase the system's adaptive capacity has been presented. Furthermore, a portfolio of possible climate change adaptation measures relevant to tourism in SIDSTs has been presented based on the current literature. This leads us to the more practical contribution of the thesis.

The V/R framework and the V/R analysis of Luganville's dive tourism system provide four practical contributions. Firstly, I have presented an overview of the aspects of the system that are relevant to the tourism-climate change relationship. Secondly, a roadmap for climate change adaptation for dive tourism in Vanuatu has been proposed. Thirdly, the theoretical framework may have the capacity to empower different stakeholders of the tourism system in addressing climate change. This is achieved by providing an easy to follow step-by-step framework that aims to allow the stakeholders of Luganville's dive tourism to improve the overall resilience of the dive tourism system, better adapt to the impacts of climate change, and provide recommendations for how local livelihoods can be better protected and developed. Fourthly, the importance of incorporating all stakeholders in the process of formulating and developing climate change adaptation actions that will build the resilience of the system has been highlighted, opening up opportunities for collaboration and partnerships that are important for both climate change adaptation and disaster risk management. This leads into the next section on lessons learned.

10.4 Lessons learned

A number of lessons were learned from developing a climate change V/R assessment that will be useful for future researchers: (1) do not mention the words 'climate change'; (2) ensure stakeholder involvement, (3) multi-disciplinary teams are crucial; and (4) communication is vital.

During the second field visit, I experienced the difficulties of having mentioned the words 'climate change' in the initial invitations to partake in the project. Furthermore, this PhD was linked to the larger PT-CAP project and climate change and climate were mentioned in the project flyer. In Vanuatu, like other places, climate change seems to have divided the community into believers and sceptics and it is very difficult to have a

constructive discussion about climate change with people who are sceptics. This makes climate change a difficult topic to discuss with stakeholders. This is similar to lessons learned in other sectors, such as in the fisheries (pers. comm., Second Marine Adaptation Network Graduate School, 5-6 September 2011). Consequently, the words 'climate change' should not be mentioned at all, perhaps a term like '*climate smart'* could be used, but in some circumstances it may be best not to mention climate at all. In Vanuatu, it was obvious that the expatriate community members did indeed care for the environment, but any discussion of climate change was met with disdain, so discussion of environmental changes may be a better approach to discussing the topic of climate change.

Stakeholder involvement is important to ensure the successful implementation of the proposed adaptation actions. This study showed some limitation in its application in terms of stakeholder involvement. Although RRA was one of the key methods applied during the second field visit, there were limitations to how involved the stakeholders could be, since the outcome for this PhD thesis had to be the candidate's own work. Furthermore, it was difficult to ensure stakeholder involvement in the project, as many saw very little benefit in taking part in the study. Therefore, future climate change V/R studies may consider the use of participatory rapid appraisals, where the stakeholders themselves take ownership of the V/R assessment from start to finish with some guidance by the experts.

Multi-disciplinary teams are crucial to a successful V/R assessment. The team should cover technical expertise in different fields within the spheres of environment, society, economy, culture and policy. A V/R assessment demands expertise in a whole range of areas, which is difficult to achieve by one person or even a very small team. I was lucky that I was able to draw on the experience of team members from the PT-CAP during data collection (second field visit) and through discussion of my findings with team members after data collection. Without being able to draw on these other knowledge spheres, I am convinced that the V/R assessment would not have provided a sufficient picture of the current situation for dive tourism in Luganville.

Finally, communication is vital. Aligned to stakeholder involvement, communication is an important aspect of good governance (Beaumont & Dredge, 2010), an element of making knowledge explicit, is crucial after a crisis has occurred (Blackman, Kennedy &

Ritchie), and is an important element of building resilience of people and institutions (Longstaff & Yang, 2008). Consequently, future climate change vulnerability and resilience frameworks will benefit from including another dimension that focuses on communication with the right communication assets mix (Longstaff & Yang, 2008).

10.5 Future research directions

From this research, four recommended areas of research are warranted:

(1) Through the examination of exposure, vulnerability and resilience of the dive tourism system in Luganville, this thesis proposed five broad adaptation actions. It has, as such, provided a first step in building the resilience of this dive tourism system. Nevertheless, this study showed that more research is required to test these findings. It was beyond the scope of this thesis to undertake a feasibility study of the proposed actions and test their relevance further with the local stakeholders. It is highly recommended that future research tests these findings within the case study, either by taking the results back to the dive tourism stakeholders for further validation of the data or through a new participatory V/R assessment of the dive tourism system, allowing for a comparison of the findings. Furthermore, it will be important to undertake a feasibility study of the proposed adaptation actions to ensure they are at all appropriate and if other alternatives may be more or less attractive. This is supported by Füssel and Klein (2006) who argue that feasibility studies of implementing proposed adaptation actions will be vital to provide a more complete picture of the vulnerability of the system.

(2) There is a need for future research to focus on the implementation and evaluation phase of the V/R assessment. Some questions that warrant further research include: What are the processes undertaken that have made the implementation of adaptation successful? Are the five proposed types of maladaptation appropriate and/or applicable? What are the success stories of climate change adaptation? What actions made these and not others successful? This is supported by Smit and Wandel (2006), who claim that more research examining the implementation of successful adaptation measures would be beneficial to understanding what processes or actions made these adaptation measures successful.

(3) Incorporating communication into future V/R assessments will add another dimension to the current V/R framework proposed in this thesis. Based on Longstaff and Yang (2008), suggestions at this stage include looking at how communication enhances trust and how effective the information exchanges are, in terms of ensuring that correct information is transferred and accurately transmitted. Furthermore, which collaborative approaches have been successful in Vanuatu or elsewhere, and what are some of the lessons to be learned from these?

