A study of the potential for post- disaster resilience in indigenous Fijian communities

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Dedication

This dissertation is dedicated to my father, Mr Atunaisa Veitata and granddad Mr. Maloni Veitata. They are both not alive today to see this educational achievement, however it was their drive and belief in my siblings and I, that drove us to achieve excellence in all that we did.

My dad was a quiet man, who was always curious about the *iTaukei* culture. He loved reading and was passionate about indigenous land. Early conversations with him got me also interested in my culture and traditions. One of his favorite books, *The Fijian Ethos* became a key reference book for my research.

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List of Acronyms

ABD	Asian Development Bank
AuSAID	Australian Aid
BNPL	Basic Needs Poverty Line
CCF	Community Capitals Framework
CSIRO	Commonwealth Scientific and Industrial Research Organization
CRED	Center for Research on Epidemiology of Diseases
CSR	Colonial Sugar Refinery
DISMAC	Disaster Management Committee
DFAT	Australian Department of Foreign Affairs and Trade
EEZ	Exclusive Economic Zone
EM- DAT	Emergency events data base
ENSO	EL Nino Southern Oscillation
FJD	Fiji Dollars
FRANZ	France, Australia, New Zealand Agreement
GDP	Gross Domestic Product
GOF	Government of Fiji
GNI	Gross National Income
HH	Household
IDA	Initial Disaster Assessment
INGO	International Non- governmental organization
IPCC	Intergovernmental Panel on Climate Change
NDMA	National Disaster Management Act
NDMO	National Disaster Management Office
NDMP	National Disaster Management Plan
NGO	Non- Government Organisation
PCFD	Partners in Community Development Fiji
PDNA	Post Disaster Needs Assessment
SOPAC	Pacific Islands Applied Geoscience Commission
SPCZ	South Pacific Convergence Zone
TC	Tropical Cyclone
UNISDR	The United Nations Office for Disaster Risk Reduction
USD	United Stated Dollars
UN	United Nations
UNU	United National University
UNOCHA	The United Nations Office for the Coordination of Humanitarian Affairs
WAF	Water Authority of Fiji
WASH	Water, Sanitation and Health
WCS	Wildlife Conservation Society
WHO	World Health Organization

Glossary

Bula Taucoko – better wellbeing, quality of life.

Bulubulu – a ceremony of forgiveness, "burying" resentments. Usually a whale's tooth is given as a request for forgiveness.

Bure – traditional Fijian thatched house serving a special function in villages such as, meeting place, men's house or women's house.

Butudravu – this practice is held whenever a female experiences her first period and that she is ready for womanhood.

Curu ibure – this practice is held whenever a male child undergoes circumcision and that he is becoming a man.

Duavata – to be united.

Duguci - this social occasion is held when a man's family visit's a woman's family to traditionally ask the woman's hand in marriage. vakamau – marriage in the iTaukei context.

iSevu – traditional presentation of the first fruit of the land to the church and the chiefs.

iSevusevu – (entry protocol) Presentation of yaqona root in a ceremony of introduction or greeting by a visitor. It is an acceptable behaviour to present the isevusevu and seek entry to a Fijian village or home.

iTaukei – indigenous Fijian people: natives of Fiji Islands.

iTatau – (departure protocol) presentation of yaqona root by a group in a ceremony to inform of their departure.

iTeitei – food gardens or farms.

iTokatoka – extended family within a clan, (mataqali). The itokatoka is literally a family and all members are intimately related by birth and marriage.

iYau – traditional artefacts used in ceremonies like mats, tapa cloths, and tabua.

Kerekere- Asking for something and will repay the favor later

Koro – village.

Lagi – sky and heaven.

Lewenivanua – ordinary people or population of a village.

Lotu – religion.

Magiti – food (Syn. Kakana).

Masi – tapa Large printed bark cloth used in presentation ceremonies. The print design varies across Fiji. Vatulele island in western Fiji, Islands of the Lau group and Cakaudrove province in Northern division are known for making tapa. There are four kinds, gatuvaka Viti, gatuvaka Toga, kumi and isuluvaka Viti. The Tongan type used freely hand printed designs, mostly with a tan colour, and often has writing relevant to the occasion. The Fijian type has more formal geometric design using stencils and often, darker in colour.

Marama – woman, lady.

Magimagi – a strong line made of coconut sinnet used by indigenous Fijians as a rope to tie things.

Matanitu – state, government or a nation.

Matanivanua – traditional role as an orator who speaks on behalf of the vanua or a chief.

Mataqali – clan, more inclusive than the extended family

Oga – sociocultural obligations and responsibilities, or social burdens.

Sautu – peace and prosperity in the land. Solesolevaki – a social, cultural capital where people work together for a common good without being paid.

Solesolevaki – Communal work or labor for a task

Solevu – a traditional ceremony (Syn. Soqo).

Soli vakavanua- Communal collection and fund collection

Tabu - forbidden, prohibited.

Tabua – whales tooth. Valuable artefact used in most Fijian ceremonies such as birth, marriages, death and seeking forgiveness between families, clan and tribes.

Talanoa – to yarn, chat or discuss. Usually done around kava bowl to discuss issues of importance to the family and village; veitalanoa when more than 2 people are involved.

Tako- Lavo- the distinctive generational relationship that is only seen in the highland villages of Viti Levu

Tui/ Turaga – chief.

Turaga – reference to a male or a chief.

Turaga ni Koro - village Headman.

Uvi – (Dioscorea alata) tropical yam, a chiefly status tuber-crop in Fiji and Pacific Islands.

Vanua - refers to the universal whole and the interconnectedness of people to their land, environment, cultures and epistemology, history, chiefs, relationships, spirituality, beliefs, knowledge systems, values and God(s).
Veirairaici – looking after one another.

Veidokai – respect.

Veilomani – the act of love and caring for each other.

Veiwekani – kinship, relative.

Veivakarogotaki – to inform or to hold discussion and consultation.

Vula vakaviti – Indigenous Fijian lunar calendar.

Vuravura – The earth.

Vuvale – family.

Yalomatua – to have wisdom or maturity.

Yaqona – (Piper methysticum) plant that is the basis of the traditional Fijian drink also known as *kava*.

Yasana - province with a geographical entity. There are 14 provinces in Fiji. Rotuma an independent island across the Northern part of Fiji is categorised as the 15th province for operational and administrative purposes only.

Yavusa - The largest kinship group within the Fijian social system. A combination of several clans forms the yavusa.

Executive Summary

1. Background of Dissertation

Over the years, disasters have increased and affected many people worldwide. Natural disasters have affected approximately 45,000 people globally each year; this results in about 0.1% of the global population. Despite the Pacific adding the least number to this percentage, the effects are strongly felt because of their vulnerability. The islands in the Pacific are highly vulnerable due to their remoteness, geographical spread, limited island markets, and available resources. They are also vulnerable because of the exposure to a wide range of natural disasters, 76% tropical cyclones, affecting 2.5 million people and causing 1400 fatalities. Tropical cyclones will increase in intensity or remain unchanged in the 21st century. However, cyclone strength is projected to increase due to global warming.

In the past seven (7) years, the South Pacific has experienced four (4) category five cyclones, namely, Tropical Cyclone (TC) Pam (2015), TC Winston (2016), TC Harold (2020), and TC Yasa (2021). These cyclones severely damaged infrastructure, society, health, and the Pacific island economies. The strongest was TC Winston which made landfall in Fiji, Vanuatu, Tonga, Niue, and Queensland in the South Pacific. It recorded a speed of 285 km/h killing 44 people in Fiji and causing damages in ten (10) of the fourteen (14) provinces in Fiji. The Fiji government estimated the disaster effects value to be F$2 billion (US$0.9 million), and TC Winston is the subject of this dissertation. The experience caught the country off guard. The government mechanism was not prepared to address the impacts of a category five cyclone. This resulted in a lot of coordination mishaps and ill-preparedness from the community. Communities were helpless, and many waited for government assistance for aid and food to restart their lives again.

This is a wake-up call for Fiji. Policies and strategies that are in place have to reflect the lessons and strengthen the communities. One of the biggest lessons from TC Winston was the communities' lack of preparations due to a lack of awareness and the delay in both relief and rehabilitation supplies. The experience also brought forth the need to strengthen community-based approaches to disaster management. Communities are usually the first to respond to disasters. Grassroots actions could enhance local knowledge and social capital and help identify the root causes of human vulnerability to improve solutions for livelihood and strengthen community resilience. In the same paper, he mentions that bottom-up activity can fill gaps or previous top-down and centralized management forms that reduce resilience to short-term technology and expert-driven solutions (Steward, 2007).

Communities' vulnerability brings about the need to address community-based disaster management. Evidence is needed to show how communities responded and recovered from the cyclone. This research aims to identify mechanisms that can contribute to strengthening Fiji communities' resilience based on their experiences with TC Winston. This research focuses on the indigenous Fijian context, as the majority of people in the Fijis population. Fijian villages are homogenous to a certain extent, and the indigenous society is very communal, with great

importance attached to the family unit and the lands (*vanua*). Resilience in this research refers t,o a community's or an individual's capacity to adapt, reorganize, and thrive in the face of a disaster. (Adger, 2000).

2. Research Objectives:

Given the intensity of the cyclones affecting Fiji and other small islands in the Pacific, there is a need to encourage communities self- reliance. This dissertation aims to explore the potential of community resilience in the Fijian context focusing on post-disaster recovery activities, to enhance community-based disaster management in Fiji. The following research objectives are addressed in this study:

a. To examine the international frameworks and Fiji's national policies in disaster risk reduction and related topics to provide a background for the need and opportunities to strengthen CBDRR

b. To investigate how traditional practices are maintained and traditional cultural norms are utilized in the indigenous Fijian communities

c. To develop a framework to enhance CBDRR in Fiji based on findings from community response and recovery practices within the communities

This study was conducted in three locations to answer the research questions. Nabuna village is located on a remote island, Navala village is a highland village, and Rakiraki is an 'urban' village. Table 1 shows the characteristics of the case study sites. The villages are representative of the types of villages in Fiji.
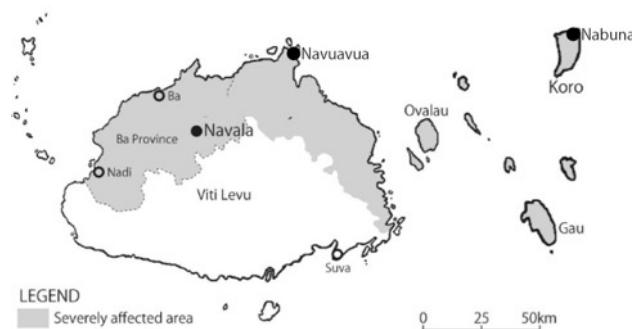
Map of Fiji showing the three case study sites

Summary characteristics of the three case studies

Attributes	Nabuna (Site 1)	Navala (Site 2)	Rakiraki (Site 3)
Geography	Coastal, two river systems	Relatively steep landscape, rural, dry vegetation	Valley, coastal, dry,
Physical features	Coastal village has two river systems running through the village	Savanna, rocky, in a valley by the Yaloku river	Flat coastal village
Average Population	250	800	300
Household numbers	75	127	100

| The primary source of livelihood | Farming, fishing | Farming | Hotel, private sector, land lease |

3. Key Findings:
Communities use social capital in response to cyclone Winston. This was reflected in all three case study sites. Bonding social capital was more effective within the village in the first month, as family and church networks could mobilize resources and distribute food, sanitation, water, and shelter supplies.

Although the national policy is well aligned with the global and regional frameworks for disaster management, there is no apparent link to the community. Historically, societies have relied on community ties, food preservation, and collection techniques to respond to disasters. The introduction of rehabilitation funds and aim, as is the practice now, allows more aid dependency within communities.

Utilization of the *Turaga ni koro* (village headman) and introducing a village emergency community can mitigate coordination problems that arise when responding to cyclones at the community level. Ensuring that a more coordinated approach is in place at the community level can help alleviate some of the responsibilities expected upon the *Turaga ni Koro.* In strengthening the community-based disaster governance and volunteers, bridging the expectations within the policy implemented at the government level will be more coordinated and effective.

Table 2 summarizes the case study's findings regarding the *solesolevaki* activities carried out in the villages. Nabuna and Navala villages showed much more cooperation in the recovery process through house building. All three villages rely on neighbors and family (neighbors) to evacuate and for temporary shelter together with carpenter's availability is significant. Nabuna and Navala relied on the carpenters in the village, while in Rakiraki, carpenters were hired from town. In the Pacific, informal kinship structures create connections within communities. In all three villages, community members create strong social networks in several ways, including (i) Offering food and shelter, (ii) Supporting people experiencing hardship (iii) Looking out for vulnerable community members.

Post-disaster resilience is vital for community preparedness. Resilience in the *iTaukei* view is *solesolevaki.* A communities' ability to work together (cooperate) and utilize the networks and community capital available. This cooperation component was also apparent in the agricultural activities in the village. Most of the youths worked together to rehabilitate their farms. Government programs should align with community-based *solesolevaki* activities to formalize and recognize it as a need for communities' resilience.

4. Conclusion
The indigenous Fijian communities are resilient because of their *iTaukei* norms and practices. CBDRR is vital to formalize and institutionalize emergency committees' roles and the factors and resources needed. This thesis concludes that *solesolevaki, kerekere, solevu, tako-lavo*

relationships, social capital, kinship, and family must be considered when considering safety net in national policies. This thesis has confirmed how these traditional factors are actioned within indigenous villages. Therefore, incorporating indigenous knowledge into policies and plans would strengthen the contextual relevance of policy and encourage iTaukei people to link their everyday practices to enhance their disaster resilience. National DRR policies can broaden their impact by including a strategy addressing CBDRR in formulating such procedures by considering communities and their experiences.

Communities, as first responders to disasters, must be well-equipped and ready to face future disasters. Experiences from TC Winston and TC Yasa have shown that the *iTaukei* villages have addressed infrastructure damages and rehabilitation in the villages with *solesolevaki,* family links, and assistance from business partners nearby for resources. All the 14 elements of CBDRR mentioned by Shaw (2014) can be related to Fiji's experience in strengthening the community's resilience.

Village's disaster preparedness needs to be strengthened, as shown in the findings most of the households evacuated or were saved by their neighbors. So, while local and national authorities have vital responsibilities for civil protection in hazard events, communities are always the first responders and should be empowered in that role.

Solid and practical community-based DRR requires grassroots support and linkages to the community's day-to-day life. Linking disaster risk awareness and preparedness activities to local cultural events can effectively maintain a culture of preparedness.

In addition to grassroots support, building effective and sustainable capacity for community-based DRR requires local and national authorities' formal recognition and support. In addition to providing financial and technical assistance, local

The framework below is proposed to contribute to the potential of community disaster resilience in Fiji. The framework highlights the need for policy inclusion, strengthening networks (through the role of *Turaga ni Koro* and village DRR committee), resources, and providing opportunities for volunteers to practice and better their response to future cyclones. The framework reiterated the need to have and proposed the CBDRR policy as the first step in formalizing the focus on building disaster-resilient communities.

The findings of this research are expected to fill a significant gap in existing knowledge about indigenous community actions in CBDRR in Fiji and provide the much-needed evidence base for formulating and implementing future policies to enable and improve communities' participation in DRR. The three case studies presented in this thesis try to contribute to empirical research on the visibility and significance of the traditional links and norms in DRR.

Chapter 1: Disaster Response and Recovery in Fiji

This doctoral study aims to explore the potential for communities' resilience in the Fijian context focusing on post-disaster recovery activities, to enhance community-based disaster management in Fiji. This chapter begins with an overview of the key terms used in this research, followed by an overview of the impact of disasters on small island nations such as Fiji. This overview will highlight the importance of the following study to understand how effective disaster risk reduction initiatives can be implemented in Fiji during recovery to increase communities' preparedness for future events. The chapter also highlights the importance of social capital in post-disaster response activities to link this doctoral dissertation to my previous thesis on "Study of community response to post-cyclone disaster: a case study from three different communities in Fiji." (Unpublished master's thesis). Subsequently, the research objectives and questions lay a foundation for the dissertation. To conclude, an overview of the dissertation structure is provided, summarizing the key components of each chapter.

1.1 Background

1.1.1 Natural hazards and disasters

Mayena (2006) stated that since the 1970s, the impacts of an increasing number of hazards on society and at a global level had brought the issue of vulnerability, recovery, and, more recently, resilience under the spotlight. Before that, disaster risk reduction models focused on physical and natural viewpoints rather than the human perspective. Thus, it led to a shift to disaster risk reduction in the global platform, which links to national governments, affecting decision-making in and for communities.

According to the UNDRR website for terminologies, disasters are events that cause "serious disruptions to the functions of a community, bringing with it human, economic and environmental losses and impacts, thus leading to the inability of the affected community to utilize its resources to cope" (UNISDR, 2009). The UNISDR terminology (2009) report further defines disasters as:

> "A severe disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resources (UNISDR, 2009, P9).

Disasters forms from different sources, including natural, technological, and civic/political disasters (Coppola, 2007). This research focuses on natural disasters, which originate and are transmitted through the environment (Smith and Petley, 2009). Human activities and development can enhance these natural disasters and increase community vulnerability to natural hazards (Blaikie, Cannon, Davis, and Wisner, 1994; Pelling, 2005; Wisner, Blaikie, Cannon, and Davis, 2004). Natural disaster in this research focuses on tropical cyclones, prevalent in the South Pacific.

Mutter and Barnard (2010) see the three phases of disasters as "before" (when a vulnerability is created)," "occurrence," and recovery (actions after the disaster occurrence). Disaster response and recovery is the final phase of the disaster, which usually involves many stakeholders to fix or better the previous condition. Disaster response can be divided into emergency relief, recovery, rehabilitation, and reconstruction. Relief aid and activities provided with immediate humanitarian aid can be food, water, or shelter. This is followed by the recovery of livelihoods like replanting crops and finally by reconstructing dwellings (Johnson, 2016). Figure 1.1 below illustrates the disaster management cycle and its 4 phases (UNISDR). The process is completed by the " Mitigation" phase - where the vulnerability may be more/less/different from the state before the hazard event occurred (O'Brien, O'Keefe, Gadema and Swords, 2010).
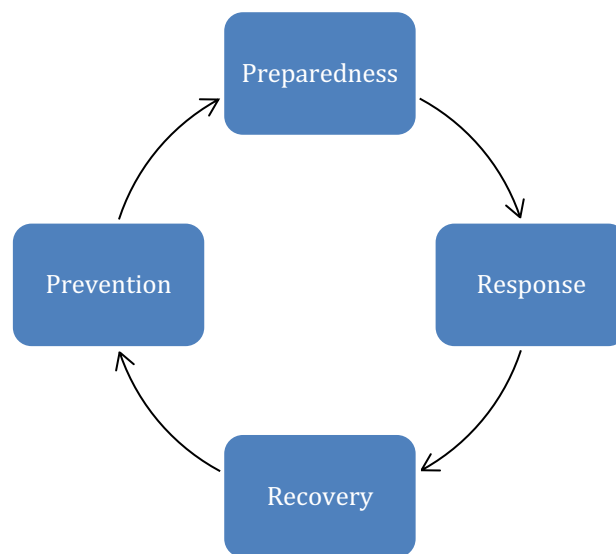
Figure 1. 1 Disaster Management Cyclone (Source: UNDRR)

"Mitigation" focuses on activities designed to reduce the risk associated with particular hazards. "Preparedness" includes the activities which improve the effectiveness of the community's response to a disaster event. "Response" and "Recovery" activities occur during the post-disaster period, attempting to fulfill basic needs before transitioning into longer-term rebuilding processes (EC, 2011). Of these phases, "Response and Recovery" are the most poorly understood and least well researched (Barton, 1969; Coppola, 2007; Lloyd-Jones, 2006; Rubin, Saperstein, and Barbee, 1985; Schwab, 1998).

Disaster recovery encompasses rebuilding, reconstructing, repairing the damages associated with a hazardous event, and returning affected areas to functional condition (Coppola, 2007). Within the disaster recovery literature, various terms are sometimes used synonymously with recovery, other times alluding to more specific components of recovery. To clarify how these different words are used in this dissertation, recovery denotes all the activities, processes, and outcomes occurring in the post-disaster period. In comparison, terms such as reconstruction, rehabilitation, and restoration refer to specific aspects of recovery. Reconstruction almost exclusively refers to rebuilding physical structures damaged or destroyed in a disaster. Restoration suggests a return to prior conditions, indicating the reversion of physical or social

aspects to pre-disaster norms (Coppola, 2007). This is mainly associated with infrastructure, such as transportation and communication (Haas, Kates, and Bowden, 1977). On the other hand, while rehabilitation also refers to some forms of restoration, the term is generally used in association with people as opposed to physical objects (Quarantelli, 1999).

Defining a time for the difference between response and recovery period in Fiji is hard to explain, as is the case with other developing countries. However, for reconstruction there has handbooks published by World Bank (2012) and UNOCHA (2010) where initial response period is up to 2 weeks, and the emergency relief distribution is one month after the cyclone. The handbook published experiences from countries in previous disasters like; Indonesia (tsunami), Iran (earthquake), Pakistan (tremor), and Italy (earthquake), whereby the government coordination would address immediate needs assessment and appeal within 4 to 6 weeks after the disaster. From the second month after the disaster, the reconstruction phase commences until the second year post- disaster to when reconstruction is completed.

1.1.2 Disasters in the Pacific and Fiji

Small island states, including those in the Pacific, are vulnerable to disasters due to their exposure to a wide range of disasters, with 76 % of natural disasters that occurred in the South West Pacific being Tropical Cyclones (TC) (World Bank, 2006). In the same report by the World Bank (2006), 2.5 million people have been affected by tropical cyclones, with approximately 1400 fatalities. Despite this, communities still managed to survive and, in some instances, thrived under these conditions even before European contact and colonization (Campbell, 2009). Small islands development state (SIDS) is known to be vulnerable due to the environmental vulnerability of island ecosystems and the heavy social reliance on limited primary resources (Box 1). These often scarcely populated islands are considered very vulnerable to the impacts of natural disasters, as are their economies (Mimura, 1999; Mataki, Koshy, and Nair, 2006; Connel, 2013; Magee, Verdon-Kidd, Kiem, Royle, 2016). These communities face livelihood, health, well-being, shelter, and food security challenges (Barnett and Campbell, 2010).

There have been several TC that has been experienced in the Pacific region within the last two decades. TC Kina, which occurred in December 1992-January 1993, and caused an estimated damage of USD 120 million with 26 fatalities (Salinger and Lefale, 2005). TC Evan occurred in 2012, incurring damages of USD 315 million in Samoa, Fiji, Wallis and Futuna, Tonga, and New Zealand, and 1,4 recorded fatalities (Government of Fiji, 2013). Three years later, TC Pam affected Vanuatu in 2015, causing an estimated damage of USD 360 million with 11 deaths (Nishijima et al., 2015). As seen above, in the past 30 years alone, there has been an increase in the frequency and intensity of TCs (IPCC, 20TCswith limited time for disaster recovery, social and traditional indigenous knowledge is valuable for effective community-led response in post-disasters (Kenney and Phibs, 2015). According to the World Ban's list of the top 12 countries in the world that are most vulnerable to storms, there are three South Pacific islands listed; these are Samoa (8th), Tonga (9th), and Fiji (12th) (World Bank, 2009).

Fiji lies east of the 1800 longitude, where there is an increase in storm activity expected. It is highly exposed to natural disasters compared to some of the countries in the Pacific. The high exposure is also because Fiji lies in the Pacific Rim of Fire and the Pacific cyclone belt (Johnson, 2016). With the focus of this research on how the community responded to Tropical cyclone Winston, exploring community structures and functions before and after the cyclone was apt in understanding the potential for community resilience after disasters.

This research could not be timely, considering the outcomes of the recently published IPCC working group II report (2022) have confirmed the vulnerability of small island nations such as Fiji. This increases the need for this research, as shown in Box 1. Although there is little data on the efficacy of adaptation practices and the scope of action required, some island communities are resilient and have strong social safety nets and social capital that support responses and actions already being taken. Several enablers can be used in small islands to improve adaptation outcomes and build resilience. Small islands present the most urgent need for investment in capacity building (Mycoo et.al,2022).

Table 1. 1 Summary of Chapter 15 in IPCC Working group II (2022) Source: Mycoo et.al,2022

Impact	Details
Observed Impacts	A sense of urgency is prevalent among small islands in combating climate change and in adherence to the Paris Agreement to limit global warming to 1.5°C above pre-industrial levels.
	The observed impacts of climate change differ between urban and rural contexts, island types, and tropical and non-tropical islands
	TCS is severely impacting small islands
	Scientific evidence has confirmed that globally and in small islands, tropical corals are presently at high risk
	Freshwater systems on small islands are exposed to dynamic climate impacts and are among the most threatened on the planet.
	Small islands host significant levels of global terrestrial species diversity and endemism. Due to the extensive range of related vulnerabilities, almost 50% of terrestrial species presently considered at risk of global extinction also occur on islands
Projected Impacts	Projected climate and ocean-related changes will significantly affect marine and terrestrial ecosystems and ecosystem services, which will, in turn, have cascading impacts across both natural and human systems
	Projected changes in the wave climate superimposed on Sea Level Rise (SLR) will rapidly increase flooding in small islands, despite highly contrasting exposure profiles between ocean sub-regions
	Modeling of both temperature and ocean acidification effects under future climate scenarios (RCP4.5 and RCP8.5) suggest that some small islands will experience severe coral bleaching on an annual basis before 2040
	Projected changes in aridity are expected to impose freshwater stress on many small islands, especially SIDS
	The continued degradation and transformation of terrestrial and marine ecosystems of small islands due to human domination will amplify the vulnerability of island peoples to the impacts of climate change

	Reef island and coastal area habitability in small islands is expected to decrease because of increased temperature, extreme sea levels, and degradation of buffering ecosystems, which will improve human exposure to sea-related hazards
Future Risks	The reduced habitability of small islands is an overarching significant risk caused by a combination of several key risks facing most small islands even under a global temperature scenario of 1.5°C
	The vulnerability of communities in small islands, especially those relying on coral reef systems for livelihoods, may exceed adaptation limits well before 2100, even for a low greenhouse gas emission pathway
	Small islands are already reporting losses and damages, mainly from tropical cyclones, and increases in SLR
Options, Limits, and Opportunities of Adaptation	Some island communities are resilient, with strong social safety nets and social capital that support responses and actions already occurring, but there is limited information on the effectiveness of the adaptation practices and the scale of activity needed
	In small islands, despite the existence of adaptation barriers, several enablers can be used to improve adaptation outcomes and build resilience
	Small islands present the most urgent need for investment in capacity building and adaptation strategies but face barriers and constraints that hinder adaptation response implementation.
	For many small islands, adaptation actions are often incremental and do not match the scale of extreme or compounding events
	Although international climate finance has increased in magnitude, small islands face challenges in accessing adaptation finance to cope with slow- and rapid-onset events
	The unavailability of up-to-date baseline data and contrasting scenarios/temperature levels continue to impair the generation of local-to-regional observed and projected impacts for small islands, especially those that are developing nations

1.1.3 Tropical Cyclone (TC)

Cyclones have different names according to where in the world they occur in, it is called a Hurricane in the North Atlantic Ocean and Caribbean. In the Northern Pacific Ocean and the China seas they are called Typhoons and Tropical Cyclones in the Western South Pacific Ocean and Indian Ocean (Terry, 2007). This is illustrated in figure 1.2 the regions where hurricanes, cyclones and typhoons are prevalent.
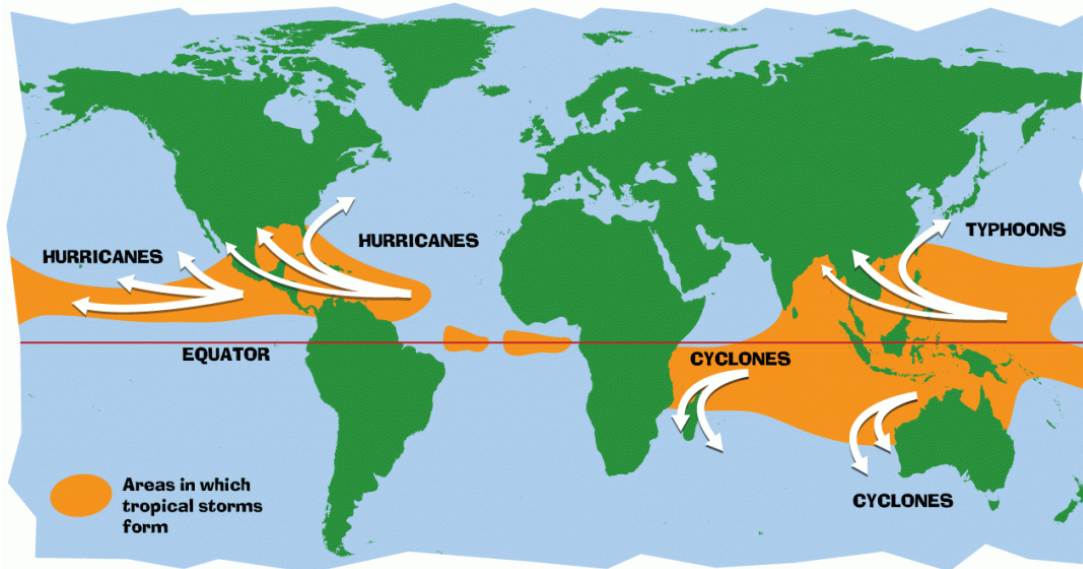
Figure 1. 2 Map showing the storm names in the world (Source: www.noaa.gov)

These storms would need a temperature of 27 ^{o}C to form on the sea surface, and cyclones are basically a huge storm with associated winds and rains (Deo et al., 2011) and they are categorized according to the maximum force of the wind it sustains (Table 1.1). Low-pressure systems (first stage of cyclone formation) form between 5 ^{o} and 30 ^{o} North and South of the equator. Their intensity may vary from less than 62 Km/ hr (tropical depression) or to a tropical storm with wind intensity ranging from 62 to 118 Km/ hr (Campbell, 1984).

Table 1. 2: Category of Tropical Cyclones (Deo et, al, 2011)

Category	Sustained Wind speed (Km/hr)	Types of Damages due to Hurricane Winds
1	119- 153	Very dangerous winds will produce some damages
2	154- 177	Extremely dangerous winds will cause extensive damage
3	178- 208	Devastating damage will occur
4	209- 251	Catastrophic damage will occur
5	> = 252	Catastrophic damage will occur

Cyclones form in a circular motion around the 'eye' towards the middle of the storm, where there is also little to no wind or rain at all. Storms surges are also a characterizes of cyclones, often follows the strong storm winds. Storm surges are formed by the combination of strong winds and low atmospheric pressure causing huge swells at sea, these swells are then driven to the shoreline by the strong winds and in turn pile up the shorelines. It would take about an hour

for the water to reach its peak in causing a rapid increase in sea level. It would take an hour for the water to subside after the storm surge (Terry, 2007). The damages caused by the storm surges are usually as high as the damages caused by the gale winds.

Cyclone weaken by the time they reach land and it is through the loss of energy supply from the warm moist air on the surface of the sea. On the other hand, the Pacific islands have smaller land size so, the cyclone strength tends to not weaken when it makes landfall (Terry, 2007). This is the reason why a single tropical cyclone in the South Pacific will affect more than one country at a time. In the south Pacific region climate change is predicted to affect the weather patterns in the future. Climate change will lead to a higher temperature and stronger El Nino events (Mimura et. Al., 2007). According Terry (2007) impacts of these climate change effects on tropical cyclones would include;

1. Changes to the pattern of the origin of the cyclone- indicating there will be less clustering and more cyclones spreading to the east than the present
2. Not much change to the total number of cyclone frequencies but in general there would be more storms east of the 180^0 longitude
3. There will be increase in tropical cyclone intensities, lower central pressures and bigger maximum wind speeds
4. A much longer cyclone lifespan
5. Cyclone track direction will be more towards the south (southerlies)
6. Longer track length and farther poleward direction before the cyclone decays

This simply means that although there may not be an increase in cyclones in the region, the tropical cyclones will most likely be stronger.

1.2 Tropical Cyclones in Fiji

According to World Risk Index of 2019, Fiji is ranked number 12 out of 180 countries for risk of natural disasters. The index combines exposure to natural hazards such as storms, floods, earthquakes, droughts and sea level rise; susceptibility in terms of likelihood of suffering harm through public infrastructure, nutrition and general economic conditions; capacities arising from governance, medical services, social and economic security to reduce negative consequences; and capacities for long- term adaptation to future events and climate change (Johnson, 2016; United Nations University Institute for Environment and Human Security (UNU), 2011). Fiji has been affected by 46 cyclones (Table 1.2) from 1980 to 2018, where about 10% of Fiji's population is directly affected by natural disasters in a year. Of this 10%, half of it was tropical cyclones, one – third floods, and 8% earthquakes (Johnson, 2016).

Information for cyclones in the South Pacific are mainly from two sources EM-DAT[1] and the Pacific Disaster Net managed by the South Pacific Community (SPC) database. The EM-DAT data has data dating back to 1950 whilst the Pacific disaster net has data from 1940, together with reports and data from Meteorology office of Fiji, the list of cyclones in Table 1.2 were documented (Johnson, 2016). Additional information was gathered were cited from Terry, (2007).

