



Pacific
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RESCCUE

INITIAL DIAGNOSIS OF THE NORTH EFATE PILOT SITE, VANUATU



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ABBREVIATIONS AND DEFINITIONS

AFD	Agence Française de Développement
CBA	Cost-Benefit Analysis
CC	Climate Change
CCA	Climate Change Adaptation
CCCPIR	Coping with Climate Change in the Pacific Island Region
CRISP	Coral Reef Initiatives for the Pacific
DEPC	Department of Environmental Protection and Conservation
DPSIR	Drivers, Pressures, State, Impacts, and Responses Analysis
DRR	Disaster Risk Reduction
ELMA	Efate Land Management Area
FAD	Fish Aggregating Device
FFEM	Fonds Français pour l'Environnement Mondial
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (a German-based development project management organisation)
ICM	Integrated Coastal Management
IDD	Initial Diagnosis Document
INGO	International Non-Government Organisation
MALFFB	Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity
Malvatamauri	The national council of Chiefs in Vanuatu
MCC	Ministry of Climate Change, Meteorology, Geohazards, Energy and Environment
MFA	Ministry of Foreign Affairs, International Cooperation and External Trade
MoL	Ministry of Lands and Natural Resources
MPA	Marine Protected Area
NAB	National Advisory Board on Climate Change and Disaster Risk Reduction
NDMO	National Disaster Management Office
NGO	Non-Governmental Organisation
PICT	Pacific Island Countries and Territory
PRA	Participatory Rural Appraisal
RESCCUE	Project name, representing the activity of 'Restoration of ecosystem services and adaptation to climate change'
RoI	Return on Investment
SPC	Pacific Community / Communauté du Pacifique (formerly known as Secretariat of the Pacific Community)
SPREP	Secretariat of the Pacific Regional Environmental Programme
Tasivanua Environmental Network	A community network that monitors natural resources including Locally Managed Marine Areas.
Vanua Tai	A local network of natural resource monitors operating across Vanuatu
VANGO	Vanuatu Association of Non-Government Organisations
VCC	Vanuatu Christian Council
VFD	Vanuatu Fisheries Department
VMGD	Vanuatu Meteorological and Geo-hazards Department
VNCW	Vanuatu National Council of Women
VRA	Vulnerability Reduction Assessment

1. INTRODUCTION

The Vanuatu RESCCUE Project (restoration of ecosystem services and adaptation to climate change) covers the northern side of the island of Efate beginning at the village Mangaliliu and ending with the village of Epao (inclusive). The islands of Nguna, Pele, Lelepa, Emao and Moso are also included in the project site, as shown in Figure 1. In total, the site covers around 50 km² of marine ecosystems (coral reefs, seagrass beds, lagoons, mangroves and beaches), 180 km² of terrestrial ecosystems (including forests) with a total population of approximately 8,000 (VNSO 2009). The project area also includes an established network of marine protected areas at Nguna-Pele, as well as multiple community-managed marine protected areas.

The Vanuatu RESCCUE project commenced in October 2015. A comprehensive stakeholder engagement and information gathering exercise commenced at the end of October and continued throughout November. The RESCCUE team used a number of tools to gather information including Participatory Rural Assessment (PRA), Vulnerability Risk Analysis (VRA), and Drivers, Pressures, State, Impacts, and Responses Analysis (DPSIR), and the development of seasonal calendars and community resource mapping.

The aim of this exercise was to provide for a precise and qualitative characterisation of the North Efate site in relation to areas where the RESCCUE project can support positive change in terms of adaptation to climate change through Integrated Coastal Management (ICM). The site characterisation and the identified opportunities for the RESCCUE project are outlined within this Initial Diagnosis Document (IDD).

The IDD is a strategic document and sets out the opportunities that will in turn refine the programme of activities at the North Efate site to be undertaken over the next three years. The IDD also provides a baseline against which the effectiveness and efficiency of the project can be evaluated. To this end, the IDD will be updated with mid-term and end-of-project diagnoses.

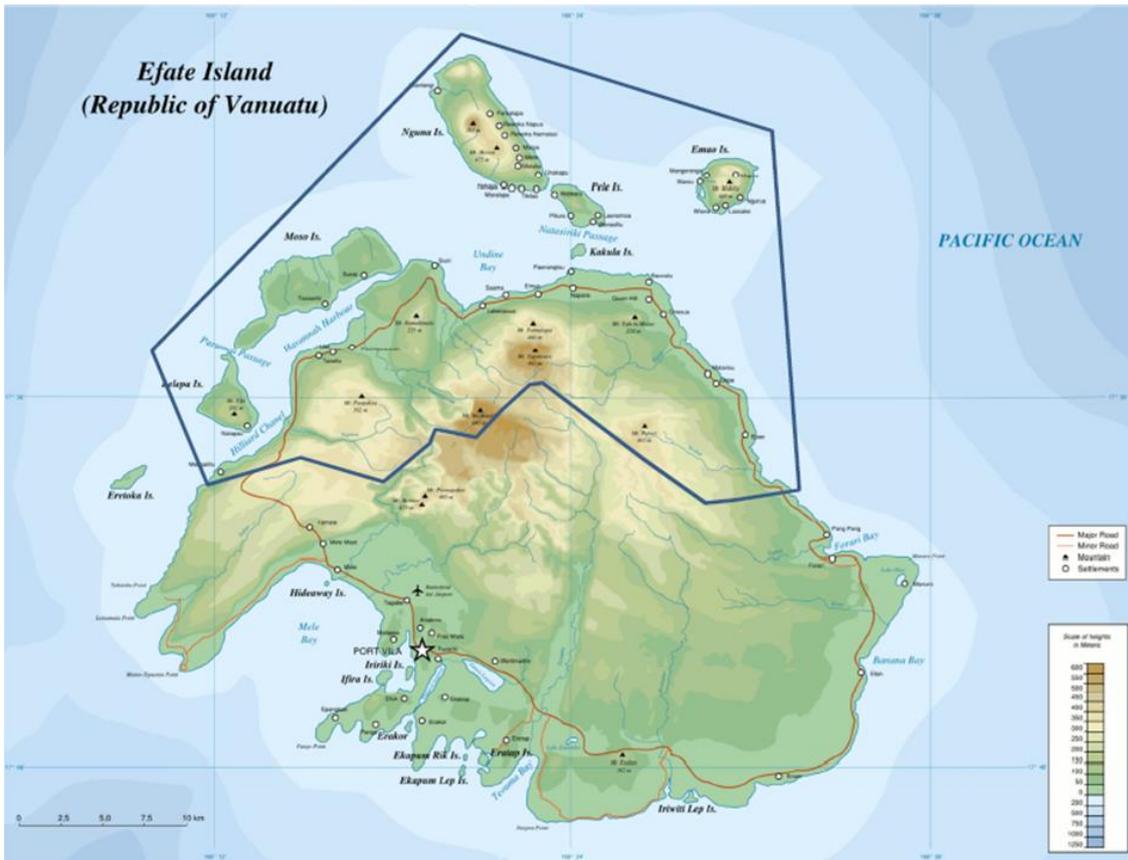


Figure 1: Approximate North Efate RESCCUE Project Area

2. NORTH EFATE BASELINE ASSESSMENT

The following section seeks to characterise the North Efate RESCCUE site and outlines key environmental, social, economic and governance features as they relate to the objectives of the Vanuatu RESCCUE Project.

2.1 Socio-Economic Baseline Assessment

The following assessment is based on initial consultation and engagement of communities using a Participatory Rural Assessment (PRA) and various tools such as community resource mapping, generation of seasonal calendars etc. Due to the limited time available to get to all villages in North Efate and engage with communities, the following data is mostly quantitative. However, it provides a good overall analysis of social and economic activities and process in North Efate. More detailed information will be collected during detailed thematic studies to be undertaken in the development of the ICM.

2.1.1 Employment and Economic Opportunities

The communities located within the North Efate RESCCUE project area are almost entirely subsistence-based, relying primarily on family-run agricultural plots and fishing. Surplus produce and fish are sold at road markets and the Port Vila market. The sale of marine invertebrate resources such as trochus, sea cucumber, shellfish, crabs, octopus, and other species is limited and opportunistic in most communities. Sea cucumbers (*Holothurians*) are harvested only during periods when the Vanuatu Fisheries Department (VFD) declares the fisheries open. Individual community harvesting is then subsequently decided by the Chief. In the north-western and northern communities, income is supplemented with the sale of firewood and charcoal.

Given the prevailing drought conditions associated with the El Nino Southern Oscillation (ENSO) during this assessment in November 2015, there is little agricultural surplus available for sale. Communities also report heavily depleted marine fish and invertebrate stocks resulting in limited available surplus for sale.

Port Vila is a source of employment opportunities for people from Tanoliu (north-western area). A small percentage of individuals from most communities in North Efate leave to work abroad but return with the money earned. Money that is earned abroad is used to improve the construction of homes and for purchase of items that are considered to improve quality of life including boats and tools.

Many communities have small-scale ecotourism initiatives and cooperatives reporting limited success and a need for increased management capacity. Examples of identified income generating activities include:

- An aquaculture project raising Tilapia in Lamin (north-eastern area);
- The sale of wetland-produced watercress in Epule (north-eastern area);
- The sale of specialty products, such as vanilla from community members in Matarisu (north-western area) to Noumea, New Caledonia;
- The 'Top Rock' lookout and wildlife visits in Saama;
- Cave visits in Siviri; and
- A 'swimming enclosure' in Ekiye.

High transportation costs are an economic barrier to individual families selling directly at the Port Vila market, reducing the available profit. As an alternative, the village of Saama (northern area) has established

a community-level cooperative for collection and sale of produce. Road markets offer an additional point of sale when there is surplus, however given the much lower volume of local traffic on the round-island road, there is reduced access to customers. In the eastern area of North Efate, Epule has continued to produce large quantities of kumala (sweet potato; *Ipomoea batatas*) through continuous planting and variety diversity. As a result the community continues to supply the Port Vila market.

In order of priority, communities in Vanuatu perceive that income is used for food (especially in the aftermath of Tropical Cyclone (TC) Pam and as a result of depleted fisheries), school fees, weddings, and Christmas expenses. The 2010 Household Income and Expenditure Survey (HIES) (VNSO 2010, p. 30) conducted by the Vanuatu National Statistics Office reports the main area of expenditure for households is on food, accounting for 56% of expenditure each year (including self-grown food). Accounting for 14% of expenditure is household operations (including fuel and lighting, communications (mostly mobile phones), household supplies, appliances, equipment, and furniture), and 7% to housing (rent, home improvements, maintenance and the construction of new dwellings owned by the household). These expenses were likely to have been significantly higher in 2015, due to the housing repairs and replacement of household goods required for most households in North Efate following TC Pam.

2.1.2 Literacy and Education

Appendix 1 provides a comprehensive assessment of the literacy and education levels for Vanuatu and the North Efate project site. The main trends that can be determined from the 2009 census data relevant to the RESCCUE Project are:

- There are some 110 local languages in Vanuatu, with the main language spoken in private households being a local language (63%), Bislama (34%), English (2%), and French (1%), although most people can speak Bislama.
- In 2012 the literacy rate of adults aged 15 and above was 84%, although it is worth noting that the younger generation (15 – 24 year olds) has a much higher literacy rate of 95%.
- The 2009 census recorded that literacy in Bislama was the highest, with 74% of the population able to read and write a simple sentence in Bislama, followed by literacy in English (64%), and French (37%).
- Approximately 72% of students complete primary school (MoE 2011). Due to the limited number of places available at high schools and the expense for families, many 10-12 year old children finish their education when graduating from primary school.
- From 2013, the Department of Environment Protection and Conservation (DEPC), the Ministry of Climate Change, and several environmental and climate change projects (including the SPC/GIZ Coping with Climate Change in the Pacific Island Region – CCCPIR program) have been working with the Curriculum Unit in the Ministry of Education to include environmental conservation and management and climate change concepts into the curriculum for K – Year 13. The DEPC urges Integrated Coastal Management (ICM) projects to include children and schools in their programming and awareness activities, especially for waste management, to build knowledge from a young age.

- Due to the small population of the villages, most islands (including Efate) have several centralised high schools in locations across the island.
- A 2009 study found that 18% of adults aged 25 to 34 had graduated from high school (VNSO 2009a). In the RESCCUE pilot site area, in a sample of nine villages with an average population of 406, approximately 14.3% of youth in each community are currently attending high school. There are two high schools in the RESCCUE pilot site region: Ulei and Onesua.

2.1.3 Population Information

Population data was obtained from the 2009 Vanuatu National Population and Housing Census, produced by the Vanuatu National Statistics Office. Appendix 2 contains a comprehensive demographic breakdown as well as a table of population numbers per village in North Efate recorded after TC Pam. This information is summarised below.

2.1.3.1 Vanuatu

The total population of Vanuatu in 2009 was 234,023, with an average annual growth rate of 2.3% (4,733 people per year). The urban population was 57,195 people (24.4% of the total population), and includes the towns of Luganville in Sanma Province with 13,156 people, and Port Vila in the Shefa province with 44,039 people.

Internal migration during the five year period 2004-2009 was primarily directed towards Shefa province and specifically to the capital Port Vila. The largest numbers of migrants came from Tafea, Malampa and Penama. Net international migration is estimated to be negligible during the intercensal period 1999–2009.

Although a high percentage (71%) of Vanuatu's population aged 15 and older was economically active, only a relatively small proportion (30%) received a regular paid income. This group consisted of 37% males and 23% females. Subsistence work (such as growing or gathering produce or fishing to feed families) was the main activity of 32% of Vanuatu's males and 28% females aged 15 and older. About 39% of the population in rural areas was made up of subsistence workers compared with 5% in urban centres.

The main source of household income for all households was the sale of fish, crops, or handicrafts (46%). 18% of rural household's main source of income came from wages or salary. 11% of urban households were involved in marine fishing activities, while 39% of rural households participated in fishing. Freshwater fishing activities were carried out by 4% and 21% of urban and rural households respectively.

While 81% of all rural households were involved in growing cash crops, only 17% of urban households grow cash crops. Compared to rural households, where 80% of households raised chickens, 57% raised pigs and 39% cattle, only a small proportion of urban households raised any livestock.

While 91% of urban households had at least one mobile phone compared to 71% in rural areas, there were 9% of urban households and 2% of rural households that had an internet connection.

Information on tenure reveals that 81% of all households owned their dwelling outright, while 12% rented, and 6% resided in their dwelling rent-free. More than 90% of households in the rural areas owned their dwelling, while 39% of urban households rented their dwelling.

Forty-six per cent of all households obtained their drinking water through a piped system and the second most important source was rainwater tanks (34%). However, private piped water was only used by a significant proportion of households in the urban areas. In rural areas, 14% of households obtained their water from a river, lake or spring.

The most frequently recorded toilet facility used by 47% of all private households was a pit latrine, while 21% of all households used a flush toilet; this percentage was 65% in the urban areas and only 6% in the rural areas.

The main source of lighting in Vanuatu was a kerosene lamp, used by an average of 48% of all households, although this percentage was only 6% in the urban areas, compared to 62% in the rural areas. Eighty per cent of urban households were connected to the electricity main grid. This was only 11% of the rural households.

The main energy source for cooking for 85% of all households was wood or coconut shells. It was almost universally used by the rural households and by slightly more than 50% of the urban households, where 40% used gas as the main energy source for cooking.

About 52% of all households dispose of their waste by burning it. In the urban areas two in three households dispose their waste using the authorized waste collection. In rural areas there are no authorised waste collection facilities.

2.1.3.2 North Efate RESCCUE Site

Within the RESCCUE pilot site, which includes the coastal region from North-west Efate, North Efate, to Epau in North-East Efate and the islands of Moso, Lelepa, Nguna, Pele and Emau, a population count was taken following TC Pam. Thirty-seven villages were counted, with a total population of 7,197 people . The villages counted contained 1,518 households. Of the population, 2,015 (28%) were men, 2,097 (29%) were women, and 3,085 (43%) were children aged 0 – 17 years old (sex not recorded for children).

The RESCCUE community engagement found that the North Efate site was generally consistent with rest of Vanuatu in terms of the findings of the 2009 Vanuatu National Population and Housing Census and outlined above.

2.1.4 Gender Issues

Vanuatu is a signatory to the Convention on the Elimination of All Forms of Discrimination Against Women, and the promotion of the equal participation of women in domestic, local and national affairs has been part of the government's development plan since independence (Tor and Toka 2004 p. 58). The Vanuatu National Council of Women was established in 1980 to provide a forum for women's issues and in 1992 the Vanuatu Women's Centre was established to assist victims of violence. There is also a Department of Women's Affairs, which is responsible for programmes to promote gender equality. In reality, however, there is an enormous division among ni-Vanuatu based on gender (Malloch and Kaloran 2006). Eighty-seven percent of households are headed by men, men are twice as likely as women to be in paid employment and the majority of positions of power are held by men. Since Independence in 1980, only four women have been elected to parliament. A report commissioned by the Department of Women's Affairs in 2004 entitled *Gender, Kastom and Domestic Violence* notes that 'there is a significant

marginalisation of women from pertinent discussions and decisions on areas of social and economic development, governance and human rights at community and national levels' (Tor and Toka 2004 p. 9).

In terms of ICM and climate change, women are often excluded from committees and decision-making meetings. When they are included, they are often expected to take an 'observer' role rather than a role of active participation. Planning (at village level and by donors) often considers the needs of 'the community' without considering specific needs of women, youth, or vulnerable groups, and many community leaders comment that they are unaware of what gender-specific needs would need to be considered for women and children (Vanuatu Christian Council 2015). Limited access to information and decision making processes limit the capacity of women to prepare and respond to adverse impacts of climate change. Cultural norms can also prevent women from preparing adequately for disasters. For example, post-TC Pam women from Tanna said that they had wanted to start fastening down the house roofing materials several hours before the cyclone, but that their husbands had dismissed their concerns, saying that the cyclone would not damage the housing. Most of the housing on Tanna was destroyed (Vanuatu Institute of Technology 2015).

Domestic violence is also a prominent issue for Vanuatu women. A 2011 national study by the Vanuatu Women's Centre (Vanuatu Women's Centre 2009) found that 60% of women had experienced physical or sexual violence from their partners or husbands during their lifetime, with 44% having experienced violence in the last 12 months. Ninety percent of the respondents who had experienced violence classified it as 'severe violence', including being punched, kicked, beaten repeatedly, choked or burned, or hit with a weapon. Twenty-one percent of those who had been injured through domestic violence now have a permanent disability. Forty-seven percent of rural women said their partner expects them to seek his permission before they do anything, including attending meetings, travelling to another village, or seeking health care.

The other significant issue for women in Vanuatu today is the vast amount of domestic labour they are expected to do. Women undertake the majority of the housework, child raising, caring for the sick, elderly, and people with disabilities, and often the work of growing the family's food. The majority of rural homes do not have electricity or running water, and use open fires and charcoal for cooking, so much of the housework is very labour intensive.

The explanation often given for these gender differences is that a woman's role is based on *kastom*. It is implied that to challenge this role is to challenge the foundation of Vanuatu society. Critical social analyses in the past 15 years have challenged this belief. Tor and Toka's report *Gender, Kastom and Domestic Violence*, for example, argues that traditionally Vanuatu women were leaders and participated in the socioeconomic and political development of their community (Tor and Toka 2004). They attribute the decline of the participation of women in public life and her relegation to the home under the authority of her husband to the teachings of the missionaries and to the introduction of Western ideas (Tor and Toka 2004).

Many communities that have worked with overseas volunteers, organisations and donors have accepted the need to include women in activities to meet overseas expectations or funding requirements. Some government departments including the Vanuatu Meteorology and Geohazards Department (which hosts the National Advisory Board on Climate Change and Disaster Risk Reduction), have also modelled equitable

recruitment, with two of the six senior technical managers being women and several female climate scientists. An ongoing gender-sensitive approach during planning, consultation, implementation and monitoring assists in embedding this as normal practice within activities, and provides women with the opportunity to demonstrate their capabilities as agents of change.

2.1.5 Natural Resource Use and Dependence

The communities of North Efate are highly dependent on natural resources for household food, income, cultural significance, and disaster recovery (see Appendix 3 – Natural Resource Dependence). Key resources include:

- Forest resources - firewood, charcoal, agricultural plots, traditional wild foods, wild game, building materials;
- Soils - agricultural production, native flora;
- Freshwater - springs, surface water, and groundwater resources;
- Thermal springs – tourism;
- Wetlands - agricultural production and increased climate change resilience with diversity in agricultural variety and income streams;
- Mangroves (crabs, shells, wood, and coastal protection); and
- Coral reefs - fish, invertebrates including sea cucumber, triton, trochus, green snail and giant clam, tourism.

Some land has been sold to foreigners, who are also dependent on the natural resource base (including land, surface water, and marine resources). Their presence has resulted in some competition for local resources and challenges to traditional resource management systems. Cattle ranching is conducted by some communities in the north-eastern area but primarily carried out by non-nationals in the upper watershed, causing the downstream communities to report water contamination and erosion problems. Communities interviewed frequently reported poaching of their traditional managed resources by indigenous peoples from other communities. External markets (e.g. sea cucumber and milling) also depend on the natural resources of North Efate. The area supplies agricultural produce, firewood, fish, and other marine products to end-users in Port Vila.

Given the direct and high-level of dependence of the local population on the resources of North Efate, it is important to note that the health and integrity of the natural resource base is directly correlated to resilience to climate change related natural disasters.

2.1.5.1 Previous Income Generating Activities and Capacity Building Experiences

In addition to the current income generating activities mentioned above, communities report having previously earned money through:

1. The harvest and sale of marine invertebrates including trochus (*Trochus* spp.) for a button-making factory in Port Vila that has since closed and is indicated as responsible for the depleted trochus stocks;
2. Cooperatives that have failed due to management problems (Tanoliu and Paunangisu); and
3. Failed tourism initiatives (guest house in Tasiriki destroyed by TC Pam and eco-tourism in Epule). Interviewees commonly stated that initiatives fail because they need increased financial literacy and capacity to effectively manage cooperatives in a sociocratic and transparent manner.

2.2 Environmental Issues

The North Efate project site from Mangaliliu in the west to Epule in the east and coastal islands includes a diversity of environments that support natural resources important for food security and livelihoods of local communities. The population is concentrated in coastal areas and on the islands of Lelepa, Moso, Nguna, Pele and Emao, and use coastal habitats and waters for substance and economic opportunities in addition to heavily depending on land-based resources. The coral reefs, seagrass meadows, mangroves, beaches and intertidal habitats of North Efate support a high diversity of marine plants and animals that provide critical resources for coastal communities and also species of conservation concern, including dugongs and marine turtles. Consistently, communities, government and NGOs report that the greatest threat to the marine and coastal environments of North Efate are tropical cyclones, overexploitation of fisheries, coral predation and bleaching, land-based pollution and coastal development (Raubani 2009, Pakoa 2007, community workshops 2015).

The impacts of climate change, including increased intensity of extreme events, higher temperatures, and changes to agricultural productivity and water availability, are being felt across Vanuatu, and are projected to increase in the future. Climate change projections are that average maximum surface temperatures will increase, rainfall will most likely increase and become more extreme, extreme temperatures will increase in frequency, number of dry days will increase, sea level will rise, ocean circulation will change, and ocean pH will decline causing acidification that will impact significantly on coral reefs (BoM and CSIRO 2014).

The results of the Participatory Rural Assessment (PRA), Vulnerability Risk Analysis (VRA), and Drivers, Pressures, State, Impacts, and Responses Analysis (DPSIR) undertaken in North Efate for this IDD, suggest the environmental issues of North Efate fall within four primary categories:

1. Impacts from extreme weather events, such as TC Pam;
2. Marine and fisheries;
3. Terrestrial resource; and
4. Water resources.

2.2.1 Extreme Weather Events: Tropical Cyclone Pam

Vanuatu is extremely vulnerable to a range of natural hazards. In a report for the International Decade for Natural Disaster Reduction for the Pacific Island Countries, Vanuatu was classified as highly vulnerable to natural hazards, including cyclones, storm surge, coastal flood, river flood, drought, earthquakes, land-

slides, tsunami and volcanic eruptions. Vanuatu is also vulnerable to anomalously long dry spells and prolonged wet conditions associated with the El Nino (warm phase) and La Nina (cool phase) of the El Nino-Southern Oscillation. Since 1939, Vanuatu has experienced 124 tropical cyclones, of which 45 were categorised as having hurricane force winds. Several of these disasters have caused loss of human life, disrupted livelihoods and resulted in millions of dollars of damage to infrastructure.

Extreme weather events, such as severe tropical cyclones, are projected to become more frequent in Vanuatu, with climate change projections of an increase in the maximum intensity of tropical cyclones as the mean global temperature rises, of between +3% to +21% by 2100, or between +2% and +11% if expressed as maximum wind speed (Knutson et al. 2010). Ultimately, tropical cyclone numbers are projected to decline in the southwest Pacific in the future but those that do occur are likely to be more intense (BoM and CSIRO 2014).

The most recent major tropical cyclone to hit Vanuatu was TC Pam. This was a category 5 (severe) storm with sustained winds of 269 km/h when it passed the east coast of Efate on 13 March 2015 (Emergency Response Coordination Centre¹). Coastal and island communities, fringing reefs, beaches and coastal terrestrial habitats of northeast Efate were severely impacted by TC Pam. Within the project area, the north-east was most severely impacted, as evidenced by damage to villages, public infrastructure and shorelines, and the north-west was the least affected (Government of Vanuatu 2015).

The people of North Efate report that the devastation caused by TC Pam was much worse than was expected, despite extensive cyclone warnings and preparation in many communities (primarily driven by the Red Cross). In the aftermath of TC Pam, conservation areas were opened to fishing throughout Efate, creating additional pressure on already depleted fisheries. Current drought conditions that are the result of the a strong El Nino event have decreased agricultural production and are also increasing demand for and pressure on marine resources.