(4) Finally, further climate change policy research with a focus on adaptation will broaden the knowledge span on this topic. This research has presented a first assessment of the policy environment, the policy processes and the individual policies in Vanuatu. However, further policy research in Vanuatu is required to answer some further questions arising from this current study. For example, what causes the general lack of awareness of policies within Luganville's dive tourism system? Will this lack of awareness facilitate or hinder the development and/or implementation of climate change adaptation? What are some of the contextual factors required to ensure a successful implementation of policies in general? Can the facilitating factors be encouraged further?

Having presented the future directions for research, I conclude this thesis with a few final words. At the time of writing, climate change is slowly entering the policy arena in Vanuatu, but there is still some way to go. The majority of the Ni-Vanuatu people connected to Luganville's dive tourism system are afraid and feel a need for further climate change awareness, whereas the expatriate tourism sector stakeholders are more knowledgeable about the environment but are primarily sceptical about climate change.

Some significant climate change projections have been made within these last years for Vanuatu and these have been proven—in this thesis—to have the capacity to exacerbate current shocks and stressors. This will further influence the vulnerability of the dive tourism system. For the stakeholders of Luganville's dive tourism system, the research—presented in this thesis—provides an overview of factors that increase the system's vulnerability to change; an outline of the inherently adaptive capacity of the system; and a proposed roadmap for how to adapt to future climate change. The implementation of these recommendations will depend on the political will, the

stakeholders' commitment to adaptation and the financial and human resources available.

This thesis has highlighted the lack of studies in tourism and climate change. This study calls for greater depth and breadth of understanding of the tourism and climate change phenomenon and encourages research in a range of future directions. As tourism moves to adapt to the changing climate over the next decades and centuries, academics have a growing role in: (1) disseminating and effectively communicating the findings of climate change research; (2) analysing the implications of the effects of climate change for tourism and understanding linkages with other fields and sectors; (3) proposing pragmatic solutions for the tourism sector's adaptation to climate change; and (4) directing and facilitating the sector's effective implementation of adaptation measures. (Becken & Hay, 2012). Acknowledging this growing role of academics, this thesis offers a starting point for reducing the vulnerability and resilience of tourism systems, particularly dive tourism systems, in a changing climate. Finally, in the words of The World Bank (2010),

> "We must act now, because what
> we do today determines both the
> climate of tomorrow and the
> choices that shape our future"
> (p. xiii).

THE END

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12 APPENDICES

Appendix 12.1 – Vulnerability definitions

Appendix 12.2 – Letter of support

Appendix 12.3 – Memo links

Appendix 12.4 – Semi-structured interview outlines

Appendix 12.5 – Group discussion outline

Appendix 12.6 – Semi-structured interview schedules and details

Appendix 12.7 – Group discussion schedules and details

Appendix 12.8 – Different experience of participants

12.1 Vulnerability definitions

Risk/hazard definitions

The focal questions in this lineage are: What are the hazards? What are the impacts[?]. What is exposed, to what, where and when?

Key attributes: Exposure (physical threat, external to system), sensitivity

Exposure unit: Places, sectors, activities, landscapes, regions

Decision scale: Regional global

Examples:

Gabor and Griffith (1980)

Vulnerability is the threat (to hazardous materials) to which people are exposed (including chemical agents and the ecological situation of the communities and their level of emergency preparedness). Vulnerability is the risk context.

Timmerman (1981)

Vulnerability is the degree to which a system acts adversely to the occurrence of a hazardous event. The degree and quality of the adverse reaction are conditioned by a system's resilience (a measure of the system's capacity to absorb and recover from the event).

UNDRO (1982)

Vulnerability is the degree of loss to a given element or set of elements at risk resulting from the occurrence of a natural phenomenon of a given magnitude.

Kates (1985)

Vulnerability is the capacity to suffer harm and react adversely.

Pijawka and Radian (1985)

Vulnerability is the threat or interaction between risk and preparedness. It is the degree to which hazardous materials threaten a particular population (risk) and the capacity of the community to reduce the risk or adverse consequences of hazardous materials releases.

Bogard (1989)

Vulnerability is operationally defined as the inability to take effective measures to insure against losses. When applied to individuals vulnerability is a consequence of the impossibility or improbability of effective mitigation and is a function of our ability to detect the hazards.

Mitchell (1989)

Vulnerability is the potential for loss.

Chambers (1989)

Vulnerability refers to exposure to contingencies and stress, and difficulty in coping with them. Vulnerability has thus two sides: an external side of risks, shocks, and stress to which an individual or household is subject: and an internal side which is defenselessness, meaning a lack of means to cope without damaging loss.

Watts and Bohle (1993)

Vulnerability is defined in terms of exposure, capacity and potentiality. Accordingly, the prescriptive and normative response to vulnerability is to reduce exposure, enhance coping capacity, strengthen recovery potential and bolster damage control (i.e., minimize destructive consequences) via private and public means.

Dow (1992)

Vulnerability is the differential capacity of groups and individuals to deal with hazards based on their positions within physical and social worlds.

Smith (1992)

Risk from a specific hazard varies through time and according to changes in either (or both) physical exposure or human vulnerability (the breadth of social and economic tolerance available at the same site).

Alexander (1993)

Human vulnerability is a function of the costs and benefits of inhabiting areas at risk from natural disaster.

UNEP (1999)

Vulnerability is a function of sensitivity to present climatic variability, the risk of adverse future climate change and capacity to adapt. The extent to which climate change may damage or harm a system; vulnerability is a function of not only the systems' sensitivity, but also its ability to adapt to new climatic conditions.

Adger (2000)

Individual and collective vulnerability and public policy determine the social vulnerability to hazards and environmental risks, defines here as the presence or lack of ability to withstand shocks and stresses to livelihood (following Chambers 1989; Watts and Bohle 1993; Adger 1999)

Dow and Downing (1995)

Vulnerability is the differential susceptibility of circumstances contributing to Vulnerability. Biophysical, demographic, economic, social and technological factors such as population ages, economic dependency, racism and age of infrastructure are some factors which have been examined in association with natural hazards.