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[1] EM-DAT: The OFDA/CRED International Disaster Database- www.emdat.be- université catholique de Louvain, Brussels, Belgium

Fiji experiences on average one cyclone per year, and since 1980 the various disasters have resulted in average annual economic damages of around F$35 million (US$16.3 million) and impacted the lives of around 40,000 people each year (Government of Fiji, 2016).

Table 1. 3 Tropical cyclones in Fiji, 1980- 2022 (Johnson, 2016; Terry, 2007).

Named tropical cyclone (category)	Cyclone category	Date	Effects
Cody	1	5- 13/1/2022	USD 4 million
Ana	2	30- 31/2021- 1/2/2021	1 death, 7,000 people affected
Yasa	5	17- 19/12/2020	USD 250 million in damages
Sarai	2	25 27/12/2019	USD 3 million in damages
Josie, Keni	1	2-5/04/ 2018	USD 10 million in damages
Gita	4	13/02/2018	USD 1.23 million in damages
Winston	5	19-10/2/2016	44 deaths 350,000 people affected USD 1.4 billion in damages
Lusi	3	14/3/2014	10 deaths USD 3 million
Ian	4	2/1/2014	1 death USD 4.3 million in damages
Evan	4	12- 17/12/2012	1 deaths 8,400 people affected USD 8.4 million in damages
Daphne	2	3/4/2012	Unlisted
Bune	2	24/3/2012	Unlisted
Wilma	4	23/1/2011	USD 1.9 million in damages
Tomas	4	12/3/2010	3 death 39,101 people affected USD 39 million in damages
Mick	2	14/12/2009	4 deaths 3,845 people affected FJD 26 million in damages
Gene	3	28/1/2008	7 deaths
Daman	4	5/12/2007	69 people affected USD 0.7 million in damages
Cliff	1	5/4/2007	1 death Landslides and mudslides associated
Vaianu	1	11/2/2006	Unlisted
Jim	3	29/1/2006	168 people affected
		8/4/2004	16 deaths 5,000 people affected USD 4 million in damages
Ami	3	14/1/2003	17 deaths 30,000 people affected

			USD 30 million in damages
Paula	2	1/2/2001	1 death 7,000 people affected
Iris	4	7/1//2000	Unlisted
Dani	3	19/1/1999	9 deaths 1,772 people affected USD 3.5 million in damages
Cora	2	23/12/1998	Unlisted
Hina	3	12/3/1997	Unlited
Gavin	4	10/3/1997	25 deaths 3,500 people affected USD 27 million in damages
Tomas	4	20/3/1994	Unlisted
Kina	3	2/1/1993	21 deaths 160,003 people affected USD 100 million in damages
Joni	4	11/12/1992	1 death 2,000 people affected USD 1.6 million in damages
Fran	4	5/3/1992	Unlisted
Sina	3	28/11/1990	6,000 people affected USD 10 million in damages
		1/1/1987	1 death 3,369 people affected USD 25 million in damages
Rajah	3	28/12/1986	1 death 3,000 people affected USD 20 million in damages
Martin	1	10/4/1986	Unlisted
Hina	3	11/3/1985	Unlisted
		7/3/1985	1 death 20,000 people affected USD 3 million in damages
Gavin	4	5/3/1985	3 deaths 2,000 people affected
Eric, Nigel	3 3	17/1/1985- 19/1/1985	28 deaths 1000,000 people affected USD 73 million in damages
Oscar	2	1/3/1983	9 deaths 200, 014 people affected USD 50 million damages
Arthur	2	15/1/1981	4,700 people affected
Wally	1	24/3/1980	18 deaths 35,250 people affected USD 2 million in damages
Peni	3	2/1/1980	Unlisted

1.2.1 Tropical Cyclone Winston

TC Winston – the biggest ever recorded in the South Pacific at Category 5 with wind gusts at 200 mph and average wind speeds of 285 km/hr tore its way through Fiji on 19-20 February 2016 (Gard and Veitayaki, 2017). The cyclone damage was estimated to have caused damages amounting to nearly FJD 4 billion (US$1.8 billion) and killing 44 people (GOF, 2016). 30,369 houses were estimated to have been damaged or completely destroyed (22 % of the households in Fiji) (ADB, 2017; Gard and Veitayaki, 2017). The cyclone forced 131,000 people into temporary shelters around the nation and other damages also included infrastructural damage to 495 schools and 88 health centres (ADB, 2017; Gard and Veitayaki, 2017). Traditional communities and informal communities were the vulnerable group of people in Fiji, who relied a lot on agriculture-based resources for livelihood.
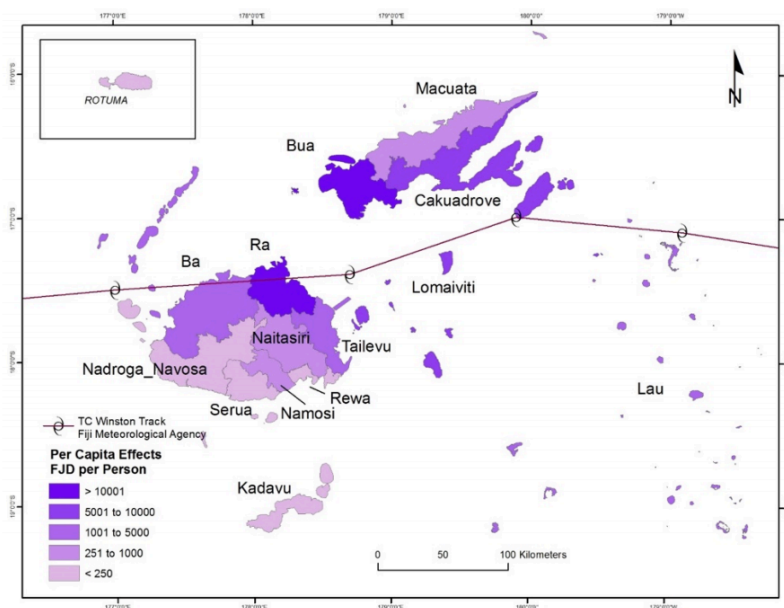
Figure 1. 3 Tropical Cyclone's Winston effect in Fiji (PDNA, 2016)

The Eastern Division of Fiji was the first to be hit by Winston and severely damaged the Islands of Koro, Ovalau and Taveuni, also damaging other Island's within its path before reaching its peak strength and making landfall on Viti Levu (Northern part) and Vanua Levu (Southern part) (Figure 1.3).

In addition to the extreme wind speeds, storm surges led to flooding in many islands, and in some cases, inundated areas almost 200 meters inland. The damage to the housing and agriculture sectors was severe, with significant damage also to public buildings (particularly schools) and transport, as well as electricity and communications infrastructure. Some of the worst hit areas were outlying islands. The Post-Disaster Needs Assessment (PDNA) estimates total damage and losses to the productive, social and infrastructure sectors at USD 959 million (22 percent of GDP).

1.2.2 Tropical Cyclone Yasa

TC Yasa made landfall on 17 December 2020 as a Category 5 cyclone, causing extensive damage across Vanua Levu, with estimates of 97,000 people affected. It was the most destructive cyclone since TC Winston in 2016. Just over a month later, on 30 January 2021, TC Ana made landfall as a Category 2 cyclone across Vanua Levu and Viti Levu, heavily damaging crops, weakening house structures and causing power failures. Significant flooding, accompanied by extremely high seas and storm surges, caused coastal inundation.
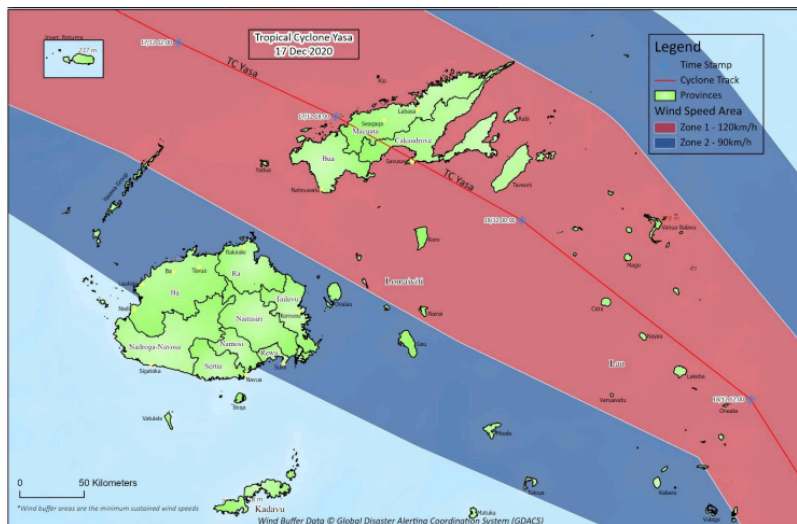
Figure 1. 4 Tropical Cyclone Yasa path (UNOCHA, 2020)

The worst impacted communities were in Macuata and Cakaudrove, which were still recovering from TC Yasa. A total of 14,755 evacuees in 422 evacuation centres were supported as part of the early warning and response. Access in the Northern division was initially a challenge during the response period due to severely damaged roads, continuous cyclones, flooding, and poor weather. Access was further restricted due to the COVID-19 outbreak.

During this operation, significant challenges were faced due to the widespread community transmission of COVID-19, which started in mid-April 2021. A total of 52,009 COVID-19 cases and 673 deaths were recorded between April and October, although it is assumed numbers were much higher due to lack of testing. During this time, the Fiji government put in place significant restrictions, with movement restrictions across several containment zones throughout the main island of Viti Levu and stopping all inter-island travel, including to key cyclone-affected areas in Vanua Levu.

1.3 Post disaster response and recovery in Fiji (national intervention)

After the devastating effects of TC Winston on the island nation efforts by the government to respond and recover to the effects of the cyclone. According to the Disaster Recovery Framework (DRF) (Government of Fiji, 2016), some sectors like agriculture which a lot of the indigenous communities rely on will take years to recover. The DRF aimed at implementing and planning for recovery programs that was targeted towards building resilient infrastructure and building back better. The top recovery priority for the government is shown in Table 1.3.

Table 1. 4 Recovery Priority for Fiji after TC Winston (Source: Government of Fiji, 2016)

Recovery Priority	Scope	Lead government agency
(i) Rebuilding Homes	to assist in the repair/ reconstruction of damaged houses, relocate affected families living in hazard prone areas to safe areas, and to develop sustainable and disaster resilient settlements	Ministry of Women, Children and Poverty Alleviation
(ii) Restoring Livelihoods	to support the recovery of rural and urban livelihoods and the delivery of employment, livelihood and social protection services at the community level in affected areas	Ministry of Employment, Productivity and Industrial Relations
(iii) Repairing and Strengthening Critical Infrastructure	to restore and improve infrastructure and to facilitate the delivery of basic services such as education, health, water supply, sanitation and electricity	Ministry of Local Government, Housing, Environment, Infrastructure and Transport
iv) Building Resilience	to strengthen community and environmental capacity to cope with future disasters	Ministry of Agriculture, Rural and Maritime Development and National Disaster Management

The Fiji governments priority for recovery following TC Winston emphasizes the importance of developing resilience. This is accomplished through government interventions in (i) voluntary community relocation and (ii) disaster risk reduction and management, which focused on building government assets and institutional frameworks for policy and disaster framework delivery in the country. (iii) The environment through the conservation of coral reefs and the replanting of mangroves, and (iv) culture and legacy through the restoration of historic places. The ministries responsible was highlighted in the framework and a budget of 331 million USD was set aside as the total cost of the governments' recovery work (Government of Fiji, 2016).

The government also responded to the plights of those affected thorough social assistance programs targeted towards shelter, cash transfer programs and relief assistance (Figure 1.5). According to the PDNA (2016) the humanitarian efforts given by countries outside of Fiji was successful in terms of responding to basic shelter, food and water for the affected communities. The sector that was the worst affected was agriculture. Apart from the humanitarian aids

received from development partners, affected households and individuals were ablet to access social assistance from the government and from the Fiji National Provident Fund (FNPF).
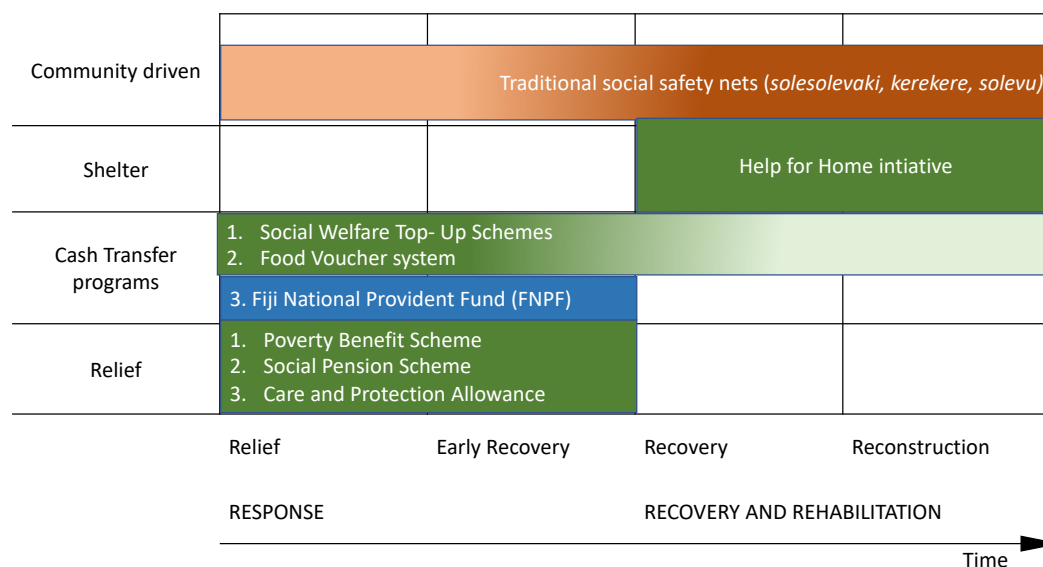
Figure 1. 5 Social Assistance program Post TC Winston

1.4 Community interventions

When considering communities response to TC Winston, social capital was prevalent in how communities were able to organize and address their immediate needs. This section states findings from my master's research which forms the bases of this research. The role of social capital was investigated in 3 case studies sites (Veitata. S, et al, 2021). The sites will be discussed in the later section of this chapter. The aim of highlighting of these findings here is to introduce communities' capacities and their potential in community resilience.

Social capital is the collective asset in the form of shared norms, trust, networks, social ties, and institutions that promote cooperation and collective action for mutual advantages. It has been extensively studied in the past (Chamlee-Wright and Storr 2011; Zahnow et al. 2019). Beyond these many shared norms and elements found by researchers, Aldrich (2012) notes that social capital is studied in three dimensions: bonding, bridging, and linkage (Figure 1.6).

According to Woolcock (2002) and Putnam (2000), community members that are similar to one another and may reside nearby may form relationships with one another. This is referred to as bonding social capital. The family unit and the individuals are linked through bridging social capital to create a "connection to external assets" (Putman 2000,23).

Linkage is a vertical relationship with those in formal or institutional levels in society or those in positions of power, whereas bonding and bridging social capital are considered as horizontal links (Szreter and Woolcock 2004). In this study, "bonded social capital" refers to ties among families, communities, and the village network. The church in the village, family networks outside the village, and other networks outside the village are all tied to bridging social capital.

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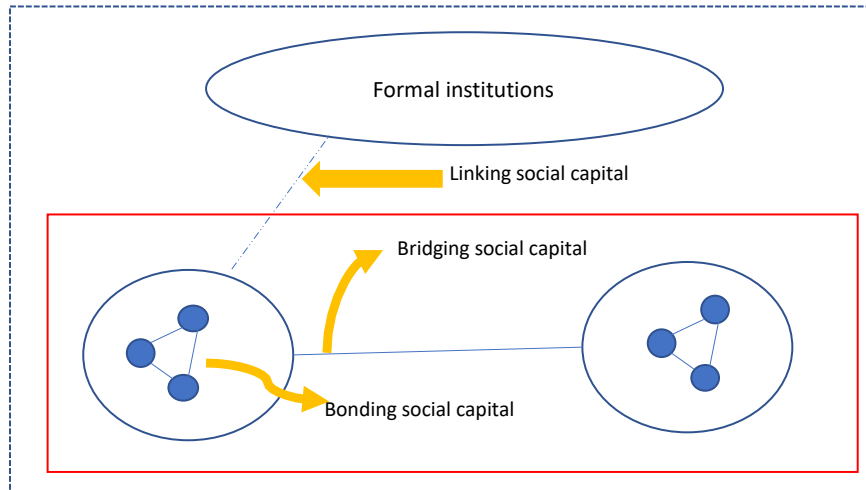
Figure 1. 6 Social capital framework used in the research adapted from Aldrich (2012)

1.4.1 Social capital in community response activities

Following a village headman's interview, the needs identified by the locals are described in this section. The coordination of actions immediately after the cyclone will be assisted by the necessities. The first thing that was done the day following the cyclone was to assess the damage, which also involved keeping track of injuries and fatalities. Then the village was cleaned up, which was mainly done by males and young people while the women concentrated on cleaning their individual homes. Other village urgent priorities included: housing repairs and building, food for evacuation centers, drinking water, sanitation, and the care of the elderly, disabled, and children, aside from the initial disaster assessment and the clean-up (village and individual residences). The timeline in Table 1.4 shows each event in detail.

Cleaning was continuously carried out for about three months with the fixing of water pipes and toilets carried out simultaneously. Despite the complete destruction of farms (100%) and households gardens in the villages, root crops and vegetables could still be salvaged through a quick harvest during the first two months post-cyclone. These were used for consumption in evacuation centers and individual homes. The destruction of farms included food and fruit trees that the villagers also relied on for their livelihood. Shelter and the need to move back to stranded family homes were a need observed in all three villages. Home repairs and reconstruction allowed for the repurposing of materials collected from the cyclone debris collected from the village clean ups. Materials included corrugated iron sheets, timber, and fallen trees for poles and beams.

Table 1. 5 Timeline of identified needs and relevant activities in the villages

Name of the villages and Need		Activities	YEAR 1 (months)					
			F	M	A	M	J	J
All the villages	Cleaning	Village youth and men clean the village and women at home	▨	▨	▨			
	Water and sanitation	Temporary fix water pipes and toilets from debries materials	▨	▨				
	Food	Salvage food from the gardens to share with families	▨	▨				
	Shelter	repair and construct temporary houses from materials saved from the cyclone (eg, corrugated iron sheets, tember, beams and poles)	▨	▨	▨	▨	▨	
Nabuna	Protection of the elderlies	Villagers transferred sick and injured by boat to hospital	▨					
	Food	Village canteen/shop were distributing food to those that needed	▨	▨				
Navala	Shelter	Patching roofs of traditional houses from collected grass and reeds	▨	▨	▨			
	Shelter	Collection of timber from the river (floated downstream)	▨	▨				
Navuavua	Cleaning	Villagers clean up individual homes	▨	▨	▨			
	Food	Village canteen/shop were distributing food to those that needed	▨	▨				

In addition, there were specific needs in some villages. In Nabuna village, the priority also included the transfer of elderlies, disables and the children to Suva (capital city of Fiji), to be in the care of their families (the week after the cyclone). This was because of the extent of the damage in the village was about 92% of the houses were destroyed (28 of the 29 households interviewed). In Navala village, there are 94 of the 119 households living in traditional houses and 60% of which were minimally damaged (where only the thatch was blown away by the strong wind). Grasses and reeds collected from the cyclone debris were used to thatch and patch the areas of the houses damaged. Beams and poles collected from the river were also used to either 'straighten' the houses or to build temporary shelters for the families. In Navuavua village, most of the houses were made of concrete and 85% of the interviewed houses were destroyed, either completely or partially. The community's ability to priorities immediate needs and to work together to address them is crucial in community response after a disaster is vital. Despite the difference in communities' characteristics, the activities they prioritized were the same.

1.4.2 Community response bonding social capital

a. Family bonding

Families are an important unit of a traditional Fijian village and are usually the first unit of interaction within the village, before the clan and village level. The extended families (same family unit in different houses) in the three villages were the first point of assistance within the village. They evacuated at neighboring family' houses particularly in Nabuna and Navuavua as the family commonly live close to each other in traditional villages.

Food acquired from quick harvest and from those with small village shops, was shared with families in the village and those in the evacuation center. The sharing of food is reflective of

the traditional practice of *takitaki* whereby food is given to another family because of mutual care (*veilomani*) or kinship/relationship (*veiwekani*) or as a thank you for a task one has assisted with. The act of *takitaki* is also done to families with elderlies and those in need as they would not be able to go to their own farms to salvage their farm crops. All three communities shared experiences of sharing food and eating communally during the first weeks after the cyclone.

The Fijian culture is centered around family and communal living, these inbuilt bonds form a safety net for any family that may need help during or after disasters. The concept of *veilomani* (love, kindness or mutual care) and *veiwekani* (kinship) are seen to be amplified in community response amongst families. This is further discussed in Chapter 4 of this dissertation.

b. Community bonding

Fijian traditional communities share human resources. Many interviews referred to the traditional practice of *solesolevaki* as the primary means of labor sharing. *Solesolevaki* mainly refers to the collective efforts which "manifests in the communal nature of Fijian society, where everyone is related and is obligated to work together" (Movono and Becken, 2018). This traditional practice mirrors social capital in the Fijian context. Communal work was evident in the cleaning and the fixing of necessities after the cyclone. Navala with traditional houses, particularly heavily relied on bonding social capital for the maintenances of these house (Figure 1.6). Repairs of temporary houses immediately after the disaster was possible through *solesolevaki* in the three villages, the trust and mutual understanding within the villagers encouraged bonding social capital.

Figure 1. 7 Men of Navala participating in *solesolevaki* in the village (Source: Mari Miyaji)

The existing governance structure within traditional villages in Fiji allow for an organized coordination of activities and the distribution of relief supplies. There is a strong trust and mutual understanding placed on the leaders within the village and coupled with the traditional practice of *solesolevaki*, there are strong bonds with families and clans that is in existence in daily life and is utilized well during and after disasters.

The chief and the clan leaders are the leaders in any traditional Fijian village and are often the decision-making body together with chairman of any village committee (Figure 1.8). This structure is important in the implementation and the maintenance of the practice of *solesolevaki*.

The traditional leaders choose the village headman who plays an important role in managing the village administration. The village head man (*Turaga ni Koro)* takes on the leadership and coordination role in the community bonding process. Chiefs and traditional leaders cooperate and follow the directives given by the village headman during the response period and this ensures the respect of the villagers.
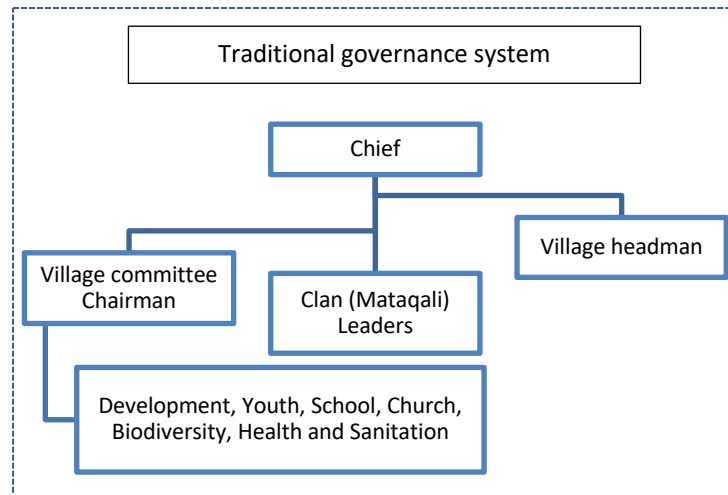
Figure 1. 8 Established community governance system in traditional villages

1.4.3 Community response bridging social capital

a. Family network

Family networks are in those living beyond the boundaries of the villages and this mostly refers to family either extended unit or in the nuclear family unit. These networks are important in assisting families in the villages immediately after the cyclone. In Nabuna village an emergency committee was formed by family members on the main island of Viti Levu. The goal of this committee was to collect relief supplies from donations and gifts and its immediate transport to the village. The early intervention of this family link enabled the distribution of water pipes, construction materials to fix drinking water systems, toilets and supply beddings and food to the village. The committee also organized the transfer of elderly, disabled and children to families on Viti Levu. In Navala and Navuavua, families' outside of the village assisted in the supply of relief items and building materials. This was carried out more at the individual family level and not at the communal level.

Family networks outside of the village are formed due to marriages, urbanization and the search for employment and better education in the cities and towns. These family members residing outside the village often contribute to ceremonies and obligations such as deaths, birthdays, weddings and catering for *solesolevaki* activities within the villages.

b. Church network

Religion is important in traditional villages in Fiji, where the Christian faith is dominant. Christian rituals are imbedded into Fijian traditional culture, prayers before every meal, daily devotions and several church services within a week is considered a norm and can be observed in all villages in Fiji. All villages have a church building and Sundays are considered *tabu* (forbidden or holy) where attending church and resting is mandatory.

The churches in the three villages also played an important role in community response activities in the three villages. In Navala, because of its location the Catholic catechist from Ba town was the first to reach the village, having to walk 20km to deliver toiletries and food items the day after the cyclone. In Navuavua village, a family who is a member of the Salvation Army church was assisted by the church with food supplies and the reconstruction of their damaged homes. The church was also able to assist the family in setting up a small shop in their house to help with their livelihood. The Indian division of the Methodist church in Navuavua also assisted families who were members of their congregation with clothes and food relief supplies, which was shared with families within the village. The Methodist church provided psychosocial support to the affected in Nabuna village, via the provision of counselling and spiritual support for families.

The church networks in the villagers are forged by the community. It is built by those that attend the same church within the village and extends to the church network of congregations and divisions outside of the village. The church is also utilized by the government and NGO's in Fiji to share about climate change, and disaster management.

c. Other groups of people

In Navuavua village people from all walks of life were delivering food and relief items to the village. Businesses from the western side of Fiji supplied and delivered cook food within the first week after the cyclone. This also included supplies of clothes, toiletries from people that wanted to help those affected. These businesses and donors were mostly from towns unaffected by TC Winston. The proximity of Navuavua village to the main highway allowed for the ease of dropping off relief supplies by different groups of people. These groups were connected to the village through businesses that employed the villagers. These businesses have a network in the village as seen in Navuavua and are bringing social capital in that sense that these existing networks assist with the communities' response activities.

The family outside the village, the churches, and other pre-existing networks were the bridge to the community in providing food supplies, providing the much-needed evacuation shelter spaces, transportation of the elderlies and providing materials for rebuilding houses and temporarily fixing water pipes and toilets. The networks formed through the bonding and the bridging social capital in the three villages shows an insight into the community capacities in Fiji. They highlighted the preexisting non- governmental networks available that are in play in villages. To bridge the gap highlighted in the National Disaster Risk Reduction policy, it is

important for government to recognize these networks and to utilize and enhance them to build community resilience and to manage relief and response in future disasters.

1.5 Significance of this study

Villages in Fiji will draw upon social capital when responding and recovering from any disasters when relief supplies and distribution are delayed. Communities were able to meet their immediate needs such as food, temporary shelter, cleaning and basic sanitation within the villages whilst waiting for the relevant authorities to reach them. This was possible through their family, community and existing networks. Communities ability to prioritize needs and utilize both bonding and bridging social capital is important in creating resilient communities with a bottom-up approach in linking the existing gap in Fiji's disaster management act and policy. Whilst governance in Fijian traditional communities are observed and trusted upon, they can also become a factor to influence social capital is maintained in the villages. The current leadership should maintain the organization of the village to allow for traditional bonding and bridging social capital to be encouraged.

Natural disasters will increase in intensity in the future, and communities need to be better prepared in the future. Disaster management in Fiji should be focused on risk reduction in its management approach to strengthen the links between local government and local communities. This research can be applied to broader issues within any community, looking at the potential and actual roles that traditional indigenous communities play when responding and recovering from TC Winston. The findings of this research are expected to fill a gap in the formulation and implementation of the Community Based Disaster Risk Reduction (CBDRR) policy for Fiji. It will provide the highly important evidence base for the formulation and implementation of the policy. It will also bring to light actions and practices that utilized communities' social capital, resilience and traditional practices which can deepen the understanding of Fijian communities.

1.6 Research Objectives, Questions and Hypothesis

The study of community response to the disaster in Fiji, saw a need to explore how social capital was utilized in the successful interventions by the community. Given the vulnerability of communities and Fiji's disaster profile, and the knowledge that communities social capital and social networks play an important role in creating resilient communities. This doctoral research aims to investigate the potential of traditional norms and practices as an effective vehicle for CBDRR in Fiji.

Community level is considered to be an appropriate level for disaster preparedness interventions, where community members experience different degrees of access to community institutions and resources. Fiji because of its location is highly vulnerable to many intense cyclones. Communities need to be properly equipped and informed on how to act. The latest IPCC Working group II reports and the experiences from past research should be the main drive towards the need for building resilient and prepared communities. Indigenous

communities are more at risk with the traditional knowledge and resources they hold. The specific objectives of the study are as follow:

    a. To examine the international frameworks and Fiji's national policies in disaster risk reduction and related topics in order to provide a background for the need and opportunities to strengthen CBDRR

    b. To investigate how traditional practices are maintained and traditional cultural norms are utilized in the indigenous Fijian communities

    c. To develop a framework to enhance CBDRR in Fiji based on findings from community response and recovery practices within the communities

The following questions are answered in this dissertation:

1. How has the National Disaster Risk Reduction policy in Fiji, changed from the pre-colonial to colonial to post-colonial period? How does this shift reflect community-based actions?

2. What traditional practices in Fijian communities pre-disaster times supports communities' responses and actions?

3. What is the community-based evidence for disaster preparedness, evacuation, response, and recovery in different types of villages in Fiji?

4. What are the research contribution to the Community Based Disaster Risk Reduction (CBDRR) in Fiji?

As mentioned earlier this PhD research is a continuation of my Master's research conducted from 2018 to 2020 investing the timeline of communities response activities after TC Winston (Veitata, 2020). Section 1.3 on Social capital discussed the main findings from that research. Table 1.5 shows a brief comparison between the coverage between the previous study and the current study. This research will look closely at the role of *solesolevaki* in community disaster response and recovery. It investigates *solesolevaki* pre-disaster settings and in the evacuation, temporary housing, and reconstruction phase of recovery after TC Winston (Table 1.5).

Table 1. 6 Comparisons between previous Master's research and current PhD research

	Master's research	**PhD research**
Case study sites	Nabuna, Navala and Navuavua	Nabuna, Navala and Rakiraki (a combination of two villages Navuavua and Navutulevu)
Post TC Winston focus	Communities response activities	Evacuation, temporary housing, farming, reconstruction phase Also includes findings and interviews from TC Yasa
Data collected	Timeline of activities against community social network	Focus on *Solesolevaki* (community cooperation) activities in the villages from communities affected by both TC Winston and TC Yasa
Main output	Understanding social capital potential in disaster response	CDBRR framework for building resilient communities post disasters

The study used the term 'potential' when referring to post- disaster community resilience. This is understood as having the power, influence or authority to develop into something in the future. Resilience in the indigenous community can be a given, the indigenous community believe they are already resilient because of the practices they have in the villages now are utilized for generations. However, there is still a lack of studies that highlights the factors that make communities resilient especially in terms of disasters. With keeping up to the focus of this research, definitions will be identified and tabulated with each researchers' who contributed to this disaster scholarship. Definition of terms used in this dissertation, in addition to the terms in the glossary:

Table 1. 7 Definitions used in this dissertation

Term	Definition	References
Traditional village	• Represents a cluster of human settlements that are governed by traditional leaders and culture	Dumaru, 2010
Indigenous communities	• Communities of people who are inheritors and practitioners of cultures and have ways of relating to people and the environment	UNESCO, 2002
Disaster Risk Reduction	• The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposures to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.	UNISDR, 2009
Community Based Disaster Risk Reduction	• A process of disaster risk reduction and management in which at risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities, and where the people are at the heart of decision-making and implementation of disaster risk reduction and management activities. • Referred to as "CBDRR" in this thesis	GOF, 2018 The National Disaster Risk Reduction Policy
Community Resilience	• Community resilience is the capacity to foresee potential hazards, adapt to ever-changing circumstances, and withstand disruptions while recovering quickly. Resilience-building activities include disaster preparedness, which covers prevention, protection, mitigation, response, and recovery.	UNISDR, 2009
Disaster response	• Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected	UNISDR, 2009
Disaster recovery	• The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-	UNISDR, 2009

	affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk.	
Vulnerability	• The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.	UNISDR, 2009

1.7 Research Framework and Methodology

To achieve the research objectives and to answer the research questions, this study was conducted in three stages, as shown in the research framework in Figure 1.9, in three case study locations, Nabuna village (an island village) on Koro Island, Navala village (mountain village) and Rakiraki village (urban village) in Viti Levu in the Republic of the Fiji Islands, from January 2022- August 2022. Field work was delayed in this PhD studies due to the global COVID-19 pandemic. Before the field work in 2022, I conducted an online survey to gather data on *Solesolevaki* for the second objective of this study. The findings from the online survey helped better understand community cooperation in villages in Fiji. This is discussed in Chapter 4 of this dissertation.