Post-cyclone rapid reef surveys conducted at 12 sites by this RESCCUE project in November 2015 documented average hard coral cover of 19.5% and 39% on north and north-west reefs, respectively (Figure 2) but could not access the most impacted north-east reefs due to bad weather at the time of the surveys. These data represent a decline in coral cover from previous surveys (noting that site locations and methods vary), and are most likely the result of TC Pam damage. The earliest surveys from 1989 after TC Bola recorded average coral cover of 20.5% on north-west reefs (Done and Navin 1990). In 2004, coral cover in north Efate was 60–75% (Pakoa 2007), and surveys in 2006–2007 recorded average hard coral cover of 49% across 11 sites in north Efate (Raubani 2009), representing the highest coral cover of all reefs surveyed in Vanuatu at that time. Unpublished Reef Check surveys in 2009 recorded the lowest coral cover for north Efate sites of 7–16%, which is substantially lower and is likely to be due to an unidentified impact.

¹ http://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc_en Accessed November 2015

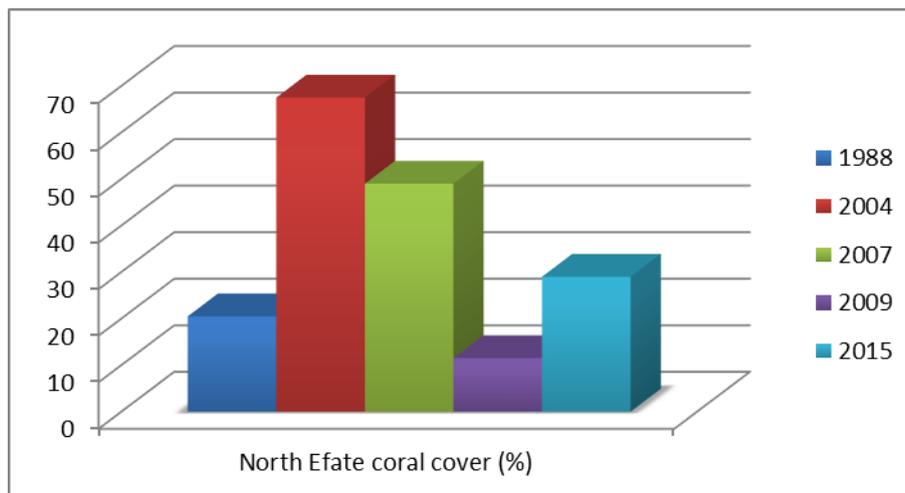
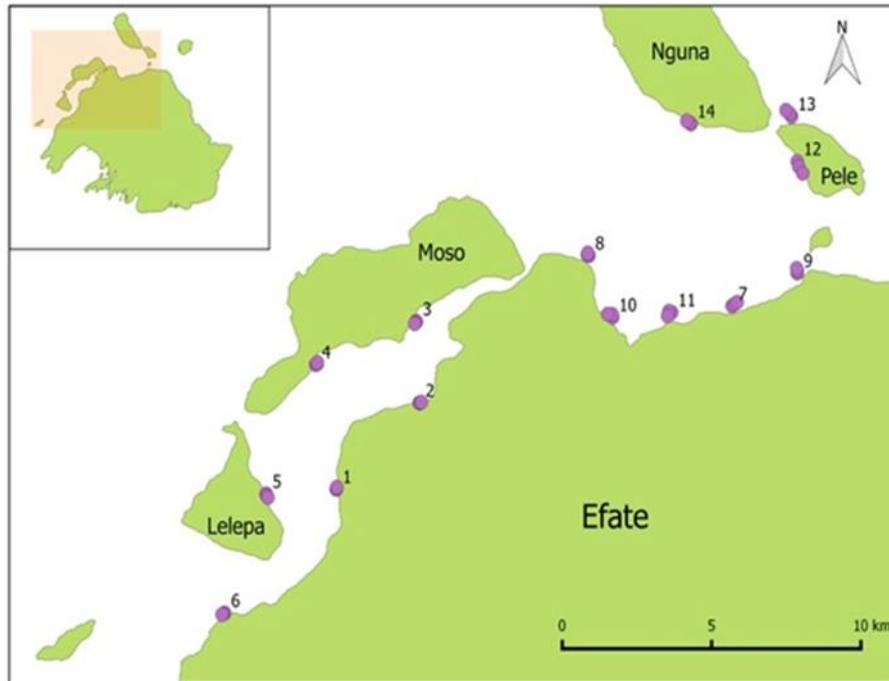


Figure 2: 2015 rapid reef assessment survey sites and percentage of hard live coral cover for reefs of North Efate based on available data since 1989.

Notably, the 2015 rapid surveys documented macroalgae cover on northern reefs of 26–55%, which is considerably higher than on north-west reefs and in previous surveys of the same region. The presence of high macroalgae cover can be an indicator of recent disturbance, which has been observed after tropical cyclones in other regions (e.g. Chin et al. 2006, GBRMPA 2011).

All reef sites surveyed had moderate to high coral diversity (except Lakenasua in the north), consistent with previous surveys, and indications of low fish diversity, particularly piscivores (snapper and grouper) and large herbivores (parrotfish). These fish are functionally important in reef ecosystems as herbivores control algal growth and biomass, slow growing species (groupers) represent a stable ecosystem, and predatory

species (snapper) maintain the balance in fish communities. Depletion of these key functional groups can be a sign of overfishing as well as recent cyclone disturbance (Tobin et al. 2010). No data on the severity of impacts on coastal environments (mangroves, beach vegetation or seagrass meadows) was available. These systems are important for their ability to support community livelihoods and food security. Although seagrass was recorded at some survey sites, detailed abundance or distribution data are not available.

The spatial patterns of impact severity documented are consistent with proximity to the path of TC Pam, and reef recovery will depend on:

1. reef condition prior to the cyclone;
2. absence of other perturbations, including human pressures such as land-based pollution and overfishing; and
3. the return period between disturbances.

Although post-cyclone reef data is limited, there is some evidence after TC Bola (1989), TC Dani (1999) and now TC Pam (2015) that the coral reefs of north Efate have a natural resilience to physical disturbances. However, it is interesting to note that Matarisu village felt that because of the relatively short time period between cyclone events, their reef had been progressively destroyed.

In general, coral reefs can recover from the impacts of cyclones within 5 to 15 years if they are free from other stresses (Connell et al. 1997, Hughes et al. 2003), more substantial recovery to high diversity habitats (including slow-growing corals such as *Porites*) with larger colonies, can take several decades (Hughes and Connell 1999). During community workshops, residents reported that within the villages, TC Pam caused coastal flooding and storm surges (the worst flooding being in Takara). In many communities, virtually all homes (both those made from store-bought and traditional materials) were destroyed. Several respondents stated that traditional roofs made from wild cane were least damaged by the storm. Residents said they were terrified of sheets of metal roofing that were hurled through the villages by the strong winds. Agricultural plots were destroyed or covered by debris. Water systems throughout the region were damaged and many drinking water supplies were contaminated. Much vegetation on hillsides and coastal areas was uprooted or stripped of branches or leaves, which caused further damage to reefs and houses, loss of habitat, damaged water catchments, and reduced the availability of building materials for rebuilding houses and fuel for cooking fires. There was severe riverbank erosion near Port Havannah (Al Creek). Communities also reported that since TC Pam, there have been fewer fish, including in the rivers. This has resulted in a change of diet for some (toward dependence on store-bought food and government and NGO supplied rice).

According to community consultations the most effective coping strategies used were:

1. preparations recommended by the Red Cross (including the coppicing of trees in the villages and the early harvest of some crops);
2. community solidarity and support; and
3. sharing of plant cuttings and seedlings to replant damaged gardens.

Lack of financial capital has made it difficult to repair cement homes with corrugated iron roofs while the damage to natural materials has made it difficult to rebuild homes constructed of traditional materials. Respondents generally agreed that they would like to better understand possible impacts from disasters so

they can more thoroughly prepare themselves, including with the storage of more food and water. Communities also stressed the need for local capacity to fix damaged water infrastructure. Several communities are interested in learning how to build traditional cyclone shelters. There is currently one such shelter in Ekiye and another in Epau, but in most communities this traditional knowledge has been lost. There is also interest in learning and sharing traditional methods for food preservation. These methods are most commonly practiced in the outer islands of Vanuatu including the Banks Islands. Some communities demonstrate the desire to strengthen their internal resilience to extreme events like TC Pam while others expressed substantial dependence on external aid and resources.

2.2.2 Marine Environments and Fisheries

The North Efate site includes large areas of coral reefs, seagrass meadows and mangrove forests, although their exact extent is unknown. Bathymetry surveys by SOPAC undertaken in the early 1990's identified fringing reef along most of the northwest Efate coast and around the islands of Lelepa and Moso (Smith 1991), except along the North Efate coast across from Moso Island, which is dominated by mangroves. This section of the coastline represents the largest area of mangroves in the project site. Preliminary surveys have documented 82 km² of mangroves between Paunagisu and Takara, as well as 0.9 km² near Emua and 4 km² near Lakenasua (OceansWatch unpublished data). Reef surveys conducted by the VFD and Reef Check (Pakoa 2007, Raubani 2009, Reef Check unpublished data) confirm that most of the North Efate coastline and the islands have fringing reef with seagrass, however no data are available on the area or spatial distribution. Surveys in 1989 documented the coral species present in North Efate as well as the presence of 2–5 seagrass species depending on the site but did not map the area or distribution of these habitats (Done and Navin 1990).

These environments provide critical goods and services to communities, as well as essential coastal habitats and protection from extreme events and information on their spatial distribution and abundance is a key knowledge gap that will be needed to inform integrated coastal management actions. Marine fisheries and aquaculture make vital contributions to economic development, food security and livelihoods. Climate change and ocean acidification are expected to have profound effects on the status and distribution of coastal and marine habitats, the fish and invertebrates they support and, as a result, the productivity of fisheries and aquaculture.

A global assessment found that Vanuatu coral reefs are currently most threatened by land-based pollution and overfishing, which affect between 75% and 90% of its reefs (Burke et al. 2011). Most reefs in North Efate are currently in the very high to critical threat categories when local pressures are integrated (Chin et al. 2011). Vanuatu reefs are in the top nine most vulnerable worldwide to the effects of coral reef degradation due to high reef dependence (World Resources Institute 2012), and coastal communities were ranked 8th most vulnerable to the effects of ocean acidification of the 22 Pacific nations assessed (Johnson et al. 2015). Reef vulnerability is expected to increase under future climate change, and by 2030, the combined effects of ocean acidification and thermal stress will result in 90% of Vanuatu reefs being highly to critically threatened (Burke et al. 2011). Addressing local threats is therefore important for minimising current pressures, and building resilience to future threats, particularly as climate change is projected to reduce ocean pH, increase sea temperatures, increase cyclone intensity, raise sea levels and change rainfall patterns, which will have implications for species, environments, communities and industries (Bell et al. 2011).

Outbreaks of coral-eating crown-of-thorns starfish or COTS (*Acanthaster planci*) present a potential threat to reef condition and ultimately food security and income. COTS outbreaks were documented in the reefs of North Efate and the surrounding islands of Emao, Nguna, Pele, Moso and Lelepa in 2006, 2008, and 2014 (Dumas et al. 2014). COTS populations are described as an outbreak when they reach densities where the starfish are consuming coral tissue faster than corals are known to grow (Osborne et al. 2011). Local tourism operators and fishers are usually the first to observe increased COTS densities, and have identified this as a significant issue to the condition of the reefs that they depend on for their livelihoods. Current control programmes use manual collection and shore disposal of individual COTS, and since 2006, some SCUBA operators have done this on key dive sites at their own expense. Village-scale control programmes through local NGOs (e.g. Tasivanua) are also undertaken with variable success. Ultimately, however, long-term solutions lie in understanding and mitigating the causes of COTS outbreaks in North Efate. The current scientific consensus is that COTS outbreaks can be influenced by a range of anthropogenic changes, including nutrient-driven increases of larval prey (large phytoplankton) availability and removal of adult or larval predators (Brodie et al. 2005, Fabricius 2010).

Fisheries in Vanuatu consist of oceanic (tuna) industrial fleets, coastal (finfish and invertebrate), freshwater (finfish and prawn) and coastal aquaculture (shrimp and tilapia are the highest volume products) ventures. In North Efate, fishing activity is predominantly subsistence catch (mostly of reef fish and invertebrates), artisanal catch targeting reef fish and pelagic species around fish aggregating devices (FADs) for local sale, small-scale tourist fishing charters, and trial mariculture ventures for giant clam, trochus and green snail for restocking in Mangaliliu, Lelepa and Moso (JICA 2015). Fishing activities take place on coral reefs, seagrass meadows, mangroves and intertidal habitats, with coastal communities accessing nearby fringing reefs. Island communities and some coastal communities are also able to access nearshore FADs to target pelagic fish. In North Efate, communities generally use outboard motor boats for fishing, usually staying within 1 km of the shore. Reef fishing is mainly practiced using handlines, gillnets and spearguns, with handlines the most common gear that is used by both genders of all age groups but most commonly by women and children. Men tend to prefer spearguns and gillnets. Catch from handlines was mainly for daily consumption, while gillnets and speargun are used to catch fish for communal uses, customary activities and income generation (Kaltavara et al. 2013, see Table 1).

Table 1. Summary of fishing capacities and marine reserves in north Efate villages (Source: Kaltavara et al. 2013)

EFATE							
Villages	Population	Fishing capacities				Marine reserves	
		Gillnets	Spearguns	Canoes	Motorized boats	Date of creation	Status
Takara	320	19	9	7	0	2008	temporary (pluriannual)
Paunangisu	630	66	15	10	0	2007	permanent
Emua	280	32	9	2	0	2005	permanent
Siviri	110	35	12	9	2	2006	temporary (annual)
Tanolu	650	46	21	7	1	1998	permanent
						2002	permanent
Mangaliliu	260	15	23	6	3	1990s	temporary (annual)
Eratap	1350	200	20	50	3	1990s	permanent

Stock assessments of finfish on Efate reefs found that stocks of commercial food fish were low (Naviti and Hickey 2001), which was confirmed in 2004 when assessments again revealed very low stocks of reef food fish (Sykes 2004). Community-based marine resource management has placed a tabu on the taking of sea cucumber and turtles in North Efate (SPC 2008), and a significant green turtle and hawksbill nesting beach on northwest Moso Island is protected and monitored by the Vanuatai community network. However, the Fisheries Department has opened the sea cucumber fishery for three months in all areas. Although catch rates for coastal fisheries are difficult to determine at the scale of individual villages or localities, national figures for Vanuatu show that finfish make up 51% of the total annual catch, while nearshore pelagic fish make up 23%, and invertebrates 26% (Bell et al. 2011). These figures are likely to be representative of coastal fisheries catches in North Efate, and climate change projections are that the productivity of coastal fisheries will decline by -2 to -5% by 2030, which will have implications for community livelihoods and food security into the future. These projected productivity declines are even greater by 2100, at -10 to -35% (Bell et al. 2011), and will exacerbate the already overexploited status of coastal fisheries in Efate.

Community consultations throughout North Efate imply seriously degraded marine ecosystems and depleted fisheries driven by a suite of confounding factors, including extraction of clamshells from coral with crowbars, walking on the reef at low tide for harvesting of shellfish and sea cucumber, or fishing off the edge of the reef, lack of conservation areas in some communities, and non-compliance with conservation areas in others. In addition, siltation of the reef may be the result of land use change and land management issues, however this causal link has not been determined. There are also reports of solid waste dumping. The Participatory Rural Appraisal (PRA) undertaken for this project suggests that overharvesting of marine resources has resulted from the reliance on fish as a primary source of protein and income generation for the population, cultural celebrations and obligations, and insufficient awareness of Chiefs and communities regarding the importance of sustainable marine resource management.

Communities perceive that there is competition for existing resources. Poaching by ni-Vanuatu that do not belong to the community (this is likely driven by increased urban migration from the other provinces) was regularly highlighted. They were also concerned about foreign landholders who purportedly have larger boats and take a larger catch. There was particular concern among communities visited in November about whether sea cucumber licensing and harvesting is being adequately monitored and enforced, particularly after TC Pam.

To relieve pressure on coastal fisheries, FADs have been placed in areas around North Efate (one near Lelepa and one near Havannah Bay, and one off the northeast coast which was lost during TC Pam). Access is limited to individuals who have boats and fuel, making it difficult for the majority of the population to benefit from these FADs.

There were inquiries by communities about sand mining which would cause further degradation of the marine ecosystem but the extent of this practice is not known.

2.2.3 Terrestrial Resources

Almost every resident of North Efate is a small-scale agriculturalist, heavily relying on this sector for their livelihood (see Section 2.1. Socio-Economic Baseline). As such, communities have identified current agricultural challenges as a key environmental issue. The primary concerns include:

- Production losses due to ENSO-related drought conditions (and reduced livelihoods).
- Increased pests. The DEPC have also noted the impact of invasive species on Efate's forests and biodiversity. Flora such as *Cordia alliodora* (Ecuador laurel or salmwood), *Merremia peltata* (big lif rop) and *Mikania micrantha* (also called mile-a-minute weed) are penetrating forest areas, overgrowing and killing native plants and threatening the region's biodiversity (Bakeo and Qarani 2003). Noted by the field team in several areas was Singapore Daisy (*Sphagneticola trilobata* (*wedelia*)). The Indian mynah bird (*Acridotheres tristis*) is becoming a dominant species on many islands. The giant African snail (*Achatina fulica*) has also become a major agricultural and garden pest, but it also feeds on trees and leaves. It has been observed to feed on the bark of certain trees like *Dendrocnide latifolia* and tissues or shoots of young seedlings. It is also a vector (as are many snail species) of several human pathogens and parasites. It lays hundreds of eggs and multiplies at an alarming rate (Bakeo and Qarani 2003).
- Changing distribution and susceptibility of laplap (important for traditional foods) to a fungus recently identified by the Department of Agriculture.
- Deforestation due to a high demand for agricultural land (reported to result from growing populations) combined with traditional slash and burn agricultural methods (that require a change of plot every few years).
- Planting on sloped areas resulting in increased erosion and loss of topsoil. Respondents associate loss of topsoil with reduced agricultural production (and possibly increased incidence of pests) and correlated erosion with reported reef siltation.
- Shifting weather patterns were also of concern to participants. They have stressed that changes in yearly precipitation patterns make it difficult to determine planting times and have reduced yields of key crops. This has consequences for cultural activities (specifically the wedding season which depends on availability of yam (*Dioscorea* spp.) and pandanus (*Pandanaceae* spp.)). Examples given include:
 - Heavy rain in September damage flowers on mango trees resulting in a much smaller harvest (approximately November to March).
 - Heavy rains in the dry season results in reduced yields of manioc, taro, and banana (*Manihot esculenta*, *Colocasia esculenta* and *Musa* spp.).
 - Traditionally ni-Vanuatu have been able to determine planting times according to the flowering times of particular trees, however trees are now flowering out of season.
 - Unseasonal heavy rains can flood gardens and damage crops. Respondents propose that traditional planting methods are being lost because they no longer work with changing climatic conditions.
- Biodiversity loss - Vanuatu environment officers have expressed concern about the potential impacts on endemic flora and fauna in the future from climate change impacts, extreme weather events, poor solid waste management and invasive species. There are also several vulnerable

species and endangered species in the region (DEPC 2014) including all turtle species, Dugongs, Giant Clams, and a number of palm species to provide an example. Although there are regulations in place to protect some of these species, resources to enforce compliance are limited.

- Waste management is also a key environmental concern to the communities of North Efate. This was supported by the DEPC, where several staff nominated this as the priority environmental issue impacting Efate, and suggested that this was an area where community awareness and simple management techniques could show tangible benefits in a short period of time. It appears that the three most common ways to manage rubbish are to 'not' manage it, e.g. dropping or throwing it nearby, collecting waste and burning it (including leaf waste, paper waste, plastics and tyres), or burying solid waste (tins, bottles, plastics etc.) in open pits (approximately one by one metre) dug into the ground in and near villages. Some participants aired their concern about the pollution and health issues that result, including contamination of river and groundwater resources and the impact on marine ecosystems. These waste management issues may be due to the increased consumption of packaged products without a cultural antecedent, lack of local access to waste management services, and lack of community awareness about the importance of waste management.
- Coastal erosion, driven by large storm events, was also a concern to communities. Tanoliu has tried to address this issue by building a sea wall that has since been destroyed. A seawall is being built in Emua to prevent road damage as a result of future tropical cyclones.

While land sales are not directly an environmental issue, they appear to be a key driver in several matters of concern. Indigenous landholders perceive that after land sales, local communities have reduced control over their resource base, increased competition for fisheries, reduced ability of the community to manage marine resources, and that downstream resources are degraded by upstream land management. Downstream resource degradation is primarily attributed to cattle production in the upper watershed, associated deforestation, and the access of cattle to water sources including rivers. Participants believe that this may be resulting in the contamination of some fresh water supplies, reduced access by the communities to fresh water springs (increasingly important in times of drought, as are currently being experienced), and compromised marine ecosystems caused by changes in land use and the resulting increased runoff and erosion. Severe nutrification of at least one stream passing through a large scale cattle farm was observed by the field team.

Land sales or leases and land use (including land and marine use for conservation areas) are contentious and highly political. Issues of 'ownership' in a western land tenure sense do not align with customary land use practice (Jowitt 2004). Land ownership was traditionally managed through family lines and communal trusteeship. When it is requested that a boundary be placed around an area for sale, lease or use, significant disagreement can arise within communities around boundary locations and ownership. These disagreements can take many years to resolve. Land leases are valuable to families as a source of income generation. This income is usually used to improve the construction of homes. Interviewees stated that most houses made from brick or cinderblock were built using money from land sales. The DEPC notes that some of the community managed conservation areas have also been a source of dispute.

2.2.3.1 Efate Land Management Area

The upper watershed catchment of the RESCCUE site include land areas subject to the proposed Efate Land Management Area (ELMA). The idea for the ELMA originated with the Efate Vaturisu Council of Chiefs (Shefa Province Council of Chiefs), and its implementation is supported by both the National Government and Shefa Provincial Government.

The ELMA project seeks to protect and conserve the terrestrial and aquatic environments within the area indicated on Figure 3, whilst ensuring that local people are still able to use the area in a sustainable manner to support subsistence lifestyles and local economies. The ELMA is located in the centre of Efate, and is intended to cover approximately 20 percent of the island. It is proposed that the ELMA would act as a terrestrial and surface water conservation area/national park. This mountainous ELMA area is the source of six major rivers many of which supply water to villages.

It is intended that the ELMA would be a legislated protected zone under Vanuatu's Environment Protection and Conservation Act 2002 and managed by local volunteer Park Rangers and Provincial Area Secretaries.

The project intends that local communities would create sustainable social and economic opportunities such as eco-tourism operations within the ELMA, to improve livelihoods. In addition, the ELMA would allow for the creation of at least one scientific research station, to allow for further study of biodiversity in central Vanuatu. Management options for the park would be decided upon by local communities who would be involved in extensive consultation on the management plan and governance options.

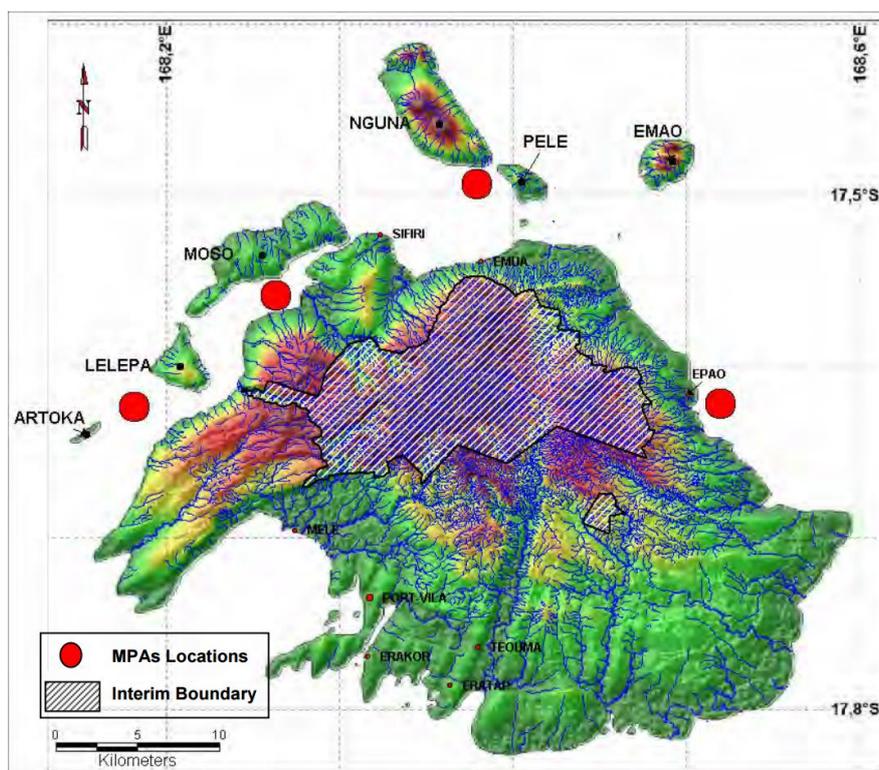


Figure 3: Map of Efate Island with MPAs and the Interim Boundaries of the ELMA Initiative (Herrenschmidt and Despinoy 2007).

2.2.4 Water Resources

Given the current drought as a result of El Nino conditions, water shortage is a primary concern among communities. Drought conditions are linked to decreased agricultural production, increased deforestation for the extraction of firewood for income generation, increased pressure on water resources for hand watering some food crops, wild animals damaging water systems in the search for water, and increased pressure on already depleted fisheries for food security. Drought conditions may also be encouraging the creation of agricultural plots in the riparian zones of rivers in some communities, contributing to erosion, siltation, and compromising the integrity and resilience of river ecosystems to future extreme weather events.