Blaikie et al. (1994)

By vulnerability we mean the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone's life and livelihood are put at risk by a discrete and identifiable event in nature or in society.

IPCC (1997)

Vulnerability is defined as the extent to which a natural or social system is susceptible to sustaining damage from climate change. Vulnerability is a function of the sensitivity of a system to changes in climate and the ability to adapt to system to changes in climate. Under this framework, a highly vulnerable system would be one that is highly sensitive to modest changes in climate.

Vogel (1998)

Vulnerability is perhaps best defined in terms of resilience and susceptibility including such dimensions as physical, social, cultural and psychological vulnerability and capacities that are usually viewed against the backdrop of gender, time, space and scale (e.g. Anderson and Woodrow, 1989)

Cutter (1996)

Vulnerability is conceived as both a biophysical risk as well as a social response, but within a specific areal or geographic domain. This can be geographic space, where vulnerable people and places are located, or social space_who in those places is most vulnerable.

Cutter et al. (2000)

Broadly defined, vulnerability is the potential for loss of property or life from environmental hazards.

Kasperson, et al. (2002)

Vulnerability is the degree to which a person, system or unit is likely to experience harm due to exposure to perturbations or stresses.

Political economy/political ecology lineage

Focal question: How are people and places affected differently?

What explains differential capacities to cope and adapt?

What are the causes and consequences of differential susceptibility?

Key attributes: Capacity, sensitivity, exposure

Exposure unit: Individuals, households, social groups

Decision scale: Local, regional, global

Examples:

Susman et al. (1984)

Vulnerability is the degree to which different classes of society are differentially at risk.

Liverman (1990)

Distinguishes between vulnerability as a biophysical condition and vulnerability as defined by political, social and economic conditions of society's vulnerability is defined both in geographic

space (where vulnerable people and places are located) and in social space (who in that place is vulnerable).

Downing (1991)

Vulnerability has three connotations: it refers to a consequence (e.g., famine) rather than a cause (e.g., drought); it implies an adverse consequence; and it is a relative term that differentiates among socio-economic groups or regions, rather than an absolute measure of deprivation.

Cutter (1993)

Vulnerability is the likelihood that an individual or group will be exposed to and adversely affected by a hazard. It is the interaction of the hazards of place (risk and mitigation) with the social profile of communities.

Bohle et al. (1994)

Vulnerability is best described as an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of potential harmful perturbations. Vulnerability is a multi-layered and multidimensional social space defined by the determinate, political, economic and institutional capabilities of people in specific places at specific times.

Cannon (1994)

Vulnerability is a measure of the degree and type of exposure to risk generated by different societies in relation to hazards. Vulnerability is the a characteristic of individuals and groups of people who inhabit a given natural, social and economic space, within which they are differentiated according to their varying position in society into more or less vulnerable individuals and groups.

Ecological resilience thinking

Focal question: Why and how do systems change?

What is the capacity to respond to change?

What are the underlying processes that control the ability to cope or adapt?

Key attributes: Thresholds of change, reorganisation; Capacity

Exposure Unit: Ecosystems, coupled human-environmental systems

Decision scale: Landscapes, ecological regions, multiple scales

Examples:

Carpenter, Walker, Anderies and Abel, 2001

Vulnerability defined as the opposite of resilience, where resilience is "the capacity of a system to undergo disturbance and maintain its function and controls"

Source: We Adapt, 2011

12.2 Letter of Support

GOUVERNEMENT DE LA REPUBLIQUE DE VANUATU
BUREAU NATIONAL DU TOURISME

GOVERNMENT OF THE REPUBLIC OF VANUATU
DEPARTMENT OF TOURISM

Private Mail Bag 9099; Tel: 26020; 26333; Fax: 24422

Our/nos ref
Your/ vos ref

Date: *30th March 2010*

Professor Terry Delacy
Centre for Tourism and Services Research
Victoria University
Melbourne
Australia

Dear Sir,

Subject: Support for the Pacific Tourism – Climate Adaptation Project (PT-CAP)

I write to confirm the support of the Department of Tourism for Vanuatu to be included in the above said project and especially for the PhD student Ms. Louise Klint to undertake her research in Vanuatu as part of the implementation of the project and the PhD research in the area of – *A Climate Change Resilience Framework for Tourism – A Case study of the Dive Sub-Sector in Vanuatu.*

The department values this contribution as very important because the final product will be a framework that we can use to promote and guide future developments of other sub-sectors within the tourism industry in this country.

I would like to take this opportunity to assure you of the full support and cooperation of the department and all staff in this programme. Please do not hesitate to advice us of any support that Ms Louise Klint may need during her assignment here in Vanuatu.

I would like to take this opportunity to thank you for choosing Vanuatu as the location of this programme and I look forward to a fruitful cooperation between our two organisations and a successful outcome of the work as expected.

Yours sincerely,

George Borugu
Director
Department of Tourism

REPUBLIQUE DE VANUATU ★ REPUBLIC OF VANUATU
Département du Tourisme
Department of Tourism

12.3 Memo Links

The following provide a some examples of memo links attached to interviews from the first and second field visit field trip (please note that names have been removed and replaced with interviewee, guide, respondent etc. to give the memo meaning without identifying a specific person):

> *"A big table at Numbawan cafe, some background noise and disturbances, but a nice and casual setting. The interviewee was fairly open and sharing of his knowledge although he knew very little of any policies related to tourism or environment. He was a bit sceptic towards the skills of the Government and was worried as to how much consideration has been made to planning for tourism."* (Tuesday 24 November 2009)