The case study sites will be described in detail in section 1.7 below. In Stage 1, the researcher examined National policies and how it has shifted looking at Fiji's history. The stage mainly focuses on bridging the gap between national policy guidelines/interventions to the community reality. In Stage 2, the research focuses on traditional villages social systems and practices. In stage 3, the activities communities participate in in terms of the disaster cycle are evaluated according to the factors for CBDRR. The findings from these three stages are used to formulate a framework for the proposed contribution to the national CBDRR policy for Fiji (Figure 1.9).
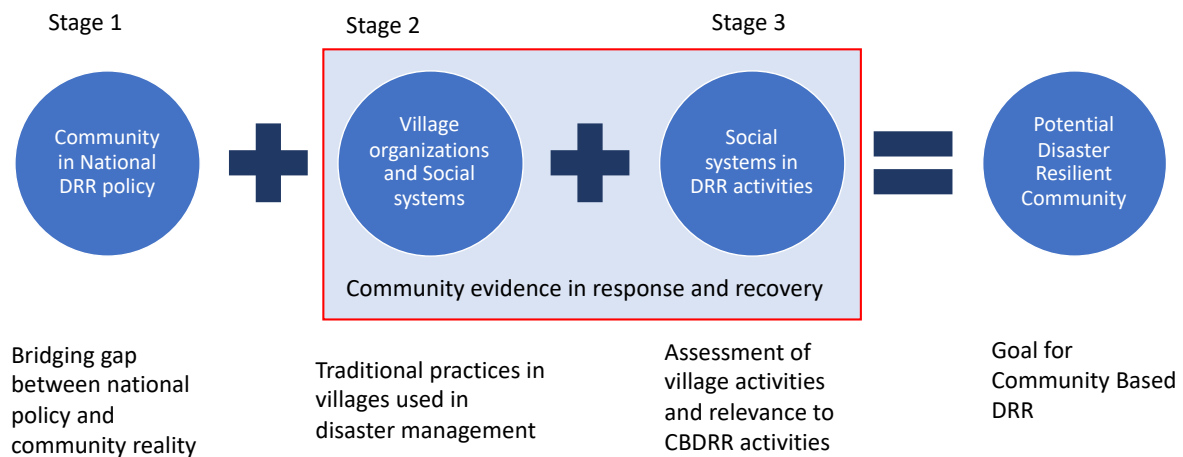
Figure 1. 9 Research Framework

The schedule of the field work and all that was done is captured in Table 1.7 below.

Table 1. 8 Data collection and details for the doctoral study

Date	Place	Main Activities
July 31 2021- August 31 2021	Online Survey- google form	• Questionnaire survey tagetted to all fijians • Interviews with two community examples (best practices post TC Yasa)
January 10 2022– April 4 2022	Navala (1. 5 weeks) Nabuna (1 week) Rakiraki (1 week)	• Household surveys • Interviews with NDMO officers
July 2 2022- August 30 2022	Navala (1 week) Nabuna (1 week) Rakiraki (2 weeks)	• Household surverys (continued) • Interviews with Key informants in the villages (*talanoa*)

The research methodology is briefly discussed here, with details to follow. The *Vanua* Research Framework (Nabobo-Baba, 2008) provided the overarching research methodology for this study. Three interconnected research threads pull it together: *bula vakavanua, tali magimagi* and *talanoa* based on the Vanua Research Framework. *Bula vakavanua* (Nainoca, 2011) is linked to active participant observation where the researcher is immersed in the *bula vakavanua* (indigenous Fijian way of life) and actively engages with the activities of the locals to build the trust needed for in-depth inquiries. *Tali magimagi* (Meo-Sewabu, 2015) involves the researcher in the weaving of both insider and outsider perspectives, knowledge, and insights of the research. *Talanoa* (Nabobo-Baba, 2008; Vaioleti, 2016), which is a form of dialogue and conversation rather than interviews, is a knowledge seeking and sharing activity which is culturally bounded and respected. For this research *talanoa* was used in the interviewing and questioning process in the village. This allowed for an informal and relaxed conversation between the research and the informants.

The traditional protocols of *sevusevu* where one requests for permission to visit the village and collect information was strictly adhered to. This was done in all of the three villages and the protocol included the gifting of a kava (*Piper methysticum)* plant to the elders in the village. This is observed in Figure 8 below. The same is done, when one leaves the village, where the *itatau* is presented to thank the village for being gracious hosts and for the hospitality they have

Figure 1. 10 *Sevusevu* in Navala village (Source: Sainimere Veitata)

shown. The research also adhered to the research permit protocol issued by the *iTaukei* Affairs, in 2017 as this research was a continuation from the researchers work in 2017- 2019.

1.6.1 Literature review

An extensive literature review is undertaken to summarize the results of previous research on community disaster recovery and resilience in the area of disaster risk reduction as well as to get acquainted with different literature available on Fijian indigenous culture and social norms . The research gathers secondary data from published books, scientific journals, organizational reports, and various websites. This is highlighted in chapter 2 of this dissertation together with a brief literature review serving as the background in Chapters 3, 4 and 5.

1.6.2 Preliminary Survey

An online survey was designed based on information gathered from literature on *solesolevaki* and the *iTaukei* world views. Questions was also asked based on my previous experiences in the field and as an *iTaukei* researcher. The online survey was also conducted as a mitigation to COVID- 19 protocols and measures. Field work could not be conducted from March 2019- December 2021 as Fiji was closed as villages could not be accessed. Google from was used for this purpose and the details can be found on Appendix 1 of this dissertation.

1.6.3 Household interviews and observations

One questionnaire survey was conducted targeting all the houseld holds in the three case study sites (see Appendix 2 for a copy of the household questionnaire sheet). In the villages the *talanoa* approach was used when gathering information from each household. This was carried out in the *iTaukei* language. The researcher having familiarity with the villages thorough previous work and family connections helped with the data gathering process. The *bula vakavanua* is vital when one is or carry out research in any indigenous village in Fiji. The researcher participated in the daily engagements in the village whist staying in the village, this allowed for in-depth understanding of the culture and the norms and in the village. The daily activities in the village, had to be closely followed and interviews were carried out when the opportunity arose (Figure 1.11).

Figure 1. 11 Pictures from the researchers' field work in Navala and Rakiraki (top), Nabuna (bottom)
(Source: Sainimere Veitata)

In total there were 253 household surveys completed from the three villages and the breakdown is in the table below. Houses that were not surveyed were empty or the occupants were never home when visited for interviews.

Table 1. 9: Details of household surveys conducted in the field

Site #	Village name	Number of houses	Completed survey	Houses empty or not present in the village	Percentage (%) of houses surveyed
1	Nabuna	75	54	21	72.0
2	Navala	141	127	14	90.1
3	Rakiraki	134	72	62	53.7

1.6.4 Key informant interview

Semi-structured interviews were conducted with officials from certain institutions who worked with community based DRR. This method was applicable when the discussion was conducted within the precinct of their offices and during official hours. In other cases, *talanoa* was also a culturally appropriate way of discussing and re-discussing of issues regarding the study, usually conducted informally over food or while kava was served. This is the most common approach taken in Fiji. Interviews were also done with key people in the village like the *Turaga ni Koros.*

1.7 Overview of the study locations

1.7.1 Site Selection

As TC Winston is the last major cyclone that affected Fiji, at the beginning of the research, numerous villages were taken into consideration. Ten (10) of the fourteen (14) provinces in Fiji were affected by TC Winston. The province of Lomaiviti, Koro island was among the totally damaged islands in Fiji. Together with Lomaiviti were the provinces of Ba and Ra. One of the assumptions that this research hopes to confirm is that locations and access to urban centers is a major factor in communities' ability to respond and recover from a disaster. Additionally, access to work, markets and alternative sources of livelihood will also determine the services that villages can use when recovering. Therefore, the type of village is key, case study sites chosen for the research is a representation of the common village types.

With these assumptions into consideration, the case study sites were narrowed to three indigenous villages in Fiji.
The main criteria for the case study sites are;
1. A village on an island
2. An 'urban' village
3. A highland village (one located more than 20 km from the nearest urban center).

Other factors that were taken into consideration include; (i) safety and accessibility for field work, (ii) traditional and family connections for ease of communication and facilitation of fieldwork needs, and lastly (iii) existing networks in the sites. The villages (Figire 1.12) chosen were; (i) Nabuna village on Koro Island, Lomaiviti Province, (ii) Navala village, Ba and (iii) Rakiraki village in Ra. A detailed description of the sites is given in the following sections. Navala and Navuavua are located on the main island of Viti Levu, the largest of the 300-plus islands in the Fiji Group. Koro island where Nabuna is situated is the sixth largest island in Fiji.
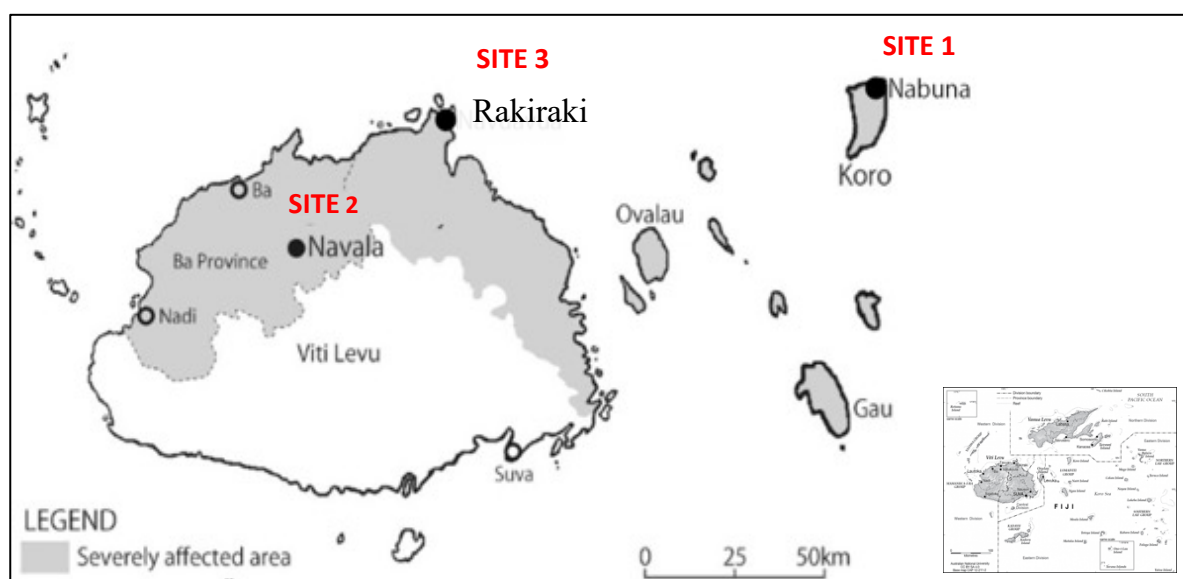
Figure 1. 12 Map of case study sites

This section provides a brief presentation of the geography, demography, and land tenure system in the three case study sites. The background information makes it possible to understand better why the communities were chosen for the case studies and their physical characteristics.

All three villages are considered Traditional Fijian villages. A traditional Fijian village is defined by the following;

- Houses built around a rara (village square) and they are grouped according to clans (Zamolyi, 2004)
- They follow the traditional governance system
- Inhabitants are indigenous Fijians
  The village is formally registered in the Ministry of iTaukei Affairs and the village is administered by the *Turaga ni koro* (village headman)

Figure 1. 13 *Rara* (an open space) in Navala village (Source: Sainimere Veitata)

1.7.2 Nabuna village

Figure 1.12 illustrates a map showing the location of Nabuna village, site 1 in this research. Nabuna village is an island village that is about 140 km west of the main city of Suva, Fiji's capital city. It is one of 14 villagers on the island of Koro, where none of the villagers were spared from TC Winston. Nabuna village has a population of about 300 people. There are six *mataqali* in this village and each has a leader who is also a member of the village committee. Land ownership in Fijian village is based on *Mataqali*'s whereby all six (6) clans have land distribution in the village. Nabuna village they are part of the Cawa district on Koro island (one of the two districts).

Figure 1. 14 Nabuna village showing some house damaged by TC Winston (Source: Mari Miyaji)

The village belongs to the province of Lomaiviti in the Fiji group. Figure 1.14 shows the houses in village and Figure 14, is the ariel shot of Nabuna showing its proximity to the coast. Koro is a big supplier of agricultural crops to the main markets in Fiji (Suva, Lautoka, and Nadi) and even supplies to export companies. Their main sources of the commodity are taro (*Colocasia esculanta*), cassava (*Manihot esculanta*), and kava (*Pipers methysticum*). Yaqona or kava is an important plant that is used in traditional ceremonies in Fiji and in the Pacific. There is a school close to the village that was used as an evacuation center during and after the cyclone. There is a church in the village that was destroyed by the cyclone and was later reconstructed by the villagers. The village has three outlying farming settlements where some of the households also have houses for farming. There is an inter-island ferry that services the island weekly together with a domestic flight from Nausori airport (20 km from Suva). The impact of the cyclone on the village is discussed in chapter 5 of this dissertation.

Figure 1. 15 Ariel image showing Nabuna village (Source: NDMO using a drone)

1.7.3 Navala village

Navala village is located in the highland of the main island of Viti Levu, at a distance of approximately 20 km from Ba town. It is the only village in Fiji, with the majority of houses made from traditional sources, the houses are called *bure* in the Fijian language (Figure 15). Navala is the biggest of the three case study sites, with a population of about 800 people and 141 households. The traditional structures within the community are similar in all three sites. Navala belongs to the province of Ba in Fiji.

Figure 1. 16 Navala village showing Bures (traditional Fijian houses) (Source: Ba Provincial Office)

Figure 1.12 shows the location of Navala village in Fiji. There is a bus that services the village four times a day, and this is how farmers transport their produce to the market. The bus fare is approximately 3 FJD (1.50 USD). Additionally, there are trucks that can be hired from Ba town to Navala and vice versa and would cost 50 FJD (25 USD).

1.7.4 Rakiraki village

Navuavua village is located on the western side of Fiji, close to the township of Vaileka in the district of Rakiraki, in the province of Ra. The village is located 2 km from the town, it can be regarded as an urban village, in that they have easy access to most goods and services from the town. The village is also located on the main Kings road, one of the two main highways on the main island of Viti Levu. The village has a population of 500 people with 100 households. The village is joined by the village of Navutulevu, and they are only separated by a footpath in the village. Navuavua village has six land-owning units (mataqali or the clans). The church and schools were designated evacuation centers, but these two structures were heavily destroyed after the cyclone. Figure 17 shows the houses in the village.

Figure 1. 17 Houses in Rakiraki village (Source: Sainimere Veitata)

The extent of the land that belongs to the six land-owning units is discussed in chapter 4, the main source of livelihood in the village is paid jobs and there are also some who farm in the village. The lands that are close to town are often let (leased) to sugarcane farmers and this is also a source of money for the clans. The village is surrounded by a lot of sugarcane farms and

some of the youths and men in the village are employed as cane-cutting gangs during the cane-cutting season and some also work in the sugar mill (Penang) on a seasonal basis. There are also some village shops inside the village, selling some basic food items and toiletries.

1.7.5 Comparing the characteristics of the three sites

The geography and the physical features of the three communities are distinctively different. The three studies made it possible to take a closer look at these community characteristics and provide a comprehensive set of data to answer the research questions and meet the study objectives. A summary of the specific characteristics of the three sites is presented in Table 1.9 below.

Table 1. 10 Summary Characteristics of three case studies

Attributes	Nabuna (Site 1)	Navala (Site 2)	Rakiraki (Site 3)
Geography	Coastal, two river systems	Relatively steep landscape, rural, dry vegetation	Valley, coastal, dry,
Physical features	Coastal village, have two river systems running through the village	Savanna, rocky, in a valley by the Yaloku river	Flat coastal village
Average Population - indigenous Fijian ethnicity (iTaukei)	250	800	300
Household numbers	75	127	100
Main source of livelihood	Farming, fishing	Farming	Hotel, private sector, transport, land lease

1.8 Structure of the Dissertation
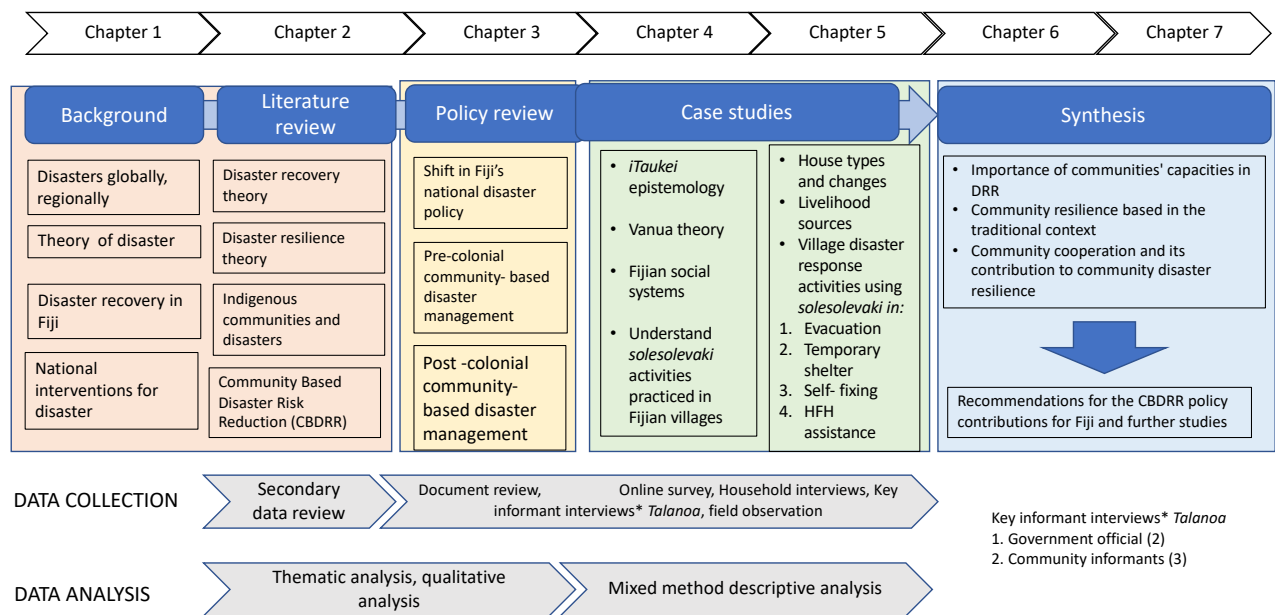
Figure 1. 18 Structure of Dissertation

Chapter 1: This chapter presents the background of this study including research objectives, questions, scope and the background of case study together with the research methodology.

Chapter 2: This chapter provides a review of disaster recovery theory and literature, presents the key concepts (recovery, resilience, social resilience, and community-based disaster management) incorporated into the framework for this study. As the main outcome of this study is the proposal factors in Community Based Disaster Management, this chapter also highlights some successful implementations and key factors to consider in implementing community-based disaster risk reduction measures and policies.

Chapter 3: This chapter presents the background to Fiji's Disaster management policy from the global to the national level. It emphasis the need to bridge the gap in how disasters are managed at the national level, with consideration to community findings. A review of the current policy is needed since communities are often at the forefront of disasters, and there needs to be a strong focus on community-based disaster management in Fiji.

Chapter 4: The general purpose of this chapter is to provide a brief background of the *iTaukei* worldview and its link to the concept of cooperation. It outlines the *iTaukei* worldview to overview how *solesolevaki* exists in a local community. This chapter also highlights similarities with other Pacific island countries to bring a more regional overview of traditional cooperation systems or *solesolevaki* in the Fijian context. This chapter reflects findings from an online survey done in August 2021 and interviews to provide an opportunity to explore the traditional practices that still exist in villages in Fiji. The chapter also discusses case studies of

how *solesolevaki* operates in some communities after TC Yasa in 2020 from interviews and 2021 fieldwork observations.

Chapter 5: The general purpose of this chapter is to provide detailed examples and comparisons of how *solesolevaki* functions in three different types of villages during and after a disaster. The main focus of this chapter is the response and recovery activities of the three case study sites detailed in Chapter 1. This chapter answers the third research question, "What are the community- based evidence for disaster preparedness, evacuation, response and recovery in different types of villages in Fiji". Findings from this chapter will contribute to the Stage 3 of the research framework: Evaluation of social systems in DRR activities. *Solesolevaki* is introduced in the chapter as Community cooperation.

Chapter 6: This chapter is the discussion of whole thesis. Where the three parts of the research framework are discussed in detail following the findings of the research.

Chapter 7: Details of each chapter are summarized. The overall conclusion of the dissertation is heighted together with the limitations of the study, recommendations and future studies opportunities.

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Chapter 2: Literature Review

Disaster management is an ongoing process used by individuals, groups, and communities to attempt to lessen, do away with, or recover from the risks and harms brought on by hazardous events. The method of dealing with disasters encompasses all aspects of preventing and recovering from extreme events, including mitigation, prevention, relief/response, and recovery (Henstra & McBean, 2005).

While preparedness comprises actions that improve a community's ability to respond to a catastrophic event, mitigation focuses on steps meant to reduce the risk associated with certain hazards. Before beginning longer-term rebuilding and recovery processes after a disaster, response and recovery activities strive to address urgent needs (EC, 2011). These four disaster management pillars are designed to work together to reduce losses in terms of money, property, and people before, during, and after a disaster (Phillips, 2009). The fourth phase, recovery, is the least studied and understood of these four (Barton, 1969; Coppola, 2007; Lloyd-Jones, 2006; Rubin, Saperstein, & Barbee, 1985; Schwab, 1998). This research hope to contribute more towards the preparedness phase by investigating activities and communities' capacities in the disaster recovery phase.

Before we can study the outcomes of the disaster recovery process in the wake of the Tropical Cyclone Winston event in 2016, it is crucial to establish the important language, concepts, and frameworks used for the research. The following chapter, which also provides a review of disaster recovery theory and literature, presents the key concepts (recovery, resilience, social resilience, and community-based disaster management) incorporated into the framework for this study. As the main outcome of this study is the proposal factors in Community Based Disaster Management, this chapter also highlights some successful implementations and key factors to consider in implementing community-based disaster risk reduction measures and policies.

2.1 Disaster Recovery Theory

Early research on disaster recovery centered on explaining the processes that take place during this time as well as behavioral responses to disaster occurrences both during and after they occurred. With his research on the nature of societal response to chronic and rapid-onset disaster occurrences in both developing and developed country contexts, Barton (1969) provided a summary of the literature on disaster recovery up to 1970. His research identified organizational behavior patterns and examined how people and communities behave during times of recovery:

> 1) The substitution of improvised emergency government agencies (such as a citizens committee or in combination with provincial/state or national agencies) for local government institutions that are frequently unable to cope and respond efficiently;
>
> 2) Voluntary, humanitarian organizations that frequently compete for funding and recognition are given the task of relief and reconstruction efforts, which may result in a breakdown in coordination;

3) The public's reaction to organizations is influenced by both symbolic actions and rational assessments of accomplishments; bureaucratic and emotionally impassive answers frequently lead to confusion and even animosity;

4) The teamwork and camaraderie felt in the immediate wake of the disaster may be overcome by resurgent animosity and group conflicts during the recovery and reconstruction phase.

5) To support local responses and boost efficiency, significant national programs are needed as large-scale catastrophes overwhelm local capability (Barton, 1969, p. 284).

Haas, Kates, and Bowden (1977) conducted one of the early studies to carefully evaluate the recovery process and made the claim that "disaster recovery is organized, knowable, and predictable" (p. xxvi). After researching the recovery and reconstruction efforts following four significant disasters—three in the United States and one in Nicaragua—they created a disaster recovery model that split the process into four distinct but related phases:

1) Emergency Period: the early period after a disaster, last a few hours or days, during which the community begins to cope with losses of life, property, and injury while also commencing the cleanup process. During this time, the community's regular operations are disrupted. The emergency phase is usually referred to as the response phase in disaster management cycles.

2) Restoration Period: includes the time when vital communications, transportation, and services are resumed. This time frame could be weeks or months long, depending on the community and resources available.

3) Substitution The capital stock of the city is rebuilt to pre-disaster levels, and economic and social activity are at pre-disaster levels or higher during the reconstruction period.

4) Commemorative, Betterment, and Developmental Reconstruction Period: consists of three connected purposes, including disaster memorials and commemorations, large reconstruction works to improve the city, and the start of future growth and development (Haas, Kates, & Bowden, 1977, p. xxvii).

Although recovery and reconstruction times are also "a function of pre-disaster trends, the damages suffered, the resources available for recovery, and, to a lesser extent, leadership, planning, and organizations," according to the recovery model, each period's length is based on a logarithmic relationship, lasting roughly ten times longer than the one before it (Haas, Kates, & Bowden, 1977, p. 1). Others have criticized the Haas, Kates, and Bowden (1977) model for its linear, value-added approach and for failing to explicitly acknowledge the politics involved in disaster recovery, despite the fact that it provided one of the first theories of disaster recovery (Berke, Kartez, & Wenger, 1993; Schwab, 1998).

Geipel (1982) used the study of reconstruction following the 1976 Friuli earthquake in Italy to explore the influence of historical heritage, culture, and politics on the perception of hazards and the recovery process. The crisis event, he found, made pre-existing disparities more pronounced, and the "original hierarchy of duties, persons, and power relationships expresses itself greater fiercely than ever, and it is very hard even for relief policies to change" (Geipel,

1982, p. 180). While the elderly and the economically challenged suffered as a result of the 1976 Friuli earthquake, merchants and tradespeople gained from the post-disaster rescue operations.

Like Haas, Kartez and Bowden (1977), Geipel (1982) noted that the time required for reconstruction is a function of the damages suffered, pre-existing economic trends and the presence of local resources for recovery. Geipel's work also focused on the conflicts experienced during the recovery period as planners and developers establish grandiose rebuilding plans that compete with local citizens' ideas for reconstruction – which are usually to see the area rebuilt to pre-disaster norms. This is supported by other recovery research that found local citizens exert tremendous pressure on governments to rebuild the community to its pre-disaster form and that other forms of conflict arise from the distribution of relief and recovery aid (Mileti, 1999; Mustafa, 2003; Schwab, 1998). These findings are depicted in the conflict model of recovery in Figure 2.1
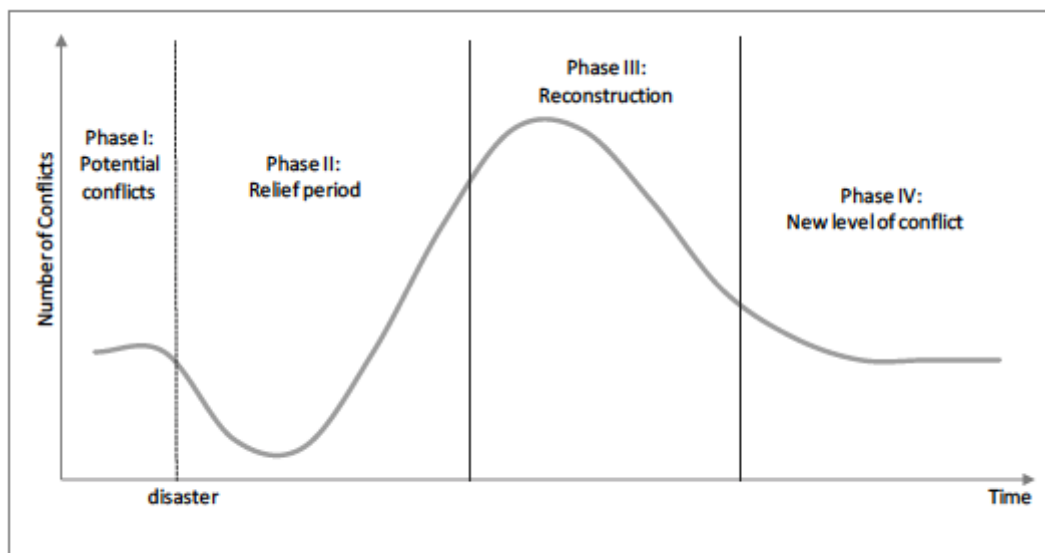
Source: (Geipel, 1982, p. 172)

Figure 2. 1 Conflict model of Recovery (Source: Geipel, 1982)

In Geipel's (1982) model, there are a number of pre-existing potential conflicts (phase I), although the disaster event itself acts as a catalyst for solidarity, sacrifice and mutual helping (phase II). As external interventions begin and relief aid is distributed, conflicts begin to arise and during the reconstruction planning phase, conflicts reach a maximum (phase III). Issues of class, culture, and in the case of Friuli, historical heritage, create differing perceptions on needs, rebuilding plans and the role of government and external intervention in the recovery process. As reconstruction comes to an end, the number of conflicts decreases as individuals' and families become accustomed to the new circumstances and living arrangements (Geipel, 1982).

Rubin, Saperstein, and Barbee (1985) explored the difficulties in measuring recovery as an outcome. After examining how previous research had attempted to use recovery as a dependent variable, they made the decision to conceptualize recovery as a process: "recovery is an

ongoing process and, therefore, difficult to measure once and have that suffice" (Rubin, Saperstein, & Barbee, 1985, p. 14). Conceptualizing recovery as a process has a definitive impact on how assessments of recovery efforts are conducted and this view has been increasingly adopted in recovery research (Brown, et al., 2008; Mileti, 1999). Mileti (1999) focuses on recovery as a process incorporating "not just a physical outcome but a social process that encompasses decision-making about restoration and reconstruction activities…[and] also stresses the nature, components, and activities of related and interacting groups in a systematic process and the fact that different people experience recovery differently" (p. 229 – 230).

The recovery framework developed by Haas, Kartez and Bowden (1977) was critiqued by Rubin, Saperstein, and Barbee (1985) who found that the recovery process did not always imitate the sequential phases set out by their model and that "issues frequently crop up in simultaneous or illogical sequences" (p. 6). Rubin, Saperstein, and Barbee (1985) also found that local governments, particularly in the United States, have increased their capacity to respond to disasters, limiting the need to supplant them with emergency government agencies, as suggested by Barton (1969). For example, Lewis (1999) observed that supplanting indigenous administrative units with non-indigenous equivalents may result in reduced "local capacity to identify, assess and to adjust those structural weaknesses that exacerbate vulnerability" (p. 159). On the other hand, this finding is contradicted by research on more recent disaster events, particularly in developing countries, which found that the establishment of coordinating reconstruction and recovery agencies has helped facilitate the recovery process and increased communication and coordination among the many actors involved in reconstruction after large-scale disasters (for example: see Rehabilitation and Reconstruction Agency (BRR) in Aceh, Indonesia after the 2004 Indian Ocean tsunami) (Fengler, Ishan, & Kaiser, 2008).

Rubin, Saperstein, and Barbee (1985) developed a framework for examining important elements of the recovery process (see Figure 2.2). Unlike Haas, Kartez and Bowden (1977) and Geipel (1982), Rubin, Saperstein, and Barbee (1985) focus on the roles of leadership, organizational knowledge and the capacity to implement formalized programming as three key elements necessary to increase efficiency and reduce the length of disaster recovery.
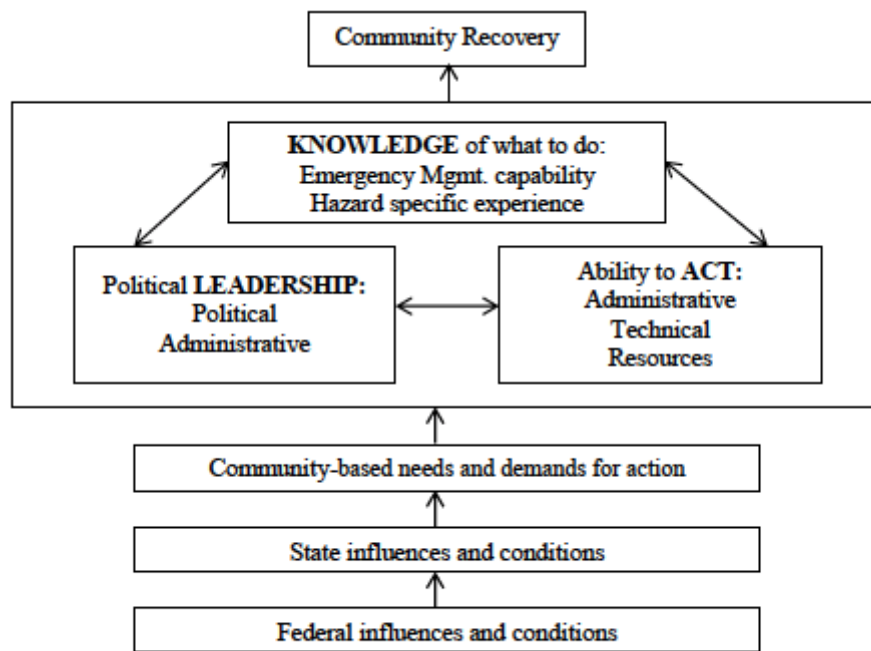
Source: (Rubin, Saperstein, & Barbee, 1985, p. 18)

Figure 2. 2 Community Recovery framework

During the recovery process, recovery operations are influenced by larger-scale national policies and conditions, as well as the needs and demands of local populations. According to the model, if the community is able to effectively integrate knowledge, leadership and implementation capacity in order to meet the needs and demands of the local population, the overall community recovery program will be improved (Rubin, Saperstein & Barbee, 1985). While the focus is almost exclusively on political leadership, Alesch (2004) acknowledged that although local governments can influence community recovery, overall "whether a community system survives and becomes viable in the post-event setting depends in part on the individual choices of a critical mass of people and institutions (automata) in the community" (p. 7). This suggests further information is required regarding the role of political leadership and collective action during recovery periods.