Water shortage in the region seems to primarily be a result of inadequate water infrastructure, management, storage, and distribution. The VRA found that most springs in the North Efate region were still supplying some water. While there is substantial water infrastructure in the region (tanks and pipes both for rainwater capture and distribution of water from fresh water springs), much of it has not been adequately managed or maintained and is not functioning at capacity. Some communities report experiencing days without water (Siviri and the offshore island of Moso) with some outer islands receiving deliveries of NGO supplied freshwater. Participants explained that projects that supply water systems tend to not sufficiently build local capacity to maintain water systems and there is often insufficient financial capital to repair problems. This may be compounded by water systems being overly “high-tech” for local capacity and resources. Most communities have water committees that could manage these systems if given the proper training and resources. A water levy system exists in some communities to provide the financial capital for repairs, but it seems that these funds are currently inadequate. Water committees’ members receive no compensation (no financial incentive) for their work while still needing to meet their daily needs through agriculture and other means.

Water pollution is an issue that appears to be caused by inadequate waste management, contamination of water resources by upstream human activities and cattle grazing. Many communities report that their water resources were contaminated during TC Pam. The causes of this were varied (NDMO 2015) but included wind and debris destroying infrastructure used to capture rainwater (i.e. roofs and gutters), damaged piped water systems (especially older and poorly constructed or maintained systems) and debris blocking spring water intakes. Power failure and mechanical damages caused failure of pumped water systems. In addition, assessments showed destruction of nearly all sanitation infrastructure, especially those made of bush materials, with little availability of materials for rebuilding. There was a substantial increase in open defecation, with the accompanying risk of contaminating water supplies. Many of these systems and structures are still awaiting repair.

Bacteriological water quality tests in April 2015 showed poor water quality in all sites tested outside of Port Vila, and demonstrated a need for water treatment prior to drinking (NDMO 2015). Less than half of households were reported to have access to some form of water treatment method. As of November 2015, some communities still report non-potable water.

2.3 Governance

2.3.1 Government and Policy

2.3.1.1 Government and Administrations

A full assessment of the Governance Vanuatu and North Efate are provided in Appendix 4. A summary as it relates to the RESCCUE project is provided below.

The lead Vanuatu government agency for the Vanuatu RESCCUE project is the Ministry of Foreign Affairs, International Cooperation and External Trade (MFA). During implementation, close engagement and collaboration with additional Ministries and Departments is envisaged including the MFA; the Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity; the Ministry of Climate Change, Meteorology, Geohazards, Energy and Environment; the Ministry of Lands and Natural Resources; and the Ministry of Health.

Within Vanuatu there are six provinces, and the RESCCUE project is located in the Shefa Province, which includes the islands of Efate and the Shepherd Islands. Each province is governed by a Provincial Council, consisting of two civil servants appointed under formal procedures (the Secretary-General and Accountant), and representatives appointed by the Minister of Internal Affairs. The provincial government has a range of functions, including licensing of businesses, physical planning, control of land use, provision of basic administrative services such as personal records and vehicle licensing, and the local implementation of national laws in areas such as agriculture and fisheries. It is important for the RESCCUE project to keep the Provincial Government office informed of activities being implemented within their jurisdiction. This communication both supports good relations, and reduces duplication of activities in villages where several organisations may be working in the same region.

Each province is itself divided into 'areas'. Within each area, there is an elected Area Council, chaired by a Chief and representatives of different local communities and groups. Area Councils typically cover a number of villages and play an advisory and consultative role. The Area Councils are linked to the Provincial Council via an Area Council Secretary who resides in one of the villages and reports to the Province's Secretary General. The Area Secretary provides a range of administrative services (business licensing, registration of births, deaths and marriages, assistant registration officer at election time). In addition, they are often called on as a link to the villages, to take messages out from national or provincial government to the individual villages, or to collect information from villages (e.g. on community needs, current population, needs assessments during emergencies etc.) (Cox et al 2007, p. 46). Engagement of the Area Secretaries for North-West Efate, North-East Efate and North Efate areas will be important to the implementation of the RESCCUE project.

In daily life, the limited resources available to Area Councils, Provincial Councils and national government offices for transport, communications, and staff resourcing have resulted in many rural communities having very little interaction with formal state institutions (Cox et al 2007, p.47). Customary and informal institutions at local level are seen as legitimate and far more relevant to people's lives with Chiefs being the main authority at community level (Cox et al 2007, p.47). Many communities have established village councils to provide a forum where representatives of different groups can meet to discuss and decide jointly on local matters. The Vanuatu RESCCUE community consultations established the need to host an information session or workshop for the Chiefs within the project area, to build knowledge of climate

change and the importance of coastal and land management, and to engage Chiefs' to build support of the RESCCUE activities.

Local committee structures, sometimes linked to church, women's or youth groups, have also long been a feature of village life (Cox et al, p. 47). The RESCCUE community consultations identified several villages which had existing water committees. Management of marine protected areas largely occurs under the approval of the Chief. In North Efate, several inter-village committees have also developed, including the Tasivanua Environmental Network which has volunteers in villages across North Efate to raise awareness and lead activities for marine conservation. At the executive meeting of the Tasivanua Environment Network in July 2015 it was determined that the network should also include land issues. Discussions with Vanuatu Government staff and community members have indicated that supporting the existing local community committees and networks with capacity building in management skills, planning skills, monitoring and technical skills would be one effective channel to support community based management of coastal resources.

The churches also play a key role in community governance (Cox et al 2007, p.47). In the past four years the churches have also been taking a prominent role in assisting communities with disaster preparedness, climate change adaption, and disaster recovery. This has been through implementation of several donor-funded programmes including the Vanuatu Community Resilience Project (2012 – 2015), the Disaster Risk Resilience Programme (2014-17), Pacific Community-focused Integrated Disaster Risk Reduction programme (PCIDRR, 2012–14), the Pacific Community Climate Change Risk Reduction programme (PCCRR 2012-14), *Joj blong yumi I help long taem blong disasta* programme (2012-14), and *Kaikai blong laef* (food security) (2012-14) (VCC 2015). The churches are therefore an additional resource that the RESCCUE programme can link with, either in individual villages or through their joint body, the Vanuatu Christian Council.

2.3.1.2 Key Instruments

Direct responsibility for agriculture, fisheries and aquaculture lies with the Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity (MALFFB) that manages fisheries and aquaculture resources using gear or equipment restrictions, prohibitions, exportation approvals and authorizations. The Vanuatu Fisheries Act (2005) is enforced by the VFD, and includes regulations on size limits for shellfish and crustaceans, no-take of gravid crustaceans (those with eggs), harvest and export quotas for some fisheries products and in some cases requirements for licences and permits. National law also prohibits the export of wild (i.e. not cultured) giant clams from the island of Efate and its offshore islands. In addition in 2010 the Department developed a National Integrated Coastal Management Framework for Vanuatu, though it is not confirmed how far implementation has progressed.

Environmental management is implemented by the DEPC². The Department's work is governed by the Environmental Management and Conservation Act No. 12 of 2002. Underneath this act there are a number of regulations, policies and plans, including regulations on bioprospecting and community conservation areas. The Department also works to enact commitments under International Conventions, including the Convention on International Trade in Endangered Species of Wild Flora and Fauna and the International Plant Protection Convention. The main focus of the Department is environmental impact assessments,

² It should be noted that although the Ministry of Climate Change has 'Environment' in its title, the Department of Environmental Protection and Conservation is currently sitting within the Ministry of Lands and Natural Resources.

waste and pollution control (compliance), ozone layer protection, and biodiversity and conservation (research, protection, and management of invasive species) (Mullins 2015). DEPC staff have also supported development and registration of three new community conservation areas in 2015 (Mullins 2015).

The Department of Geology, Mines and Water Resources under the Ministry of Lands and Natural Resources is responsible for monitoring coastal water quality to ensure the environmental protection of Vanuatu (Government of the Republic of Vanuatu 2013, p. 14). They are also responsible for managing, protecting and conserving water supply for drinking, washing and sanitation (MoL 2014). This includes the management of water quantity (during droughts and flooding) and management of water quality, which encompasses issues of natural contamination, pollution from human activities, and testing for waterborne diseases. The Department works in four main areas of activity: water supply safety and quality; monitoring water levels; public awareness; and monitoring hazard areas (e.g. for flooding) (MoL 2014). The Department's activities are governed by the Water Resources Management Act 2002 [Cap 281].

2.3.1.3 Protected Areas

Vanuatu has developed its own Protected Area Management System and there are a number of options for recognising Protected Areas including:

- Conservation areas under the Forestry Act 2001;
- Marine reserves under the Fisheries Act 2005;
- Protected sites under the Protection of Sites and Artefacts Act;
- Community conservation areas under the Environmental Management and Conservation Act 2002;
- National parks and nature reserves under the National Parks Act 1993; and
- Provincial Councils are also empowered to create environmental protection zones under the Decentralisation and Local Government Regions Act 1994.

However, these options tend to be under-utilised. In general the current protected areas are not necessarily fully 'protected' but managed by communities or leaders in such a way as to conserve the present ecosystem (Government of the Republic of Vanuatu 2013, pp 13-14). From the consultations with stakeholders it also appears that there is a lack of understanding in communities regarding the best use of this range of options and which agency to go to when developing a conservation area (Mullins 2015).

There is also uncertainty within communities about whether registration of conservation areas will result in loss of community control over those areas, and communities may feel hesitant to aligning with formal systems of conservation and regulation (Tiwok 2015). Although recently the VFD has assisted several communities to develop management plans, the RESCCUE team was unable to gain confirmation of how many conservation plans in the North Efate area have been finalised and registered to date. Only one community management plan (for Lelema community) has been mapped online. Further efforts will be made to obtain this information. The Community Conservation Area process also requires communities to develop a management plan. While many communities retain traditional resource management, they tend not to have the expertise to complete these plans, and therefore need to wait on government or external assistance to commence this work (Tiwok 2015). During initial consultations by the RESCCUE team, DEPC

noted that initial training had been provided to the Tasivanua network members on how to develop community conservation area management plans, but that further training was needed to bring the standard of plans up to a level where they were appropriate for registration. The Department indicated that if a formal request was made to the Director by RESCCUE Vanuatu, Department staff may be able to collaborate in further training for Tasivanua in 2016, depending on their existing programme commitments.

2.3.1.4 Commitment to Environmental Protection, Biodiversity Conservation, and Adaptation to Climate Change

The Government of Vanuatu is highly committed to adapting to climate change. The government was the first government in the Pacific Region to have established institutional arrangements for joint governance of climate change and disaster risk reduction. In 2013, the government opened a new Ministry, the Ministry for Climate Change Adaptation, Meteorology, Geo-Hazards, Environment, Energy and Disaster Management. The Government of Vanuatu is currently preparing a 15-year National Sustainable Development Plan (NSDP) for endorsement. The NSDP will guide the economic, environmental and social development of the country. As in the two previous country strategic plans the new NSDP identifies climate change and disaster risk reduction as key priorities for government. VMGD is currently hosting staff for three separate donor-funded CCA projects, and is investigating providing further support (a dedicated Secretariat team) for the National Advisory Board on Climate Change and Disaster Risk Reduction.

Vanuatu has introduced several legislative mechanisms to register and conserve protected areas: conservation areas under the Forestry Act 2001; marine reserves under the Fisheries Act 2005; protected sites under the Protection of Sites and Artefacts Act; community conservation areas under the Environmental Management and Conservation Act 2002, and national parks and nature reserves under the National Parks Act 1993. The Provincial Councils are also empowered to create environmental protection zones under the Decentralisation and Local Government Regions Act 1994. However, these options tend to be under-used (for example, there are no formalised national parks), and in practise protected areas are not necessarily fully 'protected' but managed by communities or leaders in such a way as to conserve the present ecosystem (Government of the Republic of Vanuatu 2013, pp 13-14). This may be due to a limited government capacity to centrally implement or enforce management across the archipelago, as is also the case in other Pacific island countries. Additionally, most Government Departments operate with a small staff. For example, the DEPC has a permanent staff of 10, and in August 2015 was operating at 50% capacity due to unfilled positions and staff absences on extended study leave. Their capacity to monitor and enforce environmental regulations is therefore stretched.

Bureaucratic and procedural processes operating at national scales do not fully cede responsibility to communities. Ultimately community-based resource governance, alongside national-level advice and coordination, is Vanuatu's defacto coastal resource management policy position (Bartlett, Maltal, Petro, and Valentine 2010).

2.3.2 Communities and Public Participation

2.3.2.1 Community Based Management

Traditionally, governance in Vanuatu has been at the village level where issues are discussed and decided by the entire community. This community-based decision making structure is guided by the Chief, who is the primary and ultimate authority within the community, followed by the Village Council. Actions are then

carried out by a variety of committees (such as Community Disaster Committee, Environment Committee, and Water Committee) as shown in Figure 4.

Communities repeatedly emphasized to the RESCCUE team that successful resource management depends heavily on the Chief understanding and engaging with the issues at hand, setting priorities for long-term needs over short-term gains. This correlates to the RESCCUE PRA data which suggests that communities with strong traditional leadership are better able to manage their local resource bases. As a result, successful RESCCUE projects depend on the project's ability to work within and fortify this existing governance structure as outlined below.

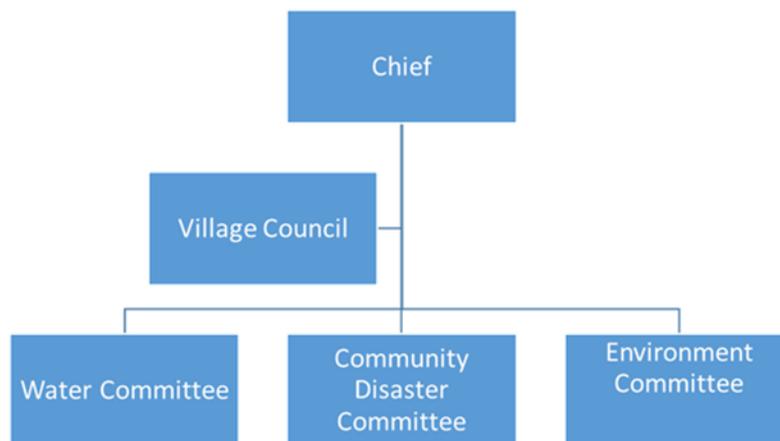


Figure 4. Community Governance Structure

In North Efate, the terms tabu (traditional conservation area), community conservation area, and marine protected area (MPA) are used interchangeably. According to collected data, there are currently no community conservation areas in North Efate that are registered with the DEPC. There are, however, established tabu areas in Mangaliuliu, Lelepa, Tanoliu (2), Siviri, Takara (opened to fishing since TC Pam and about to be closed again by the community), Epau, Tasiriki, Sunae, and Emao. Marou, Mangarongo, Wiana, Lausake, Ngurua Villages had conservation areas that were opened after TC Pam, with their current status unknown. Epau is scheduled to meet in December 2015 with surrounding villages to discuss the creation of a new and shared tabu area.

Restrictions on fishing within conservation areas are not-necessarily well established, understood, or followed and there are concerns about non-community members poaching in conservation areas. As well as the opening of conservation areas to fishing after TC Pam, they are often also opened for community celebrations. The Fisheries Department has also temporarily lifted the ban on the harvesting of certain marine resources including sea cucumber and turtles. The sea cucumber fishery is currently open for a three-month period. Some communities commented that this temporary opening has substantially reduced fish and other stocks.

Conservation areas appear to be most effective when they are closer to village areas. However, some communities are reticent to establish conservation areas as they fear they will have to register caught fish sizes and that they will get in trouble. There are few community level fishing regulations outside of tabu areas. Workshop participants expressed the need for increased awareness about the importance of marine

resource management and local capacity to monitor and manage local resources. There is little local knowledge of Fisheries regulations in most communities.

2.3.2.2 Existing Capacity Regarding CCA and ICM

Despite the SPC GIZ CCCPIR climate change adaptation work that has been conducted in Nguna and Pele, the mainland communities of North Efate report and demonstrate very little knowledge about climate change causes or adaptation strategies. There are several individuals in the region who demonstrate leadership and significant knowledge about certain techniques that contribute to ICM and solving environmental issues. There is also a strong demand for increased capacity for marine resource management and improved agricultural techniques. Those communities that appear to demonstrate strong traditional leadership seem to have more effective resource management and participate in activities that contribute to increased resilience to climate change impacts (such as abstaining from harvesting sea cucumber and building traditional cyclone proof homes). The youth tend to be better informed about general climate change causes and impacts through schools. Given TC Pam, the 2015 El Nino, and the observed changes in precipitation, seasons, and agriculture, communities generally expressed strong interest in understanding climate change and how they can adapt. Communities repeatedly called for increased awareness about climate change for adults and specifically the Chiefs as the primary decision makers in the communities.

The RESCCUE PRA suggests that the commitment to environmental protection, biodiversity conservation, and adaptation to climate change within local communities of North Efate depends on:

1. The Chief understanding and publically engaging with these issues;
2. Increasing the awareness of all community members about the importance of these issues and the relevance to the well-being of their families;
3. Increased local capacity to monitor and manage their resources;
4. The creation of sustainable livelihoods and protein sources that offer an alternative to fishing; and
5. Addressing the issue that committee members and Tasivanua monitors have too many commitments and do not receive financial compensation for the work they do.

2.3.2.3 Community-Based Coordination Groups

The Tasivanua Environment Network has representatives in each community in North Efate. All Tasivanua members also belong to the national-level organization Vanuatai which is funded through and created by Wan Smol Bag. Tasivanua members do not receive any financial compensation or support.

Each community has several local management committees. Members of other community-based coordination groups, for example Tasivanua, are usually members of these committees. Generally Committees are led by a Chairman and a Secretary. The community of Epau have recently applied a new model to their committee in which they have put a "role model" or "champion" in charge of each committee. They report that this technique has been very successful as these leaders have a personal interest in motivating the community to act. These leaders are highly respected. People interviewed as part of the RESCCUE engagement also expressed that committees tend to be active if they are supplied with the capacity and tools that they require, indicating the need for further capacity building.

2.3.2.4 Public Participation in and Openness of Key Decision-Making Processes

Decision-making throughout North Efate is inherently a community-based activity. Villages usually have a monthly meeting to decide all issues that concern the community at the time. Participation in these meetings is not compulsory, but any decisions made at the meetings must be adhered to by all community members, regardless of attendance. Both women and men attend meetings, however men tend to be more vocal in the decision-making process. According to interviewees, people are very respectful of the Chief but also say that the “Chief is the head but we make the Chief.” On occasions in which it is difficult for the community to reach consensus, the Chief may make the final decision.

2.3.3 Stakeholder Analysis

The Communications Plan identified six main groups of local and national stakeholders in Vanuatu:

- Local communities;
- Vanuatu Government;
- Traditional government and civil society organisations;
- Parallel projects, NGOs and INGOs, and donors (other than AfD, SPC and FFEM);
- Private sector; and
- General public.

Regionally and internationally, the key stakeholders for RESCCUE Vanuatu are:

- SPC (Pacific Community);
- French Development Agency (AFD); and
- French Global Environment Facility (FFEM).

SPC will lead on engaging with other regional and international stakeholders on behalf of the RESCCUE programme as a whole.

The key actors in ICM and climate change adaptation (CCA) in North Efate are: the National Advisory Board on Climate Change and Disaster Risk Reduction (NAB), international NGOs (INGOs), and the SPC-GIZ CCCPIR programme that has been operating in Vanuatu since 2009.

The NAB was formulated in 2012. This board was set up within the Vanuatu Meteorological and Geohazards Department (VMGD), with the chair jointly shared between the VMGD and the NDMO. The Board is composed of the Director-Generals of the line Ministries linked to CCA and disaster risk reduction (DRR) and representatives of key non-government actors. The NAB develops and endorses all national policies, strategies and positions on DRR and CCA including all programmes, projects and initiatives to be conducted in the country. Given its position, the NAB is a critical focal point to collect and disseminate disaster and climate change information, and to support coordination.

In late 2015, one of the co-chairs and long-time champions of the NAB, Mr Jotham Napat, resigned from his position as Director-General of the Ministry of Climate Change to pursue a career in politics. This may impact the momentum and unity of the NAB in the short-term.

The Vanuatu RESCCUE programme has already engaged with the NAB and sought its endorsement and will continue to engage with the NAB and its network to share information and to keep the Government of Vanuatu informed of key activities within their jurisdiction.

The INGOs have been very active in developing and implementing joint and sole CCA and DRR programmes. Following TC Pam, the INGOs have also led many of the disaster recovery initiatives. Because Vanuatu is a small country with a population of around 258,000 people, it has been important for the active organisations to communicate with each other and the Government of Vanuatu, to avoid duplicating activities or overwhelming communities with too much project activity in one location. The INGOs have therefore formed a very collaborative and open relationship between themselves to better work with communities. In 2012, Oxfam led a consortium of INGOs to implement a collaborative national Climate Change Adaptation programme, involving Oxfam, CARE International, Vanuatu Red Cross Society, GIZ, Save the Children (Australia) and Vanuatu Rural Development and Training Centre Association (VRDTCA) planned and actioned a series of activities, each utilising the organisations' core strengths. Oxfam also led the creation of the Vanuatu Climate Action Network, an information-sharing network where NGOs involved in climate change work came together regularly to share information on activities, discuss issues, develop joint policy positions, and provide a united NGO perspective on government policy.

The INGOs have established links with Government through the NAB, and an INGO representative and a local NGO representative attend NAB meetings. The INGOs have also improved communications and collaboration with Government through establishment of the Vanuatu Humanitarian Team, which follows the UN Cluster system to pair INGO and government partners to prepare for humanitarian response. While people in Vanuatu climate networks have welcomed the central role of agencies like Oxfam and GIZ, there is also an awareness of their (potentially disproportionate) influence because they are at the hub of a range of activities. Despite this, nearly every interviewee noted that INGO staff were playing a dynamic and positive role (Maclellan 2015, p.35). See Appendix 6 for a full list of INGOs, NGOs and donor projects recently implemented in North Efate.

The RESCCUE Vanuatu programme should engage with this network to share information, but should not at this stage need to have resource-intensive engagement (e.g. collaborative project activities).

The SPC-GIZ Coping with Climate Change in the Pacific Island Region programme (CCCPIR) has been very active in several sites around the country. The programme has developed a range of resources for use. The programme's office sits within the Ministry of Climate Change building (NDMO building), and the Country Director of the programme, Dr Chris Bartlett, has established good working relationships with the Director-General of the Ministry of Climate Change, Mr Jotham Napat, and with the senior management and staff of many implementing Departments in Vanuatu such as the Department of Education (climate change science included in the new curriculum), Ministry of Agriculture and Rural Development (identifying and trialling climate resilient crops and livestock), and the Vanuatu Meteorological and Geohazards Department (mapping traditional knowledge of climate and adaptation techniques, raising community awareness on climate change). Dr Bartlett has also worked closely with the INGOs and local NGOs, and with government in developing CC and DRR policy. It will be important for the RESCCUE Vanuatu programme to engage closely with the CCCPIR programme. Given that the two projects both receive funding from SPC and are working in the same region (CCCPIR has done a lot of work on Nguna-Pele), there are likely opportunities for collaboration and sharing of resources.

In addition to these three main actors, the primary focus for stakeholder engagement will be SPC, the 3 pilot site villages, the Ministry of Foreign Affairs, traditional governance and civil society organisations (focusing on chiefs and the Tasivanua environmental network), and partner government departments such as Department of Fisheries, Department of Environmental Protection and Conservation, Department of Geology, Mines and Water, the National Advisory Board of CC and DRR, and Shefa Provincial Government. These agencies are all high power / high interest stakeholders. Engagement with these organisations will be largely verbal and participatory, aiming to build strong relationships that will support implementation of RESCCUE activities.

Currently there is some interaction between these groups, but those most directly engaged with ICM and ACC (the local communities, chiefs, Tasivanua, and resource-focused government departments) would benefit from efforts to strengthen the information-sharing networks between them. Community consultations indicated that chiefs need further information on the nature and value of ecosystems services and adaptation to climate change before their full support (and therefore the support of communities) can be gained. Tasivanua reports that their relationship with government is fairly minimal, although they feel that they could be a useful resource in disseminating information. Local communities are currently not sharing much information with each other on resilience and ICM techniques. Government agencies have limited resources, and so have felt restricted in the amount of engagement and awareness they have been able to undertake locally, especially around legislation and regulations governing use and protection of natural resources. All parties indicate their willingness to engage more with each other, if they had the resources and access to do so.

2.4 Vulnerability Reduction Assessment

The Vulnerability Reduction Assessment (VRA) aims to contribute to the overall understanding of conditions and circumstances at the North Efate site and provide a quantitative description of how communities perceive conditions at the site. The VRA is based on a composite of four indicator questions, tailored to cover locally-relevant issues that are at the heart of understanding the level of community vulnerability. Questions are posed during a series of community level meetings over the life of the project. Responses to the questions take the form of a numerical score provided by the respondents during the community meetings. The full results of the VRA are contained in Appendix 5. The following is a summary of the VRA findings.

2.4.1 Findings

Question 1: What are the top three environmental and land/marine resource management issues for each community? How serious is each issue?

The primary concerns (of approximately equal importance) in the communities in North Efate were consistent:

- Water Resources - specifically contamination, infrastructure, and quantity.

Water Resources were considered to be a serious issue because water infrastructure is inadequate. Additionally supplies are affected by drought and contamination of the upper watershed with communities dependent on these local water resources for all domestic uses.

- Land Management - specifically insufficient agricultural production, deforestation, inadequate upper watershed management, and land sales.

Land Management was considered a serious issue due to a reduction in agricultural production (both household consumption and income generation) and deforestation and erosion from cattle farming and the collection of firewood and charcoal. Inadequate waste management has resulted in pollution of land, air, and water.

- Marine Management - specifically marine resource and fisheries management, land impacts on marine resources, and competition for resources and access.

Marine Management was considered a serious issue because fish and invertebrates are the primary protein source for the local population and there is concern about future fish stocks and inadequate marine resource management and poaching. However, some people in the north-east region, did not consider marine management a serious issue because “there are still lots of fish and people from the village keep fishing” and because there are other protein sources including chicken, pigs, and cows.

Question 2: For each priority, if the issue were twice as bad because of climate change, how serious would it be?