> *"I met the interviewee in his office at the Sanma Provincial Council, which is situated on top of a hill on the outskirts of town. It was a small but very official office, a bit cluttered with boxes and documents around. The interviewee was great in explaining the policy environment in Vanuatu as well as the different regions of Vanuatu. He provided me with a copy of the Sanma Tourism Plan and said he would try to send me the Sanma REDIPlan in electronic format. A really informative meeting! Interesting to note that the consultation has taken place, but it seems that none of the tourism businesses I have spoken with so far is aware of the policy document."* (Thursday 26 November 2009)

> "*I interviewed the interviewee in the kitchen of their office. Here there was also a desk and two chairs. The interviewee had been sick with the flu and was still not completely well. The interviewee was really excited about the project and could see many benefits of our collaboration."* (Tuesday 1 December 2009)

> *"The interviewee and I went to a local Nakamal and talked. It was a very interesting interview setting. It was dark, so the interviewee found a flashlight in his ute and worked out a workable writing light for me. Around me there were many locals drinking Kava and there was a constant spitting sound all around us. The interviewee was really happy*

to share his information with me and he found no difficulty in doing most of the talking, while I was scribing as a mad." (Wednesday 2 December 2009)

"Our guide [name removed] showed us the nakamal where the chief and elders of the village normally have meetings and women are not allowed to attend. We then had the group discussion outside the nakamal under a couple of big trees (which is also their normal meeting place when the weather is good), so that the women could join the group discussion. There were a few long wooden benches there and we were seated on one of these benches, and the mothers and children sat on the ground with mats. The seating arrangements made it feel like a panel discussion at conferences, where we were seated above the rest and at the focus of the discussion, instead of as part of the discussion. The ocean was just a few meters away and it was quite windy. The sound of the waves made it hard to hear the discussions clearly. A large group of villagers (about 15 men and 17 women) sat in the discussion, but only 6-7 of them, mainly men, actively participated including the chief, the village school principal, the water man, and the bungalow business owner. The majority of the villagers didn't speak good English and our guide [name removed], therefore, translated our questions into Bislama and also their responses into English for the discussion." (Sunday 3 October 2009)

"The group discussion was held in a local park in front of the Provincial Government building in an open building structure with some tables and benches. It was a casual enough setting and although we could hear some traffic in the background, it was not disturbing the discussion. One of the respondents [name removed] did not want to say much at all, although we tried to encourage him several times to have his say. The two other participants [names removed] both enjoyed the discussion and had some what would seem interesting discussions in Bislama between them, which one of them [name removed] then would translate. One of the respondents [name removed] commented on how much he enjoyed the rating and rich picture diagramming activity." (Sunday 10 October 2010)

12.4 Semi-structured Interview Outlines

12.4.1 Field Visit 1 Suggested Interview Structure

Source: Adapted from Wong (2009, pp. 17-19)

Stages of the Interview	Question Outline – First Field Visit
Introduction	• Small talk • Introduce yourself and the project • Explain interview objectives – identify policies pertinent to climate change adaptation for the tourism sector and to understand the policy-making environment; this would provide the context for future policy recommendations. • Length of interview: about 30 min • Ensure confidentiality – the content of the conversation is confidential and the identity of the interviewee would not be revealed in any publications • Explain that the interviewee can withdraw from this study at any time and that the withdrawal will not jeopardise him/her in any way • Ask for permission to use voice recorder
Scoping	• Specify the policy areas or policies you want to discuss – this depends on the background of the interviewee • The interviewee may add to the list suggested • Discuss each policy in turn unless the policies are interrelated
Policy purpose	• What is the purpose of the policy? Is there a difference between what's on paper and the reality? E.g. One can be an "empty shell policy" when it was put on paper just to satisfy some institutional or procedural requirements, and is not meant to be implemented. • Is the policy supranational, national or local?
Conceptualisation	• When was the policy developed? • If it was a climate change specific policy, which climate scenario project was the policy based on (i.e. the timeliness of the projection)? • What triggered the development or formulation of the policy? E.g. Factors in the macro environment; decision of an individual; result of another policy etc. • What issues were to be resolved? • Which agencies or individuals were involved? • How were they involved? / What was their role? • How was the relationship of these individuals/agencies with the others? E.g. They were the most powerful / influential / powerless in the government; there was intense competition between A and B etc. • At the early development stage, was the policy related to other ones? E.g. It complemented / contradicted / improved other policies. • Any key events / cornerstones? • What were the resources deployed?

	• What kind/level of commitment was demonstrated? • What kind of policy instruments was used?
Decision	• When was it decided that the policy would be implemented (or abolished)? • Any event that triggered the decision? • Were the issues intended to be resolved still the same? • Which agencies or individuals were involved in decision-making? • How were they involved? / What was their role? • How was the relationship of these individuals/agencies with the others? E.g. They were the most powerful / influential / powerless in the government; there was intense competition between A and B etc. • At this stage, was the policy related to other ones? E.g. It complemented / contradicted / improved other policies. • Any key events / cornerstones? • What were the resources deployed? • What kind/level of commitment was demonstrated? • What kind of policy instruments was used?
Implementation and coordination	• Did the policy eventuate? • If so, when was the policy implemented? • Any event that triggered the implementation (or abolishment) of the policy? • Were the issues intended to be resolved still the same? • Which agencies or individuals were involved in implementation? • How were they involved? / What was their role? • How was the relationship of these individuals/agencies with the others? E.g. They were the most powerful / influential / powerless in the government; there was intense competition between A and B etc. • At this stage, was the policy related to other ones? E.g. It complemented / contradicted / improved other policies. • Any key events / cornerstones? • What were the resources deployed? • What kind/level of commitment was demonstrated? • What kind of policy instruments was used?
Outcome	♦ What was resulted from this policy? ♦ Was it an intended / unintended outcome? ♦ When did it happen? ♦ What was the stakeholders' response?
Implications for climate change adaptation for the tourism sector	♦ Does the policy facilitate or hinder climate change adaptation for the tourism sector? How? ♦ What are the outstanding adaptation issues to be addressed subsequent to this policy? ♦ Who / which agencies should be involved to resolve these issues? ♦ What are the policy instruments or resources required?