Berke, Kartez, and Wenger (1993) focused on inter- and intra-community relationships to explore the success of disaster reconstruction and recovery processes. The roles of horizontal and vertical linkages are explored in order to develop a typology of communities based on the types of relationships present. Horizontal relationships refers to the level of formal and informal integration of people and organizations in a equalitarian manner whereas vertical integration refers to the level of relations between various social units and organizations in the community to external social, economic and political institutions (Berke, Kartez, & Wenger, 1993). The quality of both vertical and horizontal relationships can impact disaster recovery as they inevitably reflect the capacity to influence and organize effective recovery programs that meet the needs of the community and impacted households.

2.2 Resilience and Disaster Recovery

Community resilience, broadly speaking, is the capacity of a community to adapt to, absorb, mitigate, and recover from shocks and stressors in a way that promotes favorable future outcomes and lowers the community's overall vulnerability to shocks and stressors in the future. (Walker et al., 2004; Adger, 2000).

The concept of resilience originated in the ecological literature, particularly in the study of ecosystems, during the 1960's and early 1970's (Folke, 2006; Janssen, Schoon, Ke, & Borner, 2006). Early understandings saw resilience as the "persistence of relationships within a system and is a measure of the ability of these systems to absorb change of state variables, driving variables, and parameters, and still persist" (Holling, 1973, p. 17). As losses associated with hazardous events increased, disaster researchers began to explore concepts of resilience and acknowledged the need for "more inherently resilient social and technological systems, capable of absorbing shocks with grace and designed so that their failure does not lead to inevitable catastrophe" (Foster, 1993, p. 93). While preliminary understandings of resilience focused on ecological systems, the following discussion focuses on resilience in the context of hazards and disasters.

As the resilience concept has been increasingly used in the hazards literature, the number of definitions has begun to increase. Many authors describe resilience as the activities and capacities which allow communities and societies to withstand, rebound and bounce back after disaster events (Foster, 1995; Paton & Johnston, 2006; Ronan & Johnston, 2005). Ferrier (2008, p. 109) defines resilience as the "relative ability of a community to absorb the effects of a hazard event and quickly return to normal, or near-normal, operations". Buckle, Mars & Smale (2000, p. 9) similarly define resilience although they argue that this approach appears somewhat static and fails to "identify that individuals, groups and communities may each possess degrees of resilience which will vary over time and within each of these categories". While many definitions focus on the ability to quickly return to normal operations, other authors argue that communities will never return to the pre-disaster state, as a disaster will result in changes to the physical, social and psychological reality of societal life (Alesch, 2004; Paton, 2006). Focusing solely on the ability to bounce back also assumes that resilient systems can achieve a state of equilibrium, whereas human and natural systems are more accurately seen as chaotic and non-equilibrating (Birkmann & Wisner, 2006). Paton (2006, p. 8) defines resilience as "a measure of how well people and societies can adapt to a changed reality and capitalize on the new possibilities offered". In this sense, resilience concepts incorporate a measure of the adaptive and transformational capacity of individuals, groups and communities (Folke, Carpenter, Walker, Scheffer, Chapin, & Rockstrom, 2010; Magis, 2010).

From these various understandings, Maguire & Hagan (2007) conceptualize resilience along three different dimensions: resistance, recuperation and creativity (see also Adger, 2000). *Resistance* relates to the ability to withstand or absorb an external pressure or disturbance before long-term impacts are experienced. This view of resilience examines the amount of disturbance a system can absorb before changing state (Maguire & Cartwright, 2008). The

amount of time it takes the community to 'bounce back' to previous levels of functioning is the *recuperation* approach to resilience. The faster a community is able to return to pre-disaster levels of functioning, the more resilient the community is. While these conceptualizations of resilience are common in the hazards literature, Maguire & Cartwright (2008) argue that the resistance and recuperation approaches are deterministic and fail to incorporate the dynamic nature of people and communities. The *creativity* approach to resilience, on the other hand, is related to the idea of increasing the functionality and resilience of the community after a disaster event. Creativity is the process of mitigating and "adapting to new circumstances and learning from the disaster experience" to create communities that have achieved greater resilience and functionality through the recovery process (Adger, 2000; Maguire & Hagan, 2007, p. 17). This is similar to the approach taken by the Resilience Alliance, where resilience is understood within three dimensions: the ability to absorb, the degree of self-organization, and the capability for learning and adaptation (Kuhlicke, 2010).

The notion of creative resilience leads into the growing body of literature that focuses not only on returning the community to its previous level of functionality, but also as a tool for improving overall welfare conditions (Kumpfer, 1999; Kulig, 2000; Paton, 2006; Ronan & Johnston, 2005). Folke (2006, p. 253) focuses on the positive aspects of disaster events, viewing them as having the "potential to create opportunity for doing new things, for innovation and for development". In other words, a hazardous event can be viewed as a catalyst for learning, transformation and growth in the community (Berkes, 2007; Kumpfer, 1999). This view of resilience "accepts that change is inevitable, rather than seeing change as a 'stressor' from which a community needs to recover its original state" (Maguire & Cartwright, 2008, p. 5). Conceptualizing resilience from a transformational perspective provides a more structured and nuanced understanding of 'building back better' strategies of recovery, and links to the idea of a 'window of opportunity'. In this sense, communities may use disaster events as a learning platform to initiate a move towards improved mitigation and preparedness programs, as well as increased emphasis on reducing vulnerabilities and building capacities (Birkmann, et al., 2010). This supports the use of a resilience conceptualization that integrates not only the capacity to absorb and cope with hazards, but also aspects of learning, transformation and adaptation.

2.3 Attributes to community resilience

Many researchers have explored the different components or attributes that contribute to resilient communities, some of which are outlined in Table 2.1 below. These attributes focus on a variety of factors that may influence levels of resilience, including access to resources, the existence of institutions and policies to reduce risk in the community, the capacity to respond to hazardous events, as well as psycho-social components that explore individual and community perceptions, experiences and feelings. This overview of attributes indicates the broad scope of resilience and incorporates aspects from social, economic and political spheres.

Table 2. 1 Table showing attributes to Community Resilience

Author/Date	Description of Components	Strengths and Weaknesses
(Folke, Colding, & Berkes, 2003; Berkes, 2007, pp 287-288)	Identification of four critical factors that interact to building social and ecological resilience: 1) Learning to live with change and uncertainty 2) Nurturing diversity in various forms 3) Combining different types of knowledge and learning 4) Creating opportunity for self-organization and cross-scale linkages	Broad approach focusing on issues of scale and system dynamics, although there is limited recognition of the power structures within communities and social systems.
(Paton, 2006, p. 9)	Resources – required to ensure safety of community and core functions from hazard consequences; Competencies – required to mobilize, organize and use to confront/adapt to encountered problems/issues; Planning/Dev't Strategies – integrate resources at each level to ensure coherent social capacity to capitalize on opportunities for change, growth and enhancement Sustained Availability – ensure resources/competencies available over changes and time	While this approach incorporates access to various resources and human capital, focuses on positive change and incorporates a sustainable approach to resilience, there is under-emphasis on non-capital forms of resilience, including informal social capital networks, disaster experience and knowledge.
(Rose, 2006, pp. 228-229)	Focuses on economic resilience, taking place at three scales (micro, macro and meso) and distinguishing between: **Inherent** – ability under normal circumstances; and **Adaptive** – ability in crisis situations due to ingenuity or extra effort	Recognizes different forms, temporal aspects and scales of resilience, although the focus is exclusively economic.
(Pelling & High, 2005, p. 309)	Focusing on resilient adaptation, Pelling & High outline several components derived from the literature, including some degree of overproduction or excess capacity; overlapping functions; rapid flow of materials, investments and information; responsive decision-making at an appropriate subsidiary level; diversification of inputs and of the economic base; alleviation of absolute poverty; learning from past events; mobilizing systems to redistribute costs including insurance; and, active experimentation and support for innovation.	Focus on a variety of areas and aspects that produce resilient and adaptive communities although the focus appears exclusively at the systems level with little input on the role of individual and household factors
Kulig, 2000)	Emphasis on 3 factors that lead to increased community resilience:	Incorporates aspects of psycho-social well-being although there is limited

	1 – Interactions experienced as a collective group or community 2 – Expressions of a sense of community 3 – Community action	acknowledgement of other aspects of resilience.
(Tobin, 1999)	Combination of three theoretical models, including: 1 – Mitigation model: reducing community risk through policies and standards; 2 – Recovery model: policies to aid in relief and recovery operations, leading to re-accumulation of capital/resources; 3 – Structural/Cognitive model: includes issues of societal changes, situational factors (i.e. socio-demographics, community characteristics) and cognition (psychological/attitudinal).	Good focus on resilience both before and after a disaster event, as well as psycho-social aspects of resilience. Over-emphasis on policy aspects of resilience, as opposed to building adaptive capacity among individual community members.

2.4 Community based Disaster risk reduction

The approach to disaster risk reduction (DRR) has grown more locally centered in recent years (Shaw, 2012). The crucial contribution of community-led DRR to enhancing community resilience is now better understood (Hayden and Cologon, 2011). Communities are at the focus of DRR because at this level, actions to save lives and property may be taken in a very concrete manner. People may express their true needs and priorities at the community level, which enables problems to be precisely defined and personalized solutions to be designed and implemented (Shaw, 2012). Community people are frequently the first responders at the scene of disasters due to their proximity, before help from the local and federal governments can arrive (Chakrabarti, 2009; Ainuddin et al).

Emergency reaction speed is essential for preserving life and reducing suffering. This is why the "four on the-spot" method, which entails leadership, human resources, supplies, and logistics on the spot, was particularly effective in Vietnam at assisting locals in overcoming harsh occurrences (Thi et al., 2012). Community-based disaster risk reduction (CBDRR) has been pushed by international NGOs and relief organizations since DRR measures are thus carried out more effectively and efficiently at the community level (Manyena et al., 2013). For instance, the Japan International Cooperation Agency (JICA) switched to an integrated approach that includes CBDRR in 2008 after five decades of mostly focused on structural measures, acknowledging the community as the most important stakeholder. It would be difficult to reduce vulnerability and disaster losses unless DRR activities are sustained at the community level (Izumi and Shaw, 2012). The use of community-based initiatives in DRR is intended to solve the shortcomings of the top-down approach's failure to include the impacted population in addressing their needs (Victoria, 2009).

The idea of involvement is central to CBDRR (Shaw, 2012). Community members should be involved in risk assessments to incorporate their perceptions of vulnerability and capacity

(Shaw, 2012). In their compilation of CBDRR case studies from six nations (Bangladesh, Cambodia, India, Indonesia, Nepal, and the Philippines), Shaw and Okazaki (2003) noted that raising community involvement is one of the 60 variables that contribute to the sustainability of CBDRR.

The tradition of community involvement in disaster planning in Japan, according to Ranghieri and Ishiwatari (2014), played a significant role in reducing the number of casualties in the 2011 Great East Japan Earthquake and Tsunami. The devastating earthquake and tsunami that struck Japan demonstrated the necessity for every town to choose how to effectively protect itself against disasters by combining a variety of soft and hard measures, regulations, investments, education programs, and readiness drills. The community can play a variety of roles in tackling different DRR challenges (Figure 2.3).

Figure 2. 3 The various tasks of the community in DRR (Source: Ranghieri and Ishiwatari (2014)

The involvement of numerous stakeholders is necessary for CBDRR to be successful. Multistakeholder involvement has been identified by Luna (2014) as one of the components of CBDRR best practices. These good practices include:
- Community ownership
- Use of local knowledge about the hazards
- Communities as ultimate beneficiaries
- Multi-stakeholder participation
- Education and capacity-building
- Gender sensitivity
- Cultural appropriateness
- Sensitivity to local structures
- Harmony with local, indigenous, and scientific knowledge

- Complementarity of top-down approach
- Demonstration of potential for building economic resilience
- Transparency and accountability in procedures and processes
- Communication design
- Exit strategy with sustainability mechanisms (for external stakeholders)

People's participation was cited by Victoria (2009) as one of the main characteristics that set CBDRR apart from more conventional top-down DRR strategies. Facilitating networking and coordination of the participation of many stakeholders is one of the duties of CBDRR implementers (Shaw, 2012).

CBDRR promotes communal cooperation and social cohesion (Shaw, 2012). DRR initiatives that are developed and carried out by the community foster a sense of ownership and community effectiveness (Hayden and Cologon, 2011). In order to improve social connections, which are essential for both individual and community safety and well-being, CBDRR must be encouraged. Shaw et al. (2014) made three recommendations for developing nations on CBDRR after examining the lessons acquired from the Great East Japan Earthquake and Tsunami. These recommendations are:

4. **Empower community members.**

Most people saved from major disasters are rescued by relatives and neighbors within the first 24 hours, before professional responders can get there. Statistics show that in the 1995 Hanshin-Awaji (Kobe) Earthquake, 80 percent of those rescued were saved by their neighbors. So, while local and national authorities have key responsibilities for civil protection in hazard events, communities are always the first responders and should be empowered in that role.

- **Raise awareness.**

Strong and effective community-based DRR requires grassroots support and linkages to the day-today life of the community. Linking disaster risk awareness and preparedness activities to local cultural events can be extremely effective in maintaining a culture of preparedness.

- **Support community organizations.**

In addition to grassroots support, building effective and sustainable capacity for community-based DRR requires the formal recognition and support of local and national authorities. In addition to providing financial and technical assistance, local and national governments should develop legislation on and institutionalize the role of Community-Based Organizations (CBOs) Shaw et al. (2014).

Community resilience is the ongoing capacity of a community to face challenges and overcome them (Links et al., 2018; Fernandez, 2015). According to Paton (2007), research into community-led disaster management is pertinent to broader issues of sustainable development as well as the continuum of hazard mitigation, preparedness, response, and recovery. Additionally, community-based initiatives work well to help communities become more resilient to disasters (Johnston, Becker, & Paton, 2008; UNISDR, 2009). These definitions are the basis of community resilience in this research. This doctoral dissertation aims to contribute

to understanding community disaster resilience, especially in the indigenous community context.

This research draws a parallel from a similar study conducted in Indigenous communities focusing on traditional networks and knowledge to address disasters. Research by Kenney. C, *e al* (2015) in the Maori community in Aoteroa whereby the Maori Network responded to the Christchurch earthquake. They used kinship and ties to draw in volunteers and effective community response strategies. In their research, they highlighted the importance of conceptualizing the traditional Maori Approach to *Tikanga* (cultural practices), *Matauranga* (Maori knowledge), and *Kaupapa* (Values and Practices) (Kenney and Phibbs, 2015).

For Fiji, the concept of community resilience and cohesion is tied to the *Vanua* (land), relationships and hierarchy within the villages, and the concept of *Veivakaturagataki* (respect and being humble). This research will explore these traditional values as the potential for building resilient communities after a disaster. The potential for community resilience in the indigenous Fijian context is highlighted throughout this dissertation through the practice of *Solesolevaki* (community cooperation), which is a traditional norm vital in maintaining and protecting traditional values within the villages.

2.4 Key Findings

The process of disaster recovery in a community requires three things, (i) political power/governance, (ii) the knowledge on what to do and (iii) the ability to act. To act a community must have the resources and the technical knowledge on how to respond.

Community resilience is dependent on many factors and the three of these factors include, (i) access to resources, (ii) the existence of institutions and policies to reduce risk in the community, (iii) the capacity to respond to hazardous events. These three attributes amongst many others are related to the purpose of this research. Exploring individual and community perceptions, experiences and feelings is important in addressing national government level resilience.

Additionally, resilience attributes focus on a variety of factors that may influence levels of resilience, including, as well as psycho-social components that explore individual and community perceptions, experiences and feelings.

Participatory DRR is meant to integrate the views of multiple actors and stakeholders, including the national government, local governments, national and international NGOs, UN agencies, academia, mass media, business sector, faith-based organizations, and community-based organizations. Each stakeholder has its own important role to play in the DRR process. Partnership between the vulnerable and less vulnerable sectors is important. The less

vulnerable sectors are able to contribute resources like finances, leadership, technical skills, intellectual thinking and material resources which are much needed to sustain CBDRR.

There are many examples around the world that shows how community based DRR can be effective. Elements on what makes these community practices a success needs to also be taken into consideration.

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Chapter 3: Bridging Gap Between National Policy And Communities Actions

3.1 Overview of chapter

The Sendai Framework on Disaster Risk Reduction and the Framework for Disaster Resilience in the Pacific states the roles of communities in disaster risk management. These policies have informed the National Disaster Risk Reduction (NDRR) policy in Fiji, however, their link to communities is unclear. In this paper, we examine the NDRR policy and highlight ways to bridge the gap between the policy and community-based DRR (CBDRR) in Fiji. This is done through a historical review of disaster management processes in the country before the colonial period (before 1874), a review of the changes from the colonial period (1874- 1970), the post-colonial period (1970- 1990) to now (1990- now).

The policy is critically analyzed to highlight how it addresses community resilience in Fiji. Communities' realities are also examined through the following factors: (a) traditional governance and leadership in communities, (b) social systems (*solesolevaki* (community cooperation) and community cohesion), and (c) livelihood strategies. We find that the coordination between government and communities needs to be strengthened through the role of the *Turaga ni Koro* (village headman). *Solesolevaki* (community cooperation) is a system that is working very well in communities, this needs to be enhanced through the enforcement of disaster committees and disaster funds in villages. It is also prevalent that communities' livelihood capacity is enhanced as most villages rely on agriculture for income. We proposed that a framework for Community Based Disaster Risk Reduction is needed for Fiji to implement the policy at local levels, to do this there needs to be: (1) a comprehensive understanding of communities' reality in the DRR context and (2) a better understanding of how the existing systems/capacities are maintained and enhanced in the present time.

Fiji, like other small island states, is susceptible to the effects of climate change and has been subjected to two categories 5 Tropical Cyclones (TC) in the past 5 years (TC Winston in 2016 and TC Yasa in 2020). For the Republic of Fiji Island, this calls for imminent attention to the national policy and focus on a more action-based approach that contributes to community resilience and self-reliance in the face of any disaster. The current national policy in Fiji is influenced by the global and regional frameworks that contribute to national disaster management.

The shift in disaster polices and framework globally, started in the 1970s after the United Nations General Assembly (UNGA) approved measures pertaining to catastrophic disasters. According to the GAR report (2019), to lessen the effects of natural catastrophes on everyone, particularly in developing nations, the 1990s was designated as the International Decade for National Disaster Risk Reduction (IDNDRR). An important outcome of the UDNDRR is the adoption for the Yokohama Strategy for a Safer World, a guideline for Natural Disaster Prevention, Preparedness and Mitigation during the World Conference on Natural Disaster

Reduction in 1994. The Yokohama Strategy initiated a significant change in the political and scientific environment in which disaster reduction was being considered. It placed great emphasis on socioeconomic vulnerability in disaster risk analysis, emphasizing the critical role that human actions play in lowering a society's vulnerability to natural hazards and disasters (GAR, 2019).

The global focus on community resilience was mobilized at the end of the IDNDRR with the formulation of the International Strategy for Disaster Reduction (ISDR) and the adoption of the Hyogo Framework for Action (HFA) 2005-2015: 'Building the resilience of nations and communities to disaster's. The shift was after the realization from the UN that disaster response and humanitarian action alone will not be enough. The root cause of risks needed to be addressed by mobilizing resources towards building resilience. This was the start of the focus on building community and nations resilience at the global level. The Hyogo framework had 5 priority actions and it emphasizes that a comprehensive and multi-hazard approach to disaster risk management was needed. The need for a holistic approach can have a substantial influence on social, economic, cultural, and environmental systems (ISDR, 2005).

At the end of the HFA, UN member states came to the realization that their actions did not lead to reducing physical loss and economic impact, thus concluding that shift is needed from the protection of social and economic development to transforming growth and development in a more holistic manner. This conclusion formed the basis for the Sendai Framework on Disaster Risk Reduction (2015- 2030). The focus of the framework is for a "Substantial reduction of disaster risk and losses in lives, livelihoods, health and the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries" (UNDRR, 2015). Additionally, the framework recognizes that states have the primary role to reduce risk, but the responsibility should be shared with other stakeholders including, local government, the private sector, and other stakeholders. (UNDRR, 2015).

Aligning with the HFA the Pacific leaders endorsed the Disaster Risk Reduction and Disaster Management framework (2005- 2015) also formulated to support sustainable development in the Pacific. The focus of the framework was on a more resilient Pacific island nations and communities to disasters so people may achieve sustainable livelihoods and accelerated implementation of disaster risk reduction policies in the Pacific island countries. This was achieved thorough the three (3) guiding principles.

This was the basis of the current regional framework the Framework for Resilient Development in the Pacific (FRDP) (2015- 2030), it also aligns with the Sendai Framework. The FRDP hopes to (i) reduce the Pacific's exposure to climate and disaster risks, (ii) support low carbon development and (iii) improve disaster response and reconstruction. The FRDP allows for inclusive actions from the national to the community – levels (e.g., strengthening local response, policies, plans, and implementations). It acts as a guideline for practitioners and development in the Pacific. According to the framework document (2017), the overlapping concerns of both climate change action and disaster risk reduction is the, increasing frequency and intensity of climate-related hazards like storms, floods, droughts, and landslides (SPC, 2017). The

framework also identifies the need to have an integrated approach with national, and sub-national government and administrators, private sectors, civil society organizations, and other development partners are important in creating resilient communities. Resilience in this context is the ability of a system, community, or society to accommodate, recover and transfer the impact of a hazard in a particular place.

To bridge the gap in how disasters are managed at the national level, there needs to be an understanding of the shift that disaster is managed in Fiji. This is concerning the pre-colonial approach of community disaster management to now (40+ years after Fiji gained independence in 1970). Haque (2019) stated that there has been a paradigm shift from post-disaster relief operations and rehabilitation to disaster risk reduction. This shift has influenced disaster policies, planning, and structures globally, and Fiji is no exception. A review of the current policy is needed since communities are often at the forefront of disasters, and there needs to be a strong focus on community-based disaster management in Fiji.

To empower local authorities and communities there is a need to closely examine their efforts. The guiding principle directly links to the aim of this paper, to examine the National Disaster Risk Reduction (NDRR) policy and highlight ways to bridge the gap between the policy and the community-based actions in Fiji. This paper has been structured as follows: Firstly, gives an overview and details about the evolution of disaster management in Fiji, focusing on before, during, and after the colonial period. The second section brings the current NDRR policy to light, showing how it addresses communities' roles and resilience. The third section sets forth the reality in the community, focusing on the importance of good governance, existing social factors within communities, and livelihood practices. The paper's concluding section highlights some recommendations that are needed for Fiji, to have a more action-based disaster policy in the future.

3.2 Policy background (Disaster management policy in Fiji)

For communities such as those in Fiji, their community-based approaches to disaster management has become increasingly important. Steward (2007) stated that grassroots actions can strengthen local knowledge and social capital and help identify the root causes of human vulnerability to enhance solutions for livelihood and enhance community resilience. In the same paper, he mentions that bottom-up activity can fill gaps or previous top-down and centralized forms of management that reduce resilience to short-term technology and expert-driven solutions (Steward, 2007).

Researchers have highlighted that communities have struggled to act as there are few opportunities provided to them to be involved in the management cycles (Clark, 2007; ADPC, 2007 & Wagenet and Pfeffer, 2007). This is because communities have not developed grass-root social lessons related to the disaster. Therefore, building community networks will help in addressing public needs and the representation of communities in the creation of policies and legislations within government (Wagenet and Pfeffer 2007). A lot of communities do not have the extra resources and the professional skills to initiate planning or adaptive solutions and are

overwhelmed with development issues daily. A study by Clark (2007) concluded that for a successful community-based initiative today, limitations include:

1. Institutional procedures and funding allocations and arrangements that limit many communities' empowerment
2. Different views of stakeholders that affect negotiating power
3. Plans that do not match the socioeconomic and political context of community capacity.

To encourage community resilience there needs to be more attention given to understanding the community's vulnerability and building the community capital. There is a need to improve social learning opportunities or initiatives in the community that promotes public involvement in observing, retaining, and replicating behavior that leads to greater vulnerability reduction, especially at the national level (Benson and Twigg 2009).

Bottom-up approaches from the communities instead of being enforced have been called for about policy and disaster reduction, but remains remain common practice (O'Brien, Bhatt, Saunders, et al., 2,012). This is also the case for Fiji (Becker, 2012), where the filtering down of strategies and policies for the remote community remains unclear. According to Gillis (2001), remoteness is the product of physical distance, natural features, social processes, history, economics, politics, and sociology.

There have been previous studies on disaster response and aid in the Pacific Islands (Campbell, 1984) and remote island communities highlighting the need for a holistic understanding of community capacity in disaster response (Mèheux et al., 2010; Campbell, 1990; McLean, Bayliss- Smith, Brookfield, and Campbell, 1977). Additionally, recent studies have addressed climate change adaptation issues, including disaster risk management in the Pacific islands (Bijay et al., 2013; Barnett, 2001). These features of remoteness are what described rural communities in Fiji. Thus, increasing their vulnerability to disasters because of their economic status, location, isolation, on and shelter. This study aims to add to the understanding of how gaps can be addressed in terms of national policy. To formulate effective frameworks targeted toward building communities' resilience there is a need to understand areas within communities that can be enhanced.

3.3 Analysis methodology

This study aims to examine NDRR policy and highlight ways to bridge the gap between the policy and community-based actions at the community level in Fiji. To learn more about the gaps in the current policy addressing DRR in Fiji, the study employed desktop reviews of the policy documents including past papers and literature describing Fiji's historical changes in Disaster management paradigm shifts. Key informant interviews were also done to gather perceptions from government officers who work in the field of DRR. Interviewees were also selected from a desk-based review of reports and the policy document to determine key actors in the area. To suggest effective recommendations to contribute to the enhancement of Fiji's community-based- disaster risk reduction policy, a case study was needed to understand the lessons from the ground. Observations from the field were carried out twice in 2022 (January-March, 2022 and July- August 2022). The study was built on findings from interviews with

community members and government officers. Table 3.1 is a list of interviews and methods used to conduct this research. Interviews were semi-structured where questions were asked on the relevance of the research and gaps in implementing the policy at the community level. Questions were also asked to find out more about the plans of the NDMO (National Disaster Management Office) in enhancing community-based disaster risk reduction in the future.

In the community, village headmen in the three case study sites were interviewed utilizing the '*Talanoa*' (fluid conversation) method, allowing for a conversation in a culturally responsive way (Vunibola, 2022). '*Talanoa*' is guided by rules of relationship and kinship, shared ways of knowing, and worldviews (Nabobo-Baba, 2006). Questions were asked about the community's experiences whilst responding to Tropical Cyclone Winston, a category 5 cyclone that made landfall in Fiji on February 19-20, 2016. In the '*talanoa*' process, age, gender, status, and knowledge sensitivity are usually taken into consideration when broaching topics and questions, as a female indigenous researcher. Key informants within the communities were involved in response and recovery work, mainly the village headman in the 3 case studies communities. Observations were made in the village, during the duration of the time spent in the study sites.

Table 3. 1 Methodology details for the review

Method	Details
Document analysis	Text analysis of the Fiji National Disaster Risk Reduction policy
Key Informant Interviews	Interviews with government officers working in NDMO (2) Interviews with community key informants (3)
Field Observation	Observations from 3 case study sites that researchers research in

Policy actions in Fiji need to be actioned in the communities. This paper highlights some of the findings from case studies in 3 traditional communities in Fiji (Figure 1.2). These sites are located in three different geographical locations representing some of the types of communities in Fiji. Nabuna village is located on Koro island in the Lomaiviti Province. It is one out of the 14 villages on the island. There are about 200 people in the village in 75 houses. Navala village is located in the mountain ranges of Ba, on the island of Viti Levu and Rakiraki is a village located 2km from Vaileka town on the North Eastern side of Viti Levu. Viti Levu is the biggest island in the Fiji group. Navala has a population of 800 people with 142 households whereas, in Rakiraki village, there are 500 people in 140 households. Rakiraki village in this instance includes Navuavua and Navutulevu villages.

Interviews, policy documents, and observations were analyzed using thematic analysis, focusing on themes of how community resilience is achieved, in the established policy documents and how this translates to what is observed on the ground. The gaps were identified based on key informant interviews and case study observations.

3.4 Historical Study of Disaster Management in Fiji

Disaster management in Fiji has evolved from colonial times (1887- 1970) when the first formal structure was implemented to respond to the damages caused by tropical cyclones affecting the island group. Pre-colonial (before 1887) communities reduced the impact of tropical cyclones and storms through, a variety of food sources, effective application of food storage and preservations techniques, the implementation of intra-community and inter-community cooperation, and lastly thorough sound settlement locations (Campbell, 1984). According to Clarke (1977) and Thaman (1982), Pacific island communities were self-sufficient through the diversity of food sources available to them, including wild plants which were mostly collected from the forest. In the drier parts of Fiji, yams were in abundance, and in the wetter parts, taro (Seeman, 1982; Thomson, 1908; Williams, 1858). The forest also played an important role in providing shelter from the wind, as well as the impact of storm surges (Thaman and Clarke, 1983). As an agriculture-reliant society, there is a close link traditionally with food sources in the island communities. These pre-colonial practices also included the barter of resources among islands in Fiji.

After Fiji was ceded to Great Britain in 1894, the first disaster response program was initiated (Figure 1). In 1895 there was a Hurricane Relief Fund implemented by the colonial government (Campbell, 1984). The fund would provide 9,000 pounds in the reserve to address the increasing number of houses damaged on the islands. However, before this fund was set up the government provided food relief to islands in Lau (Moala, Matuku, and Totoya) in 1886, the supplies included sugar, rice, and biscuits, these supplies would just assist with the food until yams were supplied from their inter- island cooperation supplies. Additionally, the government promoted the planting of quick-maturing food like sweet potatoes, rice, and cassava. The food relief program started the government's intervention to assist communities, to respond and recover from cyclones and storms in Fiji during the 19th century. The agricultural rehabilitation and community management to cope with food scarcity were the responsibility of the traditional leaders and experts, utilizing the social structures and governance that were in existence in Fijian communities. The fund continued under a different name after Fiji gained its independence in 1970, it was known as the Prime Ministers Relief Fund.

As illustrated in Figure 3.2 there has been a shift in how the disaster was managed during the colonial period, where an ad-hoc committee was established calling themselves the "Central Relief Committee", which then became the "Rehabilitation committee" in 1965. The shift was mainly due to the demand for more infrastructure and rehabilitation of houses, government infrastructures, and schools (Campbell, 1984). In 1972 Fiji was affected by Tropical Cyclone Bebe, a category 3 storm, affecting 60-90% of Fiji's population, killing 19 people, and reporting widespread damage to crops, and people's livelihood. The government established its "Emergency Service Committee" to coordinate response and recovery efforts in the nation. The committee administered funds given to them from public assistance and international funding from countries and organizations. The committee then distributed money for food relief, housing rehabilitation, school rehabilitation, and other activities identified by the government representatives. (Campbell, 1984).
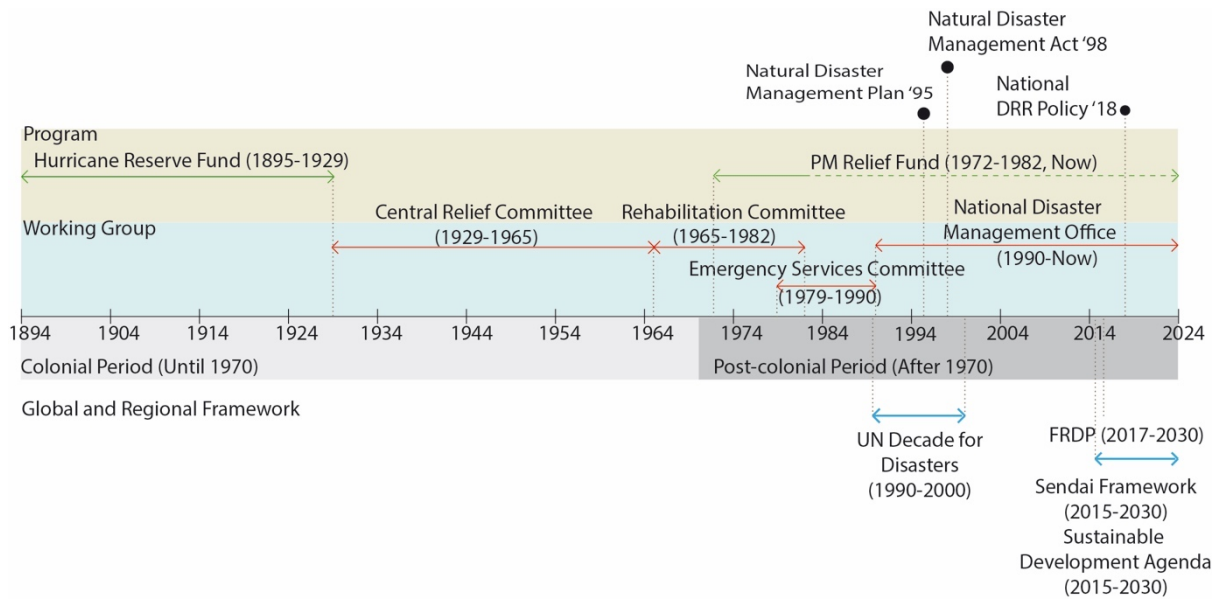
Figure 3. 1 Timeline showing Fiji's policy changes and interventions: Colonial and post- colonial period

1990 was declared an "International Decade for Disaster Risk Reduction" by the UN. For Fiji, this decade was significant in the shift and change in Disaster Management structures. The National Disaster Management Office (NDMO) was established in 1990 and its main role is to "facilitate, coordinate and manage national disaster risk reduction and disaster management activities to enhance the provisions of a safer and more secure Fiji" (Fiji DM Act, 1998). Fiji's first legislated act was approved by parliament in 1998, and its main role is to make better provisions for the government and relevant agencies to perform duties related to natural disaster management.