VRA results demonstrate that the North Efate communities consider that their priority issues will be more serious given the projected impacts of climate on the existing resource base.

- Water Resources – the potential impacts of climate change on water resources was considered serious because of the necessity of water for life and that there is a lack of proper water management in North Efate including sustainable water use.
- Land Management - the potential impacts of climate change on land management were considered serious because trees provide important ecosystem services and their removal is affecting services such as the retention of heavily soils.
- Marine Management - the potential impacts of climate change on marine resources and management were considered serious since fish are an important food source and there is a lack of coordinated management in place. Reef health will also be affected.

Question 3: How difficult is it to solve these issues?

Participants perceived these issues to be between ‘difficult’ and ‘somewhat difficult’ to address.

- Water Resource - The primary barriers identified to addressing the Water Resource issue were:
 - Limited financial capital to purchase and maintain infrastructure.
 - Lack of technical expertise to address issues.
 - Insufficient time to address issues (related to lack of incentive).
 - Difficulty in having discussions with cattle farmers.

- Need for more advice and expert knowledge.
- Land Management - Primary barriers to addressing Land Management issues were:
 - Loss of influence over management of land and resources once land sold.
 - Lack of awareness about the importance of trees and management practices such as slash and burn.
 - Need for more awareness of improved agricultural practices.
 - Limited waste management processes or facilities in place.
 - Greater community awareness prior to programmes.
- Marine Management - barriers include:
 - Difficulty in monitoring traditional tabu area in the north-west because of its large size.
 - Poor management rules and enforcement.
 - Fish is the main source of protein thus it will require substantial awareness building to improve the management.
 - Lack of awareness and lack of traditional tabu areas.

Question 4: How willing do you think the community would be to work to solve these issues?

The VRA indicates that communities of North Efate are “somewhat willing” to work to address their priority issues. Barriers to willingness are:

- Not understanding the importance of the issues (including climate change).
- Not knowing alternatives to current practices.
- Chief not engaged in process of resource management.
- Poaching within the MPA is by the monitor so a change in the monitor is required.
- Too many commitments and no financial compensation; fear that if marine resources were protected then they have no other sustainable livelihood; lack of willingness to implement changes.

Community willingness is likely because:

- People have started to see how important the issues are after the impacts from TC Pam and El Nino.
- Water is a basic need so the community would engage, especially if the Chief is willing to also engage in these activities.
- When there is a problem, the people get motivated.

- People want to help their families and it is for the good of the community.

2.4.2 VRA Score

The VRA is designed to measure the changing vulnerabilities of communities, and determine if a given project is successful or unsuccessful in reducing climate change risks and other related pressures.

The VRA is measured in a series of meetings with local community stakeholders. In these meetings, locally-tailored questions based on the set VRA indicators are asked. The community then assigns a numerical score from a 1 (very bad) to 5 (very good) in response to each question. These responses are aggregated to provide the VRA score.

However, a single VRA score is not very meaningful. It becomes meaningful when it is measured at the pre- and post-project stages. The key quantitative output of the VRA is the degree of change from the baseline score between the pre-project baseline, and at project conclusion.

The initial VRA indicators scores, based on the indicators outlined above are:

VRA Questions	North West 2015	North 2015	North East 2015
1. How serious are the water resources, land management and marine management issues as discussed above?	1.3	1.3	2.1
2. For each priority, if the issue were twice as bad because of climate change, how serious would it be?	1	1	1.1
3. How difficult is it to solve these issues?	2.5	2.6	2.75
4. How willing do you think the community would be to work to solve these issues?	3	3	3

2.5 Brief History of Interventions

There has been a large number of interventions that are either completed or still being implemented in Vanuatu. Those that are relevant to the RESCCUE project in North Efate are outlined below.

Where possible, the RESCCUE will build on work previously undertaken by such interventions. The overarching perspective of the community members engaged with by the RESCCUE team was that the majority of projects have offered them little sustainability development to the communities and unintentionally foster a dependence on future aid projects instead of building self-reliance, capacity building, and local empowerment. Interviewed community members indicated that most NGO-driven development projects tend to:

1. Present inadequate tools;
2. Be ill-prepared;
3. Offer initiatives that are not applicable to the village context;

4. Offer technology that is not appropriate for the local context or cannot be managed under existing capacities;
5. Fail to build sufficient awareness within the entire community; and
6. Insufficiently build the awareness of the Chief (the importance of this was emphasised repeatedly by visited communities).

Participants offered several examples of how programmes could be improved. The primary request of all communities was increased awareness and capacity building so the communities can improve their ability to independently manage their resources and infrastructure. Communities highlighted the need for awareness building with the Chiefs (given their role as the primary decision maker), capacity building of the existing community committees who manage resources and guide community activities, and increased whole-community awareness (to increase community cohesion and involvement in management decisions). In addition, the results of the engagement with the communities indicate that results could potentially be improved through:

1. The Government taking a primary role in awareness and capacity building in communities instead of NGOs. If the appropriate Government Ministries do not have the capacity to take this lead, interviewees strongly recommended that Ministry officials accompany NGOs;
2. Projects should be designed for longevity, community participation, and be relevant to the community needs;
3. Workshops should present material in a variety of ways that are a combination of hands-on, participatory, visual, and experiential;
4. Ongoing training should be given to the entire village;
5. Capacity building for youth and women should be conducted separately from the men;
6. 'Train the trainer' methodology be used in which experts train and assist local facilitators;
7. Projects should build on and utilise existing community structures; and
8. Community knowledge should be 'fact checked' at the conclusion of the activity to ensure information has not been misinterpreted.

2.5.1 Economic Analysis

Economic analysis as a component of interventions in Vanuatu and North Efate have been somewhat limited. One such analysis was undertaken as part of the Coral Reef Initiatives for the Pacific (CRISP) Programme coordinated by SPC and SPREP. The CRISP project undertook a cost-benefit analysis (CBA) and Return on Investment (RoI) assessment of community-based marine protected areas in Vanuatu. This was based on five MPA case studies in North Efate and was completed in 2011. This study sought to provide an analysis of the impacts of MPAs on economic growth, poverty reduction and on biodiversity. The location of the MPAs were:

- Emua - North Efate;
- Piliura, Laonamoa and Worasifu – Pele Island; and
- Unakap – Nguna Island.

This study found that investments in the five MPAs ranged from €5,000 to €19,000 per MPA for the initial setup phase and €900 to €4,000 per MPA every year for operational costs (Pascal, 2011). The investments were mainly spent on capacity building in the villages which accounted for 70% of the operational costs.

The study concluded (Pascal, 2011):

- MPAs managed by communities made an average gross profit mainly as a result of tourism and fisheries.
- MPAs provided important sources of local cash income and proteins for the villages.
- MPAs have had positive impacts by providing other ecosystem service such as coastal protection.
- On average 70% of the benefits from the MPAs have been directed to villages. The other 30% went to national stakeholders (mainly through tourism activities). The main beneficiaries inside villages are fishermen and tourism business owners.
- Overall there was recorded an increase in fisheries productivity, with both subsistence and commercial fishery benefitting from MPAs.
- Benefits on tourism are present for the niche of rural tourism (through guest house and day tours family own-businesses).
- The case studies showed that not all the investments in MPAs were recuperated after the first 5 years. Villages with low fishing effort and no tourism potential have a low RoI.
- The cost-benefit ratio is likely to be positive at a village level even when benefits are low (i.e. commercial fishery or tourism sector in a start-up phase).
- However, no observations have been found to demonstrate that MPAs have influence on the level of maximum sustainable yield for fishery or for the maximum carrying capacity for tourism. Therefore the hypothesis that MPA can ensure sustainable benefits (from fishery and tourism) at intergenerational scale remains uncertain.

This study also found that, at a national level, the financing of many MPAs at a village scale can present a challenge due to potentially high transaction costs and difficulty of controlling funding. A network approach has the potential to reduce these costs. The author stated that providing funds through local NGOs is one option but has additional costs, and that the setup of small trust funds with a direct refunding to each village committees seems also a valuable option that needs to be precisely analysed (Pascal 2011).

Regarding the setup of trusts, it was announced in 2015 that the Government of Vanuatu is setting up a trust fund for its environment and climate change initiatives³. The trust fund is to be administered by DEPC and is part of the government's supporting the Coral Triangle Initiative (CTI). It is proposed that the local tourism sector would be initial fund source for the trust.

A trust fund for climate change will also be handled by the DEPC. The fund will seek to provide sustainable financing for Vanuatu's responses to climate change impacts. Like the environment trust fund, the climate

³ <http://www.ctknetwork.org/catch-of-the-week/vanuatu-sets-up-environment-climate-change-trust-fund/>

change trust fund is also expected to function as a reliable funding source to complement government budgets.

More information regarding these trust funds and how they may relate to the RESCCUE objectives will be obtained as it becomes available.

2.5.2 SPC/GIZ Coping with Climate Change in the Pacific Island Region

The most significant intervention for the RESCCUE project is the SPC/GIZ, Coping with Climate Change in the Pacific Island Region (CCCPIR) programme. The objective of this programme was to increase the capacities of regional organisations in the Pacific Island region including Vanuatu to adapt to climate change. In Vanuatu, the CCCPIR programme has actively been engaged in:

- The integration of climate change considerations into the forest policy development process in Vanuatu
- Integration of climate change considerations into Vanuatu legislation, e.g. Environmental Management and Conservation Act
- Establishment of pilot sites in Vanuatu to determine appropriate land use planning approaches and technologies to strengthen capacities of local communities, using gender-sensitive approaches, to adapt to climate change

North Efate was a CCCPIR Pilot Site, specifically Pele Island where interventions included:

- Livestock husbandry improvement.
- Coastal and catchment erosion.
- Invasive species control.
- Water protection and soil fertility.
- Food preservation and disaster risk reduction.
- Honey bee husbandry for income and food security.
- Fish Aggregating Devices (FADs) for food security.

In August 2015 the CCCPIR facilitated a 'train the trainer' event run by the Nguna-Pele Marine and Land Protected Area Network and SPC-GIZ. This provided training on Climate Change Adaptation Planning and Implementation at the Local Level through peer-to-peer expert exchange on the most effective and relevant climate adaptation and natural resource management opportunities for communities throughout Vanuatu. This included representatives from communities in North Efate and Tasivanua and was well received by those involved.

2.5.3 Other Interventions

Other interventions that the RESCCUE project will build on where appropriate include:

Name	Key Activities
<p>Marine and Coastal Biodiversity Management in Pacific Island Countries and Atolls</p>	<p>This GIZ led project sought to increase the sustainable management of marine and coastal biodiversity in Vanuatu (and other Pacific island states) through ecosystem audits, marine spatial planning and advice on protected areas.</p> <p>Activities undertaken included promoting the consideration of economic value of marine and coastal ecosystem services in national development planning, development of an EEZ-wide spatial planning framework aligning national marine and coastal protected area systems with the requirements of ecosystem conservation, allowing further expansion of these systems. It also identified best practices for the management of marine protected areas, including payments for environmental services.</p>
<p>The Coral Reef Initiative for the South Pacific (CRISP)</p>	<p>Beginning in 2002 and coordinated by SPC and SPREP, the CRISP project consist of some 50 projects in 17 Pacific Island countries, with the aim of developing a vision for the future of the region’s coral ecosystems and the communities that depend on them, and introducing strategies and projects to conserve their biodiversity, while developing the economic and environmental services they provide, both locally and globally.</p> <p>In Vanuatu, the CRISP provided a major contribution towards the setting up and strengthening of marine protected areas (MPAs) as a means of coral ecosystem conservation and sustainable management tool. CRISP also provides direct support to setting up MPAs in Vanuatu. The CRISP also setting up a governance process to integrate coastal management that combines watershed and marine areas, which are being pursued on Efate Island, Vanuatu.</p> <p>The CRISP coordination unit at SPC looked at a wide variety of studies in Vanuatu (and the Solomon Islands) designed to demonstrate the economic effectiveness of managed marine areas.</p>
<p>Natural Solutions to Climate Change in Pacific Islands Region: Implementing Ecosystem-Based Adaptation</p>	<p>This intervention seeks to integrate natural adaptation solutions into development, climate change adaptation and natural resource management policy and planning processes, led by SPREP in collaboration with the SPC-GIZ Coping with Climate Change in the Pacific Island Region Programme (CCCPIR). This 5 year programme commenced in mid-2014 and will focus its efforts on Port Vila and Efate surrounding areas plus an island within the TAFEA Province. Its activities may be similar to some RESCCUE initiatives, and lessons could be shared.</p>
<p>Pacific Adaptation to Climate Change Project (PACC)</p>	<p>Implementing by SPREP, the PACC is focused on coastal zone management and has been developed to assist with the implementation of adaptation measures in 11 countries of the region. Vanuatu, as one of the participant countries, will participate in the PACC implement adaptation measures to enhance its resilience to the adverse impacts of climate change in the longer term. The principal objective of the PACC is to facilitate the implementation</p>

Name	Key Activities
	of long-term adaptation measures to increase the resilience of a number of key development sectors to the adverse impacts of climate change.
Coral Triangle Project	The ADB-funded Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI) was launched in 2007. It provides a framework to address the growing threats to the coral triangle region, establishes important overarching commitments for strengthening policies and institutions, and sets goals and targets for the designation and management of priority seascapes, through the application of an “ecosystem approach” to the management of fisheries and marine resources and the establishment of networks of marine protected areas. It also seeks to introduce measures to strengthen adaptation to climate change, and protection of threatened marine species.
Ridge-to-Reef (R2R)	GEF-funded, this project is an on-going project. It partners with local communities and regional groups to build social and environmental resilience from the ridge to reef. The project is a response to climate change and the intensifying loss of biological and cultural diversity. It provides professional and hands-on skill sets including assessments, training, transportation, and a mobile working platform aboard Research Vessel Llyr to link people, materials, and ideas between distant communities.
Increasing Resilience to Climate Change and Natural Hazards in Vanuatu	The objective of the Project is to help increase the resilience of communities in Vanuatu to the impacts of climate variability and change and natural hazards on food and water security as well as livelihoods. There are four components to the project. The first is institutional strengthening for climate change adaptation and disaster risk management. The second component is increasing community resilience on active volcanic islands and in coastal areas. The third component is promotion of improved technologies for food crop production and resilience to climate change. The fourth component is rural water security. This component supports the recipient to increase access to secure water supply.
Vanuatu Climate Change Adaptation Project	The Implementation of the Government of Vanuatu’s National Adaptation Project (NAP) consists of four components: improved agricultural resilience; rural water supply; strengthening adaptive capacity in coastal areas; and project management. The approach is to build on successful pilots and programmes already trialled by government and other agencies. The project balances investment with training and technical assistance, and provides important support to operating and maintenance costs. It emphasises community involvement and participation by the provincial authorities in Vanuatu. Overall, the focus of the project is to build resilience of rural communities to climate change and extreme weather events.

2.6 Logframe Indicators

The full site specific logical framework (logframe) is contained in Appendix 7. The logframe aims to provide a concrete measure of the operations undertaken as part of the RESCCUE project, and identify the RESCCUE projects contribution to CCA. The indicators for the Vanuatu RESCCUE project will then feed into the regional RESCCUE indicators.

Initial indicators and measures have been set out in the logframe. These will be finalised in line with the programme of works to be approved early 2016 following this IDD. The final logframe indicators will then be updated to reflect these activities.

3. OPPORTUNITIES AND PITFALLS FOR RESCCUE

3.1 Synthetic Summary of First Part

The Vanuatu RESCCUE team has undertaken a comprehensive engagement process, especially with the communities in North Efate. Key findings from the baseline investigation and stakeholder engagement undertaken for the IDD are:

1. Communities located within the North Efate RESCCUE project area are almost entirely subsistence based, relying primarily on family run agricultural plots and fishing. They are highly dependent on natural resources for household food, income, cultural significance, and disaster recovery.
2. North Efate supports a diversity of natural environments that are under pressure from human activities, the effects of climate change and natural hazards. Coastal marine systems appear to be seriously degraded. Communities are also concerned over land management and marine management issues.
3. Coastal and island communities, community resources, fringing reefs, beaches and coastal terrestrial habitats of northeast Efate were severely impacted by TC Pam in March 2015. Communities however, have shown they are relatively resilient to the impacts from natural hazards like TC Pam, but still need assistance in reducing some identified areas of vulnerability (i.e. dependence on fisheries, poor waste management and water infrastructure).
4. The RESCCUE project and its activities need to be undertaken in a collaborative approach. The RESCCUE project needs to work with communities to address the issues that are important to them. It will be important to engage with Village Chiefs, Village Councils and committees, existing environmental networks, and make special consideration to young people and women. The RESCCUE project also needs to work closely with the appropriate Government Departments to ensure activities are coordinated and results can be sustainable in the long term.
5. There have been a number of interventions that have (at various levels) attempted to address issues in North Efate regarding CCA, disaster risk management, and natural resource management. Most community groups considered many development projects do not deliver long term positive changes. The Vanuatu RESCCUE project needs to listen to this community feedback and any intervention taken forward needs to be designed with local stakeholders to build capacity and avoid repeating similar mistakes and ensure sustainability in the long-term. Building on the work undertaken by the SPC/GIZ - CCCPIR programme will be important as the positive outcomes from this programme on Nguna-Pele can be replicated throughout North Efate.

3.2 Opportunities and Pitfalls for RESCCUE Implementation

3.2.1 Identified Opportunities

Section 2 of this IDD suggests several opportunities for the Vanuatu RESCCUE project to strengthen ICM and CCA in North Efate. Through engagement undertaken in North Efate, communities have expressed the following needs and desires:

1. An increased awareness and understanding of the issues the RESCCUE project is seeking to address - climate change drivers and adaptation strategies, the importance of sustainable natural resource management, water systems management, improved and resilient agriculture, and effective marine resource management.
2. Building the capacity with communities so in the long term they can address and resolve issues and problems that occur within their environment without significant external support.
3. On-going training for all community members that provides long-term benefits and builds self-reliance.
4. The involvement of Government departments and the building and strengthening of local leadership structures.

To build resilience to climate change impacts, it is important to address the five capitals of adaptive capacity: Human (knowledge and people), Social/Political (networks and access to governance systems), Physical (infrastructure and tools), Natural (natural resources and ecosystems), and Financial (monetary resources and access to financing). Activities that increase ICM will help build these adaptive capacities thereby increasing resilience to climate change related impacts. As such, the opportunities below are identified with the capital to which they contribute.

All Vanuatu RESCCUE actions will focus on supporting local governance structure and use existing mechanisms. Any implementation of financial mechanisms must assure that the entire community will equally benefit from any income generated. Above all, the RESCCUE project will seek to increase self-reliance within communities instead of facilitating a dependence on external aid.

To these ends, the following are opportunities for the development of North Efate to restore ecosystems services and adapt to climate change. Please note, while the RESCCUE project IDD has identified the opportunities below, this is not an indication that all will be followed up or implemented by the RESCCUE project. However, out of these identified opportunities, it is expected the activities selected for implementation by the RESCCUE team will be drawn, in consultation with the Vanuatu Steering Committee.

Possible opportunities (divided into the five capitals of adaptive capacity) are outlined below. It is anticipated that, while the below are outlined as individual actions, whichever activities are taken forward will be done so in an approach that is holistic, collaborative, coordinated and ultimately sustainable.

Human Capital

- Build capacity and awareness of Chiefs on environmental and climate change issues as outlined in this document and measures that can be employed to avoid, reduce or otherwise mitigate these impacts. Awareness sessions and follow-up sessions regarding key issues as identified above should be offered. Ensure Chief participation by making the events sufficiently prestigious, only Chiefs should be invited to these sessions. There should be separate and similar events offered specifically to religious leaders. These gatherings of leaders will also build knowledge exchange and social capital throughout the region.
- Build capacity and awareness of the whole community on the same issues as the Chiefs, offering separate sessions for women and youth to engage, with regular follow-up.
- Build capacity and awareness of existing management committees, including:
 - Strengthen the capacity, planning and leadership capability of the Tasivanua Environment Network throughout North Efate.
 - Support Tasivanua in developing and providing specific marine and terrestrial monitoring training for the Community Monitors.
 - Help Tasivanua build the capacity of their members in developing community conservation area management plans, monitoring capacity, and to then assist other villages to develop their own plans, and other initiatives. This should be undertaken with the Fisheries Department.
 - Where there are necessary, support the establishment of other committees to meet community priorities.
 - Increase financial literacy of water, cooperative, and tourism-initiative related committees.
- Involve Wan Smol Bag in the awareness and capacity building process. They have demonstrated success, are ni-Vanuatu operated and their involvement is likely to increase the interest and engagement of youth in RESCCUE-related initiatives.
- Increase climate change and environmental awareness through education. Work through schools to support the new curriculum units on climate change and environmental conservation, waste management, etc.
- Target the youth network through formal channels such as the Vanuatu National Youth Council and informal channels such as village and church youth groups, to raise knowledge and skills in implementing conservation techniques.

Social/Political Capital

- Identify existing or new local “environmental champions” in each community to engage communities and lead implementation of activities.
- Facilitate learning through the direct exchange of existing local knowledge. There are a number of local small scale activities currently being undertaken in North Efate which can be shared with other community groups i.e. improved agriculture in Saama, community-driven forestry in Epau, traditional preservation methods and cyclone preparation in Paunangisu, traditional cyclone shelter construction with Ekipe, as well as the CCCPIR related CCA activities undertaken in Nguna Pele. According to the PRA, communities are most receptive when these local ideas are seen to be supported by outside technical advisors.
- Support and facilitate Government Departments (Water, Agriculture, Forestry, Environment, and Meteorology Climate Change Division) to build capacity of local community networks to handle local issues including marine resource monitoring and enforcement of compliance with rules and regulations, water system management, reforestation initiatives, and improved agricultural production.
- Identify mechanisms to facilitate planning discussions between non-national landholders and local communities and opportunities to engage these stakeholders in improved ICM.
- Identify opportunities for promoting ICM oriented provincial policies for land development permits.
- Identify effectiveness of Environmental Impact Assessments (EIAs) and compliance in North Efate with DEPC. Identify opportunities for improved monitoring of EIA approvals to ensure environmental protections undertaken.
- Link with the Shefa Tourism Officer to identify new tourism ventures, help promote existing and advise on measures to improve tourism sustainability and avoid environmental impacts.
- Following marine management awareness raising with Chiefs, disseminate an easy to understand explanation of Fisheries Regulations (in local language and seeking chiefly engagement and support) for discussion in monthly community meetings. Identify mechanisms by which the VFD could harmonize regulations with Chief to determine regulations for local level monitoring, compliance, and engagement in marine resource management.

Financial Capital

- Identify and implement financing mechanisms for Community Committees to assist in their ability to undertake their functions and assist in the development of financial literacy in Committees (also see Social Capital).
- Support further implementation of, and local capacity to, manage water tax to support Water Committees and maintenance of water-systems. Work with the Department of Water to facilitate this process more effectively.

- Identify and implement mechanisms (i.e. policy, legal, economic and/ or financial) to support improved land management to avoid the water contamination, erosion etc. (also see Natural Capital/ICM).
- Facilitate the promotion of community-based recycling as a financial mechanism to support Environment (or similar) Committee activities. Aluminium Recycling Programs have been piloted within suburbs around Port Vila and there is the potential to use lessons learnt for piloting similar programs around North Efate.
- Assess the economic value of reef fisheries (especially herbivorous fish) as means of their conservation and protection of the ecosystem services they provide to reef systems. At present, indications are that reef fisheries are being heavily exploited in the study area and this is a significant gap in current reef fisheries data (also see Natural Capital/ICM).
- Investigate economic incentives and activities for communities as an alternative to fishing to allow reef fish to recover and be fished sustainably in the future. These would need to be long term, and account for climate change and other pressures. Alternative livelihood strategies may include land-based production (tilapia, prawns, or ducks) or fruit and hardwood nurseries for local replanting initiatives.

Physical Capital

- Work with community to identify sustainable water supply infrastructure that are not technologically complicated, easy to maintain and not require foreign-sourced parts or technical advice.
- Facilitate community exchanges. These can be to learn how to build traditional cyclone shelters (assuring that communities have the resources available to implement the technique in their own communities), farming practices, etc.

Natural Capital/ICM

- Identify which mechanisms (which may include economic, financial, policy, legal, social) can be used to support improved land management by non-national landholders especially as it relates to cattle ranching and linkages to water contamination and erosion problems (also see Financial Capital).
- Identify alternative food sources which may include (e.g. duck, tilapia, prawn, and near shore FADs) using the example of Saama (this provides an example of an effective cooperative structure that promotes equal community benefit). This ensures community resilience to climate change, disaster impacts, and lessens the reliance of communities on reef fisheries.
- Identify current successful aquaculture ventures within the region (including prawn, oyster, and sea cucumber) and investigate opportunities to improve sustainability and support expansion and replication.