12.4.2 Field Visit 2 Suggested Interview Structure

Source: Adapted from Calgaro (2010)

Stages of the interview	Question Outline – Second Field Visit
Exposure, Shock and stressors	• What events have affected tourism numbers and business in the past 15 years? • Has tourism been affected by any other type of shocks or stressors? • Has Vanuatu experienced an increase or decrease in tourism numbers following negative events that have occurred in-the Asia-Pacific? <u>Business owners and workers:</u> • What did you do to survive financially when numbers are down (social, security, family support)? • In the past, has Vanuatu experienced an increase or decrease in tourism numbers following negative events that have occurred in-the Asia-Pacific? • In your opinion, what events do you see as the greatest risk to tourism and tourism business in the future? <u>Dive Operators</u> *Climate Change Perceptions* • From what you have observed or heard, have divers reported to you or noticed any changes to the reefs including coral bleaching? • If so, what has been their reaction? • What is your perception of the coral condition? • Do you feel that commercial land base development has had an impact on the water quality in the oceans? • Do you feel the visitors have a realistic expectation of the health of the reef? *Impacts* • Are you as a dive master/operator worried about the publication of negative changes or coral bleaching (or knowledge of bleaching) and the impact this may on dive numbers now or in the future? • Have diver numbers been affected by these changes or bleaching yet? • If coral bleaching does drastically compromise diver operations, what alternatives do operators and staff have for employment and generating income? • Do you have social support systems - family, friends, and/or business partners - to turn to for help (social, economic, emotional) if business does drop off? • Do you or your staff have access to social security or unemployment benefits if you lost your job or business?
Sensitivity	**Destination Characteristics** • What type of destination is Luganville? • Who are the main markets for the destination and why? • What are the main tourism seasons for Luganville? • How is the destination promoted to domestic and international markets? • What collaborations have the Vanuatu Government made to strengthen tourism development in the region?

	• What type of tourism development is most prevalent in Luganville and why? <u>Accommodation sector only:</u> • What type of destination is Luganville? • Who are the main markets/customers/tourists for Luganville and why? <u>Dive operators re diving:</u> • Do the key dive tourist markets match the overall key tourism markets in Vanuatu? • Have you seen a change in the profile of divers over the last decade(s)? • Age • Nationality • Have you experienced a growth in the number of divers over the last decade? • Are the majority of divers experienced or beginners? • What are the best times to dive? **Economic Capital** • What are the other livelihood options in the greater area for destination community members? • Are employers and employees entitled to social security payments if they lose their income? • If people do become unemployed, what other support does the government provide to help them re-enter the workforce? <u>Owners</u> • What type of business do you have? • Do you have another business or is this the only one? • How long have you been in business? • How many employees do you have including yourself? • Are the staff predominantly local or brought in from other areas of Vanuatu and/or overseas? • Are the staff seasonal, freelance, or permanent? • Where did you get the finances to begin your business? • Do you have other assets or financial support options from family to help you financially if business was struggling? • Has there been a time in the past where your business has struggled financially? • What precautions have you taken in the past or are you taking now to safeguard your business against shocks and stressors? • Do you have insurance for your business? <u>Employees:</u> • What type of business do you work in? • Do you have another job in addition to this job? • Why do you work in tourism? • Has there been a time in the past where you have lost your job or had reduced hours? • If so, what did you do to survive financially?

	Governance • *Main actors in shaping destination development* • Who are the main actors in shaping tourism development in Luganville? • Does your department cooperate with other departments/ministries directly or indirectly in influencing tourism and shared resources (coastal, transport, water, etc.)? • Have the destination community changed their business/working habitats in order to prepare themselves for future shocks/stressors? • Are there any local elite/influence groups in Luganville? • *Legal regulations* • What is required to set up a tourism business? • Is it easy to set up a tourism-related business? • Do businesses have to register their business interest? *Policy, planning and implementation* • What policies are in place to protect the marine and coastal environments in Luganville/Vanuatu and do they affect tourism? • Are there any regional (Pacific region) policies that facilitate or hinder protection of marine and coastal environments in Luganville? • Are there any obstacles to the successful implementation and management of existing coastal and marine environment management policies? • How are these policies managed and which governmental departments are responsible for managing the coastal zone areas? • Who is responsible for enforcing these policies? • Do the current policies and plans include building standards and or development regulations? • Have any businesses violated building standards and or development regulations? **Human and Social Capital** • What skills and training/education opportunities are available for the locals to draw upon to set up tourism-related businesses? • Are there any training programs to enhance the skill base of tourism workers? • Is information about possible risks (and past events) available to the public? • What is the un-employment rate in Vanuatu? • Are there shortages of skilled tourism staff? <u>Business operators only:</u> • Do you encourage further training of your staff? <u>Staff only:</u> • Are you aware of any types of events that have occurred in the past/or future risks that may stop tourists from coming to Vanuatu? • Is it easy to access information about possible risks (and past events)? • Are there shortages of skilled tourism staff? • In terms of a crisis, who would you turn to for help? • Are family and kin structures very strong here in Luganville? • Are family and/or village ties the most important influence in your everyday life?

	• Do you cooperate with other businesses? **Physical/Natural Resources** • What was the condition of the natural environment before tourism development started in the area? • Was this altered by tourism development? • Have you seen a change in the quality/health of the environment since tourism began? • Are there any other negative impacts from tourism development in the destination area? • Are there any disputes over land access in the coastal zone? • Are any groups excluded from accessing land? • Do the communities of Luganville have adequate access to clean water, electricity? • What types of waste water management system are most prevalent in Luganville? • Are the road and communication systems sufficient for the current and projected needs of the Luganville destinations?
Adaptive Capacity	**Emergency and Recovery Plans** • Are there any local, national, and regional emergency recovery plans in place? • Does the government have risk or hazard management plans in place? • How do these plans strengthen the resilience of the local community? **Climate Change Adaptation** • Are you concerned about climate change's impact on tourism activities? • Why and in which way? • Would you be interested in learning more about the impacts of climate change? • Are you aware of any existing/planned government policies that are designed to assist the tourism industry and your communities to respond to climate change? • Do you feel there are limitations to the types of adaptations that the government can implement? • Are there any other policies or mechanisms that you feel help the communities address climate change? • Do you feel that the community at large works well together to address risks/threats that tourism in general face?