The form and structure of Fiji's national disaster management regime are found in the Natural Disaster Management Act (NDMA) of 1998. In the 1998 act, disaster is defined as "a natural disaster and includes the occurrence of a major misfortune which disrupts the basic fabric and normal functioning of the society or community, or an event or series of events which give rise to the casualties, and/or damage or loss of property, infrastructure, essential services or means of livelihoods on a scale which is beyond the normal capacity of affected communities to cope with unaided, but does not include man-made disasters." The act ascertains different stakeholders (bodies and individuals) responsible for disaster management in Fiji (Bannon, 2005).

In addition to the NDMA, Fiji also has a National Disaster Management Plan (NDMP) of 1995, its main purpose is to direct all agencies and personnel on the conduct of disaster preparedness and emergency operations in Fiji. The plan provides the policy framework for: Disaster operations/emergency response, relief operations, rehabilitation/recovery, education, awareness and training, and mitigation, of particular relevance, the NDMP contains an appendix relating to "International Assistance" outlining the different types of assistance concerning disasters, roles, and responsibilities within the government, international appeals

for assistance and indicated the mechanisms for interactions between the government and bilateral and multilateral donors. Fiji also implemented a Green Growth Framework, in 2014, it is a tool that supports the integration of sustainable development into future development strategies for Fiji.

As seen from past practices, villagers were utilizing social networks and traditional systems that were in place to respond to disasters. The exchanges between islands and villages, food preservation and storage, and the exchanges of relief materials. These shifted also when the storms started intensifying and more help was needed in front of the community. The shift in disaster response can also influence the use of traditional norms and relationships in the villages. The community realities that will be discussed in the later sections of this paper, highlight the importance of safety- nets within communities and targeted activities toward disaster management. The three study sites, in their different characteristics also portray the different practices within the village.

3.5. National Disaster Risk Reduction Policy

The Natural Disaster Management Act of 1998 is the legislation that formalizes disaster response and management in Fiji. The Fiji National Disaster Management Plan describes the duties and responsibilities of governmental entities and other stakeholders involved in disaster management activities (ADB, 2019). To ensure that the lessons from Cyclone Winston were incorporated into the legal frameworks and disaster governance, the government started revising the Disaster Management Act of 1998 and the Disaster Management Plan of 1995 in 2018. The materials were updated to the NDRR policy, with the help of the International Federation of the Red Cross (IFRC) and Red Crescent Societies following several priority areas, such as the impact of climate change on catastrophes, and strengthening community-based disaster risk reduction (UNDRR, 2019).

The National Disaster Management Council (NDMC) is the forum where disaster policies are formulated and NDMO implements the policies. The Emergency committee is made up of permanent secretaries of certain government departments. civil society services, disciplinary forces (army, police), Red Cross sit on this committee (Figure 3.3). The coordination is headed by the director of the NDMO who works with the disaster controller who is the permanent secretary of the ministry which houses the NDMO. Interviewees stated that disaster is managed in the divisions during the disaster, and the district officers in each division have the power to manage everything at the community level. During normal operations, there are no disaster organizations at the division and district levels, however, cooperation takes place according to the procedures that have already been established. Each of the four divisional commissioners' offices in Fiji has its district officers who look after different districts within the divisions. When a disaster is declared, coordination is overseen by the ministers within Fiji's cabinet.

The policy was also drawn up after the Sendai Framework and the Framework for Resilient Development in the Pacific. The policy was formulated to address an imbalance among agencies addressing its important role, in poverty alleviation and sustainable development. The policy is administered by three government departments, the Ministry of Rural and Maritime Development, Ministry of Disaster Management and Messages Services together with the Ministry of Local Government, Housing and Community Development. There are seven (7) guiding principles stipulated in the policy and they are: (1) Capacity Development, (2) Participatory Approaches, (3) Human rights and gender-based approaches, (4) Safety net approach, (5) Cross-cutting approaches, (6) Coordination mechanisms, (7) Approaches to disaster risk reduction (Fiji Gov, 2018). The policy guiding principles are summarized in Table 3.2.
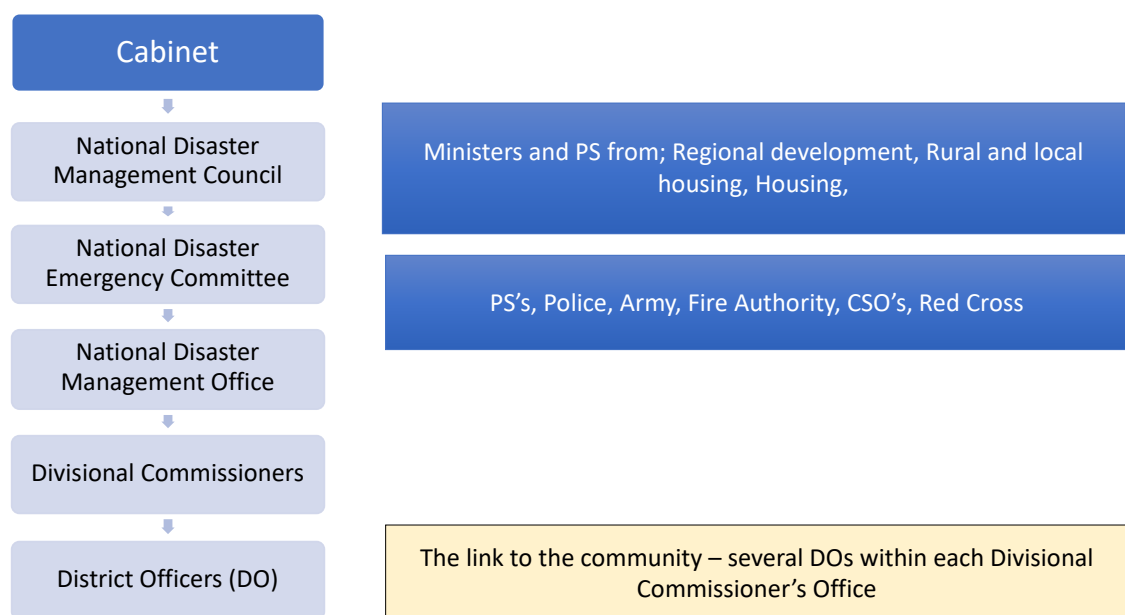
Figure 3. 2 Fiji's Disaster Management Structure

Table 3. 2 Summary of the policy guiding principles, showing the roles of stakeholders

Principle	Summary description
Capacity Development,	Capacities of stakeholders within the national and local government have to be constantly improved to effectively lead and coordinate DRR efforts in the country. The roles of the local government are not clearly defined in the NDMA and they need to be empowered as they are the direct link to the community. The general lack of understanding of disaster risk governance and its link to food security, public health, disaster displacement/relocation, livelihood, and sustainability is a major challenge.
Participatory Approaches,	This principle describes the importance of a whole-of-society approach, requiring DRR interventions to be inclusive, promote empowerment, and accessibility non-discriminatory or towards those affected by the disasters. Since communities and the local government are the first responders after a disaster, the link between them has to be strengthened. This includes pursuing new means of livelihood, thus implying the need to strengthen community leadership and the understanding of overall communities.
Human rights and gender-based approaches,	Disasters are a threat to human- security, however, some sectors within communities are more vulnerable because of the pre-existing disadvantageous conditions. Effective DRR empowers at-risk communities and vulnerable groups to take collective actions to reduce their risks and assets. This principle also considers human rights protection and gender consideration.
Safety net approach,	Disaster DRR measures contribute to socio-economic progress in communities and this makes safety net development necessary. Social safety nets are social lifelines that are safety mechanisms within communities to assist with internal disaster response. This includes community-based local systems, systems in health, and also in education.
Multi-hazard Approaches	To address multi-hazard approaches, prediction, and forecast of hazards, evacuation, response and recovery need multi agencies to need to collaborate. Agencies can identify risk areas, that may have been of intervention, and importantly have the resources to also identify "bottlenecks" in their respective interventions. The difficulty of addressing disasters makes communities no exception. Therefore, making an inclusive risk-informed decision is important.
Cross-cutting approaches,	DRR is a cost-cutting issue that affects a lot of sectors within communities. The policy is formulated to complement the NDMA and the other acts within the government encouraging a multi-stakeholder approach in disaster management at the national level. The roles and importance of mass media organizations, private sectors including businesses, and professional and private sectors are articulated in this guiding principle.
Coordination mechanisms,	Coordination is very important in addressing and coping with disasters. There are also a lot of gaps between policy and institutional arrangements at the national, local, and community levels. Coordination gaps also exist between structural and non-structural measures of DRR.

Approaches to disaster risk reduction	To reduce DRR, measures need to be taken to reduce exposure and vulnerability and the creation of new risks. Disaster governance is needed at all levels to address issues pertaining to the consequences of poverty and disparity between people. It is also needed to address the lack of incentives and regulations for private DRR investments, complex supply chains, declining ecosystems, pandemics, and epidemics. To strengthen good governance in DRR at the national level and in the improvement of preparedness and national coordination support is needed for international cooperation. Approaches need to be broader and more- people-centered. Collaboration is needed with public and private sectors, civil societies as well as academics and scientific research institutions.

Source: Fiji National Disaster Risk Reduction Policy (2018- 2030)

Additionally, to the guiding principles, there are some of the strategies within the NDRRR Policy for Fiji that are targeted towards the community, this includes: (1) Post-disaster needs assessment - to set up a mechanism to conduct post-disaster needs assessment by the national government in case of a national disaster. Their main role will be to evaluate, record, share and publicly account for disaster losses and understand the economic, social health, education, environmental, cultural, and heritage impacts. (2) Community-based organization for DRR- To set up and drive a community-based organization (CBO) for DRR supported by the NDMO, local governments, and the Fiji Cluster System to enhance collaboration among people at the local level and disseminate disaster risk information for communities. (3) Community-based disaster risk management training tools- to develop DRR tools like a community- based disaster risk management (CBDRM) training tools which are used for day-to-day operations including community-based DRR assessment by DRR and conservation officers (Fiji NDRR, 2018).

The policy describes each of the actions and parameters that will guide the implementation of each principle. Fiji's NDRRR policy well integrated the knowledge and reflected in the global and regional policy framework. However, the knowledge and principles do not reflect the realities in the communities (Scolobig, A, et. al, 2015). This is a common issue in disaster management and the same can be said for the sustainable development and climate change scholarships/fields researchers have referred to this as scale discordance (Ogra, A, 2021). To create effective strategies that affected communities' vulnerabilities and risks, there needs to be an understanding and incorporation of strengths and lessons learned from the keeper of traditional knowledge. For this paper, we focused on the guiding principles that targeted or contributed to community resilience.

Although the policy well articulates strategies and ways how the national policy will be achieved by different stakeholders, the community context needs to be understood and articulated to bridge the policy gap. The eight (8) policy guiding principles take into consideration the importance of building community resilience. The importance of taking local knowledge and experiences in the local context should be used to implement disaster risk reduction approaches nationally and in the local communities.

3.6 Coordination Gap between government and community level

Coordination in emergencies is vital, creating a coherent and complementary approach, where all stakeholders work together for the collective result. The Local Government Act provides a mechanism for coordinating sub-national activities under the direction of the Ministry of Local Government, Urban Development, Housing, and Environment. However, local efforts to implement DRR and CCA are not aligned with the central government's approach, and a lack of budget, human resources, and technical capacity further impedes the effective localization of disaster and climate action initiatives (UNDRR, 2019). Reactions from Tropical Cyclone Winston determined that there is little impact on institutional arrangements or long-term disaster governance and that humanitarian support was mostly towards infrastructure, prioritizing housing, and other serious physical damages at the expense of "soft" measures (Winterford & Gero, 2018). This was also confirmed with interviews that government officials, it was found that the coordination that is carried out in the current disaster management system for Fiji, can be problematic in terms of responding and implementing recovery activities in the communities.

Despite, this the regional framework also plays a big part in influencing the national policies in the Pacific. According to one of the interviews, the current regional framework (FRDP), also impacted the gap in coordination at the national level. The NDRR needs to align with the regional policy and this is reflected in its monitoring and evaluation process. Implementation of disaster and climate risk policies or initiatives is difficult due to the fragmented coordination systems, and financial allocations are made on an as-needed basis (Ministry of Finance, 2015). This is a problem that affects all of the Pacific Island countries, not just Fiji. The majority of nations lack the funding necessary to create and sustain adaptation projects, particularly in the isolated areas in the periphery, and this lack of resources is further impeding progress (Janif et al., 2016). The Fijian government has highlighted obstacles to putting climate adaptation measures into effect.

At the district level, the NDMA states that during an emergency, district offices carry out surveys to establish preliminary assessments of damages, casualties, and relief needs. The local governments and sub-national development are not yet supported to carry out tasks to promote adaptation at the local level due to institutional hurdles at the national level, such as the inadequate integration of climate risks into development planning (Government of Fiji A, 2018). To bridge the coordination gap, we highlight observations from the field and interview results. This coordination gap was observed by an interviewee, stating that;

> "It took the government two weeks to come and do an initial assessment in our village, by then most of us had fixed our houses and that is why we did not receive any aid from the government to build our houses. They have to work with the *Turaga ni Koro*" (male 56, Rakiraki).

When asked about this in the other two communities, the sentiments were the same. There is a *Turaga ni Koro* who is a selected member of the community who acts as the government's representative in the village. The *Turaga ni Koro* needs to be involved in the initial disaster assessment (IDA) process, together with some members of the community to ensure a more

coordinated effort in relief supply distribution, responses, and recovery at the community level. Apart from the IDA, a relief needs assessment report is expected within a week together with the Detailed Damage Assessment (DDA) and outstanding relief reports (within 2 weeks). The community does not know the different assessment that is carried out after the cyclone, in Rakiraki's case the observation may have been the DDA. The government interviewees also mentioned, that the TC Winston initiative for Help for Homes (HFH), was done on an ad-hoc basis, it was the first time the government implemented such an initiative. Help for Homes was the government's emergency housing initiative, that was issued to people whose houses were damaged. They were offered either 7,000 FJD (1FJD= 0.43 USD) for totally damaged houses, 3,000 FJD for partial, and 1,500 FJD for minimal damages. *Turaga ni Koro*'s role was to identify and help community members fill out the expected forms and paperwork for assistance. They were also signing off on materials that were delivered to the village. Our fieldwork highlighted the inconsistent supply of materials and the lack of materials in some households.

3.7 Role of the *Turaga ni Koro*

The village governance system is organized and this allows for organized coordination of activities in the villages (Veitata, S, et al, 2021). The chief in the village is usually the most powerful and whose words carry the most weight in the village. However, it is the *Turaga ni Koro* who ensures that all tasks are carried out in the village and is the gateway for the government and other keyholders into the village. The work of the *Turaga ni Koro* is enhanced and monitored by the Ministry of Itaukei Affairs through the Roko Tui (Provincial administrators) within the government officers in their respective towns. *Turaga ni Koro* is paid monthly to report on demographic data, visitors, and developments within the village. Their role as gatekeepers ensures they are kept up to date with all that happens in the village.

According to the NDM Plan, the initial disaster assessment needs to be collected within 48 hours after the emergency. The role is expected at the district level, and the *Turaga ni Koro* is expected to carry out the assessment, this included reporting the number of injured, the number of houses damaged, and other infrastructure damages within the village. In Navala, the Turaga ni Koro had to walk to Ba town (20kms) to deliver this report to the Roko Tui Ba, to get relief supplies. This was the same in all three villages observed, the *Turaga ni Koro* had to coordinate with youths and men to clear the roads into town, to deliver their IDA reports. According to a government official interviewed for Rakiraki, he stated that although the *Turaga ni Koro,* conducted the IDA for his village, his report when forwarded to the Divisional Western office, was not supplied with the relevant relief supplies. This is one of the many examples from the field, that shows the disconnect between the divisional office and communities.

With the Roko Tui in the ministry of iTaukei affairs, there is no direct link to the disaster management structure system in Fiji. In the current disaster management system in Fiji, the *Turaga ni Koro* reports damages and concerns to the District officers and Provincial administrators who are the last group in Fiji's disaster management structure (Figure 3). The *Turaga ni Koro*, also has a lot of power, for an individual in the village and this can encourage conflicts during the emergency period as some villagers cite inequitable sharing of resources.

This was discussed by one of the key informants, the *Turaga ni Koro* in Rakiraki village also changed three times from 2016- 2019. The equity and fairness of the role are often picked up by NGOs and stakeholders that enter the village, and also by government officials. This concern was also raised concerns during the response period in Rakiraki village, where there was a conflict with the distribution of relief supplies. The provincial office had to intervene to address this problem.

The role is an important one and people have also suggested that a committee is needed to support the work of the *Turaga ni koro.* In Nabuna village, the villagers in Suva formed an emergency committee whose main role was to fundraise organizers for emergency supply dissemination in the village. The committee made collective decisions to support the *Turaga ni Koro* and the emergency response in the village. The committee liaised with the *Turaga ni Koro* and he then disseminated instructions and needs to and from the committee. According to the *Turaga ni Koro,* the emergency committee "eased the burden of having to worry about emergency supplies, and they were also liaising with the government in Suva to follow up on supplies for Koro." (male, 43, Nabuna). Village emergencies used to exist in some villages (Johnson, 2016), and this can be revived for villages in Fiji as having a collective to manage the village can be very helpful in times of disaster. The policy should also recognize the need of having village committees implemented and enforced in villages, and include this in strengthening Fiji's community-based disaster management interventions.

3.8 Safety Net Approaches

Community indigenous knowledge, skills, and experience provide them the flexibility that other communities may lack. Thus, giving the custodian of this knowledge and skills better chances of surviving cyclones and other hazards (Veitayaki, 2009). Together with this, social relations and networks are what allow communities in Fiji the security to live in uncertain surroundings. Nayacalevu (1978) stated that people are related and provide support systems that offer assistance when required. Help is rent to anyone in need because they know that, they will be asking for assistance one day. Communities in Fijian communities draw upon social capital when responding to and recovering from disasters, through families outside the village and networks within villages (Veitata, et al, 2021). This social capital includes the sharing of food after the cyclone, and the evacuation of the elderly and the sick to safety by the young people. They also included the church and the help they gave to the community after the cyclone. In Navala village, cataract in the Catholic League was one of the first to respond after the cyclone, he brought basic food and maintenance supplies to the villages.

In Fiji, the social safety net would include the social groups outside of the immediate family, this will include sub-clans and clans. If one wants to build a house, he will request help from those in his clan. He can also request help in the village if he and the elders in the clan think that they may not have the manpower to do it on their own. In Nabuna village, for example, the social safety net was in the form of investment funds that were utilized for the carpenter's payment in the rebuilding processes after TC Winston. The village had invested some money

in one of Fiji's investment banks, and the return helped alleviate the financial burden from the families who had lost their houses.

The village safety net will strengthen food security, health, and security in villages. In Rakiraki, one of the interviewers stated that "when we go to our garden to plant cassava, we also see that our elders garden is clean, and harvest enough for the family and to also distribute to those in need in the village," (Male, 29, Rakiraki). In Fiji, the practice of *solesolevaki* is key in ensuring everyone is safe and well-looked after a disaster. *Solesolevaki* is the act of working together to achieve something (goal), to benefit everyone in the community, clan, or extended family. It has also been a practice that has helped Fijian strengthen social relationships among Fijians. As seen in the community disaster management practices before the colonial intervention, people responded to the cyclone intra- island and also inter-island. The act of *solesolevaki* allowed Fijians to reach out and help their families on other islands with food, building materials, clothes, etc.

In bridging the gap between national policy and community-based disaster management, it is important to take into consideration how this social system and practice work in communities. It is also believed that through *solesolevaki* a village will be able to achieve cohesion and villagers will be able to work together to achieve a common goal. It is also through *solesolevaki that* can one gather basic needs to survive. It is also through *solesolevaki* that villages can maintain their day-to-day activities and life in the village.

3.9 Poverty Alleviation Strategies

In times of disaster factors such as poverty and economic gaps, population increase, and people's socio-economic situations are linked and affected. These factors are accelerated if there are no social links present within a society to increase the degree of coping capacity within a community. *Solesolevaki* is deeply rooted in the iTaukei social systems and it can also be a factor in addressing poverty alleviation in Fiji, mainly for those whose sources of income are affected by the cyclone. Poverty alleviation is also one of the goals of the national disaster risk reduction policy and is embedded in guiding principle eight (8), addressing approaches to disaster risk reduction. The imbalance amongst agencies to address poverty alleviation and sustainable development is a focus of the NDRR policy. Disaster governance at the local government level is needed to strengthen poverty alleviation strategies within the communities. To address poverty alleviation the policy recognizes the roles of businesses, professional associations, and private-sector financial institutions within its strategy. This partnership needs to be reflected in livelihood strategies and mechanisms within communities to address poverty alleviation.

Agriculture is the main source of livelihood within the villages in Fiji and it is currently valued at approximately $690 million (FJ$1.5 billion) and accounts for about 8.1 percent of Fiji's GDP (2021) including the sugar industry (1.1 percent). The sector supports the livelihoods of 27 percent of Fiji's population and is the main source of work for more than 83 percent of Fiji's rural population (Fiji government, 2017). The main source of income within the agricultural

sectors within villages are kava (*Pipers methysticum),* dalo (*Colocasea esculanta),* and cassava (*Manihot esculanta).*

Observations in the field, show that households sometimes do not have anything saved for disasters and have to rely on relief supplies and assistance from outside the village. Through *solesolevaki*, youths in Nabuna, have been working together to plant kava and dalo in their clans. This is also part of a scheme by the Ministry of Agriculture that was introduced to encourage youths to farm. In Navala village, there is no such practice, and villages have to man their farms on their own. Interviews with the disaster management practitioners, also stated that there is a direct correlation between disasters and poverty, and there needs to be a shift in how communities can be empowered to be self-reliant in the future. Villages are directly linked to their natural resources and are the custodian of biodiversity and traditional knowledge and this is also directly linked to how they can manage disasters within their capacity. In only one of the villages (Nabuna), was private sector involvement observed in creating incentives through middleman involvement and logistics to assist with transporting their agricultural products to the national and international markets. Nabuna village also had money invested which assisted households in paying for carpenters to ensure everyone had shelter after TC Winston.

This opportunity also addressed the participatory approach that is described in the national policy, ensuring a whole-of-society approach is in place within communities to better address poverty alleviation strategies.

3.10 Key Findings

This chapter shows the gap that exists within the policy and the reality at the community level to try and address ways to strengthen community-based disaster management (CBDRM) in Fiji. It also discussed how the policy and its guiding principles addressed CBDRM in its eight (8) guiding principles.

The policy is focused on strengthening the national level structures and the focus is still viewing disasters as natural events disrupting normal lives and property. The shift in paradigm for disaster management in Fiji is still response focused viewing disasters as natural events disrupting normal lives and property. This is evident in the lack of focus on community-based disaster governance and strategy within the government policy and strategy.

There is a need to shift the focus toward CBDRR and create a framework to strengthen community-based disaster management. There are opportunities to strengthen this through the realities within communities as mentioned above. With the different policy guiding principles of the NDRR policy, opportunities can be drawn based on the community experiences, this is shown in Table 3.3 below. Although, some of the strategies are better addressed at the national level, taking community learnings and experiences into consideration is important in ensuring that an effective implementation plan is in place. Policy implementation needs good monitoring

and evaluation strategies in place to ensure that all that has been planned is achieved. Having the know-how and the experiences from the communities can help with achieving this. This can also reflect on the effectiveness of the regional Framework for Disaster Resilience (FRDP) to measure a clear pathway in how the regional policy is reflected in the national policies.

Table 3. 3 Opportunities for communities based on the NDRR policy guidelines

Principle	Opportunities within the communities
Capacity Development,	When the government link and capacity are improved, community approaches will become more effective. In having disaster committees within communities and volunteers, training can be more focused to address effective community-based approaches that are contextualized to the community characteristics in Fiji. Within communities' knowledge is passed down through traditional ceremonies and activities such as house building, planting root crops, and traditional protocols.
Participatory Approaches,	Each committee has a village committee which also is the committee responsible for community development. The development committee is responsible for approaching government organizations, NGOs, academic institutions, and businesses when they need certain assistance in the village. One of the villages was able to build a bridge with the help of a business partner near the village.
Human rights and gender-based approaches,	Women and youths are key in ensuring tasks within the village are completed. For example, catering for men and youth who build bures in Navala village. There is a women's group in existence within villages in Fiji, also within the church. Child protection and safety committees are also in existence within committees. Therefore, an effective CBDRM approach will also consider this.
Safety net approach,	The opportunities to relate this to traditional social systems and existing traditional norms such as *solesolevaki* as discussed in this paper. Such systems are in existence within traditional communities, and encouraging CBDRR strategies to consider traditional systems is important for Fiji.
Multi-hazard Approaches	There is research that has been carried out, using GIS to show hazardous areas in Fiji (Varo. J, 2021, 2019). Incorporating hazard mapping in CBDRR approaches will be very important in working to strengthen community resilience.
Cross-cutting approaches,	It is important to address cross-cutting issues within communities, to also ensure sustainability in strategies planned at the national level in Fiji.

Coordination mechanisms,	As mentioned, the role of the *Turaga ni koro* is very important in this regard. However, to alleviate the power based solely on one individual there needs to be a group of people (committee) who can share this responsibility to ensure the community responses and recovery are carried out effectively.
Approaches to disaster risk reduction	The role of the district officer can also be overwhelming if there are no proper systems in place to assist with the work. When the national level coordination is improved, community-based coordination will be more effective. This research highlights the role and importance of the *Turaga ni Koro* and in having a disaster committee, this can be enhanced.

Traditional governance and leadership networks and time-testing strategies to prepare for, respond to, and recover from emergencies need to be well understood. DRR strategies that are implemented with a top-down approach often fail to strengthen the capacities of those in communities. The most vulnerable are also the custodians of traditional knowledge skills and, resources, and their capacity is often overlooked.

We find that the coordination between government and communities needs to be strengthened through the role of the *Turaga ni Koro* (village headman). *Solesolevaki* (community cooperation) is a system that is working very well in communities, this needs to be enhanced through the enforcement of disaster committees and disaster funds in villages. It is also prevalent that communities' livelihood capacity is enhanced as most villages rely on agriculture for income.

There is a need for a framework targeting Community Based Disaster Risk Reduction in Fiji. To implement the policy at local levels, to do this there needs to be; (1)a comprehensive understanding of communities' reality in the DRR context and (2)a better understanding of how the existing systems/capacities are maintained and enhanced in the present time.

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Chapter 4: Community Cooperation In Fijian Villages

The general purpose of this chapter is to provide a brief background of the *iTaukei* worldview and its link to the concept of cooperation. It outlines the *iTaukei* worldview to overview how *solesolevaki* exists in a local community. This chapter also highlights similarities with other Pacific island countries to bring a more regional overview of traditional cooperation systems or *solesolevaki* in the Fijian context. This chapter reflects findings from an online survey done in August 2021 and interviews to provide an opportunity to explore the traditional practices that still exist in villages in Fiji.

4.1 Background on the *iTaukei* worldview

Unpacking an indigenous group's cultural inheritance requires understanding that group's perspective. Indigenous worldviews build on a comprehensive awareness of nature and everything, including the land, the sea, the creatures and plants around them, and any spiritual beings. This influences the fundamental idea of connectedness, which holds these entities complementary. Although indigenous groups have diverse worldviews, they share a sense of belief based on several factors, whether physical, social, or spiritual, in character. The way people "theorize their knowledge, understanding of the environment, and sustainable livelihood" is governed by an indigenous worldview (Nabobo-Baba 2010:14). Native American cultures view everything around them as significant and having some sort of function. The United Nations Department of Economic and Social Affairs (2009):

> Indigenous communities, peoples, and nations are those that, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories or parts of them (p. 4).

According to Gravelle (1979), the *iTaukei*, native to the Fiji Islands have lived there for the first time three thousand years ago. Most *iTaukei* are familiar with the legends surrounding their migration. These tales are passed down orally through chants, traditional dances, and poetry from one generation to the next. These tales spread through contemporary dance groups and songs broadcast on radio stations. In the native Fijian context, "*iTaukei*" refers to ownership of something, including all natural resources on land and in the sea. According to the *iTaukei* worldview, the universe builds on several interconnected dimensions where living things such as people, animals, plants, and even spiritual beings interact.

Over time, the *iTaukei* forefathers' experience and astute knowledge were preserved in testimonials handed down from one generation to the next. This dissertation refers to the *iTaukei* sociocultural practices and norms to highlight community-based disaster risk reduction. The *iTaukei* epistemology is established on their three-dimensional perspective of the universe and everything in it. *Lagi* (the skies), *vuravura* (earth), and *bulu* (the underworld) are examples of these dimensions. These three various elements were emphasized by Nabobo (2006) in

Knowing and Learning: An Indigenous Fijian Approach with reference to the Vugalei epistemology.

The three interrelated dimensions of *Lagi, vuravura* and *bulu* combine to form the basic *iTaukei* epistemology and worldview. In the *iTaukei* worldview, everything that is physical, social, or spiritual is included in the *vanua.* Physically, it embodies *tamata* (people), *qele* (land), and *qoliqoli* (fishing grounds) in the three dimensions that Nabobo (2006) and Ravuvu (1987) described. The *iTaukei* philosophy's *Vanua* notion is broadly depicted in Figure 4.1.
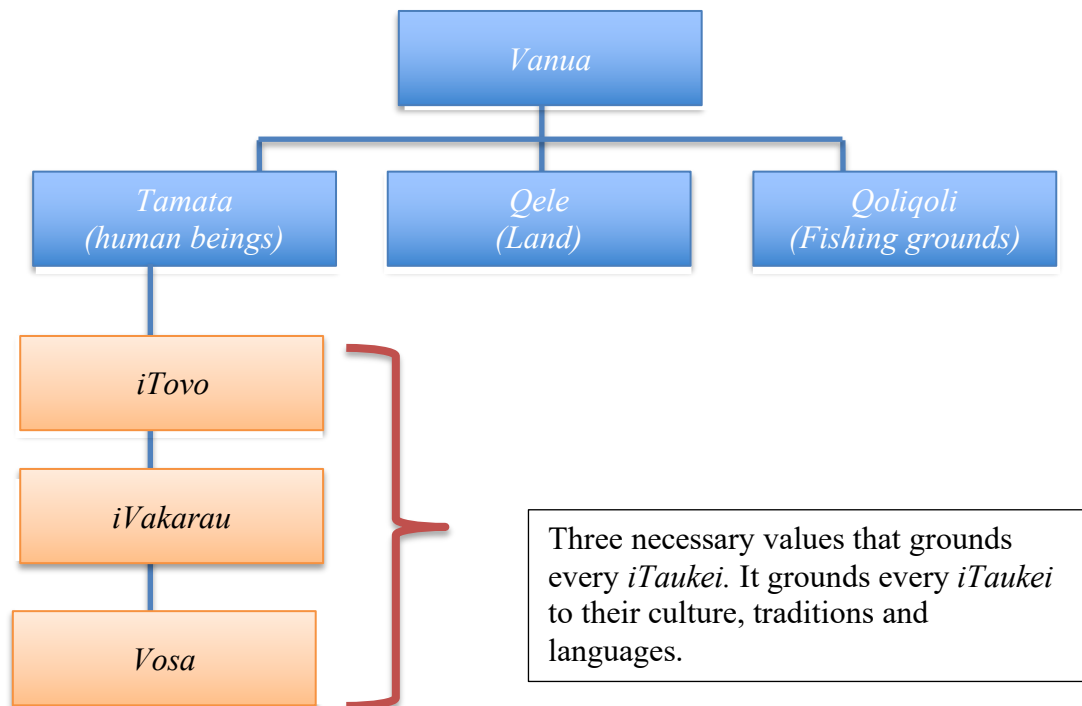
Figure 4. 1 Vanua Philosophy (adapted from Raisele. K, 2021)

Vanua is a place that also has symbolic implications, as Tuwere (2002) emphasizes. Tuwere (2002) identifies five metaphorical interpretations of *vanua. Vanua*, according to him, is an (i) means of subsistence, (ii) a way of understanding time and events, (iii) a way of holding onto (iv) the customs and memories of the ancestors, and a (v)comforting feeling of identity. The *iTaukei* worldview is based on all these symbolic meanings of *vanua*, and it is this worldview that directs the *itaukei* people's behaviors and behavior.