- Work with communities to share traditional and low-tech food preservation techniques. Understand what similar activities have been undertaken in Nguna Pele as part of the SPC/GIZ CCCPIR programme and promote in other North Efate communities.
- Continue and expand Department of Agriculture programmes that promote improved agricultural production, crop diversity (for drought or high precipitation conditions, pests, etc.), soil management, leguminous nitrogen-fixing trees (that can also provide shade to protect from El Niño drought), mulching, permanent agricultural plots, and other techniques. Understand what similar activities have been undertaken in Nguna Pele as part of the SPC/GIZ CCCPIR programme and promote in other North Efate communities. Also engage with the NARI programme to encourage sharing of experiences of trial crops, livestock and methodologies from the Malafau and Siviri sites to other villages in North Efate.
- Identify areas subject to coastal erosion that are concerning communities and facilitate shoreline planting of native vegetation (where possible) to reduce erosion.
- Consult with the Department of Agriculture about the possibility of establishing improved cattle ranching techniques and outreach into their programmes.
- Consult with Department of Forestry about community-driven replanting programmes.
- Facilitate the creation and sustainable management of traditional tabu areas.
- Work with communities to identify waste management issues and implement solutions.
- Work with communities to identify appropriate pest and disease control measures for the control of pests on leafy vegetables and root crops. These need to be cost effective and repeatable at the community levels. Understand what similar activities have been undertaken in Nguna Pele as part of the SPC/GIZ CCCPIR programme. Also work with Live and Learn's existing invasive species programme to address invasive species in North Efate.
- Map sea grass and mangrove habitats and assess their current state. Both mangroves and sea grass provide important ecosystem services in terms of coastal protection as well as critical habitat for marine species, including shellfish, trochus, reef fish and turtles. They also function as a carbon sink and sea grass has a potential role in mitigating the effects of ocean acidification. Sea grass habitats are particularly important for dugong and turtles which may have opportunities for ecotourism.
- Undertake collaborative post-TC Pam marine habitat surveys with the VFD, Tasivanua and Nguna Pele that include recovery surveys of reefs as follow-up to the November 2015 rapid assessments. This would include a training element that allows for participation and involvement of VFD personnel and community resource monitors. The surveys would document recovery state and extent of impacted marine sites and provide valuable training for ni-Vanuatu resource monitors who can continue ongoing monitoring and reporting.
- Build on efforts to monitor fish biomass and abundances in North Efate, by documenting the benefit of areas closed to fishing for community access to fish in adjacent areas. Working collaboratively with VFD, Tasivanua and Nguna Pele and as part of the reef surveys, detailed

studies of key fisheries species in accordance with national and community priorities would elucidate the value of marine reserves for community food security and livelihoods.

- Assess the economic value of reef fisheries, specifically herbivorous fish, as means of their conservation and protection of the ecosystem services they provide to reef systems. At present, indications are that reef fisheries are being heavily exploited in the study area and this is a significant gap in current reef fisheries data.
- Establish an ongoing programme for communities to collect baseline data on the marine environmental to allow long term monitoring and reporting to allow community decision making to be based on sound baseline data.

3.2.2 Possible Pitfalls

Of the three regions (North, North-East and North-West Efate) the VRA highlighted that the north-east region indicates a higher dependence on external aid. RESCCUE activities should be aware of the pitfall of creating further or additional dependence on external aid as this is not a sustainable approach for improving ICM or CCA, and thus, is not in alignment with RESCCUE project objectives.

There is a long-standing Chiefly dispute in the divided community of Paunangisu. Each Chief has a unique Village Council and Committees. Effective ICM in this community would benefit from the active engagement of both Chiefs in these issues.

Sharing knowledge is not a cultural trait. The sharing of information between villages and communities will need to be facilitated or formalised for this to be successful.

Villages, community networks and government staff are experiencing 'workshop fatigue'. Due to the small population, and accessibility of North Efate to the capital Port Vila, over the past 10 years many previous consultations have been held in this region, and several workshops, trainings and awareness sessions. Each consultation or workshop draws people away from their daily tasks for up to several days. This issue also applies to government staff. Each aid project has the requirement to work through government systems. There is a large number of aid projects being implemented at any one time. Given each government department is operating with a very small staff (e.g. the DEPC has a total staff of ten and is currently operating with seven employees), this places a large burden on government officers, as they are called to 'participate' in a range of aid project activities in addition to their core work. This provides the RESCCUE team with an opportunity to look at different or alternative consultation methods.

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Appendices

APPENDIX 1 – LITERACY AND EDUCATION

Vanuatu has a young population. In the 2009 census, almost 40% of the population were younger than 15 years of age⁴. This places pressure on education resources for early childhood education, primary school education and high school education. Schools commence teaching in Kindergarten to Year 4 in local language (there are 110 local languages), and for later years use either English or French as the teaching language (though some schools teach in both languages), with the language determined by the main language of the surrounding community. In 2014, the language at primary schools was 66% English-speaking primary schools and 34 % French-speaking primary schools. At the secondary level, 70% of students enrolled in English speaking schools and 29% enrolled in French speaking secondary schools⁵. The main language spoken in private households was a local language (63%), 34% speak Bislama, 2% English, and 1% French.

In 2012 the literacy rate of adults aged 15 and above was 84%, though it's worth noting that the younger generation (15 – 24 year olds) has a much higher literacy rate of 95%. The literacy rate gradually declines as the age brackets increase, with less than 70% of the population at age 65 years and older literate. Literacy was measured by a respondent's ability to read and write a simple sentence in any language. The 2009 census recorded that literacy in Bislama was the highest, with 74% of the population able to read and write a simple sentence in Bislama, followed by literacy in English (64%), and French (37%). Half of the population is literate in a language other than Bislama, English or French.

Many of the older citizens had less access to education. Data on educational level completed indicate that in 2009, sixteen percent of citizens 15 years old or older had never been to school or only attended preschool. Educational reforms in the past 10 years have attempted to increase access to school.

At the current time, approximately 72% of students complete primary school⁶. Under government and donor subsidies, primary school education is meant to be free, however most schools still charge school fees as well to supplement government funding. Resourcing to schools is limited, restricting the amount of books, stationary, and qualified teaching staff schools can provide. School fees are a main source of expense for many households.

Primary school completes in Year 6. Due to the limited number of places available at high schools and the expense for families, many 10-12 year old children finish their education when graduating from primary school.

From 2013, the Department of the Environment, the Ministry of Climate Change, and several environmental and climate change projects (including SPC/GIZ Coping with Climate Change in the Pacific Island Region) have been working with the Curriculum Unit in the Ministry of Education to incorporate

⁴ From 2009 Vanuatu National Population and Housing Census, <http://www.vnso.gov.vu>

⁵ 2014 Annual Statistical Digest Ministry Of Education And Training, p.24 http://moet.gov.vu/docs/statistics/Annual%20Statistics%20Digest%20for%20the%20Ministry%20of%20Education_2014.pdf

⁶ Commonwealth Education Online: Education in Vanuatu, <http://www.cedol.org/pacific/vanuatu/> ; Ministry of Education 2011 Statistical Digest, 4th Edition, p2. <http://www.vnso.gov.vu/index.php/document-library?view=download&fileId=714>

environmental conservation and management and climate change concepts into the curriculum for K – Year 13. The Department of Environment urges ICM projects to also include children and schools in their programming and awareness activities, especially for waste management, to build knowledge from a young age.

Eligibility to attend high school is determined by a national exam completed by all children in Year 6. Those who perform well are offered a place at one of the high schools in Vanuatu. Due to the small population of the villages, most islands (including Efate) have several centralised high schools in locations across the island. Students attending high school often have to board at the school, and depending on which school they are accepted at, may need to move to another island for the duration of their studies. Many families living in the largely subsistence-based rural areas find the school fees, boarding fees, books and travel expenses are a barrier for students to attend high school. The Vanuatu Ministry of Education reports that in 2010, approximately 40% of children of high school age were enrolled in high school⁷. A 2009 study found that 18% of adults aged 25 – 34 had graduated from high school⁸. In the RESCCUE pilot site area, in a sample of nine villages with an average population of 406, approximately 14.3 youth in each community are currently attending high school. There are two high schools in the RESCCUE pilot site region: Ulei and Onesua.

Several institutions offer bridging education for early school leavers. The Vanuatu Rural Training Centre Association has a network of community-based centres across Vanuatu which offer training in vocational skills to Certificate I, II and III level. These are run by the communities, with trainers volunteering their time to train youth. The University of South Pacific also offers foundation courses for students to reach Year 12 equivalency in English and Maths.

Approximately 5 percent of students continue on to tertiary study⁹. There are limited tertiary study options available in Vanuatu, including law at the University of South Pacific Vanuatu campus, Vanuatu Agricultural College, Vanuatu Maritime College, Vanuatu Institute of Teacher Education, Vanuatu Nursing College, Australian-Pacific Technical College, and Vanuatu Institute of Technology. A small number of scholarships are offered each year by the Vanuatu Government and donor partners for tertiary students to study in overseas universities.

⁷ Ministry of Education 2011 Statistical Digest, 4th Edition, <http://www.vnso.gov.vu/index.php/document-library?view=download&fileId=714>

⁸ 2009 National Population and Housing Census Youth Monograph', Vanuatu National Statistics Office, 2009; <http://www.vnso.gov.vu/index.php/component/advlisting/?view=download&fileId=1999>

⁹ UNESCO Bangkok Education System Profiles <http://www.unescobkk.org/education/resources/resources/education-system-profiles/vanuatu/higher-tvet/>

APPENDIX 2 – POPULATION STATISTICAL SUMMARY

The information below is taken from the most recent census undertaken in Vanuatu, the 2009 Vanuatu National Population and Housing Census, produced by the Vanuatu National Statistics Office¹⁰.

The 2009 Census determined that the total population was 234,023. This represents an increase of 25.4% or 47,345 people from the 1999 population showing an average annual growth rate of 2.3% (4,733 people per year).

The 2009 census enumerated 119,091 males and 114,932 females, representing a sex ratio of 104 males per 100 females. The urban population was 57,195 people (24.4% of the total population), and includes the towns of Luganville in Sanma with 13,156 people, and Port Vila in the Shefa province with 44,039 people. The average population density for Vanuatu was 19 people/km². This varies widely between provinces. For example, Shefa had 52 people/km², while Torba and Sanma had only 11 people/km².

Within the RESCCUE pilot sites region, which includes the coastal region from North-west Efate, North Efate, Epau in North-East Efate and the islands of Moso, Lelepa, Nguna, Pele and Emau, a population count was taken following TC Pam. Thirty-seven villages were counted, with a total population of 7,197 people (note: a population count was not completed on Emao Island or Malaliu village, this figure does not include those villages). The villages counted contained 1,518 households. Of the population, 2015 (28%) were men, 2097 (29%) were women, and 3085 (43%) were children aged 0 – 17 years old (sex not recorded for children). The table below contains population per village (not figures for Emau have not been included as not available). Accuracy of these figures is unable to be confirmed, as the data was collected in a post-emergency context by untrained enumerators, however the profile is consistent with the national profile.

Nationally, there are 4.8 people per household on average. More than 10% (25,451) of all people that live in private households live in households with 10 or more people. The 2009 census data show a net flow of people towards Shefa province from all other provinces during the 5-year period 2004–2009. There were 6,660 or 13% of households where a female was the head of the household (essentially the person in charge of the household, although this is sometimes interpreted as the most senior person present). Households headed by females were smaller in size than those headed by males, with an average of 3.9 people compared with 5.1 people in male-headed households. Because of their smaller size, households headed by females had a higher per capita expenditure level at Vt 16,400 per month than compared to male-headed households (Vt 15,700). However female headed households had lower average household expenditure at Vt 64,600 compared with male - headed households (Vt 79,600). Male-headed households within rural Shefa (excluding Port Vila) had higher average household expenditure at Vt 90,400 compared to households headed by females at Vt 77,900.

¹⁰ Executive summary taken from the 2009 Vanuatu National Population and Housing Census, Vanuatu National Statistics Office, <http://www.vnso.gov.vu>

Vanuatu has a young population with a median age of 20.5 years. More than one-third (39%) of the population was younger than 15 years of age, and only 6% were 60 years and older. The age dependency ratio was calculated using the 15–59 year-old age group as the “working age population”. For every 100 people of working age, 81 were in the age dependent category.

The number of births was estimated at 7,335 in 2009. This accounts for a crude birth rate (CBR) of 31.3 per 1000. The total fertility rate (TFR) — the average number of births per woman — declined from about 4.6 in 1999 to about 4.1 in 2009. Based on census data for the number of children ever born and still alive, the infant mortality rate (IMR) was estimated at 21; 22 for males and 19 for females. This estimate is lower than the 1999 levels when the IMR was 27 and 26 for males and females – and is thus an improvement in infant mortality rates.

Based on the 2009 census data, life expectancies at birth were estimated to be 69.6 and 72.7 years for males and females, respectively, representing an increase compared to 1999 when it was 65.6 and 69.0 years for males and females.

Based on the derived life tables, a crude death rate (CDR) of 5.4 per 1,000 was calculated, which were approximately 1,260 deaths in 2009. The estimated mortality indicators show more positive mortality indicators for females than for males, with females expected to live, on average, about three years longer than males.

Internal migration during the five year period 2004-2009 was primarily directed towards Shefa province and specifically to the capital Port Vila. The largest numbers of migrants came from Tafea, Malampa and Penama. Net international migration is estimated to be negligible during the intercensal period 1999–2009.

Women marry at a younger age than men. The average age at marriage was 25.5 and 22.5 years for males and females, respectively.

The Presbyterian religion is with 28% of the total population, the most dominant in Vanuatu. The Anglican is the second largest, with 15%, followed by Seventh Day Adventist (SDA) and the Roman Catholic Church, each representing 12% of the Vanuatu population.

The 2009 census questionnaire included a question on smoking and drinking habits of the population aged 15 and older. It was found that 25% of the population smoked cigarettes; 45% of males and 4% of females. The age group that most likely smokes is 20–39 year-olds. In general, more than half of all males aged 20–39 smoke, while only about 5% of females.

Furthermore, it was found that 10% of the population drinks alcohol; 17% of males and 3% are females. The age group that most likely consumed alcohols is 20–34 year-olds. In general, about one quarter of all males aged 20–34 drink alcohol, while less than 5% of females.

The proportion of the population consuming kava is much larger than that smoking or drinking alcohol. Almost one third of the population consumed kava; 53% of males and 8% of females. The age group that most likely consumed kava is 25–49 year-olds. In general, about two thirds of all males aged 25–49 drink kava, compared to about 10% of females.

Data on disabilities indicate that about 12% of the total population reported a disability. The proportion of the population with a disability increases with age, and there is very little difference in the proportion of males and females with a disability. While about 6% of children younger than 5 years of age had a disability, it was more than half of the population at age 60 years and older. Of those who reported disabilities, about 1,000 people could not walk at all, 800 people reportedly could not remember or concentrate, another 500 were deaf, and 400 people were blind.

The internet was used by 7% of the population aged 15 years and older; this was 16% in the urban areas and only 3% in the rural areas.

Although a high percentage (71%) of Vanuatu's population aged 15 and older was economically active, only a relatively small proportion (30%) received a regular paid income; this group consisted of 37% males and 23% females.

Subsistence work — such as growing or gathering produce or fishing to feed families — was the main activity of 32% of Vanuatu's males and 28% females aged 15 and older. About 39% of the population in rural areas was subsistence workers compared with 5% in the urban centre.

Only about 4,500 people were categorised as being unemployed, resulting in an unemployment rate of 4.6%; 4.1% for males and 5.2% for females. The unemployment rates are 12% and 2% in the urban and rural areas respectively.

Fifty one people did not work because of poor weather conditions, or because they could not afford the transportation costs to work. In addition, 897 people did not work and did not look for work, because they believed that no work was available. Using the international definition of unemployment, these people were not classified as unemployed because they did not look for work and did not indicate that they were available for work. However, if all of these people were included in the unemployed category, the unemployment rate would increase to 5.5%.

If subsistence workers were included as part of the unemployed — on the grounds that these people would look for work if they believed cash work was available in their labour market community — the total unemployment level would increase to 46,395 people, or an unemployment rate of 47% (43% for males and 51% for females, and 20% for the urban area and 55% in rural areas). While this assumption would not apply to all individuals in this group, it would likely apply to a proportion of them. Depending on the assumptions a user of these data may wish to use, the resulting unemployment rate would fall somewhere between 4.6% and 47%.

The main source of household income was, with 46% of all households, the sale of fish, crops, or handicrafts. However, this was 60% of all rural households compared to only 3% of urban households, where 81% of all households' main income was wages and/or salary.

Only 18% of rural household's main source of income came from wages and/or salary. Only 11% of urban household were involved in marine fishing activities; this was 39% of rural households. Freshwater fishing activities were carried out by 4% and 21% of urban and rural households respectively.

While 81% of all rural households were involved in growing cash crops, only 17% of urban households grow cash crops.

Compared to rural households, where 80% of households raised chickens, 57% raised pigs and 39% cattle, only a small proportion of urban households raised any livestock.

Regarding the availability of household items, a higher proportion of households in urban areas (compared to rural households) used items such as motor vehicles, gas stoves, fridge or freezer, TV, radio, and computers, as well as DVD decks. However, there are some items more commonly used in rural than in urban areas such as canoes and generators.

While 91% of urban households had at least one mobile phone compared to 71% in rural areas, there were 9% of urban households and 2% of rural households that had an internet connection.

Information on tenure reveals that 81% of all households owned their dwelling outright, while 12% rented their dwelling, and another 6% resided in their dwelling rent-free. More than 90% of households in the rural areas owned their dwelling, while 39% of urban households rented their dwelling.

Forty-six per cent of all households obtained their drinking water as piped water. The second most important source was a tank (34%). However, private piped water was only used by a significant proportion of households in the urban areas. Otherwise, 14% of all rural households obtained their water from a river, lake or spring.

The most frequently recorded toilet facility used by 47% of all private households was a pit latrine, while 21% of all households used a flush toilet; this percentage was 65% in the urban areas and only 6% in the rural areas.

The main source of lighting in Vanuatu was a kerosene lamp, used by an average of 48% of all households, although this percentage was only 6% in the urban areas, compared to 62% in the rural areas. Eighty per cent of urban households were connected to the electricity main grid. This was only 11% of the rural households.

The main energy source for cooking for 85% of all households was wood and/or coconut shells. It was almost universally used by the rural households and by slight more than half of the urban households, where 40% use gas as the main energy source for cooking.

About 52% of all households dispose of their waste by burning it. In the urban areas two in three households dispose their waste using the authorized waste collection.

With respect to the use of insecticide treated bednets, 76% of all households had at least one bednet available; this was 88% of rural households compared to only 38% of urban households.

According to population projections prepared for this report, Vanuatu's population in 2030 will increase to about 370 thousand people, and to 483 thousand in 2050. The population will age, with a decreasing proportion of young people aged 15 and younger, and an increase in people aged 60 and older. The working age population (aged 15–59) will be almost twice as high in 2030 compared to 2009, and will comprise of about 300 thousand people in 2050. The school age population aged 6-13 years will increase from its current level of 40 thousand to 60 thousand.

Population by Village by Area Council

North West Efate

Village or Station	Total Population	Number of households	Baby 0-5 years	Children 5-17 years	Men 18-59 years	Women 18-59 years	Men 60+ years	Women 60+ years
Essema, Port Havannah	139	28	24	36	36	35	5	3
Malafau	116	26	13	44	25	27	3	4
Mangaliliu	390	90	64	102	87	90	22	25
Meten Station	62	12	6	27	16	13	0	0
Natapau (Lelepa)	496	116	53	125	138	141	19	20
Palaunamor	53	9	9	11	17	12	1	3
Sunae (Moso)	113	19	10	42	28	26	4	3
Tanolu	480	87	65	146	136	110	14	9
Tassiriki (Moso)	163	38	23	64	34	35	4	3
Total	2,012	425	267	597	517	489	72	70

North Efate

Village or Station	Total Population	Number of households	Baby 0-5 years	Children 5-17 years	Men 18-59 years	Women 18-59 years	Men 60+ years	Women 60+ years
Emua	386	76	20	130	90	90	29	27
Epule	498	82	83	161	110	119	10	15
Lakenasua	10	2	0	5	2	2	0	1
Paunangisu	870	183	126	250	217	224	22	31
Saamma	240	47	26	55	71	69	8	11
Siviri	280	68	29	84	76	76	7	8
Total	2,284	458	284	685	566	580	76	93

North East Efate

Village or Station	Total Population	Number of households	Baby 0-5 years	Children 5-17 years	Men 18-59 years	Women 18-59 years	Men 60+ years	Women 60+ years
Ekiye	471	77	36	188	95	111	21	20
Epau	562	120	78	157	143	147	21	16
Matarisu	164	24	14	57	33	31	13	16
Total	1,197	221	128	402	271	289	55	52

Nguna Pele Islands

Village or Station	Total Population	Number of households	Baby 0-5 years	Children 5-17 years	Men 18-59 years	Women 18-59 years	Men 60+ years	Women 60+ years
Farealapa	98	24	10	31	17	20	9	11
Fareavau	45	16	3	13	9	10	5	5
Malaliu	0 (invalid data)	17	0 (invalid data)	0 (invalid data)	0 (invalid data)	0 (invalid data)	0 (invalid data)	0 (invalid data)
Matoa	80	1	2	31	17	21	6	3
Newora	264	55	23	87	54	58	19	23
Rewoka	89	27	11	40	8	24	2	4
Taloa	343	88	48	95	73	89	15	23
Unakap	149	45	20	32	33	37	10	17
Utanlangi	196	40	44	26	62	64	0	0
Launamoa	192	46	11	88	44	40	7	2
Piliura	100	26	11	36	20	23	5	5
Worasiviu Village	94	16	18	21	22	21	5	7
Worearu	54	13	12	9	10	12	6	5
Total	1,704	414	213	509	369	419	89	105

Total for North Efate RESCCUE Pilot Site

Village or Station	Total Population	Number of households	Baby 0-5 years	Children 5-17 years	Men 18-59 years	Women 18-59 years	Men 60+ years	Women 60+ years
Total	7,141	1,477	878	2,225	1,785	1,756	247	250

APPENDIX 3 – NATURAL RESOURCE DEPENDENCE OF NORTH EFATE COMMUNITIES

Resource ¹	Use ²	Household Consumption/ Use	Income	Cultural ³	Details	Disaster Recovery ⁴	Details
Forest	Firewood/ Charcoal	x	x	x	Traditional cooking methods required to prepared traditional food	x	Boiling contaminated water
	Agricultural plots	x	x	x	Yam central to marriage ceremonies	x	Emergency food resource
	Laplap	x	x	x	For preparing traditional food		
	Wild yam	x		x		x	Traditionally preserved as a disaster recovery food, resilient to drought
	Wild pig	x		Unknown		x	Emergency food resource
	Flying fox	x		Unknown		x	Emergency food resource
	Natural/ traditional medicine	x		x		x	
	Housing materials (Pandanus and others)	x		x	Traditional building material that does not require financial investment	x	For rebuilding
	Materials for			x		x	

Resource ¹	Use ²	Household Consumption/ Use	Income	Cultural ³	Details	Disaster Recovery ⁴	Details
	building traditional cyclone shelters						
	Materials for building nakamal (meeting house where most important community decisions are customarily made)			x		x	For community cohesion and coordination
	Birds	x		Unknown		x	Emergency food resource
Fresh water springs	Drinking water	x				x	
Surface water resources (rivers, streams, and creeks)	Drinking water	x				x	
	Washing	x				x	
	Fresh water fish	x	x	Unknown		x	
	Tourism		x				
Groundwater resources	Drinking water	x				x	
Swamp (NE)	Agricultural production: swamp taro	x	x	x		x	Emergency food resource
	Agricultural	x	x	Unknown			Emergency food

Resource ¹	Use ²	Household Consumption/ Use	Income	Cultural ³	Details	Disaster Recovery ⁴	Details
	production: watercress						resource
Hot springs	Tourism	x	x	Unknown			
Mangroves	Mud shells	X	X	x		x	Emergency food resource
	Mud crab	X	x	x		x	Emergency food resource
	Wood	X		Unknown		x	
	Indicator of fishing times	X		x			
	Disaster risk reduction					x	Reduced coastal vulnerability to cyclone and other phenomena
Reef	Disaster risk reduction					x	Reduced coastal vulnerability to cyclone and other phenomena
	Reef fish	x	x	x		x	Emergency food resource
	Shellfish	x	x			x	Emergency food resource
Additional marine resources	Triton	x				x	Controls COTs populations; Emergency food resource
	Giant clam						Emergency food resource

Resource ¹	Use ²	Household Consumption/ Use	Income	Cultural ³	Details	Disaster Recovery ⁴	Details
	Trochus	x	x			x	Emergency food resource
	Green snail	x	x			x	Emergency food resource
	Sea cucumber		x	x			

1. There is inherent interdependence between resource health and resilience to climate change related pressures, **2.** As identified in the Participatory Rural Appraisal (PRA), **3.** This data in this column is not exhaustive as the study did not include in-depth research of cultural connections to the natural resource base. Resources that have traditionally been important are also indicated with an "x", **4.** Direct contribution, not accounting for increased financial capital that results from a resource, or ecosystem health

APPENDIX 4 – GOVERNANCE

Government and Policy

Government and Administration

There are 4 levels of government that will be engaged with during implementation of the RESCCUE Vanuatu project: national government, provincial government, area councils, and customary government (the chiefly system).

The structure of service delivery in Vanuatu is as follows. Policy development and national implementation are the responsibilities of the national government Departments, which sit within Ministries. The RESCCUE Vanuatu project will have cause to engage with Departments in several Ministries of Vanuatu, including the Ministry of Foreign Affairs; the Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity; the Ministry of Climate Change, Meteorology, Geohazards, Energy and Environment; the Ministry of Lands and Natural Resources; and the Ministry of Health.

National government departments and Ministries are intended to develop policy and implement actions across the nation as a whole.

Within the nation, there are 6 provinces, each covering a group of islands, and three Municipal Councils in the urban areas of Port Vila, Luganville (Santo) and Lenakel (Tanna) (Cox et al 2007). Each province name is made up of the letters of their main islands:

Table 1. Provinces of Vanuatu

Province	Main Islands	Population Census 2009	Capital
Torba	Banks and Torres Islands	9,359	Sola
Sanma	Santo, Malo	45,855	Luganville
Penama	Pentecost, Ambae, Maéwo	30,819	Longana
Malampa	Ambrym, Malakula, Paama	36,727	Lakatoro
Shefa	Efate, Shepherd Islands	78,723	Port Vila
Tafea	Tanna, Aniwa, Futuna, Erromango, Anietyum	32,540	Isangel
Vanuatu		234,023	Port Vila

The provincial government links into the national government through the Department of Local Authorities (Ministry of Internal Affairs). Each Province is governed by the Provincial Council, consisting of two civil servants appointed under formal procedures (the Secretary-General and Accountant), and

representatives appointed by the Minister of Internal Affairs. In theory, the appointees on the Provincial Council should include representatives of women, youth, chiefs and churches (The Commonwealth Local Government Forum n.d). Provincial government offices also often host the provincial officers of national departments, such as Agricultural Provincial Extension Officers (Department of Agriculture and Rural Development), Fisheries Extension Officers (Department of Fisheries) or Forecast Observer staff (Vanuatu Meteorology and Geohazards Department). These officers are working within the province, but reporting to their national Department, and so are not employees of the province itself.