12.5 Group Discussion Outline

GROUP DISCUSSION

Informal discussion with participants

Welcome

Moderator to introduce the project and the purpose of the focus group

Ground rules:

Moderator lets participants know that there are no right or wrong answers. That we expect that there will be differing point of view and these are most welcome. If recording the session it is because we want to make sure none of their comments are missed. No names will be included in any reports and your comments are confidential. I, as the moderator is here to ensure that everyone has the possibility to share their point of view, please discuss with one another about specific questions. Please put mobile phones on silent mode or turn them off.

Purpose of focus group:

Get your view on this and more importantly how we can support you in addressing different types of change, including climate change. We´d like to identify possible and feasible solutions and opportunities that will help you and the tourism sector in Vanuatu.

Opening question (get people talking):

1. Let's begin. Let's find out more about each other by going around the room one at a time. Tell us your name and how long have been involved in the tourism industry in Vanuatu

Introductory questions (introduce the topic of discussion and get people thinking about their connection with the topic):

2. Who is involved in making tourism work in Luganville/Vanuatu?

Moderator to show the tourism system developed by the PT-CAP team

3. Looking at the suggested tourism system and from what we have just discussed, are there elements that are missing in our tourism system?

(adaptation has been part of society and particularly PIC societies for thousands of years)

4. Tell us about an event which has occurred in the past, where you have had to change your way of life, business, etc. (Did you receive any support then? What did you learn from this?)
    - → Have any particular shocks (coral bleaching, tsunamis, health epidemic, cyclones or political unrest) or stressors (GFC, environmental degradation, sea-level rise, coastal erosion, etc.) affected dive tourism in Luganville/Port Vila?
        - If so, what were the effects in terms of tourist flows, loss of business revenue/loss of jobs?

Transition questions (moving into the key questions driving this study)

Moderator to introduce shocks and stressors, then get participants to ranks the stressors and shocks from most concerning/threatening to least threatening. (Rich Picture Diagramming)

1. Using the most concerning stressor and shock, what are the actions that are needed to deal with shocks/stressors?

1. Looking at this list of actions, we would like you divide these into responsible actors? (e.g. communities, government, businesses, industry associations, NGOs, Donor Aid agencies, research and education institutes)

Okay, let´s discuss these allocations of responsibilities, so we can come to some consensus as to the responsibilities.

2. We'd like to discuss the barriers experienced for one or two actions - what are the main barriers experienced?
3. What support is required to overcome these barriers?

Ending questions

4. From what we have discussed today, what would you like see happen within the next 5 years?
5. What are the most important/urgent visions?
6. What factors and steps will facilitate the attainment of these visions?
7. How would you as a community execute these steps and at which scale?

Moderator to give a brief oral summary of the discussions

1. Is this an adequate summary of our discussions today?
2. How well does that capture what was said today?

Moderator to provide overview of the purpose of the study

3. Have we missed anything?
4. Do you have any further advice on how dive tourism could better address climate change?
5. Have you found these discussions helpful? Has it been beneficial for you to discuss these issues as a group? Have you learned from each other?

Moderator to thank participants and advise them of the next steps of the project and mention the destination TOOL-KIT, which will be based on these discussions and our analysis of data. Give them a loose time frame.

15-20 minute de-brief by research team immediately after the focus group.

12.6 Semi-structured Interview Schedules and Details

12.6.1 Field visit 1

Participants					**Interview Specifics**	
ID	***Sector***	***Position***	***Gender***	***Cultural background***	***Date***	***Place***
1	Private	Managing director, Accommodation	M	Expatriate	20-Nov-09	Port Vila
2	Public	Officer	F	Ni-Vanuatu	23-Nov-09	Port Vila
3	Public	General Manager	F	Ni-Vanuatu	23-Nov-09	Port Vila
4	Public	Principal Scholarship Officer	M	Ni-Vanuatu	23-Nov-09	Port Vila
5	Private	President, Sector Association	M	Expatriate	24-Nov-09	Port Vila
6	Private	Owner, dive operator	M	Expatriate	24-Nov-09	Port Vila
7	NGO	Employee	M	Ni-Vanuatu	24-Nov-09	Port Vila
8	Private	General Manager, Accommodation	M	Expatriate	24-Nov-09	Port Vila
9	Public	Climate Change Officer	M	Ni-Vanuatu	24-Nov-09	Port Vila
10	NGO	Employee	M	Ni-Vanuatu	24-Nov-09	Port Vila
11	Private	Owner, support	F	Expatriate	25-Nov-09	Luganville
12	Private	Secretary, Sector Association	M	Ni-Vanuatu	26-Nov-09	Luganville
		Chairman, Conservation area	M	Ni-Vanuatu		
13	Public	Manager	M	Ni-Vanuatu	26-Nov-09	Luganville
14	NGO/Public	Community worker, Task Force	M	Ni-Vanuatu	26-Nov-09	Luganville
15	NGO	Employee, Women's Football Association	F	Expatriate	26-Nov-09	Luganville
16	Private	Owner, Accommodation	F	Expatriate	27-Nov-09	Luganville
17	Private	Manager, Dive operator	M	Expatriate	27-Nov-09	Luganville
18	Private	Owner, dive operator	M	Expatriate	27-Nov-09	Luganville
19	Private	Owner, Accommodation	F	Expatriate	28-Nov-09	Luganville
20	Private	Manager, Accommodation	M	Expatriate	30-Nov-09	Luganville