Only after fully grasping the idea of *vanua* and the various *vanua* philosophical interpretations can one fully know the facets of the *iTaukei* worldview. There is little doubt that these three dimensions (Tuwere, 2002) belong to the *vanua* philosophy and are spoken about or explained in various contexts. One such time is when kava is served during the presentation of a *sevusevu,* an ancient iTaukei ceremony. The three elements are combined in meaning in this way as a fundamental aspect of iTaukei culture to bless the event for which the *sevusevu* is intended. According to the *vanua* principle, people are crucial to maintaining the countryside and fishing grounds. The land and fishing grounds will prosper when people play their part well, and the *Vanua* as a whole will thrive and be self-sufficient. Being effective in their role simply entails that their everyday actions should be based on the three values depicted in Figure. 4.1.

Therefore, it can be said that the social structure of *iTaukei* communities is determined by the concept of the *vanua* in the iTaukei worldview. The idea of *vanua* influences how *iTaukei* behave both toward one another (via kinship) and their natural surroundings.

The *vanua* also represents the social norms that govern interactions among *iTaukei* people, tribes, clans, and sub-clans. Seruvakula (2002) also claimed that the principles of *veivakaturagataki* (chiefly manner), *veivakaliuci* (deference), *veidokadokai* (respect), *veirogorogoci* (consensus), and *veikauwaitaki* (caring) should be upheld in the ways of the *vanua* (or the manners of the land). According to these values, treating chiefs and elders with respect comes first. It also means that everyone should constantly be taken care of and their needs met. The importance of the *iTaukei* people in guaranteeing prosperity among themselves and their surroundings is emphasized by these concepts, which perfectly reflect the *iTaukei* worldview. As a result, according to the *iTaukei* worldview, human actions help the land prosper. It is because of this perspective that *iTaukei* communities are familiar with the idea of sustainability and that "sustainable development is part and parcel of tribal (*vanua*) values, wisdom, and philosophy of knowledge and life" (Nabobo-Baba 2010:13).
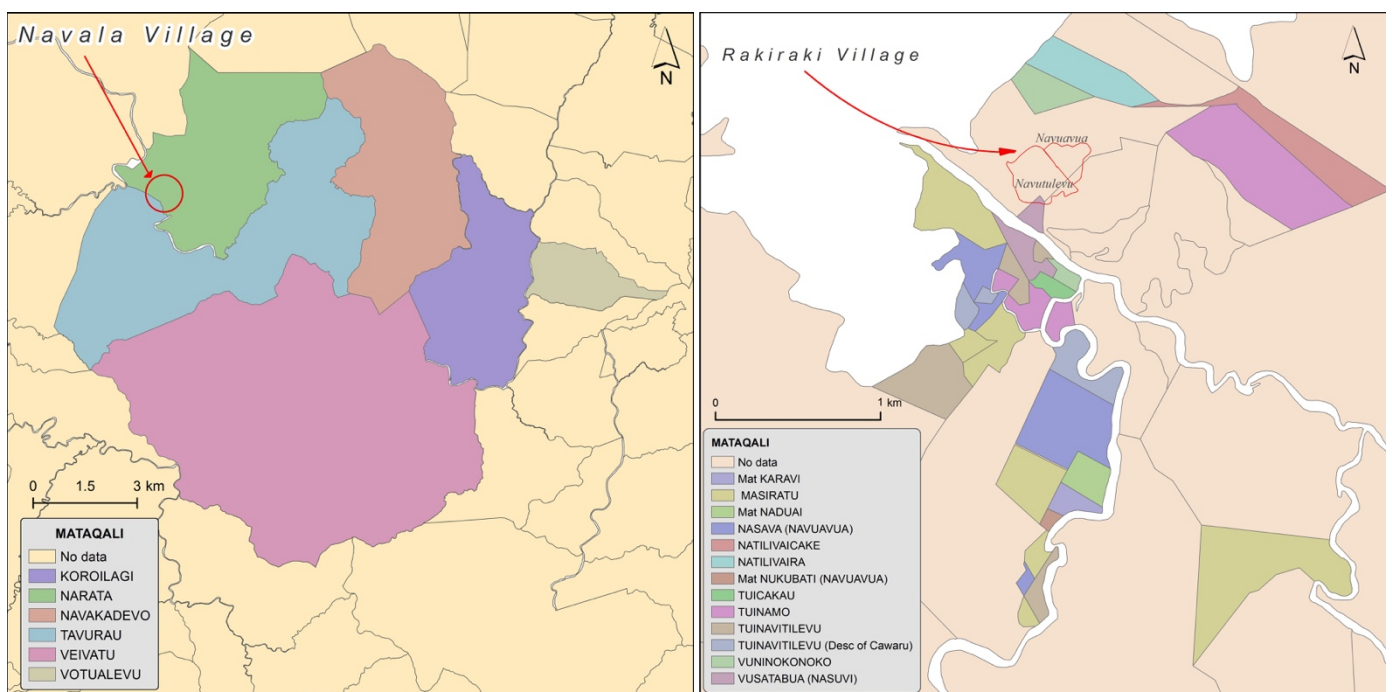
Figure 4. 2 *Mataqali* land demarcation in Navala (left) and Rakiraki (right)

Mataqali land is distributed and owned communally as seen in Figure 25. Each village in Fiji lies within the boundary of a mataqali. Land that is used for planting also belongs to a clan (mataqali), formal request is given when one has to plant in a mataqali land.

It is essential to understand this link as it lays the foundation of how one behaves in a community. These perspectives are similarly shared by Raisele (2021) in his MA thesis on *Revitalizing Intangible Cultural Heritage (ICH) for Inclusive Social Development in iTaukei Communities: The Concept of Solesolevaki.* Raisele (2021) discussed the role of *solesolevaki* in when considering sustainable ICH. This Ph.D. dissertation draws similar views on their ideas

as the basis of understanding community cooperation and how indigenous communities are resilient.

4.1.1 The *iTaukei* Worldview and Resilience

A resilient community is a community with strong social networks. In their research, Flannery (2019) articulated that *iTaukei* women and communities do not see themselves as vulnerable to a disaster. This is because of the existence of the social networks that are embedded within the *Vanua*. These networks are linked to the *iTaukei* landscapes of natural, social, and spiritual spaces. Central to the *iTaukei* worldview is the belief that people should pay respect, honor, and thankfulness to each other and to the physical and spiritual well-being of the things they depend on. According to the *iTaukei* worldview, there should be harmony and ongoing dialogue among the several states, which include the human race and society, the natural world and everything in it, and the spiritual world. According to the *iTaukei* worldview, physical, social, mental, spiritual, and emotional balance are the foundations of health and well-being.

The *iTaukei* concept of *solesolevaki* captures the idea of resilience. *Solesolevaki* mainly refers to the collective efforts that "manifests in the communal nature of Fijian society, where everyone is related and is obligated to work together" (Movono and Becken, 2018). This was also discussed in Chapter 1 of this thesis. In the *iTaukei* worldview, people coexist with everything on earth, and a balanced, healthy, and sensitive way of living should be maintained (Nabobo-Baba 2010, Ravuvu 1976, 1983, 1987).

4.1.2 The social structure of an *iTaukei* community

Understanding the social structure that supports *solesolevaki* is essential if one wants to comprehend the human behaviors that circle the idea and its contribution to sustainability. A basic grasp of the social structure or patterns in place that controls the *iTaukei* methods of knowing, sustainable living, and being is made possible by understanding the *iTaukei* worldview and its linkages to sustainability. According to Radcliffe-Brown (1940), social structure is a complex web of connections between people in a society.

In the *vanua* setting of the *iTaukei* social structure, relationships with the natural world and the spiritual world are also present in addition to the network of relationships that Radcliffe-Brown emphasizes (Ravuvu 1983, 1987, Nabobo-Baba 2006, 2010, Roth 1973). The network of relationships in this interpretation of the iTaukei social structure helps to provide explicit knowledge of the *iTaukei* sociocultural process. For *solesolevaki* to exist within the *iTaukei* culture is a result of the *iTaukei* social structure, and in the *iTaukei* worldview, this social structure is known as the *vanua*. Ravuvu (1983, 1987) and Roth (1973) emphasized this notion of the vanua immensely, and at the very core of it are the physical, social, and spiritual elements that make life occur in iTaukei communities.
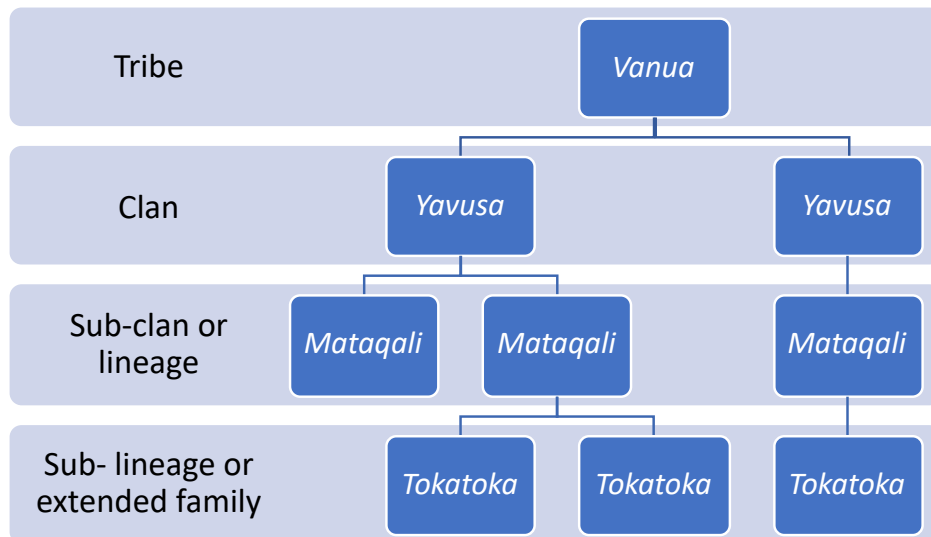
Figure 4. 3 Classic Fijian Social Structure (adapted from Ravuvu, 1984).

One cannot perceive *Vanua's* social structure. However, it is judged by the results as it includes a collection of actions, social interactions, relationships, and obligations that control how *iTaukei* interact with one another and their environment. Social groups/units like *tokatoka, mataqali,* and *yavusa* are examples of social groups/social units that embody these impacts, which demonstrate the existence of the vanua social structure (Figure 4.3). These social groups are made up of two essential parts. "Social status" and "role" are these. Each *mataqali*, for instance, has a social status (chief, herald/spokesperson, fisherman, or warrior), and expectations or roles accompany these statuses.

The network of relationships that develop from "social position" and "role" and are acted out within and between each social group or unit in an *iTaukei* community, all in the pursuit of *sautu* results in the social practice of *solesolevaki*. In the Vanua, each social status has expectations of other social groups, and those different social statuses would respond in kind as required by their respective duties.

> "Growing up in a village, one of the most common practices is whenever traditional carpenters, known as mataisau, would build a bure for the chief. The chief would reciprocate by holding huge feasts after the bure is built" (Quoted verbatim from Raisele, 2019).

The idea of *solesolevaki,* as described in the quote from Raisele (2019), is equivalent to social status, roles, reciprocity, and the overarching goal of obtaining *sautu* in an *iTaukei* context. *Sautu* is a healthy state- there is peace & prosperity between humans, with each other, and with their natural environment (Nabobo-Baba, 2008). Through *solesolevaki,* specific values and principles that are essential on the road to *sautu* are observed and promoted, including *Veivakarokorokotaki* (respect), *Veidokai* (also translated as respect), *Veirogorogoci* (consensus), *Veivakatavulici* (to educate), *Veinanumi* (caring), *Veikauwaitaki* (participation and inclusion), and *Veilomani* (love one another) (Seruvakula 2000).

A community cooperation system is a tool to ensure cohesion and self-sufficiency are achieved in a community. Cooperation demonstrates the capacity to work effectively and respectively with a group of people. This refers to indigenous groups with shared identities, values, and norms in the traditional context. This research aims to discover the traditional cooperation practices in the indigenous Fijian village. This research will examine the traditional cooperation practices in the Pacific and narrow the focus on Fiji. Data was collected for this chapter through an online data collection administered from July 2021- August 2021.

4.2 Community cooperation in the Pacific context

When one thinks of traditional communities, it is essential to understand how communities' social safety nets are a form of protection, which relates to their cohesiveness and, in turn, impacts their degree of self-sufficiency. These concepts are all connected, and research suggests that traditional social protection systems are interdependent with political governance, socioeconomic exchange, gender roles, and dispute resolution processes (e.g., Babajanian 2012; Evans et al. 2019; Loewe et al. 2020; Molyneux et al. 2016). Since there were no standardized social protection institutions in the past, social protection was a function of every aspect of social life. The basis of this is the kinship system in the Pacific is known as *veiwekani* in Fiji, *fa'a* Samoa in Samoa, or *Wantok* in Vanuatu and the Solomon Islands (Ratuva. S, 2005). This kinship system is what keeps groups and individuals alive every day. According to Burchi (2022), these social protection systems are linked to community social cohesion, which has three attributes: (i) cooperation, (ii) trust, and (iii) inclusive identity. It holds communities together, including vertical and horizontal relations among members of society. This concept explains the existence and the prevalence of community cooperation in traditional communities (Burchi. F, 2022).

The Pacific is rich in culture and norms, which have existed for a long time. The Pacific islanders were identified as seafarers inhabiting the islands and having to survive for years in coastal communities. Some of these practices have also helped with communities coping capacities and adaptability to natural disasters. This is evident in the case of Fiji, whereby inter and intra-islands networks have been utilized to respond to tropical storms in the past (Campbell, 1984). This includes exchanging food, tools, and timbers, to name a few. For communities, this consists of the exchange of yams (*Dioscorea. sp*) with wood and mats from communities in the inter-island network. The concept of cooperation is understood as the action of working together towards a common goal. Traditional societies and villages practice this daily in house building, tending to the farms, education, social events, and ceremonies.

Although the concept of cooperation seems linear, where with assistance, a goal is achieved by all, cultural aspects are attached to this, allowing it to be maintained in indigenous communities. When wanting to understand the traditional cooperation system in the Pacific, there are different words to describe community cooperation (Table 4.1). These cooperation examples function at different levels within communities. There is five countries' description of traditional cooperation systems defined and the classes within communities they are utilized.

Table 4. 1 Summary of concepts of traditional cooperation in the Pacific (adapted from Ravuvu. S, 2005)

Pacific Region	Country	Traditional concept	Definition
Melanesia	Fiji	*Kerekere*	Asking for something and will repay the favor later
		Solesolevaki	Communal work to labor for a task
		Solevu	Collection and redistribution of traditional wealth for an event
		Soli vakavanua	Communal collection and fund collection
	Vanuatu	*Wantok*	Resource sharing amongst the traditional social-cultural network of people who share languages, lineage, and history
		Kastom Ekonomi	The process of how indigenous ni-Vanuatu people looks after the concerns and resources of its members
		Nekowiar	Sharing of resources and traditional gifts at festivals
	Solomon Islands	*Wantok*	Similar network to those in Vanuatu. It acts as a vehicle for mutual assistance between its Wantok members
Micronesia	Kiribati	*Utu*	The extended family network where resources and labor are usually shared
		Karekare	Joint- work with that outside of the Utu
		Te aiai	Sharing fire, which is related to the sharing of toddy (fermented coconut water)
		Bubuti	Requests for gifts based on family relationships
		Te Katebatabe	Burden sharing, especially at funerals
		Tekaonono	Food sharing with people outside the Utu
Polynesia	Samoa	*Fa'alavelave*	The willingness to accept socio- cultural responsibilities
		Totoma	Asking, based on expecting reciprocity
		Aula	Giving knowing you will not be reciprocated
		Si'i	Traditional gifting to victims of mishaps in communities or the family of the deceased

Cultures in the Pacific have a certain degree of similarities, especially with those in the same region, i.e., Melanesian, Polynesian, and Micronesian (Figure 4.4). The island countries in the different areas each have their cultural traditions, language variations, and culinary specialties. For example, in the Melanesian region, the concept of *Wantok* is similar to Vanuatu and

Solomon Islands and can be used in a similar context. In these islands, there are overlaps between family, kinship, land ownership, the wider community, and shared cultural values. Social protection research in the region has proven that the cultural and economic systems cannot be separated when they operate within society. The traditional approaches are in place to meet demands in modern times and mitigate against the financial pressures on families concerned.
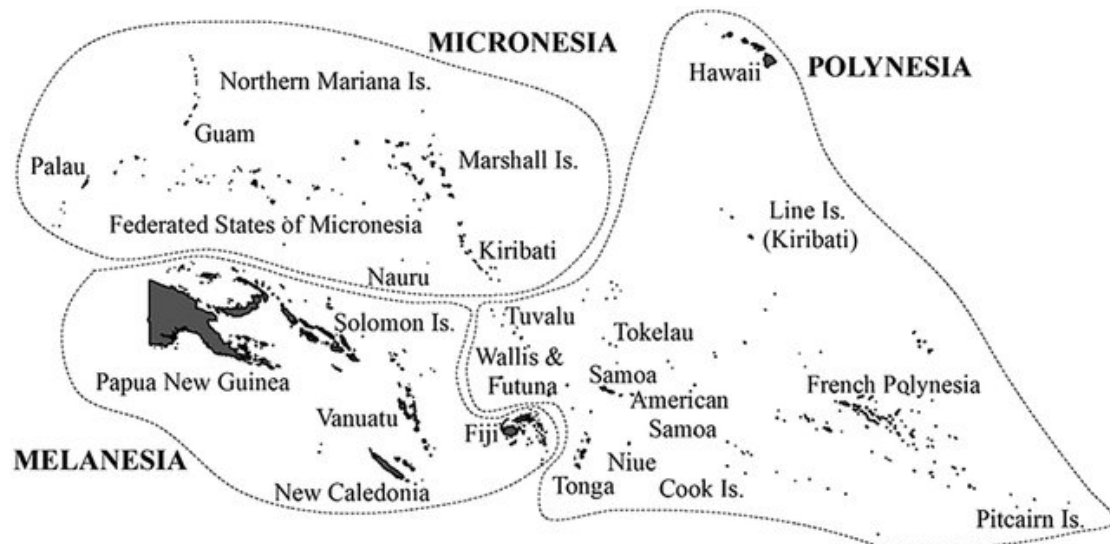
Figure 4. 4 Map of the South Pacific showing the three (3) regions and the countries in each (Taylor, 2021)

In Fiji, these systems include *Kerekere* (reciprocal aid requests), *solesolevaki* (joint communal labor), *Solevu* (mass mobilization and transfer of community resources), and *Soli vakavanua* (communal collecting and accumulation of cash). Similar traditions are considered to be a component of *Fa'a* Samoa in Samoa (the Samoan way). These include *S'i, Totoma* (seeking with the expectation of reciprocity), *Fa'alavelave* (a phrase that contains willing acceptance of sociocultural duties), and *Aula* (non-reciprocal giving: traditional gifts to victims of mishaps or the family of the deceased). In Kiribati, such traditional practices include *Bubuti* (gift requests based on family relationships), *Te Katabetabe* (burden sharing, especially at funerals), and *Tekaonono*. Such methods involve sharing labor and resources among the Utu (extended family), *karekare* (taking it in turns at joint work with non-utu members), *Te Aiai* (able to share the fire, now related to arrangements to supply toddy), and *Te Aiai* (sharing fire) (Food sharing with people outside the Utu). In Vanuatu, practices differ and are represented by various terms in different languages and dialects in the country. These include resource sharing among people of the *Wantok* (a traditional social and cultural unit with a shared origin) and ceremonial presents given at festivals (*nekowiar* or *toku*). The *Wantok* system also exists in the Solomon Islands, serving as a means of mutual aid between *Wantok* members.

While each country has somewhat different systems, Vanuatu and the Solomon Islands have significant differences between groups. While the *Wantok* system may imply that the two countries are very similar, specific characteristics within their society that will suggest the differences must be considered. These include: (i) Resource sharing within nuclear families based on primary family relationships, (ii) Resource sharing and joint activities amongst members of extended families based both on primary relationships and expectations of

reciprocity, (iii) Resource sharing, joint activities, and risk pooling amongst wider community groups linked by common descent, culture, and residence, based both on cultural values and expectations of reciprocity, and (iv) In some cases, concepts of non-reciprocal giving, often based on religious concepts.

The traditional cooperation system in these islands can be the 'glue' that maintains traditional values and villages. The erosion of these cultural norms results from a poor understanding of traditional protocols and culture In the Pacific island countries (Ravuvu, 1987). These practices are fundamental in disaster response in communities; family networks are utilized to mobilize relief supplies for transfer to island villages that are remotely located. The cooperation system is also vital for rebuilding houses and rehabilitating farms after Tropical cyclones. In Vanuatu, after TC Pam (2015), communities were able to rebuild shelters by utilizing supplies collected from the debris and natural resources from their land. This is the same for Fiji, one of the villages which predominantly has traditional houses, also known as Bures, were able to rethatch their homes using the materials collected from debris and natural materials contained in the forest.

Even though the traditional cooperation systems explained in Table 4.1, are utilized in everyday life, they are also used to a certain extent in community disaster management. In Fiji, *solesolevaki* is important in response and rehabilitation after a disaster. *Solesolevaki* is communal work that helps communities achieve certain tasks. The two main tasks that it is used are farming and housing. Examples of how this is done are described in the following sections, with a focus on Fijian traditional villages. However, it is also critical to identify practices that are maintained in traditional indigenous villages in Fiji, and to find similarities and differences (if any) amongst villages.

4.3 Data collection approach

A questionnaire was executed using google form (Appendix 1). The study's main objective was to determine how social activities are maintained or developed in *iTaukei* communities regularly. The main focus of the questionnaire is to:

a. Understand *solesolevaki* activities practiced in Fijian villages
b. Identity which activities are practiced (maintained) and those that have been lost or adapted/changed.

The questionnaire yielded 168 responses from Fijian around the world, 32.7% of which responded in the *iTaukei* language and 67.3% answered in English (Figure 4.6). The from was shared on social media platforms, (i) Facebook- 33 shares, 100 reactions, and (ii) Twitter- 63 retweets, 13 quote tweets and 93 reactions). It was also shared on the LinkedIn platform.

The questionnaire was targeted toward a representation from all 14 provinces in Fiji. All 14 provinces were represented in the survey and the majority of which were from Lau, Tailevu, Cakaudrove, and Rewa.

The distribution of the responses per province is shown on the map above (Figure 4.6). The provinces were chosen as the main category of survey participation as several assumptions formed the basis of the analysis. These assumptions were:

1. Locations matter: island communities would do some things differently from those in Viti Levu
2. Big villages (those with high chiefs) would have more resources to carry out ceremonies at the village level

Participants were asked about their occupations, and many of those that participated in the survey lived in the urban areas in Fiji and were employed (working for wages/salary in the public sector).
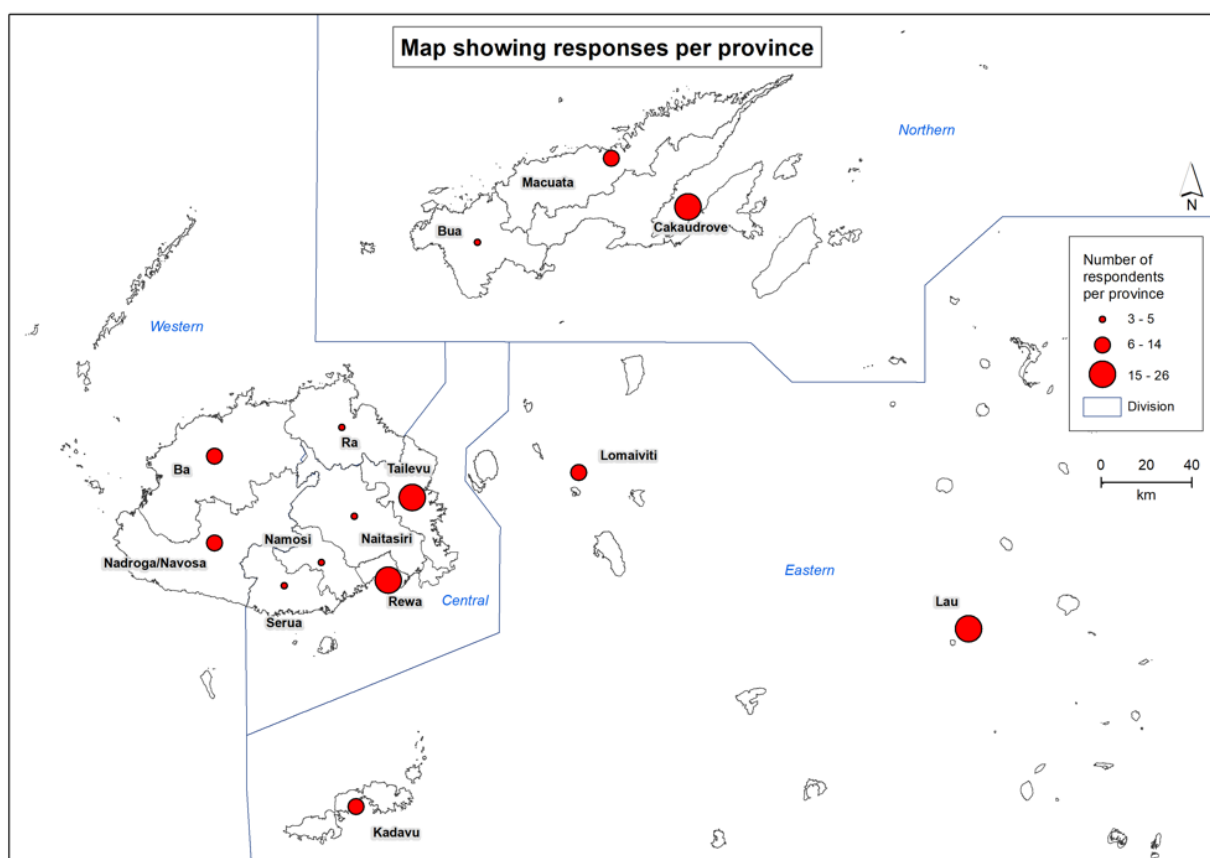
Figure 4. 5 Map showing responses per province

Additionally, observations from the case study sites are discussed as examples of *solesolevaki* activities to support the survey findings. Key informant interviews were also conducted to highlight examples from the villages. Responses were categories according to ages, <20, 20-29, 30- 39, 40- 49, 50- 59, 60- 69, and >70. Most of the respondents were in the two age categories, 30-39 and 40- 49 (Figure 4.7). This can be accredited to the internet reach in Fiji. Internet reach in Fiji is still high in urban and peri- urban areas. The *solesolevaki* activities they referred in their responses were based in their experiences in the village.
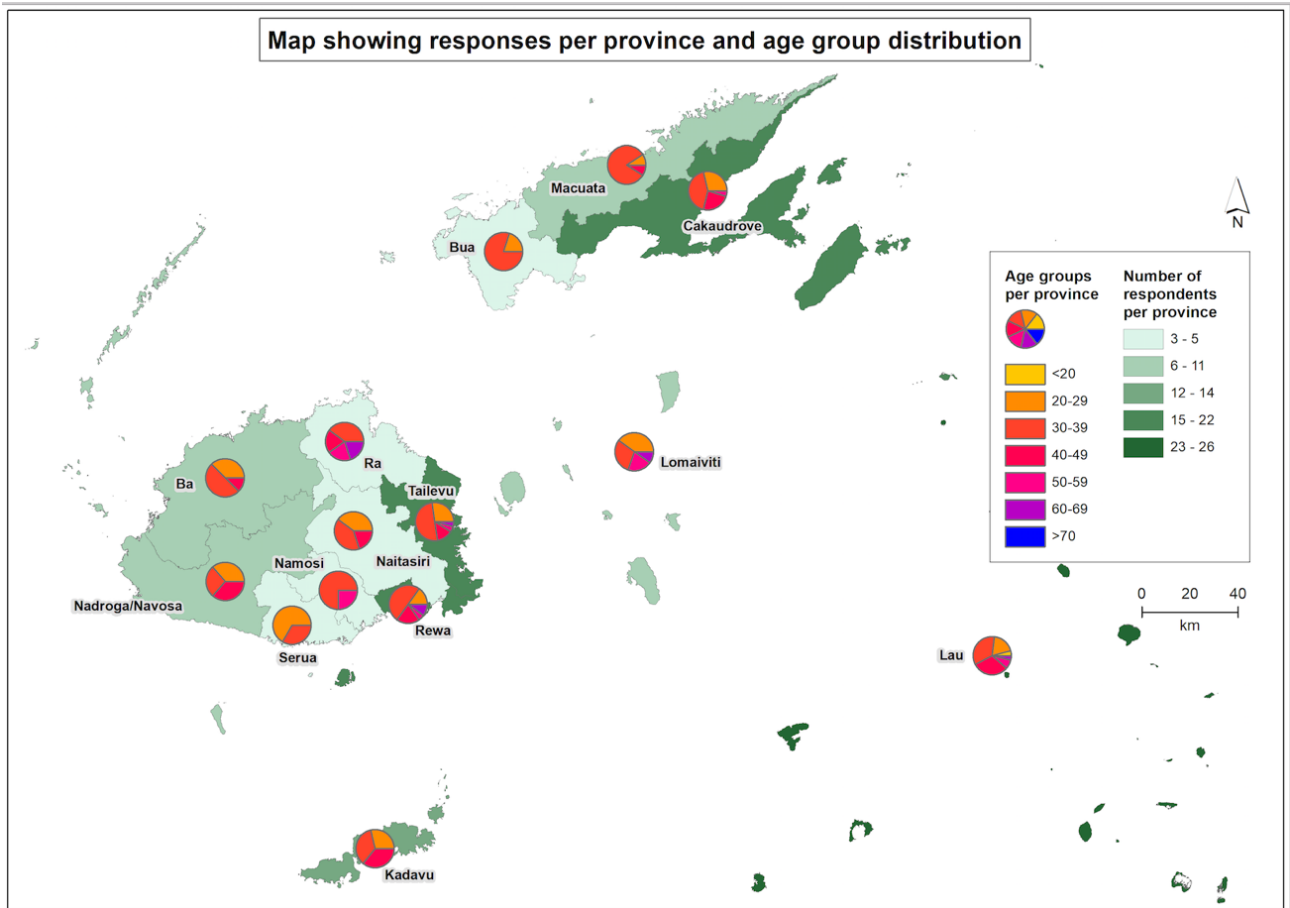
Figure 4. 7 Map showing responses age distribution per provinces
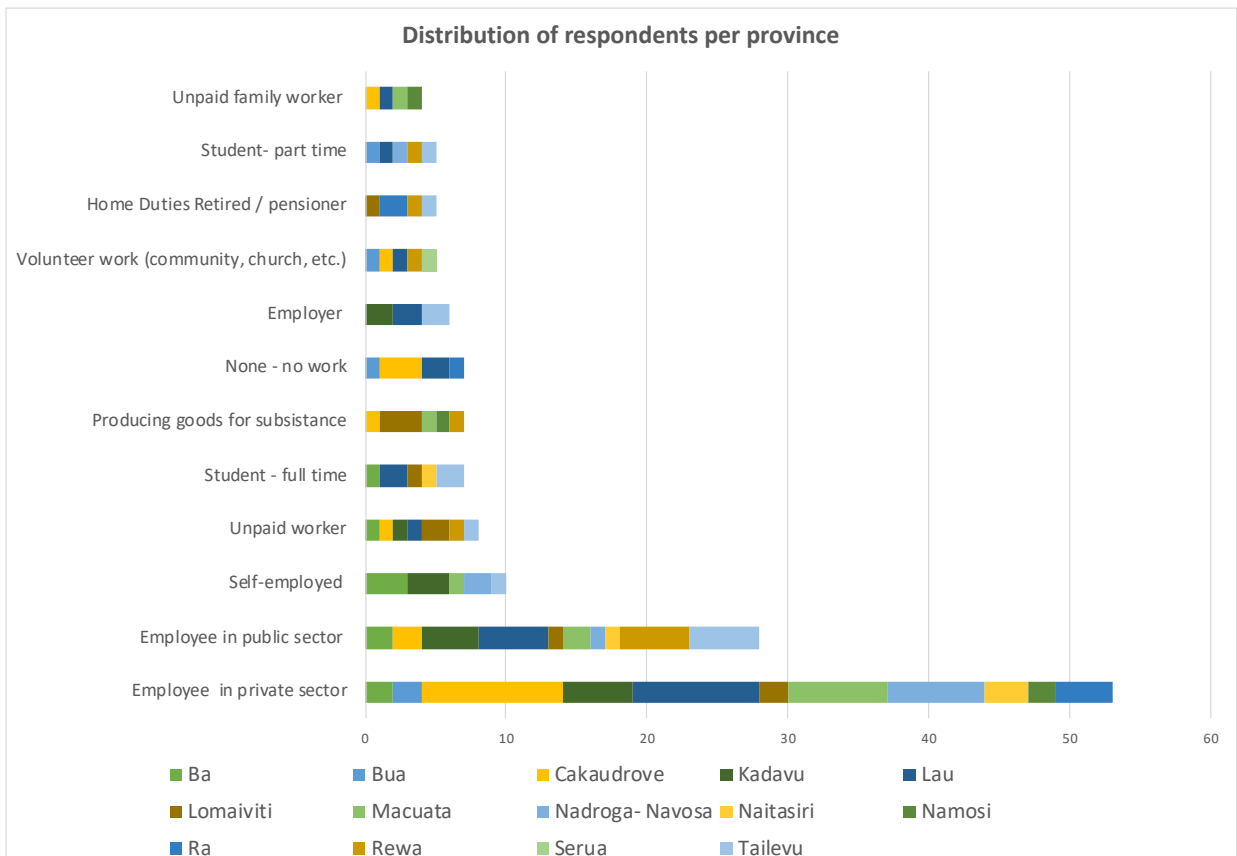
Figure 4. 6 Distribution of respondence occupation per province

Results shown in figure 4.7 above were expected as those in the urban areas would have access to the internet and the ability to respond to the survey. Respondents in the urban areas are those in the two major occupation types, 'employee in the public sector' and 'employee in the private sector'.