The provincial government has a range of functions, including licensing of businesses, physical planning, control of land use, provision of basic administrative services such as personal records and vehicle licensing, and the local implementation of national laws in areas such as agriculture and fisheries. In practice, the provinces are chronically under-resourced and able to deliver very few services outside the provincial headquarters. With few resources to travel around the islands and villages, it can be difficult for staff to provide services or maintain consistent communications across the province (Cox et al 2007, p.45). It is important however for the RESCCUE Vanuatu project to keep the Provincial Government office informed of activities being implemented within their jurisdiction. This communication both supports good relations, and reduces duplication of activities in villages where several organisations may be working in the same region. In North Efate, villages on the mainland are approximately 1 hour drive from the Shefa Provincial offices in Port Vila. The provincial Fisheries officer and provincial Environmental officer have expressed interest in maintaining links with the RESCCUE Vanuatu project.

Within each province, the islands are divided into 'areas'. Within each area, there is an elected Area Council, chaired by a chief and including representatives of different local communities and groups. Area Councils typically cover a number of villages and play an advisory and consultative role. In 2015, there were 74 area councils across Vanuatu (Daily Post 2015). The areas link to the provincial council via an Area Secretary (full title Area Council Secretary) who resides in one of the villages and reports to the Province's Secretary-general (The Commonwealth Local Government Forum n.d.). The Area Secretary provides a range of administrative services (business licensing, registration of births, deaths and marriages, assistant registration officer at election time). In addition, they are often called on as a link to the villages, to take messages out from national or provincial government to the individual villages, or to collect information from villages (e.g. on community needs, current population, needs assessments during emergencies etc.) (Cox et al 2007, p. 46). Most Area Secretaries have no office building, transport or communications provision. With no budget for travel, an Area Secretary may go for lengthy periods of time without contact with the provincial administration (Cox et al 2007, p. 46). The Area Secretaries for North-West Efate, North-East Efate and North Efate were key.

Under the Decentralisation Act (1994), the governmental structure of National Government → Provincial Government → Area Councils was intended to provide an efficient and effective channel of service delivery and communications from central government out to the geographically dispersed communities of Vanuatu. In practice, the limited resources available for transport, communications, and staff resourcing have resulted in many rural communities having very little interaction with formal state institutions, beyond the local primary school or first aid post, and studies reveal that even

provincial governments are seen as artificial and remote. Customary and informal institutions at local level are seen as highly legitimate and far more relevant to people's lives (Cox et al 2007, p.47).

Chiefs are the main authority at community level, with a particularly important role in maintaining law and order (Cox et al 2007, p.47). Most disputes, whether of a civil or criminal nature, are resolved through processes utilising the authority of a Chief. The oral, face to face nature of rural communities means that chiefly authority is dependant to a large degree on their ability to generate consensus within the community. Many Chiefs have recognised the need to establish village councils, to provide a forum where representatives of different groups can meet to discuss and decide jointly on local matters. The RESCCUE Vanuatu community consultations established the need to host an information session or workshop for the Chiefs within the region, to build knowledge of climate change and the importance of coastal management, and to engage Chiefs' support of the RESCCUE activities.

The Chiefs have their own district councils of Chiefs, and a National Council of Chiefs, named the Malvatumauri. The Malvatumauri must be legally consulted for any changes to Land legislation, and is informally consulted and acknowledged by government, in recognition of the Chiefs' important role in governing the community (The Commonwealth Local Government Forum n.d.).

Local committee structures, linked to church, women's or youth groups, have also long been a feature of village life (Cox et al, p. 47). The RESCCUE Vanuatu community consultations identified several villages which had existing water committees. Management of marine protected areas largely occurred under the direction of the Chief. In North Efate, several inter-village committees have also developed, including the Tasivanua network which has volunteers in villages across North Efate to raise awareness and lead activities for marine conservation. Discussions with Vanuatu government staff and community members have indicated that supporting the existing local community committees and networks with capacity building in management skills, planning skills, and technical skills would be one effective channel to support community based management of coastal resources.

The churches also play a key role in community governance (Cox et al 2007, p.47). The 2009 Census showed that 82.4% of the population identified as belonging to one of the Christian religions (VNSO 2009), and the main community activity on Saturdays or Sundays involves attending church services. In addition to holding a strong moral authority in communities, church programmes provide many of the public services for rural communities, including education and health services (Cox et al 2007, p.47), and in the past 4 years the churches have also been taking a prominent role in assisting communities with disaster preparedness, climate change adaptation, and disaster recovery, through implementation of several donor-funded programmes including the Vanuatu Community Resilience Project (2012 – 2015), the Disaster Risk Resilience Programme (2014-17), Pacific Community-focused Integrated Disaster Risk Reduction programme (PCIDRR, 2012–14), the Pacific Community Climate Change Risk Reduction programme (PCCCR, 2012-14), Joj blong yumi I help long taem blong disasta programme (2012-14), and Kaikai blong laef (food security) (2012-14) (VCC 2015). The churches are therefore an additional resource that the RESCCUE programme can link with, either in individual villages or through their joint body, the Vanuatu Christian Council.

Key Instruments

Direct responsibility for agriculture, fisheries and aquaculture lies with the Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity (MALFFB) that manages fisheries and aquaculture resources using gear/equipment restrictions, prohibitions, exportation approvals and authorizations. The Vanuatu Fisheries Act (2005) is enforced by the national Department of Fisheries, and includes regulations on size limits for shellfish and crustaceans, no-take of gravid crustaceans (those with eggs), harvest and export quotas for some fisheries products and in some cases requirements for licences and permits. National law also prohibits the export of wild (i.e. not cultured) giant clams from the island of Efate and its offshore islands. In addition in 2010 the Department developed a National Integrated Coastal Management Framework for Vanuatu, though it is not confirmed how far implementation has progressed.

The Department of Fisheries' main focus is on research, compliance and policy (Tiwok 2015). They're currently implementing several programmes on aquaculture, inshore fisheries and coastal fisheries management. They have a small staff, and so staff involvement in new projects needs to be considered by the Director. The Department employs Fisheries Extension Officers in all the six provinces, including Shefa Province.

Environmental management is implemented by the Department of Environmental Protection and Conservation (DEPC) within the Ministry of Lands and Natural Resources¹¹. The Department's work is governed by the Environmental Management and Conservation Act No. 12 of 2002. Underneath this act there sits a number of regulations, policies and plans, including regulations on bioprospecting and community conservation areas. The Department also works to enact commitments under International Conventions, including the Convention on International Trade in Endangered Species of Wild Flora and Fauna and the International Plant Protection Convention. The main focus of the Department is environmental impact assessments, waste and pollution control (compliance), ozone layer protection, and biodiversity and conservation (research, protection, and management of invasive species) (Mullins 2015).

The DEPC has a permanent staff of 10, though a an institutional capacity assessment conducted by ADB in August 2015 recorded that the Department was running at 50% capacity, due to unfilled positions and staff absences on extended study leave. Their capacity to monitor and enforce environmental regulations is therefore limited, as is their capacity to support communities in developing community conservation area plans. Despite these challenges, the Department staff have supported development and registration of three new community conservation areas in 2015 (Mullins 2015).

The Department of Geology, Mines and Water Resources under the Ministry of Lands and Natural Resources is responsible for monitoring coastal water quality to ensure the environmental protection of Vanuatu (Government of the Republic of Vanuatu 2013, p. 14). They are also responsible for managing,

¹¹ It should be noted that although the Ministry of Climate Change has 'Environment' in its title, the Department of Environmental Protection and Conservation is currently sitting within the Ministry of Lands and Natural Resources.

protecting and conserving water supply for drinking, washing and sanitation (MoL 2014). This includes the management of water quantity (during droughts and flooding) and management of water quality, which encompasses issues of natural contamination, such as volcanic activities producing ash fall into water systems causing acidity in water, pollution from human activities, and testing for waterborne diseases such as cholera. The Department works in four main areas of activity: water supply safety/quality; monitoring water levels; public awareness; and monitoring hazard areas (e.g. for flooding) (MoL 2014). The Department's activities are governed by the Water Resources Management Act 2002 [Cap 281].

The Department notes that the geography of Vanuatu challenges their ability to service all areas of Vanuatu. 'Vanuatu's size, isolation, fragility, and limited human, natural and financial resources means that its water supply and quality is not as stable as other countries, especially in the larger island countries and those on continents. The size of islands limits the availability of resources, including water resources. Furthermore, Vanuatu's isolation also affects water management on islands as they must rely on their own resources, as transfer of water has to overcome distance and sea.' (MoL 2014). RESCCUE Vanuatu will have further discussions with departmental staff in 2016 to identify areas for collaboration.

Protected Areas

There are a number of options for recognising Protected Areas: conservation areas under the Forestry Act 2001; marine reserves under the Fisheries Act 2005; protected sites under the Protection of Sites and Artefacts Act; community conservation areas under the Environmental Management and Conservation Act 2002, and national parks and nature reserves under the National Parks Act 1993. The Provincial Councils are also empowered to create environmental protection zones under the Decentralisation and Local Government Regions Act 1994. However, these options tend to be under-used (e.g. there are no national parks). In general the current protected areas are not necessarily fully 'protected' but managed by communities or leaders in such a way as to conserve the present ecosystem (Government of the Republic of Vanuatu 2013, pp 13-14). From the consultations with stakeholders it also appears that communities find the range of options confusing, and are uncertain of which agency to go to when developing a conservation area (Mullins 2015). There is also uncertainty about whether registration of community conservation areas will result in loss of control over those areas. The community owns the resource, and may feel resistant to aligning with formal systems of conservation and regulation (Tiwok 2015). The Community Conservation Area process also requires communities to develop a management plan. Many communities tend not to have the expertise to complete these plans, and therefore need to wait on government or external assistance to commence this work (Tiwok 2015). During consultations DEPC noted that initial training had been provided to the Tasivanua network members on how to develop a community conservation area management plan, but that further training was needed to bring the standard of plans up to a level where they were appropriate for registration. The Department indicated that if a formal request was made to the Director by RESCCUE Vanuatu, Department staff may be able to collaborate in further training for Tasivanua in 2016, depending on their existing programme commitments.

The central government of Vanuatu has protected area responsibilities. To meet these obligations, Vanuatu's parliament has passed several pieces of legislation that deal broadly with natural resource management and conservation. Confounding the issue of responsibility however, Vanuatu's ministries and government departments often hold overlapping mandates, and intra-organisational coordination is minimal and fraught with gaps. Despite national level strategies, the actual management of natural resources in Vanuatu is typically undertaken by villages or communities with little direct intervention by the central government. This may be due to a limited government capacity to centrally implement or enforce management across the archipelago, as is also the case in other Pacific island countries. On the other hand, bureaucratic and procedural processes operating at national scales do not fully cede responsibility to communities. Ultimately community-based resource governance, alongside national-level advice and coordination, is Vanuatu's defacto coastal resource management policy position¹².

Community Based Management

Community-based management through customary marine tenure systems is still practised in Vanuatu. Co-management of coastal fisheries has been encouraged by the Vanuatu Fisheries Department since the 1990s to empower communities to manage their resources and preserve this traditional practice. It appears, however, that while the local systems can offer protection of localised stocks, commercial pressure to harvest resources is beyond the control of resource owners, which is a challenge for community management efforts. Many communities were not able to control their fishers from harvesting and selling sea cucumbers¹³.

Focal group interviews were conducted in seven villages on Efate Island in 2011 and supplemented by a review of supporting literature. Results reveal the increasing and excessive reliance of community-based fisheries management (CBFM) systems on external agencies that promoted overly complex management plans. Examination of trends in CBFM systems shows that community and national fishing rules that were highly acceptable by local societies were more likely to be enforced in the long run. In particular, the establishment of marine reserves was the most widespread and best enforced community rule for the purposes of conservation, ecotourism, and fisheries. Overall, the results challenge the current effectiveness of CBFM in achieving sustainability of reef fisheries in Vanuatu, and highlight the over-reliance on small marine reserves as a management tool. Community initiatives must be strengthened by new specific national regulations governing subsistence and commercial reef fisheries as part of a multi-scale co-management approach¹⁴.

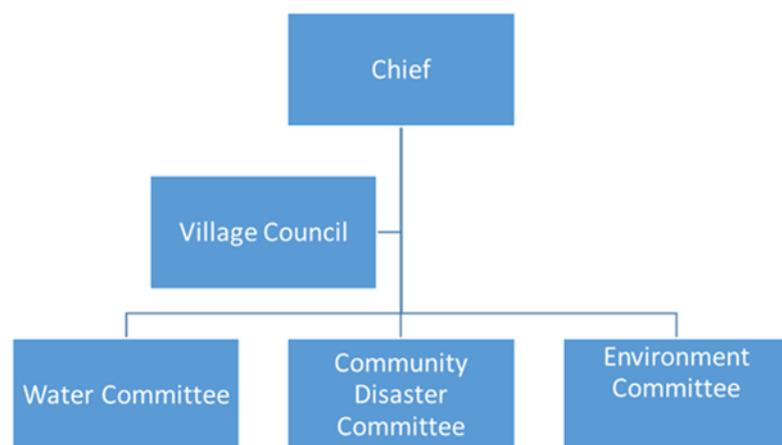
¹² Bartlett, C.Y., Maltal, T., Petro, G., Valentine, P. *Policy implications of protected area discourse in the Pacific islands*. 2010, Marine Policy

¹³ Pakoa, K., Raubani, J., Siasoi, F., Amos, G., and Ham, J. *The status of sea cucumber fisheries and resources in Vanuatu*. November 2013. SPC/ EU Publication

¹⁴ Le'opold, M., Beckensteiner, J., Kaltavara, J., Raubani, J., Caillon, S. *Community-based management of near-shore fisheries in Vanuatu: What works?* 2013. Marine Policy 42 (2013) 167–176

Traditionally, governance in Vanuatu is at the village level. All issues are discussed and decided by the entire community. This community-based decision making structure is guided by the Chief, who is the primary and ultimate authority within the community, followed by the Village Council. Actions are then carried out by a variety of committees (including, but not limited to, the Community Disaster Committee (CDC), the Environment Committee, and the Water Committee).

Participants repeatedly emphasized that successful resource management heavily depends on the Chief understanding and engaging with the issues at hand, prioritizing long-sighted needs over short-term gains. This correlates to PRA data suggesting that communities with strong traditional leadership are better able to manage their local resource bases. As a result, successful projects depend on their ability to work within and fortify this existing governance structure.



In the project area, the terms tabu (traditional conservation area), community conservation area (CCA), and marine protected area (MPA) are used interchangeably. CCA is also used by the Department of Environment to refer to registered Community Conservation Areas. According to collected data, there are currently no CCAs in North Efate that are registered with the Department of Environment. There are, however, established tabu areas in Mangaliu, Lelepa, Tanoliu (2), Siviri, Takara (opened to fishing since TC Pam and about to be closed again by the community), Epau, Tasiriki, Sunae, and Emao (Marou, Mangarongo, Wiana, Lausake, Ngurua Villages had conservation areas that were opened after TC Pam, current status unknown). Epau are scheduled to meet in December 2015 with surrounding communities to discuss the creation of a new and shared tabu area. The Department of Fisheries has often assisted communities to establish these conservation areas. Communities appear to be concerned that registering a CCA with the Department of Environment will threaten their right to govern their marine resources, especially given their importance to local livelihoods.

Restrictions on fishing within conservation areas are not-necessarily well established, understood, or followed. There is also concern about non-community members poaching in the conservation areas. In almost all communities, conservation areas were opened to fishing after TC Pam and are often open for community celebrations or important visits. At this time The Fisheries Department also temporarily lifted the ban on the harvesting of certain marine resources including sea cucumber and turtles. Respondent's perceived that this temporary opening substantially reduced fish and other stocks.

Conservation areas appear to be most effective when they are closer to village areas. Some communities are reticent to establish conservation areas as they fear they will have to register caught fish sizes and that they will get in trouble. There are few community level fishing regulations outside of tabu areas, though participants from some communities stated that they do not take small fish and some communities do not use "2 finger" nets, only permitting the use of "3 finger" nets. Kenneth Lardo, from Emua, has observed that fish stocks have significantly declined since fishing with nets versus spears has become prevalent in the communities.

Workshop participants expressed the need for increased awareness about the importance of marine resource management and local capacity to monitor and manage local resources. There is little local knowledge of Fisheries regulations in most communities.

Capacity Building Experiences

Many development projects have taken place throughout North Efate. Please see *Appendix North Efate Development Projects* for the projects and implementers identified through the interviews and community workshops. The overarching perspective of the participants was that the majority of projects have been ad hoc (offering little sustainability to the communities) and unintentionally foster a dependence on future aid projects instead of increasing self-reliance, capacity building, and local empowerment. Respondents indicated that most NGO-driven development projects tend to:

1. Present inadequate tools
2. Be ill-prepared
3. Offer initiatives that are not applicable to the village context
4. Offer technology that is not appropriate for the local context or cannot be managed under existing capacities
5. Fail to build sufficient awareness within the entire community
6. Insufficiently build the awareness of the Chief (the importance of this was emphasized repeatedly by visited communities).

Participants offered several examples of how programmes could be improved. The primary request of all communities was increased awareness and capacity building so the communities can improve their ability to independently manage their resources and infrastructure. Participants highlight the need for awareness building with the Chiefs (given their role as the primary decision maker), increased capacity of the existing community committees who manage these resources and guide the community activities (see Section 1.3), and increased whole-community awareness (to increase to increase community cohesion and involvement in management decisions). In addition, interview and workshop results indicate that:

1. The government should take a primary role in awareness and capacity building in communities instead of NGOs (if the appropriate Government Ministries do not have the capacity to take this lead, interviewees strongly recommended that Ministry officials accompany NGOs)
2. Projects should be designed for longevity, community participation, and are relevant.
3. Workshops should present material in a variety of ways that are a combination of hands-on, participatory, visual, and experiential
4. Ongoing training should be given to the entire village
5. Capacity building for youth and women should be conducted separately from the men
6. 'Train the trainer' methodology in which experts train and assist local facilitators should be implemented
7. Projects should build on and utilise existing community structures, and
8. Community knowledge should be "fact checked" at the conclusion of the activity to ensure information has not been misinterpreted.

Communities and Other Stakeholders

Stakeholder Analysis

The Communications Plan identified six main groups of local and national stakeholders in Vanuatu:

- Local communities;
- Vanuatu Government;
- Traditional government and civil society organisations;
- Parallel projects, NGOs and INGOs, and donors (other than AfD, SPC and FFEM);
- Private sector; and

- General public

Regionally and internationally, the key stakeholders for RESCCUE Vanuatu are:

- SPC (Pacific Community);
- French Development Agency (AFD); and
- French Global Environment Facility (FFEM)

SPC will lead on engaging with other regional and international stakeholders on behalf of the RESCCUE programme as a whole.

The key actors in ICM and CCA in Vanuatu are the international NGOs, the government's National Advisory Board on CC and DRR, and the SPC-GIZ CCCPIR programme that has been operating in Vanuatu since 2009. The RESCCUE Vanuatu programme will be active in sharing information with these organisations.

The international NGOs have been very active in developing and implementing joint and sole climate change adaptation and disaster risk reduction programmes. Following Cyclone Pam, the INGOs have also led many of the disaster recovery initiatives. Because Vanuatu is such a small country, with a population of only 258,301 people, it has been important for the active organisations to communicate with each other, to avoid duplicating activities or overwhelming communities with too much project activity in one location. The INGOs have therefore formed a very collaborative and open relationship to better work with the communities. In 2012, Oxfam led a consortium of INGOs to implement a collaborative national Climate Change Adaptation programme. Oxfam, CARE International, Vanuatu Red Cross Society, GIZ, Save the Children (Australia) and Vanuatu Rural Development and Training Centre Association (VRDTCA) planned and actioned a series of activities, each utilising the organisations' core strengths. Oxfam also led the creation of the Vanuatu Climate Action Network, an information-sharing network where NGOs involved in climate change work came together regularly to share information on activities, discuss issues, develop joint policy positions, and provide a united NGO perspective on government policy. The RESCCUE Vanuatu programme should engage with this network to share information, but should not at this stage need to have resource-intensive engagement (e.g. collaborative project activities).

The National Advisory Board on CC and DRR was formulated in 2012. This board was set up within the Vanuatu Meteorological and Geohazards Department, with the chair jointly shared between the VMGD and the NDMO. The Board is composed of the Directors of the line Ministries linked to CCA and DRR matters and representatives of key non-government actors. The NAB develops and endorses all national policies, strategies and positions on DRR and CCA. Programmes, projects and initiatives related to DRR and CCA are to be endorsed by the NAB to be conducted in the country. Given its position, the NAB is a critical focal point to get and disseminate disaster and climate change information, and to support coordination. It will be important for the

RESCCUE Vanuatu programme to engage with this network to share information and to keep the Government of Vanuatu informed of key activities within their jurisdiction.

The SPC-GIZ Coping with Climate Change in the Pacific Island Region programme (CCCPIR) has been very active in several sites around the country. The programme has developed a range of resources for use. The programme's office sits within the Ministry of Climate Change building (NDMO building), and the Country Director of the programme, Dr Chris Bartlett, has established good working relationships with the Director-General of the Ministry of Climate Change, Mr Jotham Napat, and with the senior management and staff of many implementing Departments in Vanuatu such as the Department of Education (climate change science included in the new curriculum), Ministry of Agriculture and Rural Development (identifying and trialling climate resilient crops and livestock), and the Vanuatu Meteorological and Geohazards Department (mapping traditional knowledge of climate and adaptation techniques, raising community awareness on climate change). Dr Bartlett has also worked closely with the INGOs and local NGOs, and with government in developing CC and DRR policy. It will be important for the RESCCUE Vanuatu programme to engage closely with the CCCPIR programme. Given that the two projects both receive funding from SPC and are working in the same region (CCCPIR has done a lot of work on Nguna-Pele), there are likely opportunities for collaboration and sharing of resources.

In addition to these three main actors, the primary focus for stakeholder engagement will be SPC, the 3 pilot site villages, the Ministry of Foreign Affairs, traditional governance and civil society organisations (focusing on chiefs and the Tasivanua environmental network), and partner government departments such as Department of Fisheries, Department of Environmental Protection and Conservation, Department of Geology, Mines and Water, the National Advisory Board of CC and DRR, and Shefa Provincial Government. These agencies are all high power / high interest stakeholders. Engagement with these organisations will be largely verbal and participatory, aiming to build strong relationships that will support implementation of RESCCUE activities.

Currently there is some interaction between these groups, but those most directly engaged with ICM and ACC, that is, the local communities, chiefs, Tasivanua, and resource-focused government departments – would benefit from efforts to strengthen the information-sharing networks between them. Community consultations indicated that chiefs need further information on the nature and value of ecosystems services and adaptation to climate change before their full support (and therefore the support of communities) can be gained. Tasivanua reports that their relationship with government is fairly minimal, although they feel that they could be a useful resource in disseminating information. Local communities are currently not sharing much information with each other on resilience and ICM techniques. Government agencies have limited resources, and so have felt restricted in the amount of engagement and awareness they have been able to undertake locally, especially around legislation and regulations governing use and protection of natural resources. All parties indicate their willingness to engage more with each other, if they knew how.

Other less impacted stakeholders will be kept informed of the RESCCUE Vanuatu activities, but not engaged to the same level. Local communities surrounding the pilot site villages, other INGOs and NGOs working on similar ICM and CCA projects in Vanuatu, other government departments, the private sector (especially in ecotourism and local small businesses) and the general public will receive regular quarterly updates via public media, including radio, television, newspaper, website and social media updates, and internet clips, and the RESCCUE Vanuatu programme will support relevant public events such as science fairs or environment days, to disseminate information about the project.

Commitment to environmental protection, biodiversity conservation, and adaptation to climate change

The Government of Vanuatu is highly committed to adaptation to climate change. The government was the first government in the Pacific Region to have established institutional arrangements for joint governance of climate change and disaster risk reduction. In 2013 the government opened a new Ministry, the Ministry for Climate Change Adaptation, Meteorology, Geo-Hazards, Environment, Energy and Disaster Management, The government of Vanuatu is currently preparing a 15-year National Sustainable Development Plan (NSDP) for endorsement. The NSDP is proposed to come into operation in 2016, and will incorporate three pillars: economic, environment and social, underpinned by a focus on culture. Like its predecessors — the Priorities and Action Agenda 2006–2015 and its Plan Long Act Short 2013–2016 document — the new NSDP identifies climate change and disaster risk reduction as key priorities for government.

The Government recognises the importance of environmental protection and biodiversity conservation, but limited financial resources means that the government response to these areas has been restricted. The Government is a signatory to CITES and some marine protection conventions, however enforcement continues to be a challenge.

The PRA suggests that community commitment to environmental protection, biodiversity conservation, and adaptation to climate change within local communities of North Efate depends on: 1. The Chief understanding and publically engaging with these issues 2. Increasing the awareness of all community members about the importance of these issues and the relevance to the well-being of their families, 3. Increased local capacity to monitor and manage their resources, 4. The creation of sustainable livelihoods and protein sources that offer an alternative to fishing, and 5. Addressing the issue that Committee Members have too many commitments and do not receive financial compensation for the work they do. Given TC Pam, the 2015 El Niño, and the observed changes in precipitation, seasons, and agriculture, PRA participants expressed strong interest in understanding climate change and how they can adapt.

Tenure and rights (real and perceived)

Many communities report boundary disputes with neighbouring villages, though the current discussions between Epau, with Lamin, and Pangpang about a shared conservation area suggest that communities might be able to overcome these issues and work together on ICM initiatives.

The Chief of each community manages local natural resources. The community consultation suggests that there is concern about other levels of government attempting to usurp these rights.