21	Public	Director	M	Ni-Vanuatu	1-Dec-09	Port Vila
22	Private	Regional Chief Engineer, Accommodation	M	Expatriate	1-Dec-09	Port Vila
23	Donor/ Development	Project Officer	M	Expatriate	2-Dec-09	Port Vila
		Project Officer	M	Ni-Vanuatu	2-Dec-09	Port Vila
	Public	Secretary General, Penama Province	M	Ni-Vanuatu	2-Dec-09	Port Vila
24	Private	Owner, dive operator	M	Expatriate	2-Dec-09	Port Vila
25	Public	Receptionist, Training School	F	Ni-Vanuatu	4-Dec-09	Port Vila
26	Private	Owner, support	M	Expatriate	4-Dec-09	Port Vila
27	Public	Biologist	M	Ni-Vanuatu	4-Dec-09	Port Vila

12.6.2 Field visit 2

Participants					Interview Specifics	
ID	***Sector***	***Position***	***Gender***	***Cultural background***	***Date***	***Place***
28	Public	Chief Executive Officer	M	Ni-Vanuatu	28-Sep-10	Port Vila
29	Public	Climate Change Officer	M	Ni-Vanuatu	28-Sep-10	Port Vila
30	Private	Employee, Tour Operator	F	Ni-Vanuatu	29-Sep-10	Port Vila
31	Private	Owner, Dive operator	M	Expatriate	29-Sep-10	Port Vila
32	Public	General Manager	F	Ni-Vanuatu	30-Sep-10	Port Vila
33	Donor/ Development	Project Officer	M	Expatriate	30-Sep-10	Port Vila
		Project Officer	M	Ni-Vanuatu	30-Sep-10	Port Vila
34	Public	Climate Change Officer	M	Ni-Vanuatu	30-Sep-10	Port Vila
		Policy and Coordination Projects Officer	M	Ni-Vanuatu	30-Sep-10	Port Vila
35	Public	Project Officer	M	Ni-Vanuatu	30-Sep-10	Port Vila
		Project Officer	F	Ni-Vanuatu	30-Sep-10	Port Vila
36	Public	Chief Executive Officer	M	Ni-Vanuatu	1-Oct-10	Port Vila
37	Public	Manager	M	Ni-Vanuatu	4-Oct-10	Luganville
38	Private	Manager, Accommodation	M	Expatriate	4-Oct-10	Luganville
39	Private	Owner, dive operator	M	Expatriate	4-Oct-10	Luganville
40	Private	Owner, Accommodation	M	Expatriate	4-Oct-10	Luganville
41	Private	Owner, Accommodation	M	Expatriate	5-Oct-10	Luganville
42	Public	Officer, planning and environment	M	Ni-Vanuatu	6-Oct-10	Luganville
		Officer, planning and environment	M	Ni-Vanuatu	6-Oct-10	Luganville
		Officer, planning and environment	M	Ni-Vanuatu	6-Oct-10	Luganville
43	Private	Stall owner	F	Ni-Vanuatu	6-Oct-10	Luganville
		Stall owner	F	Ni-Vanuatu	6-Oct-10	Luganville
		Stall owner	F	Ni-Vanuatu	6-Oct-10	Luganville
44	Private	Owner, Accommodation	F	Expatriate	7-Oct-10	Luganville
45	Public	Officer, planning and environment	M	Ni-Vanuatu	7-Oct-10	Luganville
46	Public	Officer, Public Service Commission	M	Ni-Vanuatu	7-Oct-10	Luganville
47	Public	Manager	F	Ni-Vanuatu	11-Oct-10	Luganville
48	Private	Tour operator Manager, Flight controller	M	Ni-Vanuatu	11-Oct-10	Luganville
49	NGO	Director	M	Ni-Vanuatu	13-Oct-10	Port Vila
		Adviser	M	Expatriate	13-Oct-10	Port Vila
50	Public	Manager	M	Ni-Vanuatu	13-Oct-10	Port Vila
		Employee	M	Ni-Vanuatu	13-Oct-10	Port Vila
51	Private	Owner, support	M	Expatriate	14-Oct-10	Port Vila
52	Public	Adviser	M	Expatriate	14-Oct-10	Port Vila
53	Public	Director	M	Ni-Vanuatu	14-Oct-10	Port Vila
		Tourism Officer, Province level	M	Ni-Vanuatu	14-Oct-10	Port Vila
54	Private	General Manager	M	Expatriate	14-Oct-10	Port Vila
55	NGO	Project Officer	M	Expatriate	15-Oct-10	Port Vila
56	Donor/ Development	Counsellor	M	Expatriate	15-Oct-10	Port Vila

12.7 Group Discussion Schedules and Details

ID	Sector	Association	Cultural background	Number of Participants	Date	Place
A	Private	Vanuatu Scuba Operators	Expatriate	5	1-Oct-10	Port Vila
B	Community	Port Olry community	Ni-Vanuatu	32	3-Oct-10	Port Olry
C	Private	Espiritu Santo Tour Operators	Ni-Vanuatu	3	10-Oct-10	Luganville