4.4 Key findings

The online survey provided the preliminary findings to describe and provide practical understanding on *solesolevaki.* Questions were asked based on activities from experiences of the research and from literature (Ratuva, 1984; Raisele, 2019). These activities are listed on Table 15 below.

Table 4. 2 Solesolevaki activities referred to in the online survey

Activities in Fijian	*Solesolevaki* activities inquired in the questionnaire
Tara vale Vaka Viti	Traditional house construction
Tara vale	House construction
Tara vale ni lotu	Church Construction
Tei uvi	Planting yams
Keli uvi	Harvesting yams
Teitei (yaqona, dalo, tavioka)	Planting yaqona, dalo, tavioka
Cavu (yaqona, dalo, tavioka)	Harvest yaqona, cassava, dalo
Roqororo	Baby shower
Curu I bure	Boys circumcision
Butudravu	Girls first period
Duguci	Man's family asking for a girl's hand in
Vakamau	Wedding ceremony
Tevutevu	Bridal shower
Talitali vakoro	Weave mats together
Soli	Soli (fundraising)
Cakacaka vakoro	Village works
Vasaqa I koronivuli	Cooking in school
Qaravi ni koro ni vuli	School management
Qaravi ni sitoa ni koro	Canteen management
Vakasasa vuaka	Hunting wild boar
Qaravi nai veitavi ena sasaga ni koro	Ecotourism management
Yavi rau	Gathering fish as a community
Bulubulu	Burial of the hatchet
So Mate	Funeral

The *solesolevaki* activities recorded from the survey, are categories into the four main groups (Figure 4.9). The first of which is life- time activities, There are some details in the funeral activities that only done in certain parts of Fiji. This include the *tuva ni ulu* and *suka ni cegu* which are ceremonies where the maternal side of the deceased are honored with whales tooths, traditional mats and food. This is to acknowledge them in nurturing the deceased.
The second category is Agricultural activities. In addition to the activities asked, respondents also indicated performing *solesolevaki* in fencing, piggery construction, sugarcane cutting, and

management of the village freezer. Additionally, the *iSevu* (first harvest) is practiced in all the villages across Fiji. This is when the first harvest is taken to the chief or to the pastor as a blessing presentation of the first fruit. This is also carried out to seek blessings for a bountiful supply for the year. *Coka taki doko* (first yam harvest feast) was an activity that was identified by the respondents that is not practiced now in most villages in Fiji. Yam farming is not commonly practices, and the feast for the first yam harvest is seldomly practiced.

Village maintanance & Others
- Village cleaning
- Annual cleaning of burial ground
- Cleaning of water source
- School management
- Village shop or canteen management
- Cooking in school
- Ecotourism management
- Annual traditional fishing (Yavirau)
- Traditional boat building/seafaring
- Footpath making
- Fundraising for school activities
- Church obligations
- Church annual event
- Masi (tapa) making
- Visiting those in prisons
- Visiting those in hospital
- Hosting provincial meetings
- Hosting rugby games
- Handicraft making
- Visiting widow and widowers

Life- time events
- Baby gift/visiting
- Childs christening
- Childs first visit to the mothers village
- Boys circumsition
- Girls first menstruation
- 21st birthdays
- Asking girls hand for marrige
- Wedding ceremony
- Burial of the hatchet (for eloping)
- Preparation of wedding house
- Funeral processes (reguregu, suka ni cegu, tuva ni ulu)
- Sending someone overseas
- Welcoming back from first trip abroad
- Gift for someone's new car/boat

Agricultural activities
- Planting yam
- Harvest yam
- Plant yaqona
- Harvest yaqona
- Hunting wild boar
- Livestock farming
- Fencing farms
- First harvest (sevu)
- Construction of village piggery farm
- Cutting sugarcane
- Fishing- village freezer
- Coka taki doko (feast that is done after the first yam harvest)

Housing activities
- Bure building
- House construction
- Church building
- Village hall building
- Share timber to reinforce houses- before cyclone

Figure 4. 8 *Solesolevaki* activities. Showing those asked in the survey (orange box) and the new findings.

The maintenance of villages is carried out communally. This is the third category of *solesolevaki* activities. This includes, footpath making, fundraising for school and church activities, annual church events, hosting of particular activities like sports or youth rallies. Rugby related events are also carried out communally in villages, and visiting of those that are sick, widowed and vulnerable in the village. These activities are often organized at the village (*Vanua)* level where the youth, men or the women's groups take the lead.

The last category of activities as illustrated in Figure 4.9, is Housing activities. Activities were asked about house building and also traditional house (*bure)* building to gage the participation amongst Fijians.

From the activities listed it can be confirmed that the *solesolevaki* is practiced in certain extent in all villages in Fiji. In disaster recovery activities, housing and agriculture are the two category that *solesolevaki* is utilized. The following activities highlighted in the following sections articulates some of the unique practices gathered from the survey. Additional information was confirmed thorough field observation and interviews with key people.

4.4.1 Housing activities responses
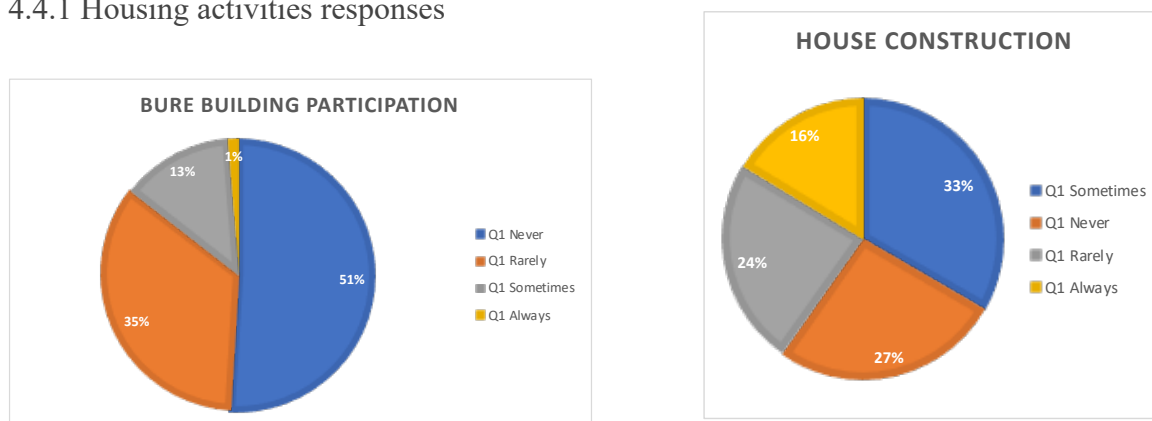
Figure 4. 9 Bure building participation responses. (Right) House construction participation response

Bure building, as indicated by Figure 4.10, is mainly lost in Fiji. 81 out of the 159 respondents stated 'never' participating in *bure* building. While 55 stated 'rarely' built *bure* in their lifetime. Only two (2) out of the 159 respondents indicated having participated in *bure* building. Those that participated in traditional building activities did so when they were younger (50- 60 years' old now). Navala (Site 2) is the only one village in Fiji where *bure* can be seen extensively. The practice is lost in the younger generations in most villages in Fiji. However, the group of *mataisau* (traditional house or boat builders) are still active in house building in village, as stated by Raisele (2019).

> "Growing up in a village, one of the most common practices is whenever traditional carpenters, known as mataisau, would build a bure for the chief. The chief would reciprocate by holding huge feasts after the bure is built" (Quoted verbatim from Raisele, 2019).

Details for *bure* building *solesolevaki* is explained in Section 4.4.4 of this chapter.

In the house construction activity, those that answered 'rarely' or 'never' is assumed to have never participated in this activity when they were in the village. Construction of houses would happen on a large scale in towns only after a cyclone as part of the rehabilitation process. Housing construction is carried out in villages, more than *bure* construction. There is a need to bring back activities like *bure* construction in villages to strengthen *solesolevaki.* A statement by one of the participants stated that,

> "division of labor in the village is entirely lost - identifying the entities like *mataisau, gonedau, matanivanu* replaced by *Turaga-ni-koro* (Male, 50- 59)."

This is an opinion showing why such practice might not be as prevalent in villages.

4.4.2 Lifetime ceremonies

According to Ravuvu (198), there are three main ceremonies in Fijian life, (1) birth, (2) wedding, and (3) death/funeral. Traditionally birthdays are not celebrated in the Fijian culture. However, having the 1st, 16th, and 21st birthdays in a Fijian family is a usual practice. The 1st birthday of the eldest child is celebrated – where the father's family provides the 'dabedabe' (mats and *masi* for the child to sit on), and the mother's family will take it afterward to share. Ravuvu (1984) also stated, "Marriage was not just a union of two individuals, it was also the 'marriage' of the two groups, who became socially and economically related to one another." Some of the common life- time ceremonies from the survey, are shown in Figure 4.11, the common activities are *tevutevu* and *vakamau* or wedding. This is a common practice throughout Fiji. However, one of the findings from the survey, showed that Yasawa in the Ba Province, do not carry out *tevutevu* as part of the marriage ceremony. *Tevutevu* is the preparing of household gifts for the bride and the group from their mother and her side of the family. *Roqororo* (baby shower) is a common practice that is observed throughout Fiji too.
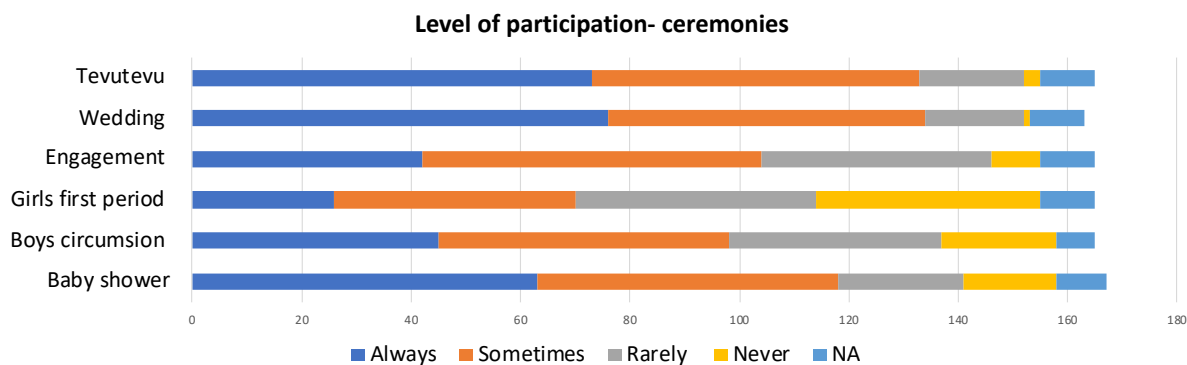
Figure 4. 10 Level of participation for life-time ceremonies

Decisions in these events would be carried out in the *vuvale* and *tokatoka* level. This is the nuclear level and extended family level in the Fijian social structure. The news and plans would then be related to the *mataqali* level in the village. Everyone is expected to contribute thorough traditional gifts, food, or time to execute the event successfully. This is similar to the activities shown in Figure 4.11.
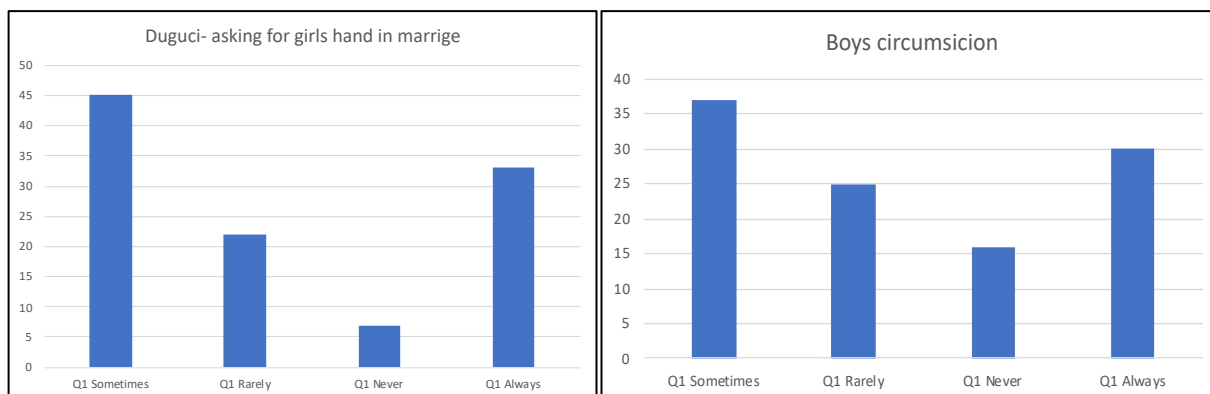
Figure 4. 11 Solesolevaki activities in life-time events

Some other provinces also indicated that instead of *tevutevu,* they participate in *Solevu.* During this more elaborate ceremony, the husband's family prepares mats, pots, drums of kerosene, and *tabua* to present to the bride's side of the family. According to the survey, *solevu* is practiced in the highland provinces of Namosi, Naitasiri, Ba, and Nadroga-Navosa.

4.4.3 *Solevu* and *Tako- Lavo* relationship

Solevu is a meaningful ceremony whereby the groom's family 'pay the bride's price' in the *iTaukei* language. It is "*Na kenai voli na yalewa,"* *which* directly translates to the price to buy a woman. This is an elaborate ceremony in the highland villages, and they prepare for years. It is believed that this ceremony has so much *mana* (power) that barren couples can have children after the *solevu* ceremony. The groom's side of the family will not rest until this ceremony is executed for any woman married into their village (Figure 4.12).

Figure 4. 12 (Left) Groom party. (Right) The *iYau* (traditional gifts) presented to brides family (Source: Sainimere Veitata)

I am from the coastal side of Fiji, and such a ceremony does not happen where I am from. This was a new experience for me. This particular couple has been married for nearly 20 years and finally had their *solevu* this year. The preparation took about two years. Interviews with the bride stated that she had to prepare four cows, 50 kgs of *tavioka (Manihot esculanta),* and about 50 kgs of *yaqona.* This was for catering purposes only.

In Navala, the *tako, lavo* relationship is unique to most of the highland villages of Viti levu island in Fiji. During the *solevu,* the *Tako* would have to prepare the cow, *yaqona,* and root crop that will accompany the *iYau* presented to the family. The *lavo* would prepare food that everyone would eat during the ceremony. *Tako* and *lavo* are a distinctive connection because, like the other traditional ties mentioned above, not all indigenous Fijians are represented in *tako-lavo* partnerships. Only those who are descended from Vitilevu's highland tribes and those who support them do so.
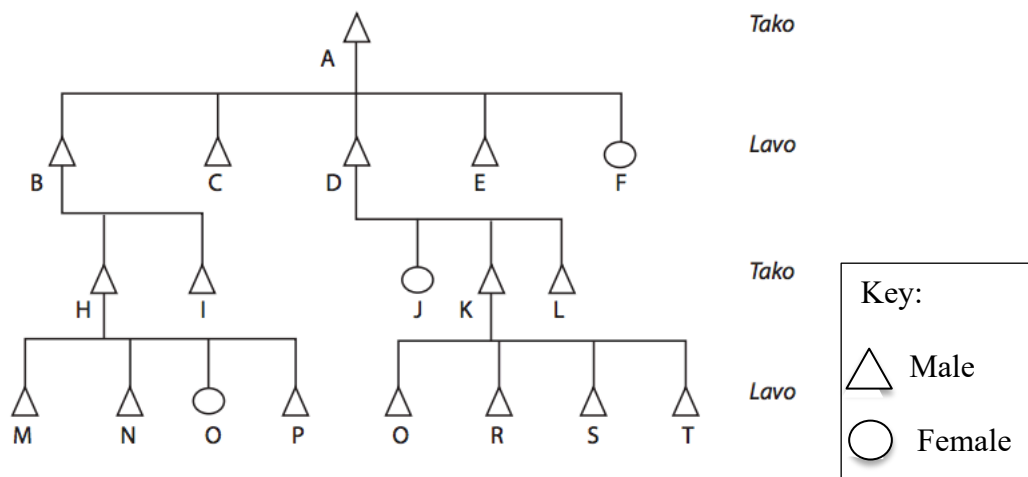
Figure 4. 13 Tako and Lavo relationship adapted from Ravuvu, 1987.

In Figure 4.13, we see that A, H, I, J, K, and L are *tako,* and they address each other as *tako.* On the other hand, B, C, D, E, F, M, N, O, P, O, R, S, and T are *lavo* and will address each other as *lavo.* In this type of tribal relationship, all the *tako* in alternate generations are *veitacini* or siblings, and all the *lavo* in alternate generations are also *veitacini.* Between ages, the *tako* and *lavo* relate to each other as parent and child (Ravuvu, 1987).

One of the respondents stated that, the *solevu* "is the most celebrated and looked forward to event in the village, there is a lot of merry making and celebrations during this ceremony (Naitasiti province, Female, 36). The dynamic connection between the *tako-lavo* system is such that during the *solevu* or any fundraising event in the village, crowds within the village would naturally group themselves accordingly. There is a lot of banter and friendly competition amongst the two group at the course of the event.

During the *solevu* the *iYau* is divided into five groups (Figure 4.14). These groups all have significant meaning to the family. The *tako* would receive the gift and this would then get redistributed to everyone who contributed to the ceremony. In the case of the event in Navala, the gifts were distributed as such:

- *Dole/kenai voli* - dowry
- *iYau nei Na (kali ni sucu)* - gift for the mom (mother of the bride)
- *iYau nei koya Lewai Yalewa*- gift for the uncle who is the coordinator for the event (usually a brother of the mum)
- *Kau ni matadratou na gone* - this is gifts for the kids, is normally presented to the mother's family on the childrens first visit to their family
- *Na dra/kau i valenibula*- gift for the mum (bride) for the first-born son- circumcisions.

Solevu is celebrated after the wedding. For some of the highland villages, they also celebrate *tevutevu* together with *solevu.* This is usually at the families' preference. These ceremonies and

distribution of *iYau* is as trong indication of how kinship relationships within the *iTaukei* villages

During the redistribution of gifts, one usually receives something back if they contribute to the ceremony. This is defined as *solevu* in the glossary of this dissertation. For example, if one lady gave a mat for the event, she will likely get a mat back in return, or a pot. Redistribution of *iYau (*Figure 4.15) is usually coordinated by the grandmothers in the *mataqali.*

Figure 4. 14 Organizing of the *iYau* according to the five (5) groups of gifts (Source: Sainimere Veitata)

Figure 4. 15 Brides side of the family sit in front of the gifts to receive them (Source: Sainimere Veitata)

4.4.4 Bure construction as an example of communal work

Bure building that is discussed in this section is from Navala village, the only village will *bure* as household dwellings. *Bure* building is a physically texting activity that requires a lot of men power (Figure 4.16). The planning and collection of materials can take up to three months before the house is constructed or rethatched. Materials are collected from the *mataqali* land and this is not only subjected to the home-owners land but the village as a whole.

The land is communally owned and gives everyone equal access to the ground for building a house and planting. It is also an important safety- net for people who do not work or are educated in urban areas. In 2020, when COVID- 19 affected the world, many people were affected and lost their jobs in Fiji. Many stories were published in the newspapers daily about such experiences. Thus, making the land a vital link for social-cultural and social protection in Fijian communities. Additionally, for Fiji, there are the ideas of *vakaturaga* (chiefly behavior) and *yalo solisoli* (social generosity). These two factors are equally important in creating a homogenous culture and tradition. For example, when an individual asks for their house to be built, there are the networks of family an individual family can get help from (*tokatoka, mataqali,* or the *yavusa*).

Figure 4. 16. (Left) preparation of ladder. (Right) *solesolevaki* in thatching of bure (Source: Mari Miyaji)

Labor for house-building is often organized at the *mataqali* level within the village. The request is addressed at the highest council in decision-making in the village, the *Bose vakoro,* which happens once a month. As illustrated in Figure 4.17, In this meeting, the village committee, together with traditional leaders, decides which houses must be built and confirms the schedule with the *Turaga ni Koro (*village headman). This shows how community leaders and villagers work together to identify able men in the village to form groups. Governance is critical in towns, where the traditional leaders are the 'advisor,' guiding and sharing their input in the decisions made in the village meeting. The *Bose vakoro* is a mandatory meeting everyone in the village must attend, a form of cooperation within the traditional village setting.
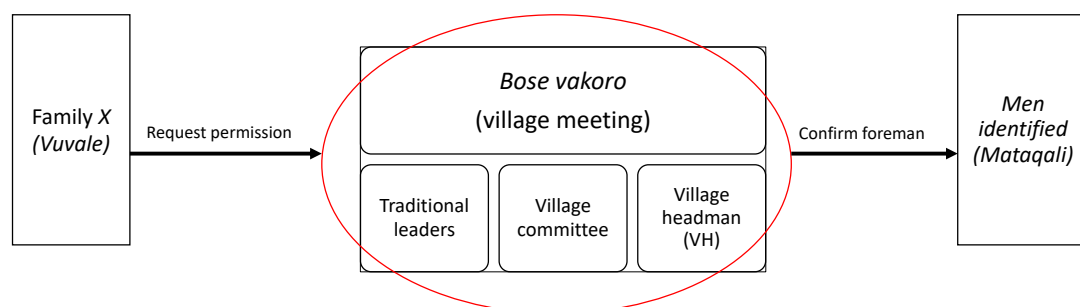
Figure 4. 17 Process for traditional house building in Navala village, Ba, Fiji

The foreman who leads construction is chosen in this meeting, and this is determined by experience and also their ability to lead. His team is then selected from men available in the *mataqali. 8*- 10 men of various ages are usually in a group. They will work together to collect materials for house building, e.g., grass for the roof thatch, bamboo for the walls and lattices, and timber for the beam, rafters, and other parts of the house (Figure 4.16). Men as young as 16 participate in this house-building process, which helps in knowledge dissemination amongst the villages. Although this chapter discusses examples from Navala village, this teaching process is prevalent amongst the indigenous communities in Fiji. For villages that do not have any *bures,* the process of working together and cooperating is similar.

Figure 4. 18 (Left) Sun drying kava (Right) Kava ceremony in Navala village (Source: Sainimere Veitata)

Preparations are also crucial for villages in Fiji that do not have *bures*. The cost of building materials has drastically increased in the last ten years, and households have felt the brunt of this. After TC Winston, the Fiji government assisted affected households by providing a housing rehabilitation fund (Help for Homes initiative). This supported many families and allowed for shelter to be built faster, considering the number of damaged houses in Fiji. *Solesolevaki* was also crucial in this rebuilding process. In some villages, the Village headman was the primary coordinator- identifying men and youths who could assist in the construction. They were divided into groups if needed. Immediately after the cyclone, these groups would collect and salvage what they could from the cyclone debris and the forest. They would also work together in a coordinated effort to clean the village and address the immediate needs of the villages.

Whereby the *Vanua* is vital for the request of *bure* building and the delegation of groups, there ais also additional cooperation task included in the building process. Table 4.3, illustrated this showing how the team work with the building foreman to collect materials in preparation for the build.

The teams would work to collect materials three (3) days a week (Monday to Wednesday). Every evening an *Oco* (debriefing meeting for the teams with their team leaders), takes place is the meeting time- when team members can bring up anything they want to talk about during this time. If there is any grievances or suggestions. This is also the time when they lay out the

plans for the next day. Kava is often consumed during the *Oco.* The team as described in Table 18, varies in numbers according to availability and strength.
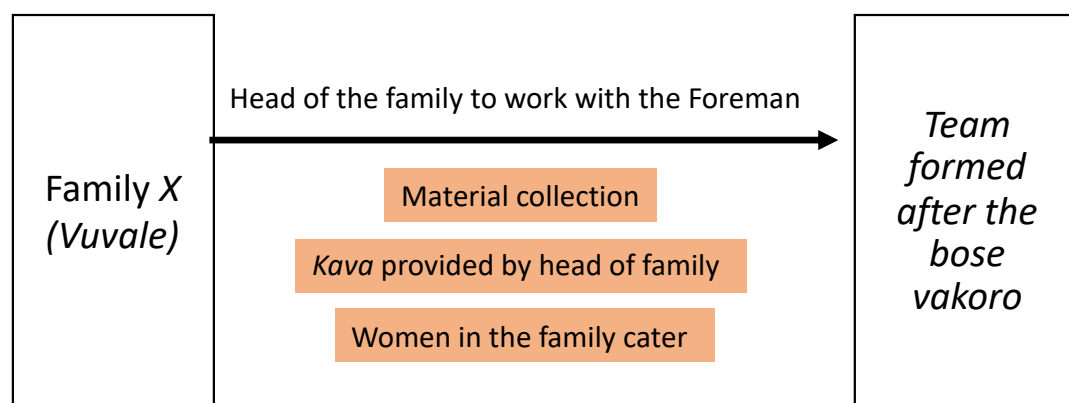
Figure 4. 19 Cooperation activities in Bure building in Navala

Women are also involved in house-building to cater to men's meals. They prepare lunch and afternoon tea for the teamwork in the house. It takes about 3-4 weeks to complete a *bure* from the foundation to the roof, and rethatching would take a week. Women of the family who have their house built and their immediate family (*tokatoka*) help in catering. A family can use up to 50 – 100 FJD/week (1FJD= 0.44 USD) for food, which mainly includes: flour, oil, sugar, salt, dried lentils, canned fish, spices, tea leaves, milk, and rice to supplement root crops collected from the garden and meat from beef or wild boar (hunted). For a family to have their *bureau* built, they need to be financially prepared to bear the cost of catering and transporting building materials. Transport cost is usually around 50-100 FJD/trip; for a house, this would take at least two visits. Kava or *yaqona* is Fiji's traditional drink. The root of the *Piper methysticum* plant is dried and pounded and has calming effects on the body (Figure 4.18). Kava is a ceremonial drink without also consumed socially in villages. After TC Winston (2016), villagers who farmed and sold kava could earn so much money as it was sold for $120/kg, a jump from the usual $50/kg they were sold before the cyclone. A family would have to prepare at least 10 kilograms of kava harvest, dried and ready for consumption during the building process.

The table below shows the recent distribution of men for bure building in 15 houses in Navala village.

Table 4. 3 Distribution of families for Bure building in Navala village

Veresia	Vatuse	Seatura	Makuluva
Leader: Bakanawa	Leader: Vatumaragi	Leader: Mataibau	Leader: Rukutabua
Tubeitoga	Oneata (son)	Davetalevu	Vucilevu (Rami)
Baivaoni	Tamayawa (father)	Gaunavou	Visakikilevu (father)
Vunito	Namasa	Visakikilevu (son)	Vatuvue (son)
Vutosara	Isireli	Oneata (father)	Nagadele (son)
Tamayawa (son)	Sawailau (son)	Burenikadi	Senicoko
Sarasaravuto	Vatuse (father & 2	Na kerekere (son)	Lesutale (father)
Natawa	sons)	Na cokula	Qalou

2 boys from Veresia	Namaqei (brother Kubu)	Na maqei (brother Drole)	Lomeri
	Naroyasi		Livono
	Vunitivi		Vuniyasi (son)
Vatima	**Tokalau**	**Nukuciri**	**Roma**
Leader: Nukuveiwaqe	Leader: Tacirua	Leader: Vutosara	Leader: Vuniyasi (son)
Nagatagata	Ocotabua	Sarasaravuto	Sawailau (father)
Savunokonoko	Loredesi (Nadri)	Yalavatu	Qaunagaga (son)
Lagi	Dakuda (father)	Tamayawa (Melo-son)	Merika
Vuniyasi	Tamavua	Tokou (son)	Korolevu
Biausevu	Ulunitei	Ulunitei (brother)	Roma (father & son)
Nanuya	Rotuma	Nukuciri	Navutowa
Vatima	Lomanibai		Vunivaini
	Vatukoro		Mosi
	Tokalau (father)		Solevu (son- Moi)
	Tuvainia		Davuilevu
			Vatumaragi (son)
Muanikau	**Wakaya**	**Lololevu**	**Vatikano**
Leader: Lavevatu	Leader: Sawailau	Leader: Vanuakula	Leader: Doilevu
Namaqei (Doidoi)	Savatu (son- Lele)	Tokou	Qwaliyasi
Namotutu	Namaqei (Lekima)	Baivaoni (son)	Wainisomu
Vuaki (3 people)	Tamayawa (son)	Lololevu	Savatu
Labasa	Lesutale (son)	Vukawa (son)	Qaunagaga
Muanikau (Nabuli & Namai)	Tubou	Waidere (father & son)	Tarivo
Namacuku	Nanuya (son)	Ovalau	Qereba
Loredesi	Dakuda (son)	Nataoni	Nasomolevu
Taiti (father- tamai Merewai)	Kerekere (father)	Tarivo	Cokobasaga
			Tacirua
Naqera	**Bosnia**	**Delailagi**	
Leader: Sasawene	Leader: Navesi	Leader: Wavuwavu	
Naqera	Vukawa	Lomeri	
Boubasaga (son)	Sainiai	Vunitivi (Leone)	
Launaqai (Vili- son)	Muanivatu	Nagadele (son- Sikeli)	
Nayau	Urata (Mika)	Bateteva	
Taiti	Vatuvue (son & father)	Delailagi (father & son)	
Taiti (father)	Korowabuta	Nabulo	
	Bosnia	Lololima	
		Vosaya (father)	
		Tovolea (father)	

The team distribution in Navala as mentioned in Table 4.3, is only specific to Navala village where bure building is still practiced. In the other two sites work is distributed on a volunteer basis, where the *Turaga ni Koro* chooses able bodied men and youths to work in houses. However, one the common practice in all the three villages is the *duavata* (unity*)* and *veilomani* (love) factors. This is key in maintaining *solesolevaki* in indigenous villages in Fiji.

Key Findings

Key findings from this chapter are the function and the role of *solesolevaki* in the *iTaukei* culture. This chapter describes the background to understanding the indigenous Fijian communities and the importance of family ties and community cooperation is to the functioning of the village in the daily life.

The online survey that was conducted showed that *solesolevaki* is still practices in all the provinces in Fiji. The existence and the practice of *solesolevaki* in pre-disaster times is crucial in strengthening community resilience in Fiji. The different activities highlighted in this chapter shows community cooperation in all the different levels within society is key in maintaining a balanced and harmonious way of life. Some of the practices are surely lost or rarely founds, there is an opportunity to revive or adapt some of the practices to suit the modern time that Fiji is going thorough now.

Organization is key in the maintained of *solesolevaki* in the community and this is maintained and managed at different level of organization within villages social system.

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Chapter 5: Community Cooperation In The Disaster Phases In Fijian Villages

The general purpose of this chapter is to provide detailed examples and comparisons of how *solesolevaki* functions in three different types of villages during and after a disaster. The main focus of this chapter is the response and recovery activities of the three case study sites detailed in Chapter 1. This chapter answers the third research question, "What are the community- based evidence for disaster preparedness, evacuation, response and recovery in different types of villages in Fiji?". Findings from this chapter will contribute to the Stage 3 of the research framework: Evaluation of social systems in DRR activities. *Solesolevaki* is introduced in the chapter as Community cooperation.

5.1 Community Cooperation Background

Over the years the number of disasters has increased and affected a lot of people around the world. Natural disasters have affected approximately 45,000 people globally each year, this results in about 0.1% of the global population. Despite the Pacific adding the least number to this percentage, the effects are strongly felt because of their vulnerability. The islands in the Pacific, are highly vulnerable due to their remoteness, geographical spread, limited island markets, and resources available (UNOPS, 2020). They are also vulnerable because of the exposure to a wide range of natural disasters, 76% of which are tropical cyclones, affecting 2.5 million people and causing 1400 fatalities (World Bank, 2006). Tropical cyclones are projected to increase in intensity or remain unchanged in the 21st century. However, the intensity is expected to increase due to global warming (Knutson. T, 2010).