Media and associations

Media in Vanuatu is a fairly small sector. There are 6 radio stations, including 4 commercial stations, a government-run station, and Radio Australia, and 1 television station that shows a limited number of programmes. The other main media sources are the three newspapers, word of mouth / village meetings, and social media on the internet¹⁵. One newspaper is printed Monday to Saturday, the other two are printed once a week and distributed on Fridays. The newspapers are generally distributed in the urban centres, and do not have a wide distribution in rural areas.

The government-run media broadcaster (Vanuatu Broadcasting and Television Corporation) has experienced management issues in recent years, and is not always operating at full capacity.

A study conducted in 2013 showed that in Shefa province, including North Efate, the majority of the respondents (74%) had used a mobile phone in the past week. Fifty-five percent had listened to the radio in the past week, and 50% had read a newspaper. Only 18% had used the internet in that period¹⁶.

Many rural citizens use the radio as their main source of news. Radio Vanuatu (the government-run station) recognises this and much of their programming is based around local news, talk-back discussions around topics of interest, including climate change and resource management, and reports from projects on findings and progress, for other communities to learn from¹⁷. The communications plan for RESCCUE Vanuatu recommends that the possibilities of the radio broadcasts are utilised in disseminating information about the project.

¹⁵ Citizen access to information in Vanuatu, ABC International Development, 2013.

¹⁶ Ibid

¹⁷ Ibid

The consultation process found that there was no radio reception in North Efate. One of the opportunities listed in the Opportunities and Pitfalls section is installation of a radio repeater in North Efate, so that these communities can hear and participate in the talk-back and news shows that are broadcast.

Freedom of expression is guaranteed in the constitution, but there is no specific protection for freedom of media, and threats against journalists are fairly common. The Media Association Blong Vanuatu (MAV) has a code of ethics for its members but no mechanism for enforcing its provisions. The Pacific Media Assistance Scheme (PACMAS) has its head office in Port Vila, and runs several activities a year to support development of a diverse, independent and professional Pacific media system.

Existing Capacity Regarding CCA and ICM

Despite the GIZ climate change adaptation work that has been conducted in Nguna and Pele, the mainland communities of North Efate report and demonstrate very little knowledge about climate change causes or adaptation strategies. There are several individuals in the region who demonstrate leadership and significant knowledge about certain techniques that contribute to ICM and solving environmental issues though there is generally a strong demand for increased capacity for marine resource management and improved agricultural techniques. There seems to be more effective resource management, as well as activities that contribute to increased resilience to climate change related impacts, in certain communities that appear to demonstrate strong traditional leadership. For example, the protection of trees in the riparian zone in Mangaliliu and Matarisu where they are building a traditional cyclone shelter in response to TC Pam. Most communities report having observed a variety of climate change related impacts on agricultural, water, and marine resources and want to better understand what is causing them given their high dependence on natural resources for their livelihoods. The youth tend to be somewhat better informed with a general climate change causes and impacts because they have learned about it in school. Participants repeatedly called for increased awareness about climate change for adults and specifically the chiefs as the primary decision makers in the communities.

The lack of knowledge in this region may indicate that these communities have been overlooked due to the concentration of CCA work that has been done on Nguna and Pele. While the RESCCUE team has observed frequent programming on FM Radio about CC adaptation, FM Radio is only available in Port Vila. A repeater on the North coast might increase local awareness on climate change issues.

The Tasivanua Environment Network has representatives in each community in North Efate. All Tasivanua members also belong to the national-level organization Vanuatai which is funded through and created by Wan Smol Bag. Tasivanua members do not receive any financial compensation or support.

There is currently a dispute for the chiefly title in the communities of Paunagisu. In the community of Takara there are separate Chiefs for Takara A and Takara B. Each Chief is represented by unique Village Councils and Committees. During workshop activities a separate delegation of participants arrived representing each Chief for both communities. These representatives were willing to come together to work on resource issues.

The PRA suggests that the commitment to environmental protection, biodiversity conservation, and adaptation to climate change within local communities of North Efate depends on: 1. The Chief understanding and publically engaging with these issues 2. Increasing the awareness of all community members about the importance of these issues and the relevance to the well-being of their families, 3. Increased local capacity to monitor and manage their resources, 4. The creation of sustainable livelihoods and protein sources that offer an alternative to fishing, and 5. Addressing the issue that Committee Members have too many commitments and do not receive financial compensation for the work they do. Given TC Pam, the 2015 El Niño, and the observed changes in precipitation, seasons, and agriculture, PRA participants expressed strong interest in understanding climate change and how they can adapt.

Many communities report boundary disputes with neighbouring villages, though the current discussions between Epau, Lamin, and Pangpang about a shared conservation area suggest that communities might be able to overcome these issues and work together on ICM initiatives.

The Chief of each community manages local natural resources. The community consultation suggests that there is concern about other levels of government attempting to usurp these rights.

Public Participation

Community-based coordination groups (local management committees)

As mentioned above, each community has several local management committees. Members of other community-based coordination groups, for example Tasivanua, are usually members of these committees. Generally Committees are led by a Chairman and a Secretary. The community of Epau has recently applied a new model to their committees in which they have put a “role model” or “champion” in charge of each committee. They report that this technique has been very successful as these leaders have a personal interest in motivating the community to act. These leaders are highly respected. Interviewees also expressed that committees tend to be active if they are supplied with the capacity and tools that they require, indicating the need for further capacity building.

Public participation in and openness of key decision-making processes

Decision-making throughout North Efate is inherently a community-based activity. Villages usually have a monthly meeting to decide all issues that concern the community at the time. Participation in these meetings is not compulsory, but any decisions made at the meetings must be adhered to by all community members, regardless of attendance. Both women and men attend meetings, however men tend to be more vocal in the decision-making process. According to interviewees, people are very respectful of the Chief but also say that the “Chief is the head but we make the Chief.” On occasions in which it is difficult for the community to reach consensus, the Chief may make the final decision.

APPENDIX 5 – VULNERABILITY REDUCTION ASSESSMENT

The Vulnerability Reduction Assessment (VRA) aims to contribute to the overall understanding of conditions and circumstances at the North Efate site and provide a quantitative description of conditions at the site. The VRA is a question based approach using four indicator questions, with the means of assessing them guided by local contexts, taking into account community considerations.

The VRA is intended to be a flexible methodology for assessing reduction in vulnerability to climate change and other pressures on a community. As such, the VRA was modified due to cultural considerations and given the breadth of ICM/CCA. The modified version allows for community groups to identify their priority issues, what is needed to address these issues, and the resources that already exist in the community that can be utilized, in addition to delivering the intended results of the VRA. The change was made because of participant disinterest and difficulty in understanding the standard VRA format during the first workshop in the Northwest Region of North Efate. The modified version addresses these issues while offering the co-benefit of giving the participants a structure to proactively address their primary concerns. The data for each region was then compiled to represent regional priorities, supply a quantitative representation of current conditions, and provide a measure for monitoring and evaluating the progress of the RESCCUE project. To complement the VRA data, the RESCCUE team also conducted a modified analysis of Drivers, Pressures, State, Impacts, and Responses (DPSIR) for each of the key priority issues identified by the participants in the VRA, using information gathered throughout the entire PRA process. Data from the VRA and the DPSIR combined was used to identify priority needs, opportunities, and possible pitfalls for RESCCUE in North Efate.

The VRA was modified due to cultural considerations and the breadth of ICM/CCA issues identified in the region through community consultations. The modified version allows for community groups to identify their priority issues, what is needed to address these issues, and the resources that already exist in the community that can be utilized, in addition to delivering the intended results of the VRA. The change was made due to participant disinterest and difficulty in understanding the standard VRA format during the first workshop in the Northwest Region of North Efate. The modified version addresses these issues while offering the co-benefit of giving the participants a structure to proactively address their primary concerns. Participants of the Northwest Region workshop also demonstrated difficulty scoring each question according to the 1-5 scale. In subsequent workshops, participants were given a choice of three responses that the facilitator then recorded as a quantitative response. For example: very serious (1, a not favourable response), somewhat serious (3), and not serious (5, a favourable response). In the Northwest Region, the VRA was completed in separated gender groups. In subsequent workshops, the VRA was completed by each community group (mixed gender) to facilitate dialogue within community groups about their key issues. This adjustment also eliminated the repetition of questions from prior activities. The data for each region was then compiled to represent regional priorities, supply a quantitative representation of current conditions, and provide a measure for monitoring and evaluating the progress of the RESCCUE project. Standard interview techniques were used. There were 16 participants in the Northwest Region workshop, 29 in the North Region workshop, and 25 in the Northeast Region workshop. In the North Region, one community group opted to only answer Question 1 (for unknown reasons), resulting in 25

participants that completed the entire VRA. In the northeast, only 19 participants in the region completed the entire VRA (Matarisu and Epule did not complete the entire VRA). The men's group of the Northwest Region (8 participants) did not complete Question 4 of the VRA because they did not think that they could discuss the willingness of their communities to engage in these issues until they had first consulted with their fellow villagers. The representatives from Epule were three 16-year old female youth with minimal knowledge of some resource issues affecting their community.

To complement VRA data, the RESCCUE team also conducted a modified analysis of Drivers, Pressures, State, Impacts, and Responses (DPSIR) for key priority issues identified by the participants in the VRA (Terrestrial Resources, Agriculture (due to importance to livelihoods, this was treated as an independent issue), Marine Resources, and Water Resources) using information gathered throughout the entire PRA process. Data from the VRA and the DPSIR combined was used to identify priority needs, opportunities, and possible pitfalls for RESCCUE in North Efate.

In the analysis that follows, specific responses were identified by region if there was significant variation between data sets.

Findings (including the overall VRA scores for each pilot site)

Question 1: What are the top three environmental and land/marine resource management issues for each community? How serious is each issue?

The primary concerns (of approximately equal importance) in each of the three regions were consistent: Water Resources (contamination, infrastructure, and quantity), Land Management (insufficient agricultural production, deforestation, inadequate upper watershed management, and land sales), and Marine Management (marine resource and fisheries management, land impacts on marine resources, and competition for resources/access). For a complete discussion about the current status of these issues please see section 1.2 Environmental Issues. Please see VRA H-Diagrams for detailed information concerning why each is or is not considered a serious issue as well as all proposed community solutions. A summary is given below.

Water Resources were considered to be a serious issue because: 1. Water infrastructure is inadequate, in disrepair, or there is insufficient local capacity to manage existing systems, 2. ENSO-related drought and other conditions are reducing agriculture production and associated income, 3. Upper watershed activities are contaminating key water sources, and 4. The communities depend on their local water resources for drinking, washing, and cooking. These reasons were consistent in all three regions. In the Northeast, Water Resources were not considered serious because of the existence of an alternative spring (that is brackish) and that the river is currently less contaminated than usual (reason unknown). Commonly cited solutions to Water Resource issues were: 1. Increasing community awareness (including the importance of conserving trees in the upper watershed/riparian zones and improved waste management), 2. Community-based improvements to, and maintenance of, water systems, 3. Increasing the capacity (financial literacy and technical skills (including water quality testing)) of the Water Committees to manage and maintain water systems including the water levy system that is currently implemented in some villages, 4. Development of alternative water sources, 5. Assistance from NGOs and the Department of Water to offer trainings and

additional infrastructure, 6. Requesting government assistance to restrict land clearance by pastoral formers, 7. Planting of trees, 8. Relocation of agricultural plots that are near water sources, 9. Better training when given water infrastructure.

Land Management was considered a serious issue due to: 1. Reduced agricultural production for household consumption and for income generation, 2. Deforestation from cattle farming operations resulting in erosion, 3. Unsustainable deforestation resulting from firewood/charcoal as a key income source, especially given drought conditions (Northwest), 4. Inadequate waste management resulting in pollution of land, air, and water, and 5. Deforestation driven by the cattle industry (Northwest). Some participants in the Northeast do not consider agricultural production a serious issue because they can buy food at the store or they will receive relief form NDMO.

VRA respondents propose that Land Management issues can be addressed through: 1. Building capacity in communities to use improved agricultural techniques (including through demonstration gardens, farmer-to-farmer knowledge exchange, Department of Agriculture assistance with a nursery and resistant crops), 2. Improving waste management (through talking with the Chief(s), requesting a waste management system from government, establishment of a community recycling cage with proceeds supporting the committee to run awareness on composting and other waste management methods), 3. Increasing community awareness to understand importance of trees, 4. The Chief(s) organising the replanting of trees and insisting that villagers plant trees when they cut trees, 5. Acquire (from Department of Forestry) and/or grow saplings (possible alternative livelihood source, especially hard woods and fruit trees which contribute to income and CC resilience), 6. Strengthening Environment Committee through capacity building, 7. Increasing engagement with Department of Forestry and SHEFA, 8. Addressing land sale drivers, 9. Working with ranchers to improve land management, 10. Mitigating coastal erosion, including the replanting of coastal trees.

Marine Management was considered a serious issue because: 1. Existing concerns about future fish stocks, given the role of fish as the primary protein source for the local population (caused by inadequate marine resource management), 2. Poaching (and resulting inability to adequately manage marine resources for community use). In the Northeast Region, some participants did not consider Marine Management a serious issue because “there are still lots of fish and people from the village keep fishing” (this contradicts all other data collected) and because there are other protein sources including chicken, pigs, and cows.

According to participants, Marine Management issues can be attended to by: 1. Increasing awareness of Chief and entire community regarding the importance of sustainable marine resource management and tabu areas (including the use of simple messages to be translated into local languages), 2. Strengthening and/or establishing Marine/Conservation/Environment Committees with increased capacity to monitor, manage marine resources, ensure compliance with tabu areas, and increase community awareness, 3. Strengthening Tasivanua (including their capacity to monitor), 4. Increasing involvement of and awareness of chief and community level natural resource managers (given resources are for the community and should be managed at this level), 5. Fisheries Department to improve their monitoring of resources and enforce compliance with regulations, 6. Creating of alternative livelihoods

and protein sources (including duck, shrimp, tilapia farming, FADs), 7. Improving/establishing tabu areas (to also increase tourism), 8. Fisheries to undertake community level awareness so they understand regulations, 9. Incorporation of Fisheries Act into local management plans (the Chief to punish for breaking infractions), 10. Acquisition of a boat per community to monitor, enforce compliance with regulations, and access FADs, 11. Creating incentive (e.g. financial compensation) for monitors, 12. Building sense of responsibility through leadership training.

Question 2: For each priority, if the issue were twice as bad because of climate change, how serious would it be?

VRA results demonstrate that all regions consider that their priority issues will be more serious given the projected impacts of climate on the existing resource base.

At the current level of community awareness regarding climate change impacts in the communities, Water Resources were considered to be a serious issue because: 1. Water is necessary for life, 2. There is a lack of proper water management, 3. There is a lack of capacity to understand the importance of sustainable water use, and 4. There will be reduced precipitation. In the Northeast Region, participants added that Water Resources are not a serious issue because people of the community still know how to find water in the “bush” (forested areas). Land Management was considered to be a serious issue because: 1. Without trees there is no fresh air, 2. (North) More trees are being cut down so the soil is too dry for planting, and 3. (Northeast) it is hard for current trees to grow with all the logging (Note: this is one of the first references to logging as an environmental concern for the Northeast Region and our observations and consultation with Kenneth Lardo indicate that logging in this region ended approximately a decade ago. We have only seen evidence of small scale milling in the region.) . Marine Management was deemed a concern because: 1. (Northwest) There will be no fish, 2. (North) No management in place; they were the first community to establish a traditional tabu area but due to poor management system it has been neglected and not well enforced; Overharvesting of the fisheries will mean there will be no fish in the future and the reef will be unhealthy, and 3. (Northeast) They would not have fish to eat and fish are their primary source of protein.

In addition to the solutions proposed to this issue when answering Indicator Question 1, participants also proposed the following actions to address the Water Resources issue in a climate change context: 1. (Northwest) Do not cut trees at the water source and do not remove sand at the river mouth, 2. (North) Provide technical training for water committee (trained plumber, technician who can do water tests, fix leakages, knowledge that pipes need to be well secured and covered to avoid breakages and disruptions, increase activities beyond only collecting water tax), 3. (Northeast) Get another water tank and improve water system. Additional solutions for Land Management were: 1. (Northwest) Encourage replanting, do not sell land, and do not use plastic bags, 2. (North) Capacity building with technical training (provided by the Department of Agriculture) on importance of different planting methods during dry periods and wet periods and different agricultural methods; Awareness building about and technical training for (by Department of Forestry) replanting trees; Establishing community nurseries for planting material as well as seedlings for trees to be replanted within the community and gardens; Plant more trees, don't burn trees; An evacuation centre with food and water, and 3. (Northeast) Food preservation workshops and start a nursery for

saplings. Further ideas for Marine Management included: 1. (Northwest) No harvesting of Sea Cucumber; replanting of coral; removal of Crown of Thorns (COTs), and MPA monitors working together to manage resources), 2. (North) Establishing an MPA, MPA committee, and training for the committee; Technical training in understanding the importance of ecosystems balance within the reef and what happens when there is sedimentation on the reef and what happens when we over harvest certain species within the reef, and 3. (Northeast) Food preservation workshops; In addition to tabu, have a resource monitor, fisherman's association, and farmer's association.

Question 3: How difficult is it to solve these issues?

Participants perceived these issues to be between difficult and somewhat difficult to address. The primary barriers identified to addressing the Water Resource issue were: 1. Limited financial capital to purchase needed infrastructure, 2. Lack of technical expertise to address issues, 3. Insufficient time to address issues (related to lack of incentive), 4. Difficulty in having discussions with cattle farmers, and 5. Need for more advice and expert knowledge.

Primary barriers to addressing Land Management issues were: 1. After a land sale the community no longer has influence over land management, 2. Slash and burn gardening practices, 3. Lack of awareness about the importance of trees, 3. Residents have substantial knowledge about agriculture and the need to be more aware of issues to be able to improve their practices, 4. Need for more awareness and seeds, 5. No waste separation, and 6. Insufficient community awareness prior to programmes.

Marine Management barriers include: 1. (Northwest) Difficulty in monitoring traditional tabu area because of its large size, 2. (North) Poor management rules and often the Environment Committee members are the ones poaching or breaking rules resulting in a lack of respect by community, 3. Fish is the main source of protein thus it will require substantial awareness building to improve the management, 4. (Northeast) Lack of awareness and lack of traditional tabu area.

General barriers for addressing Environmental Issues are: 1. Long delay for spare parts for infrastructure, 2. No follow up awareness sessions, 3. Often demonstrations do not provide the right tools, 4. And Solutions are not always relevant or sustainable.

To overcome Water Resource issue barriers, participants recommended: 1. Training and awareness building and 2. (Northeast) More NGO and Govt support and more tanks. Needs for solving Land Management related barriers were: 1. (Northwest) Support for fixing erosion, 2. (North) Awareness building including of the Chief and building capacity of institutions within the community, 3. (Northeast) More seeds/shade clothe for nursery and engagement from Department of Forestry in Building capacity and educating the community including the Chief of the importance of Resource Management, 2. (Northwest) Support for monitors (lots of work that prevents them from undertaking other livelihood activities and no financial compensation for their time) and build sense of responsibility through leadership training; Facilitate tabu area management by making tabu area smaller,

changing location of tabu area, and/or a boat to monitor the area, 3. (North) Resolving the Chiefly dispute by engaging both parties of Chiefs as well as educating both parties; Building capacity of institutions within the community, and 4. Developing an alternative source of protein.

Question 4: How willing do you think the community would be to work to solve these issues?

The PRA indicates that communities of North Efate are “somewhat willing” to work to address their priority issues. Barriers to willingness are: 1. Not understanding the importance of the issues (including climate change), 2. Not knowing alternatives to current practices, 3. Chief not engaged in process of resource management, 4. (North) Poaching within the MPA is by the monitor so a change in the turtle monitor is required, 5. (Northwest) Too many commitments and no financial compensation; fear that if marine resources were protected then they have no other sustainable livelihood; some people are lazy.

Community willingness is likely because: 1. (North) People have started to see how important the issues are after TC Pam and El Niño; water is a basic need so the community would engage, especially if the Chief is willing to also engage in these activities; when there is a problem, the people get motivated (and there is a problem) and 2. (Northeast) People want to help their families and it is for the good of the community.

The following was recommended by respondents to increase willingness within the communities to engage in these issues: 1. Engage the whole community in awareness programmes and training, 2. (Northwest) Strengthen committee on environment and Tasivanua committee to strengthen the management between communities in managing resources; call government; provide awareness to the youth (after workshop) on the issues raised asking and respond to their questions; share knowledge from this workshop to encourage solving these issues; personal actions to be completed such as making personal gardens as an example of home garden [Live and Learn Climate Resilient Pilot Garden]; champions; tell council about workshop; materials, 3. (North) Providing alternative livelihoods for the community; get someone (preferably from CC department) to discuss climate change with the entire village); make people responsible for protecting water (make it a traditional tabu marked with leaf) and 4. Support from Chief; examples of success from other places, the opportunity for other alternatives (farming/, coconut oil, livestock/improved water system), "Go house to house and ask them personally to assist. Raise awareness in village on importance and reasons (environmental knowledge)."

Participants in the Northeast VRA added that they would like more NGO assistance in CC adaptation; other NGO help has been very specific and not covered CC.

VRA Score

The VRA is designed to measure the changing vulnerabilities of communities, and determine if a given project is successful or unsuccessful in reducing climate change risks and other related pressures.

The VRA is measured in a series of meetings with local community stakeholders. In these meetings, locally-tailored questions based on the set VRA indicators are asked. The community then assigns a numerical score from a 1 (very bad) to 5 (very good) in response to each question. These responses are aggregated to provide the VRA score.

However, a single VRA score is not very meaningful. It becomes meaningful when it is measured at the pre- and post-project stages. The key quantitative output of the VRA is the degree of change from the baseline score between the pre-project baseline, and at project conclusion.

The initial VRA indicators scores, based on the indicators outlined above are:

VRA Indicators	North West 2015	North 2015	North East 2015
1. What are the top three environmental and land/marine resource management issues for each community? How serious is each issue?	1.3	1.3	2.1
2. For each priority, if the issue were twice as bad because of climate change, how serious would it be?	1	1	1.1
3. How difficult is it to solve these issues	2.5	2.6	2.75
4. How willing do you think the community would be to work to solve these issues?	3	3	3

H Diagrams

Question 1: What are the top three environmental and land/marine resource management issues for each community? How serious is each issue?