12.8 Different Experiences of Participants

Sector	Sex	Cultural background	Details of Experiences
Public	F	Ni-Vanuatu	Joined the field of tourism straight out of university. She worked as a training and education officer in the late 1980s when tourism was only just developing in Vanuatu. The initial focus of her work was on raising awareness, but after ten years it was time for a change. After having worked in the Tourism Master Plan for a year, she resigned and joined the private sector working for a tour operator. In this job, the key purpose was to market the rural tourism product and the outer islands. She worked there for 5 years doing mainly marketing, but also some training. Then she applied for a scholarship to get further training and while waiting for the approval she worked for a local association. Her scholarship application was successful and she spent 2½ years in NZ undertaking a Masters in Tourism Management. On her return she worked as a marketing manager before becoming a general manager in the public sector of tourism.[32]
Private	F	Ni-Vanuatu	Three sisters from Pentecost working in the same market stall. They arrived to Santo when they were small and have all married men from different islands. They all live on their own land with their mum staying, but need to buy electricity, food and water. There are seven girls and 1 boy in the family. One of their big sisters was voted miss Vanuatu and another sister works at a large hotel complex in Port Vila. The brother teaches computers in Tanna. The three sisters have different experiences[43]: **Sister 1** (36 years) worked at Santo Meat Packers for five years. Recognising that tourism was better, she quit her job and started working as a tour guide. She is married to a man who works for the public sector and has one daughter, who goes to high school at a mission boarding school. She has to pay for the school fees which include 35,000 Vatu for the first term; 28,000 Vatu for second term; and 24,000 Vatu for third term. **Sister 2** (34 years) goes to New Zealand every year to work. She works packaging onions or other forms of cartoning of fruit or vegetables. The work is contract based. At other times of the year, she works in handicraft. She has a son and is separated (term used by herself) from her husband, who is a teacher and has re-married. She has no child support from ex-husband. Her son goes to grade 1 in a French school. There are not school fees at this school, but the school sometimes has a fundraising event where they ask parents to pay for fees. **Sister 3** (32 years) has always worked in tourism. She has a daughter and is married to a man with many jobs, primarily

			working as a painter and handyman. Her daughter attends an English school and is in grade 7. The school fees are 7,500 Vatu for one term, with three terms per year.
Private	F	Ni-Vanuatu	Both herself and her partner works in hospitality. She has one day off and work all other days full time. She works on weekends too, but can be sent home from work with half a day's pay on days that are less busy. Together with her husband, she has four kids – two are in public school and two are in a mission school. She is required to pay the full fees for the school. Her sister in law looks after the children, while her and her husband works. The husband works from 2pm to 11pm and will do the majority of the cooking and when unable to do so, the sister in law will. On the day off, she goes to church and otherwise stays back home to relax.[30]
Public	M	Ni-Vanuatu	He has been employed in the tourism industry over the last 9 years. He started out as a marketing officer for a resort, then moved into the public sector working as an officer involved in tourism at the provincial level. In this role, he works closely with head office in Port Vila. In his spare time, he chooses to also work as an administrator for a local church.[37]
Private	M	Ni-Vanuatu	His father came from the East Coast of Santo, where he grew up. As a little kid he walked to the coast to go to school for six years, before he went to Port Vila to go to Malapoa College. He has since a little kid been interested in flying air planes, but as his mum is a big influence on his life and she didn't like this, he decided against being a pilot. Instead, he got into air tower control, which he currently works with within both Port Vila and Santo. He did his initial training in Bangkok, came back to Vanuatu and got his license. His first assignment was then in the Texan Airport in PNG, followed by a year's assignment in Nande Airport in Fiji. After this, he did a 6 months assignment in Brisbane, Australia followed by a 1.5 years assignment in Japan. It is his experience working in airports that led to his interest in tourism, which made him get involved. In 2005, he started his own tour company, which he runs as a part time job while still working in the airport, as it pays much more money. Tourism started out as a hobby for him, but eventually it got growing and became as serious as a second job. He wants to eventually only have the tourism business, as the airport controller job is extremely stressful. He highlighted that as a Ni-Vanuatu, marketing is their main weakness and getting to know the wholesalers is a real challenge. An investor will have more connections from his past experience or through business partners. He himself has also used some of his past connections from his other job to create new opportunities.[48]
Private	F	Expatriate	Arrived to Vanuatu in 1976 with her husband and together they set up a hotel business. She is originally from Malawi in Africa and has always been involved in the hotel business.[44]
Private	M	Expatriate	Born in Santo, Vanuatu. His parents started a local shop business in 1973 and he set up the motel in 1980. This was his first

			experience in the accommodation business, but he chose it because he was born here and the parents had the shop. So the residential quarters were made into a motel, but business was fairly slow at the time that it started. This caused them great grief as they were worried that the government might throw them out of the country for four to five years because the business was slow. This worry was based on the political situation in 1980, where Vanuatu had just gained its independence.[41]
Private	M	Expatriate	Arrived in Vanuatu 15 years ago to set up a dive operation at a resort. After two years, he moved to work at another resort where he stayed for 6 years before moving into hospitality. He is a PADI accredited instructor. Motivations for moving to Vanuatu were commercial as Vanuatu was the only place that was open for investment commercially. Furthermore, the presence of the Coolidge shipwreck fitted well into his diving. Back then it was not difficult to set up, and he has significant support from his franchise network. He believes that it is much more regulated now and that setting up a business would take longer now because of all the procedures to go through.[38]
Private	M	Expatriate	During his time at university (early 20s), he became environmentally aware and started recycling even before recycling became official. He would quit jobs that he felt were not environment friendly enough. He was certified as a diver at 19 years old and became an instructor a few years later. He worked as a Club Med dive instructor for several years. For example, he worked in the Maldives for 1.5 years and has during his various employments seen some of the best reefs in the world. He saw a lot of researcher needs as part of his job – but felt more comfortable from a fieldwork point of view. He did a master of resource management combined with coastal tourism point of view. Through this research, saw a real disconnect and became interested in policy. He then worked for a government department in British Columbia doing surveys. Then moved into teaching marine science at the Marshall islands. It was here that he realised he wanted to get back into tourism and Vanuatu became the ideal framework to do so in noting that although there is much corruption if you want to do it right there is every opportunity to do so. He arrived to Vanuatu in 2005 where he set up his own business.[31]
Private	M	Expatriate	With 17 years of casino experience, he has been in Vanuatu for 6.5 years. He started out working for a betting company that involved horse racing and sports, then became an assistant manager for another company, before taking over a general manager role of one of the casinos in Port Vila.[54]