Q1. Northern Communities of North Efate		
Why is this a serious issue?	1. What are the top three environmental and land/marine resource management issues? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Water:</p> <ol style="list-style-type: none"> Need water to cook, wash, drinking and for hygiene. Water systems not working properly due to leaks and low pressure. Sometimes we go 3-4 days without any water supply to the village. We need to water our gardens. Everything is hungry, even the pests. Water is life, we use it for drinking and cooking. <p>Land Management:</p> <ol style="list-style-type: none"> Many trees cut down during gardening. The community is located on a rocky and steep slope. 	<p>i. Water (Scarcity; Infrastructure): 1.2</p> <p>ii. Land Management: (Agriculture; Deforestation; Waste management): 1.2</p> <p>iii. Marine (MPAs; Overfishing): 1.4</p> <p style="text-align: center;">1.26</p> <p>What needs to happen to address this issue? What can the community do address this issue? Who, what, and how? What else might they need to address this concern?</p> <p>Water:</p> <ol style="list-style-type: none"> We need a cover over our water source to keep leaves out and a fence around to keep animals out, as well as a way to stop sediment. We need to develop our alternative water source, improve the water system by purchasing material 	<p>*Participant responses have been combined to minimise repetition.</p>

<p>3. No money to buy other food, market produce not growing well any more.</p> <p>4. The current village waste dump is located near the village's springs that we use during dry times.</p> <p>5. Burning of plastics leads to health problems and air pollution.</p> <p>Marine management:</p> <p>1. There is a decline in fish populations because the marine resources are being over harvested.</p> <p>2. There is no management of marine resources and therefore many of the resources are declining.</p> <p>3. Fishing is one of our major sources of protein as well as income.</p> <p>4. Not enough money or alternative supplies, pigs and chickens may be lost or die after disaster.</p>	<p>such as water pipes and joints.</p> <p>3. Currently just one plumber in the entire village.</p> <p>4. Need more awareness of the importance of not burning and cutting trees.</p> <p>5. Possible solutions: bury pipe, replace with stronger pipe</p> <p>6. Need financial capacity building of the water committee to manage the household water tax and plan ahead.</p> <p>7. The plumber and water technicians need training.</p> <p>8. The community could work together to bury water pipes.</p> <p>9. Get a bore dug. Ask Save the Children or WASH cluster.</p> <p>10. Water quality testing skills to be provided.</p> <p>11. Technical support and training for interested farmers within the community.</p> <p>12. Nothing, have the tools and people and structure.</p> <p>Land Management:</p> <p>1. Improve agriculture techniques to enhance soil fertility. The environment committee for can approach sponsors for a community aluminium recycling cage and raise funds to run community awareness and reduce the pressure on the rubbish dump near the water source.</p> <p>2. Raise awareness in community, talk with chief.</p> <p>3. Establish one place to bury plastic; long term.</p> <p>4. Make a demonstration resilient garden.</p> <p>5. If we had better water and shade cloth we could all have nursery by our houses.</p> <p>6. Chief needs to make people plant more trees when they cut trees; ask ministry for saplings; grow saplings (especially fruit trees).</p> <p>7. NARI project coordinator Mr. Michel has a well-established system for planting developed from enriching his soil. It would be good to share his knowledge in all communities.</p> <p>8. Department of Agriculture needs to establish a community nursery to establish different resistant crops.</p> <p>Marine management:</p> <p>1. Improved management to increase fish populations.</p> <p>2. Establish a marine conservation committee to manage and establish an MPA.</p> <p>3. Two tourism businesses exist in the community, so establishing an MPA will encourage more visits.</p> <p>4. Talk to Chief about MPA and other regulations and talk to Fisheries about a FAD.</p> <p>5. Environment Committee capacity building on marine resource management and village awareness.</p> <p>6. A turtle monitor and the Fisheries Department are not doing what they should to monitor many regulations.</p> <p>7. Licensing the Sea Cucumber companies is not well policed there are many undersized being harvested.</p> <p>8. The Turtle Monitor does not have a committee to help raise awareness.</p> <p>9. Establish other sources of protein for the community, e.g. chicken farming, piggery, duck farming.</p> <p>10. More input from Tasivanua so more awareness for everyone.</p> <p>11. Monitoring, assessments of reef, technical training and communication skills by the Fisheries Department.</p> <p>12. Training of the Chiefs.</p> <p>13. The Environment Committee needs capacity building as they do not have the expertise to manage the resources within the community.</p> <p>14. Tilapia farm, Prawn farm.</p> <p>15. Better Tasivanua monitoring.</p>	
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Q1. North Eastern Communities of North Efate

Why is this a serious issue?	1. What are the top three environmental and land/marine resource management issues? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Water:</p> <ol style="list-style-type: none"> Water is essential for life. Because the village uses the river for washing and cleaning clothes, it's becoming too dirty. Contaminated source. Only one tank at aid post. Cattle polluting water. Lots of deforestation in the catchment. <p>Land management:</p> <ol style="list-style-type: none"> We need to eat but it is hard to garden in drought. Gardens spoil after cyclones and almost every tree broken. A lot of good soil being lost from erosion. Reduced number of birds, flying fox and coconut crab. <p>Marine management:</p> <ol style="list-style-type: none"> Because in future there may not be very many fish. We need protein and sometimes it's hard to catch fish. Damage and COTs. Sediment on reef form big rain. Cyclone damaged mangrove. Need to improve management for conservation. Less fish in the sea. Overfishing. People poach. 	<p>Water (Scarcity; Infrastructure; Pollution of Rivers): 2</p> <p>Terrestrial (Agriculture; Deforestation; Forestry): 2</p> <p>Marine (Fisheries; Reef conservation): 2.2</p> <p style="text-align: center;">2.1</p> <p>What needs to happen to address this issue? What can the community do address this issue? Who, what, and how? What else might they need to address this concern?</p> <p>Water:</p> <ol style="list-style-type: none"> The water committee needs to visit Geology in Vila and ask to get a bore dug. We need better design and management of our existing system. We need more storage tanks too. Tell people to stop throwing their rubbish in the water. Have a central area to throw rubbish. We want to access the primary source so need 2 km more pipe. We need more tanks. Fencing off water source. Reduce land clearing (get it restricted). Remove gardens that are near water source and establish a water management committee. Plant more trees. <p>Land management:</p> <ol style="list-style-type: none"> Fences to keep animals from the gardens and insecticides for pests. Nursery by house to look after seedlings. Forestry has seedlings but cost money. Chief to organize replanting of these areas. Community awareness to understand importance of trees. Timber species and fruit trees to be brought from forestry department. Strengthen Environment Committee (person with more capacity in charge and more active in engaging with Forestry Dept and SHEFA. Forestry officer to get more info about establishing a nursery. Dept of Fisheries and Environment and Forestry to work on community awareness. <p>Marine management:</p> <ol style="list-style-type: none"> Need to make the reef tabu for a while so it grows back. Conservation with better management and a tabu. 	<p>Water:</p> <ol style="list-style-type: none"> We have a possible option at the beach, but it needs a RO filter as brackish. Because river not very polluted at the moment. <p>Land management:</p> <ol style="list-style-type: none"> We can store food and get relief from NDMO. <p>Marine management:</p> <ol style="list-style-type: none"> Because there's still lots of fish now and people from the village can keep fishing. We have alternatives like chicken, pigs, goat, cow. <p>*Participant responses have been combined to minimize repetition.</p>

	<ol style="list-style-type: none"> 3. Improve management of conservation area. 4. Reduce erosion through coastal and riparian zone replanting. 5. Address poaching. 6. People must respect tabu. 	
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Q1. North Western Communities of North Efate		
Why is this a serious issue?	1. What are the top three environmental and land/marine resource management issues? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Land management (women):</p> <ol style="list-style-type: none"> 1. No more trees. 2. Need to plant more trees if we want to keep making charcoal. 3. Land sales to do with money. 4. Hard to grow trees with no water. <p>Land management (men):</p> <ol style="list-style-type: none"> 1. Cattle cause deforestation, erosion, floods and are owned by/benefit foreigners. 2. Cattle industry drives land sales (men). <p>Marine management (women):</p> <ol style="list-style-type: none"> 1. Poaching. 2. Not enough resources. 3. Not enough enforcement. 4. Hard to enforce because even when the community respects the MPA, outsiders do not. 5. Projects come and go (women). <p>Marine management (men):</p> <ol style="list-style-type: none"> 1. Overfishing. 2. No management (inadequate management) due to lack of financial resources. 3. Damaged reef. 4. Management/regulations not followed – no inspection by fisheries (and no knowledge of what fisheries regulations are). 5. Custom norms make it difficult to report people who commit infractions. Sometimes hard to gather chiefs to enforce custom law. 6. People from outside the communities will give gifts to the chiefs in exchange for permission to take from MPA (once they get permission that take more than was agreed to, but given the gift received by the chief they do not say anything) (men) 	<p>1. Land management (Land sales depriving local population of access to resources, upper watershed mismanagement resulting in erosion, firewood extraction, charcoal production, and ranching practices resulting in deforestation and nitrification of streams): 1.75</p> <p>ii. Marine management (Fisheries access (need for boats to access FADs/large catch made by outsiders that have bought land); inadequate marine resource management (waste dumping, coral damage, clams retrieved with crow bar, over harvesting, human activity, siltation from land based erosion): 1.5</p> <p>iii. Water (Water contamination from ranching/upstream human activities; water scarcity; water infrastructure in disrepair): 1.5</p> <p>iv. Also: Waste Management and mangroves</p> <p style="text-align: center;">1.33</p> <p style="text-align: center;">What needs to happen to address this issue? What can the community do address this issue? Who, what, and how? What else might they need to address this concern?</p> <p>Land management:</p> <ol style="list-style-type: none"> 1. Address land sale drivers. 2. Replanting initiatives. 3. Awareness to encourage replanting. 4. Work with ranchers to improve land management. 5. Replanting of coastal trees and erosion mitigation (find alternative to sea wall (planting)). <p>Marine management:</p> <ol style="list-style-type: none"> 1. Improve monitoring for MPA compliance (need boats). Awareness in communities. 2. Find a good way to talk with relatives. 3. More involvement of and awareness of chief and community level natural resource managers (resources are for the community and should be managed at this level). 4. Strengthening Tasivanua and other existing community structures/committees. 	<p>*Participant responses have been combined to minimize repetition.</p>

<p>Water (women): 1. No food if no rain for garden</p> <p>Water (men): 1. Everyone needs water, Lelepa and Moso have no streams. Mainland streams polluted. No tanks</p>	<ol style="list-style-type: none"> 5. Fisheries to undertake community level awareness so they understand regulations. 6. Incorporate Fisheries act into local management plans – chief to punish for breaking infractions. 7. Boat per community/MPA for enforcement. 8. Support for monitors (lots of work that prevents them from other livelihood activities and no financial compensation for their time). 9. Build sense of responsibility through leadership training. <p>Water:</p> <ol style="list-style-type: none"> 1. Awareness about water conservation and management. (Use water more than once). 2. Strengthening of water management committees with awareness and training. 3. Better training when given resources (especially regarding maintenance of tanks and materials). <p>Use of appropriate level technology for local capacity.</p>	
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Question 2: For each priority, if the issue were twice as bad because of climate change, how serious would it be?

Q2. Northern Communities of North Efate		
Why is this a serious issue?	2. For each priority, if the issue were twice as bad because of climate change, how serious would it be? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Water:</p> <ol style="list-style-type: none"> 1. Without water we could die. 2. Very serious with Climate Change as we have no proper water management. 3. There is not enough capacity to understand the importance of wise use of water. 4. Less rain. 5. Land is not managed well. 6. Garden areas are located uphill from homes. <p>Land management:</p> <ol style="list-style-type: none"> 1. More trees are being cut down so the soil is too dry for planting. <p>Marine management:</p> <ol style="list-style-type: none"> 1. Very serious with Climate Change as no management in place. 2. We were the first community to establish a traditional tabu area but due to poor management system it has been neglected and not well enforced. 3. Overharvesting of the fisheries will mean there will be no 	<p><i>i. Water</i> (Scarcity; Infrastructure): 1 <i>ii. Terrestrial</i> (Agriculture; Deforestation; Waste management): 1 <i>iii. Marine</i> (MPAs; Overfishing): 1</p> <p style="text-align: center;">1</p> <p>Are there any other actions that you haven't already discussed that would help address this issue?</p> <p>Water:</p> <ol style="list-style-type: none"> 1. Technical training for water committee (trained plumber, technician who can do water tests, fix leakages). 2. Knowledge that pipes need to be well secured and covered to avoid breakages and disruptions. 3. Increase activities beyond only collecting water tax. <p>Land management:</p> <ol style="list-style-type: none"> 1. Awareness needs to be provided on the different methods for gardening. 2. Capacity building with technical training (provided by the Department of Agriculture) on importance of different planting methods during dry periods and wet periods. 3. Awareness building about and technical training for (by Department of Forestry) replanting trees. 4. Establishing community nurseries for planting material as well as seedlings for trees to be replanted 	<p>*Participant responses have been combined to minimize repetition.</p>

<p>fish in the future and the reef will be unhealthy.</p>	<p>within the community and gardens.</p> <ol style="list-style-type: none"> 5. Plant more trees, don't burn trees. 6. An evacuation Center with food and water. <p>Marine management</p> <ol style="list-style-type: none"> 1. Establishing an MPA and MPA committee, and training for the committee. 2. Technical training in understanding the importance of ecosystems balance within the reef and what happens when there is sedimentation onto reef and what happens when we over harvest certain species within the reef. 	
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Q2. North Eastern Communities of North Efate		
Why is this a serious issue?	2. For each priority, if the issue were twice as bad because of climate change, how serious would it be? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Water:</p> <ol style="list-style-type: none"> 1. Must have water/food or we die. 2. Because we wouldn't have clean water to wash in and some people drink from it too. <p>Land management:</p> <ol style="list-style-type: none"> 1. Hard for current trees to grow with all the clearing. <p>Marine:</p> <ol style="list-style-type: none"> 1. Because we would not have fish to eat. 2. Fish are the only source of protein. 	<ol style="list-style-type: none"> iv. Water (Scarcity; Infrastructure; Pollution of Rivers): 1.2 v. Terrestrial (Agriculture; Deforestation; Forestry): 1 vi. Marine (Fisheries; Reef Conservation): 1 <p style="text-align: center;">1.1</p> <p>Are there any other actions that you haven't already discussed that would help address this issue?</p> <p>Water:</p> <ol style="list-style-type: none"> 1. Get another water tank. 2. Improve water system. <p>Land management:</p> <ol style="list-style-type: none"> 1. Food preservation workshop. 2. Start a nursery for saplings. <p>Marine:</p> <ol style="list-style-type: none"> 1. Food preservation workshops. 2. In addition to MPA, have a resource monitor, fisherman's association, and farmers association. 	<p>Water:</p> <ol style="list-style-type: none"> 1. We can still find water somewhere in bush. <p>Land management:</p> <ol style="list-style-type: none"> 1. If we had warning we could store food and water underground. 2. We know bush food and can collect fallen fruit and nuts after cyclone. <p>Marine management:</p> <ol style="list-style-type: none"> 1. Disaster relief. <p>*Participant responses have been combined to minimize repetition.</p>

Q2. North Western Communities of North Efate		
Why is this a serious issue?	2. For each priority, if the issue were twice as bad because of climate change, how serious would it be? (not serious=5, somewhat serious=3, very serious=1)	Why is this not a serious issue?
<p>Land management:</p> <ol style="list-style-type: none"> 1. No tree, no fresh air 	<ol style="list-style-type: none"> i. Land management (Land sales depriving local population of access to resources, upper watershed 	

<p>Marine management:</p> <ol style="list-style-type: none"> No fish <p>Water:</p> <ol style="list-style-type: none"> No water 	<p>management resulting in erosion, firewood extraction, charcoal production, and ranching practices resulting in deforestation): 1</p> <ol style="list-style-type: none"> Marine (Fisheries access (need for boats to access FADs/large catch made by outsiders that have bought land); inadequate marine resource management (waste dumping, coral damage, clams retrieved with crow bar, over harvesting, human activity, siltation from land based erosion): 1 Water (Water contamination from ranching/upstream human activities; water scarcity; water infrastructure in disrepair): 1 Also: Waste Management and mangroves <p style="text-align: center;">1</p>	<p>*Participant responses have been combined to minimize repetition.</p>
Are there any other actions that you haven't already discussed that would help address this issue?		
<p>Land management:</p> <ol style="list-style-type: none"> Encourage replanting. Don't sell land. Don't use plastic bags. <p>Marine management:</p> <ol style="list-style-type: none"> No harvesting of Sea Cucumber. Replanting coral. Removal/clean up of Crown of Thorns. MPA monitors (need to work together to manage resources) <p>Water:</p> <ol style="list-style-type: none"> Don't cut trees at water source. No sand removal at river mouth. Kava consumes a lot of water to make/prepare 		

Question 3: How difficult is it to solve these issues?

Q3. Northern Communities of North Efate		
Why is it difficult?	3. How difficult is it to solve these issues? (very difficult=1, somewhat difficult=3, not difficult=5)	Why is it easy?
<p>Water:</p> <ol style="list-style-type: none"> Lack of technical expertise by the community. Not enough time. <p>Land management:</p> <ol style="list-style-type: none"> This is associated with the current garden process where slash and burning happens and trees are removed. People in the community need to be aware of the impacts as well as understand the importance of keeping trees. There is no waste separation happening. 	<p>iv. Water (Scarcity; Infrastructure): 3.6</p> <p>v. Terrestrial (Agriculture; Deforestation; Waste management): 2.9</p> <p>vi. Marine (MPAs; Overfishing): 1.3</p> <p style="text-align: center;">2.6</p>	<p>Water:</p> <ol style="list-style-type: none"> We have committees. Use existing manpower to fix problems with pipe. Water is a basic need so any management will be implemented
How could it be made easier?		
<p>Water:</p> <p>Land management:</p> <ol style="list-style-type: none"> We have committees. People talk about not cutting trees. 		

<p>4. It will be difficult for communities to understand the need to change unless there is awareness before the implementation of a program.</p> <p>5. Gardening practises are what they have knowledge of therefore important to increase their knowledge on these very issues.</p> <p>Marine management:</p> <ol style="list-style-type: none"> Poor management rules and often the environment committee members are the ones poaching or breaking these rules so communities do not respect them. Fish is the main source of protein so it will require a lot of awareness to improve the management. Provide an alternative source of protein such as chicken farming. 	<ol style="list-style-type: none"> Much easier after awareness. <p>Land management:</p> <ol style="list-style-type: none"> Much easier after awareness. Building capacity and educating the community including the Chief in the importance of Resource Management. Building capacity of institutions within the community. <p>Marine management:</p> <ol style="list-style-type: none"> Much easier after awareness. Resolving the Chiefly issues by engaging both parties of Chiefs as well as educating both parties. These issues will be made easier if both parties nominate representatives who will educate the community on these issues. Building capacity and educating the community including the Chief of the importance of Resource Management. Building capacity of institutions within the community. More awareness might encourage others to help. Alternative source of protein. 	<ol style="list-style-type: none"> Talk with people about not burning and only dumping in one place <p>Marine management:</p> <ol style="list-style-type: none"> We have committees. The community sees the importance of better resource management and there is great knowledge of what an MPA can do in the community. We have 1 monitor and he has support network <p>*Participant responses have been combined to minimize repetition.</p>
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Q3. North Eastern Communities of North Efate		
Why is it difficult?	3. How difficult is it to solve these issues? (very difficult=1, somewhat difficult=3, not difficult=5)	Why is it easy?
<p>Water:</p> <ol style="list-style-type: none"> Need money. Financially difficult. Difficult to begin discussions going with cattle owners. Need more advice and expert knowledge. <p>Land management:</p> <ol style="list-style-type: none"> Need more awareness and seeds. Trying to get seedlings. Want their own nursery. May need species that don't grow in other places. <p>Marine management:</p> <ol style="list-style-type: none"> Not enough awareness. Currently have no conservation and never have. 	<p>vii. Water (Scarcity; Infrastructure; Pollution of Rivers): 3.25</p> <p>viii. Terrestrial (Agriculture; Deforestation; Forestry): 3</p> <p>ix. Marine (Fisheries; Reef conservation): 2</p> <p style="text-align: center;">2.75</p> <p style="text-align: center;">How could it be made easier?</p> <p>Water:</p> <ol style="list-style-type: none"> Want more NGO and Govt support. More tanks. Training and awareness. <p>Land management:</p> <ol style="list-style-type: none"> More seeds and shade clothe for nursery. Engagement from Forestry Department in helping to establish a nursery. <p>Marine management:</p> <ol style="list-style-type: none"> More awareness from organizations like OceansWatch and Department of Fisheries. 	<p>Water:</p> <ol style="list-style-type: none"> Have a committee. If you tell people to stop throwing their rubbish in the river they will. They are a small community, if they talk to everyone together they will listen. <p>Land management:</p> <ol style="list-style-type: none"> We have some knowledge; Just need to go to Department of Forestry or Epau. <p>Marine management:</p> <ol style="list-style-type: none"> Already have an MPA and Tasivanua monitor. Recognize the importance and the discussions have started. Have seen Epau's example. <p>*Participant responses have been combined to minimize repetition.</p>

	2. An alternative food supply like tilapia.	
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Q3. North Western Communities of North Efate		
Why is it difficult?	3. How difficult is it to solve these issues? (very difficult=1, somewhat difficult=3, not difficult=5)	Why is it easy?
<p>Land management (men):</p> <ol style="list-style-type: none"> No title of land used by farmers (*Community has sold land, no longer has title to land, and people who have bought it don't care about land management). No say in land management because sold. <p>Marine management:</p> <ol style="list-style-type: none"> Large area to monitor <p>Water (men):</p> <ol style="list-style-type: none"> No money for tanks <p>All (women):</p> <ol style="list-style-type: none"> Long delay for spare parts. No follow up awareness. Often demonstrations don't provide the right tools. Solutions aren't always relevant or sustainable 	<ol style="list-style-type: none"> Land management: (Land sales depriving local population of access to resources, upper watershed management resulting in erosion, firewood extraction, charcoal production, and ranching practices resulting in deforestation): 2.5 Marine management: (Fisheries access (need for boats to access FADs/large catch made by outsiders that have bought land); inadequate marine resource management (waste dumping, coral damage, clams retrieved with crow bar, over harvesting, human activity, siltation from land based erosion): 2.5 Water (Water contamination from ranching/upstream human activities; water scarcity; water infrastructure in disrepair): 2.5 Also: Waste Management and mangroves <p style="text-align: center;">2.5</p> <p style="text-align: center;">How could it be made easier?</p> <p>Land management:</p> <ol style="list-style-type: none"> Erosion can be fixed with support <p>Marine management:</p> <ol style="list-style-type: none"> Make MPA smaller. Location of MPA, Boat per community/MPA. Support for monitors (lots of work that prevents them from other livelihood activities and no financial compensation for their time). Awareness - build sense of responsibility through leadership training <p>Water: n/a</p>	<p>Marine management: Awareness done, Tasivanua</p> <p>Land management: n/a</p> <p>Water: n/a</p> <p>*Participant responses have been combined to minimize repetition.</p>

Question 4: How willing do you think the community would be to work to solve these issues?

Q4. Northern Communities of North Efate		
<p>Why do you think they wouldn't be willing?</p> <ol style="list-style-type: none"> Poaching within the MPA is by the monitor so we require a change in the monitor. Deforestation, we do not know any other alternative method to be used. The community would not be willing if they were not aware of the problems and the issues within the environment. If the community Chief were not engaged in the process of resource management it would be difficult for the people to follow. Maybe not clear what to do. 	<p>4. How willing do you think the community would be to work to solve these issues? (not willing =1, somewhat willing=3, very willing=5)?</p> <p style="text-align: center;">3.8</p>	<p>Why do you think they would be willing?</p> <ol style="list-style-type: none"> People have started to see how important the issues are after TC Pam and El Niño. Traditional tabu area. Would be willing if they change the turtle monitors within the community. Reforestation. Increasing their knowledge would help the situation. Water Source: It is a basic need so an action the community would engage in, especially if the Chief is willing to engage in these activities. When there is a problem, the people get motivated (and there is a problem). <p>*Participant responses have been combined to minimize repetition.</p>
	<p>What would be needed to make them more willing?</p> <ol style="list-style-type: none"> Engaging the whole community in the awareness program. Providing alternative livelihoods for the community. Get someone (preferably from CC department to come talk about what's happening with climate change all over the planet with the entire village). Make people responsible for protecting water (make it a traditional tabu marked with leaf). Money, awareness, training. Extra notes: They said they want more NGO help for CC adaptation. Other NGO help has been very specific. WV-kindly, Save the Children-Road Market, Oxfam-nothing, Red Cross Disaster relief, Live and Learn-not North Coast, GIZ-Nguna Pele only. 	

Q4. North Eastern Communities of North Efate		
<p>Why do you think they wouldn't be willing?</p> <ol style="list-style-type: none"> Too many commitments and no money for the work. They don't understand the importance of it. Fear that if protected then they have no other sustainable livelihood. Some people are lazy. Some are working and don't have time. 	<p>4. How willing do you think the community would be to work to solve these issues? (not willing =1, somewhat willing=3, very willing=5)?</p> <p style="text-align: center;">3</p>	<p>Why do you think they would be willing?</p> <ol style="list-style-type: none"> Want to help families. It's for the good of the community. <p>*Participant responses have been combined to minimize repetition.</p>
	<p>What would be needed to make them more willing?</p> <ol style="list-style-type: none"> Support from Chief. More awareness. Examples of success from other places. If they had the opportunity for other alternatives (farming/livestock/improved water system). "Go house to house and ask them personally to assist. Raise awareness in village on importance and reasons (environmental knowledge)." 	

Q4. North Western Communities of North Efate

<p>Why do you think they wouldn't be willing?</p> <ol style="list-style-type: none"> 1. Need full awareness with whole community. 2. Not always understanding the full impact of climate change. 	<p>4. How willing do you think the community would be to work to solve these issues? (not willing =1, somewhat willing=3, very willing=5)?</p> <p style="text-align: center;">3 (women only)</p> <hr/> <p style="text-align: center;">What would be needed to make them more willing?</p> <ol style="list-style-type: none"> 1. Strengthen committee on environment and Tasivanua committee to strengthen the management between communities in managing resources. 2. Share knowledge. 3. Call government if want. 4. Invite people to undertake awareness. 5. Provide awareness to the youth (after workshop) on the issues raised asking and responding to their questions. 6. Sharing knowledge from this workshop to encourage solving these issues. 7. Personal actions to be completed such as making personal gardens as an example of home garden [Live and Learn Climate Resilient Pilot Garden]. 8. Champions. 9. Tell council about workshop. 10. Awareness. 11. Materials. 12. Assessment training. 	<p>Why do you think they would be willing?</p> <p>*Participant responses have been combined to minimize repetition.</p>
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APPENDIX 6 – OTHER AGENCIES AND PROJECTS CURRENTLY OPERATING IN NORTH EFATE

Organisation	Focus	Additional Comments
ADRA	Water tanks	
AusAid	Road Markets/Community water project	Water project requires further upgrade due to population pressure
Department of Agriculture (EU NARI Project)	Improved agriculture and livestock	
Department of Forestry	Replanting program	Program initiated but no follow-up so saplings died.
Fisheries Department	Conservation Area: Takara/ Invertebrate reseeded	Successful results reported by workshop participants for the conservation area. There does not appear to be any inclusion of the community in monitoring or the long term sustainability of the reseeded initiative.
GEF	Water	
Japanese aid	Solar Program	9,000 Vatu installation fee. Costs 80,000 to own at 1000v per month repayments. They trained everyone well but the repayments were too high. Service was discontinued and batteries died. Community sent two women to India (Barefoot University?) to be trained in solar and wind power. They spent 6 months there. There was a long delay in getting supplies from India and just after supplies arrived, the light bulbs were destroyed by TC Pam. The women would charge 5,000V to install.
JICA	FADs, trochus, green snail and giant clam reseeded	Perception of unfair distribution of resources and conflict regarding boat.
Live and Learn	Agricultural projects/ CC Awareness focused on Food Security	Perception that community knew more than what the program offered.
NDMO	TC Pam disaster relief	
NZAID/Italian Aid	Manioc Flour Project	Failed sustainable livelihoods project because no buyer, abandoned building, and when they did the demonstration the facilitators did not take into account that the community would have no manioc for the demonstration because of the drought.
NZD Aid Programme 2007	Water Project	Water committee established but not given necessary training
Other: Projects brought by individual foreigners	Aquaculture: Lamin	Successful to date and well received by the community. 3-6 month harvests. Recently established.
Oxfam	Water and small business initiatives	Well received by community because they continually return

Organisation	Focus	Additional Comments
PeaceCorps	Tourism and coral gardening: Tanoliu	
Red Cross	Disaster relief	Reported to be very effective during TC Pam
Saama Community	Cattle Project	
Save the Children	Aid posts, Mamas' Market, tourism	
SHEFA/European Union	Road market, awareness, water tanks	
SHEFA Province	Efate Land Management Area (ELMA)	Working with Tasivanua and Mangaliliu Council
SPC-GiZ	Climate change adaption	Mainly operated in Nguna-Pele
SPREP	Pacific Ecosystems Based Adaptation to Climate Change (PEABCC)	Focused on Port Vila but also looking at water catchment areas that service Port Vila (central and North Efate).
UNDP	Vanuatu Coastal Adaptation Project (VCAP)	Operating in every province of Vanuatu, including Epi in SHEFA.
UNICEF	TC Pam disaster relief and Kindergarten Project	
Vanuatu Football Federation	Football Field	
Vanuatu Christian Council	TC Pam disaster recovery and strengthening church evacuation centres	
WASH cluster	Health and hygiene	
WorldVision	Kindergartens	