Communities, as the first responders are the most affected by these impending disasters and often have to respond with the limited resources they have. In traditional communities, there are traditional knowledge, norms, and practices that are important for cohesion. These traditional or indigenous communities have been existing for years with these existing practices, however, some of this knowledge and practices have also adapted to suit the current time. One such practice is traditional community cooperation, where villagers have to work together to achieve certain goals and tasks within communities. Chapter 4 outlines community cooperation in the Fijian context with the *iTaukei* worldview and the *Vanua* approach. This is further details in the sections of this chapter. This chapter focuses on communities' actions responding to TC Winston. Characteristics of different villages are taken into consideration when understanding community resilience. The actions discussed in this chapter include evacuation actions, temporary shelter and housing construction discussing self – fixed actions and Help for Homes assisted construction or reconstruction. Table 1.4 in chapter 1 illustrates the timeline of activities in the three village sites.

5.2 Outline of field survey

This chapter discusses the findings from field work conducted in January- March 2022 and July- August 2022 (Table 16).

Table 5. 1 Fieldwork schedule and details

Date	Place	Main Activities
January 10 2022– April 4 2022	Navala (1. 5 weeks) Nabuna (1 week) Rakiraki (1 week)	• Household surveys • Interviews with NDMO officers
July 2 2022- August 30 2022	Navala (1 week) Nabuna (1 week) Rakiraki (2 weeks)	• Household surverys (continued) • Interviews with Key informants in the villages

Case studies, as mentioned in Chapter 1, was completed in three village sites (Figure 1.2). The characteristics of the sites in Table 1. Each of the three village sites, have 6 *mataqali* land within their village boundaries. This is seen in Figure 4.2 in chapter 4 for Navala (site 2) and Rakiraki (site 3) of this dissertation.

In this study data was gathered thorough methods stated below:
- **Household questionnaire survey** for collecting household profiles, housing characteristics and their disaster response and recovery actions.
- **Key informant interviews** for farming activity details and to verify the community response and recovery activities.
- **Observation and photography** to support the household information and to show *solesolevaki* activities in the village. Photography is also used to verify the village maps.

Table 5. 2 Case study sites showing number of completed houses

Site #	Village name	Number of houses	Completed survey	Houses empty or not present in the village	Percentage (%) of surveyed houses
1	Nabuna	75	54	21	72.0
2	Navala	141	127	14	90.1
3	Rakiraki	134	72	62	53.7

As stated, Sites 1, 2 and 3 were selected with the different characterizes of villages in Fiji in mind. Case study sites and field survey were supposed to include all households in the sites. However, some houses were empty as families were away during the field survey, thus the total number of 253 houses (Site 1= 54 out of 75 houses; Site 2= 127 out of 141 houses and Site 3= 72 out of 134 houses) (Table 5.2). Households were included in the study for both the mapping and the household survey. During the survey the maps of the village was prepared beforehand, and households were made to confirm the location of their houses before and after the cyclone.

For the household questionnaire the survey from was a mixed of both open and closed- ended questions, where the households were asked to state; (1) household profiles, (2) house types before and after TC Winston, (3) livelihood details, community cooperation in (4) Farm rehabilitation activities, (5) *solesolevaki* and what it means to individual households, activities that are carried out in each household using *solesolevaki* and (6) community cooperation during the DRR Phase: (i) evacuation actions, (ii) housing immediately after the cyclone, (iii) self-fixing reconstruction phase and (iv)Help for Homes.

The following results on the demographic, livelihood and house types in the village is to provide a background of the village sites. This will provide the context detailing traditional villages in Fiji. It will also differentiate the potential for resilience in the three villages.

5.3 Sites Background

5.3.1 Demographic information

The average number of people in the villages are illustrated in the Figure 5.1. Household numbers in villages, varies according to the livelihood activities, elderly care needed, housing maintenance and the types of family. Demographic was asked to show details of the households in each of the three village sites. In Site 1, the numbers ranged from one to 9 people per household. Only 1 out of the 54 households had 9 members of the household in their home. In Site 2, numbers ranged from one to 11 people per household. In Site 2, there is a range of one to 11 people in each household. In site 3, the numbers range from 1 to 11 too.

Site 1	N= 51
Site 2	N= 123
Site 3	N= 49
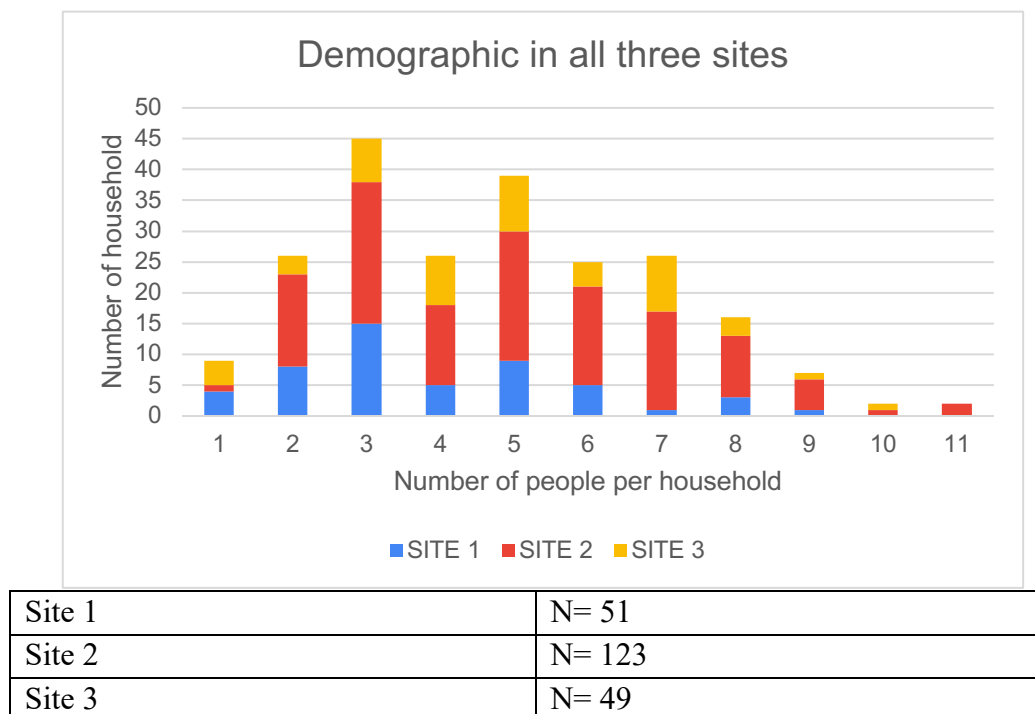
Figure 5. 1 Site demographic information.

The results show the average number of people in the village per households. In Fijian families, there is always an average of 5- 11 people per house. In Nabuna, families average only 4 people in the household. Each data set shows the maximum and the number of people in the villages.

Sites 2 and 3, shows villages that are located in the mainland of Viti Levu, where there is access to transport and government infrastructure. These two sites have a lot of families living in an extended family structure. Whereby a nuclear family (mother, father and their two children) live with an un-married aunt or uncle and grandparents (the father's parents). This is common Indigenous Fijian villages. This demographic information shows the potential that is available in the Fijian villages. With an above average household number, there is more opportunity for assistance and cooperation within the household (*vuvale*) level. Opportunity for community-based disaster response and recovery actions e.g., assisting the elderlies, provision of money and resources for reconstruction, etc.

5.3.2 Livelihood information

In each of the sites, income is earned by various people per household (Figure 5.2). For example, in site three, many households have salary paying jobs. Some of the household incomes are supplemented by farm and lease money collected from farmers who plant sugarcane in their *mataqali* land.
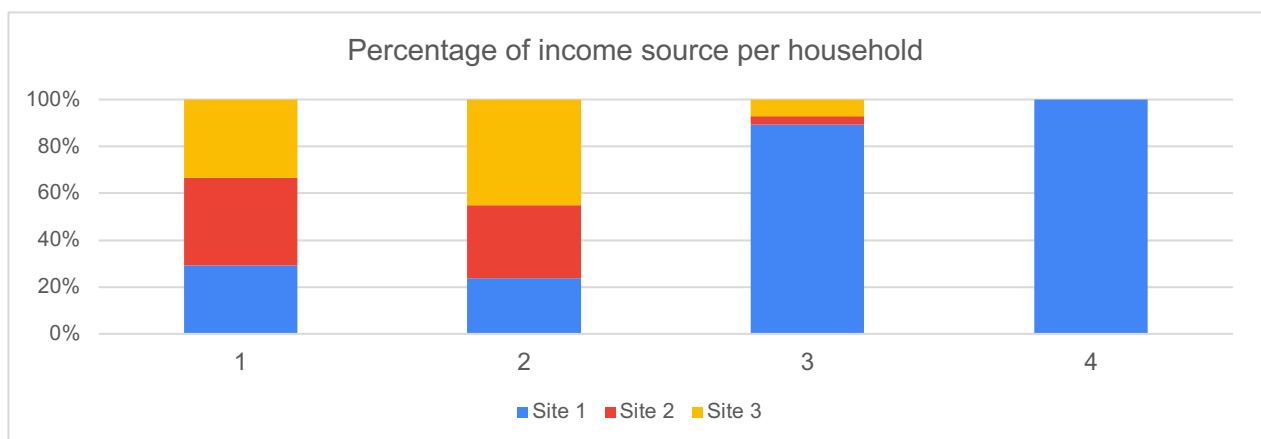
Figure 5. 2 Number of income sources per household

Types of incomes in the three sites is predominantly farming. In sites 2, only 5% of the total household are non- farmers (Figure 5.3). This includes income source from pension, remittance and social welfare. In site 1, 99% of the households are farmers and the 1% is a pension receiver from the government. In site three, only 11 of the 59 households supplemented their salary earned monthly with farming produce such as cassava and green vegetables.
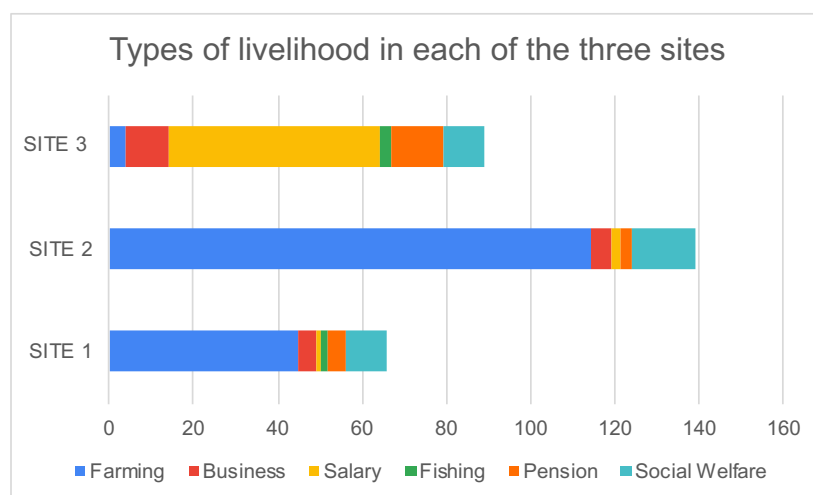
Figure 5. 3 Types of income in the three sites

The amount of money earned per household varied per site. In Site 1, households earned from 100 FJD to 1,000 FJD per month (1 FJD= 0.46 USD). For site 2, this was also the same, some earned below 100 FJD per month as they would just sell enough for monthly household groceries. This varied from 20 FJD/month to 50 FJD/month considering their households needs and number of people in each household. Table 5.3 shows a breakdown of market price of agricultural products are sold in the market from Sites 1 and 2.

Table 5. 3 Agricultural produces earnings breakdown for sites 1 and 2

Produce	Cost per Unit	Average earning per sale (monthly)
Kava (*Pipers methysticum*)	60 FJD Per kilogram (kg)	240 FJD for 4 kgs *Kava is harvested and sold 4-5 times a year depending on maturity
Taro (*Colocasea esculanta*)	2.30 FJD per kilogram (kg)	46 FJD for 20 kgs
Coconut	1 FJD each	30 FJD for 30 nuts
Mats	Depends on the types of mats sold: - Coco lawa 8- 400 FJD - Davodavo- 100 FJD - Vakabati- 300 FJD	A group of women who weave together can earn up to 100 FJD/month from the sale of a bundle of mats.
Voivoi (*Pandanus sp.*)	100 dried voivoi leaves per bundles sold @ 10 FJD	100 FJD per month
Cassava (*Manihot esculanta)*	5 FJD/heap in the market or 30- 50 FJD for a sack (20- 50kg sack	200- 400 FJD per month

Turmeric (*Curcuma longa*)	1 FJD per Kilogram	180 FJD per month or 45 FJD per week
Vudi (*Musa AAB*)	5 FJD per heap in the market	20- 50FJD per month
Goats (site 2)	150- 300 FJD	Depends on the number of livestock per family, size and gender of livestock is also taken into consideration.
Cows (site 2)	500- 800 FJD	

With the impacts of the cyclone on the livelihood, income within the households also suffered to that effect. Households that were interviewed in all three of the villages were asked about the changes to the income earned and different responses were recorded. For example, a family who earned 500 FJD/month before Winston was earning only 100 FJD after the cyclone (before the cyclone). On the other hand, some families in Site 1 now earn more after the cyclone, because of the increase in price of kava after the cyclone. Kava was sold for 75 FJD/Kg before the cyclone, and due to the low supply after the cyclone the price doubled to 150 FJD/Kg and has not gone down since.

Site 3 has a larger percentage earning a steady income despite the cyclone. This is because the wage they earn remains the same. Some interviewees in all three of the village stated that their expenses have also changed. An interviewee quoted that the cyclone has "made me conscious of saving money now, and that is why our expenses at home have decrease," (male, 24, Site 1).

Social welfare in Fiji is issued to citizens who are either over 65 years' old, disabled or unemployed. Assistance is distributed monthly at 50- 100 FJD per month. This includes food vouchers and cash assistance. The schemes included in the Social welfare scheme in Fiji includes. Poverty Benefit Scheme, Child Protection Scheme, Food voucher, Social Pension Scheme and Bus fare subsidy. In the interviews, those that indicated sources of livelihood as pension and social welfare assistance, were assisted from the government under the same Social protection initiative of the government. The social welfare program was mobilized in the dissemination of the Help for Homes Initiative post TC Winston (Figure 1.5).

Understanding livelihood activities and details in the villages also provides an opportunity for community- based disaster risk reduction activities. Farming for subsistence is common in indigenous villages in Fiji. The NDRR policy aims to alleviate poverty for Fijians, enhancing community livelihood is a way forward for building community resilience and preparedness for disaster. There is a successful story from Nayarabale village is in the interior of Vanua Levu, the second largest island in the Fiji group. It belongs to the Vaturova district in the province of Cakaudrove (Vunibola, 2022). The Nayarabale youth group registered with the Ministry of Youth in Fiji for assistance towards their million- dollar farm project. The farm project was initiated by the Methodist church and the aim was to create a 'bank' or a source to help youths in village socio- cultural obligations. The farm started from 300 kava plants in 2010 and is now a successful farm that was able to fund reconstruction in Nayarabale village after TC Yasa. The youths in Site 1, were also able to travel to Nayarabale, in December 2018 after TC Winston to collect kava sucklings to rehabilitate their kava farms.

Solesolevaki was key in these activities. There is an opportunity to enhance livelihood thorough lessons learnt from successfully established businesses and cooperative in Fiji to create resilient communities. The increase in market value of Kava after TC Winston, provides an excellent opportunity for households to farm and invest for disaster response and recovery at the community level.

5.3.3 Cash avenues during family emergencies

In investigating the potential for resilience and avenues available within the villages for CBDRR, it was also important to know avenues households have to borrow money from during emergencies. The three main categories of emergency funding the three sites are shown in Figure 5.4 below.
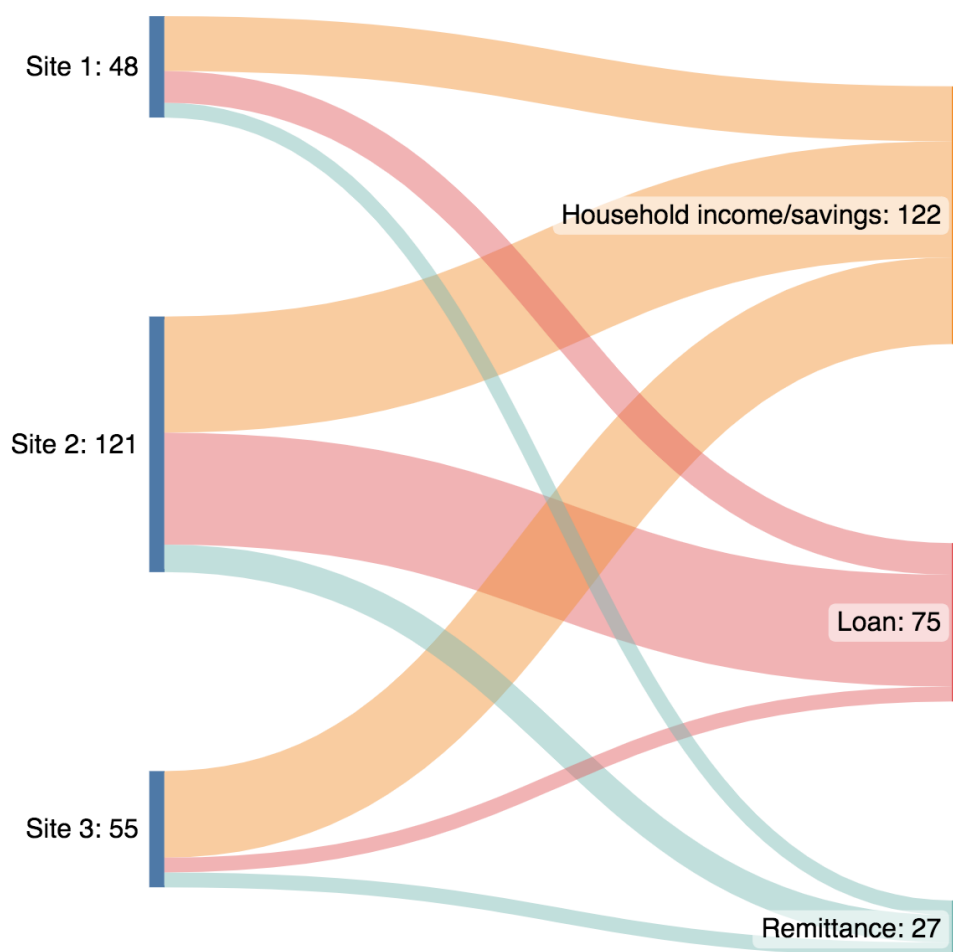
Figure 5. 4 Sankey diagram showing the types of emergency funding in the three sites

All three of the sites have majority of the households indicating household income/savings as the source of emergency funds. Some households stated that if an emergency arises, they quickly sell kava or an animal to cater for their need. In Site 1, 26 out of the 52 households have household savings, whereas in Site 2, 55 of the 121 households have savings for emergencies. On the other hand, Site 3 showed 41 of the 56 households having their own savings and income for emergencies.

The emergency funding avenues available shows that there are mechanisms in place to help households respond and recover from disasters. The households/savings options shown in Figure 5.4 highlights an opportunity for households to utilize their livelihood sources as a disaster preparedness mechanism. In addition to household incomes, the avenues for loans is detailed in the following section.

5.3.4 Types of Loans available in the villages

The social network in the village, is prevalent in the loan avenues available in the village. From the household interviews conducted, loans is accessed through the village funds, money that is collected by the *Turaga ni koro* thorough fundraisings, or village entrance fees by tourists which is the case for Site 2. The different types of loans are illustrated in Figure 5.5. In Site 1, 19 out of the 52 households rely on loans for emergency. In site 2, there are 53 of the 121 households and in Site 3, there is 7 out of the 56 households that rely on loans.
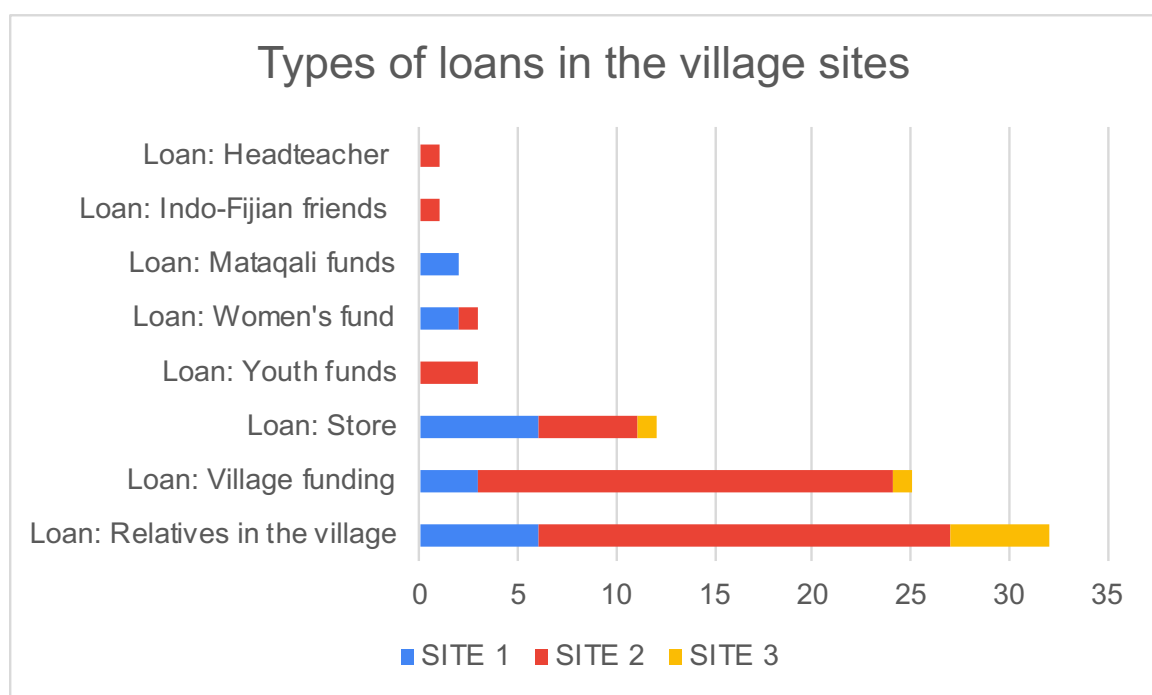
Figure 5. 5 Types of loans available in the village sites

Relatives in the village include immediate families (parents, siblings, and members of either the *tokatoka* or the *mataqali*). Families can borrow money ranging from 50 FJD to 500 FJD. An emergency is related to hospital visits, a death, funeral or school fees needs in the family. Site 1 and 2, also rely on the village store for loan and the money is often repaid after the sale of Kava, dalo or cassava.
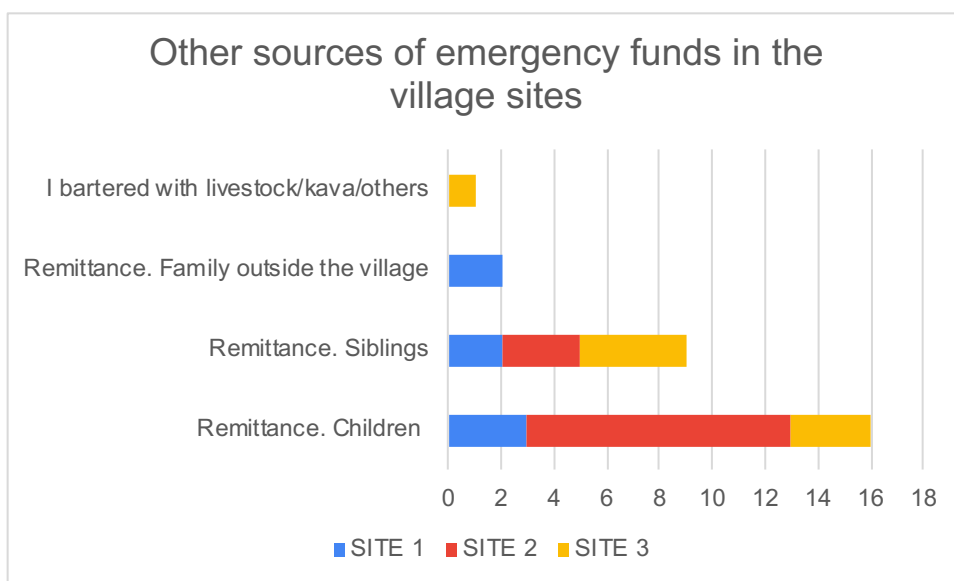
Figure 5. 6 Other sources of loan in the villages

Remittances and bartering of resources are also ways in which villages source emergency funds in the village sites (Figure 5.6). In highlighting these sources of emergency funds available in the villages, we can understand the options households have when faced with an emergency. This also includes natural disasters. In interviews with some of the households, the need for individual families to have emergency funds is now of vital importance.

5.4 Evacuation phase responses post TC Winston

5.4.1 Cyclone warning information

Disaster warning information dissemination in the villages is very important. To understand communities' capacity for evacuation and information dissemination it was important to know how information was received in the three village sites. Households were asked how they found out about TC Winston. In Fiji cyclone warnings are disseminated by the Department of Meteorology to the radio stations and the respective provincial offices. For villages close to the urban areas, the *iTaukei* Affairs (formerly Ministry of Indigenous Fijian affairs) information is passed by the *Roko Tui's* and the police is also used to assist in transportation. Figures 5.7 illustrates the responses from the three village sites.

All three sites indicated hearing the warning about the cyclone, from the radio thorough the weather updates. However, some of the households did not hear the cyclone warning because they were in their kava farms or in town doing the marketing. In Site 1, the 14% that did not hear about the cyclone warning were building the lay preachers' house. Some of the men stated that they saw cows moving in a drove upland. In Site 3, 15% heard the warning from their neighbor, and 21% of the of the respondents were in a funeral and did not hear nor prepare for the cyclone.

Site 1: How did you find out about the cyclone?

4%
14%
8%
2%
2%
70%

- Radio
- Was outside the village
- Turaga ni koro
- Famiy outside the village
- Did not hear about it
- Neighbor

Site 2: How did you find out about the cyclone?

6%
6%
2%
7%
5%
8%
66%

- Radio
- Was outside the village
- Turaga ni koro
- Famiy outside the village
- Did not hear about it
- Saw change in weather
- Neighbor

Site 3: How did you find out about the cyclone?

15%
21%
6%
5%
53%

- Radio
- Was outside the village
- Famiy outside the village
- Did not hear about it
- Neighbor

Figure 5. 7 Site 1 to 3 response to the questionnaire

In the interviews, households also shared about some cyclone warning signs based on traditional knowledge. These signs are given by animals and flowers. Below is a list of some of the traditional warning signs seen by some of the households. However, some of the households still were not prepared as they relied more on the weather reports on the radio. Signs observed in the village sites:

- Animals making their way uphill (Site 1)
- Ants and household pests seen in households prior to the cyclone (Site 1)
- Breadfruit (*Artocarpus altilis)* fruiting in abundance from December to February 2016 (All three sites)
- High humidity and unusual heat from November to February 2016 (all three sites)

Finding show that information disseminated by the Department of Meteorology reaches all the villages in Fiji thorough the radio or television. The role of the emergency committee and the Turaga ni Koro in the villages should start from making sure everyone in the village is prepared for the cyclone. In Japan, the fire volunteers would knock on dwellings in communities to ensure everyone knows about the cyclone. One of the comments from an interviewer in Site 3, emphasized the need for proper awareness and education in preparing villages for disasters. In the radio, announcement was made for a "Category 5 cyclone coming towards…. (example of weather report from the radio)" However, villagers were not able to relate to this. He stated that

> "They should say how fast the wind is according to the car speed, then we will know. If they just say the category, we will not be able to visualize it and know how devastating it can be for us." (Male, 54, Site 3).

The results from the household survey indicates, that households in the villages, hear the warning disseminated thorough the radio. It can be assumed that households would have time to prepare with adequate warning. This is not the case for some of the households as discussed in the following section. However, some households were not in the village (Site 1 and 2) or were participating in *solesolevaki* activities in the village. This finding suggests an opportunity to strengthen community preparedness. The *Turaga ni Koro* in all three sites, also recalled giving warning announcements throughout the village, up to 24 hours before the cyclone made landfall. There is adequate time and support in the villages, to hear about the warnings and prepare accordingly. The role of the *Turaga ni Koro* is key during the preparedness phase. In Site 1 and 2, youths also helped the *Turaga ni Koro* making the announcement in the village.

Youth volunteers and a village committee is needed in villages to support the *Turaga ni Koro* in disseminating the right information to help villagers prepare. The existing traditional knowledge observed in the villages, is also an element of good practice in CBDRR. These knowledge needs to be re-educated and not taken lightly.

5.5.2 Evacuation sites

Households were asked about their evacuation activities, to understand people's movement and evacuation actions during a cyclone. From all the three sites, "staying home" was the majority of the response from the interviewees. Despite the availability of evacuation centers in all the three village sites, majority of the households preferred to stay home and not evacuate to the evacuation centers. This is also due to the lack of preparations at the household level.

Evacuation centers is the school for all and only Rakiraki (Site 3) and Navala (Site 2) also use the church as an evacuation center. Figures 5.8 shows the movement of households in the village. This is common in all three sites. The use of the evacuation center is the least chosen in all the three sites.
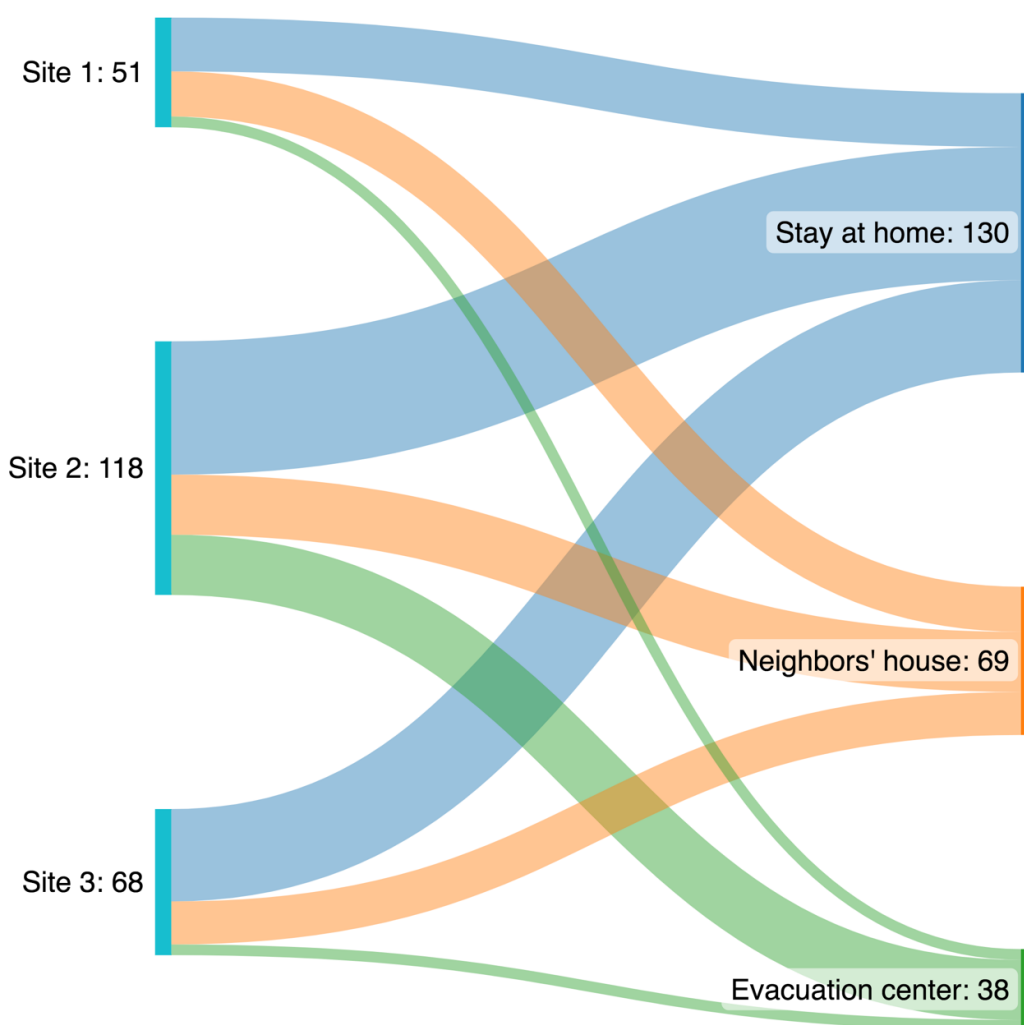
Figure 5. 8 Evacuation actions during the cyclone

In Site 1, TC Winston made landfall twice (from the villages recollection) within a two (2) hour interval. This provided time for households to move. According to the interviews in Site 1, the *Turaga ni Koro* organized the youth in the village to help with evacuating the elderlies and the sick to the evacuation center. From the findings it can be observed that the first reaction

is to remain at home. Many felt safer and secure at home, some were too old and weak to go to the evacuation centers. These reasons are shown in Figure 5.9.
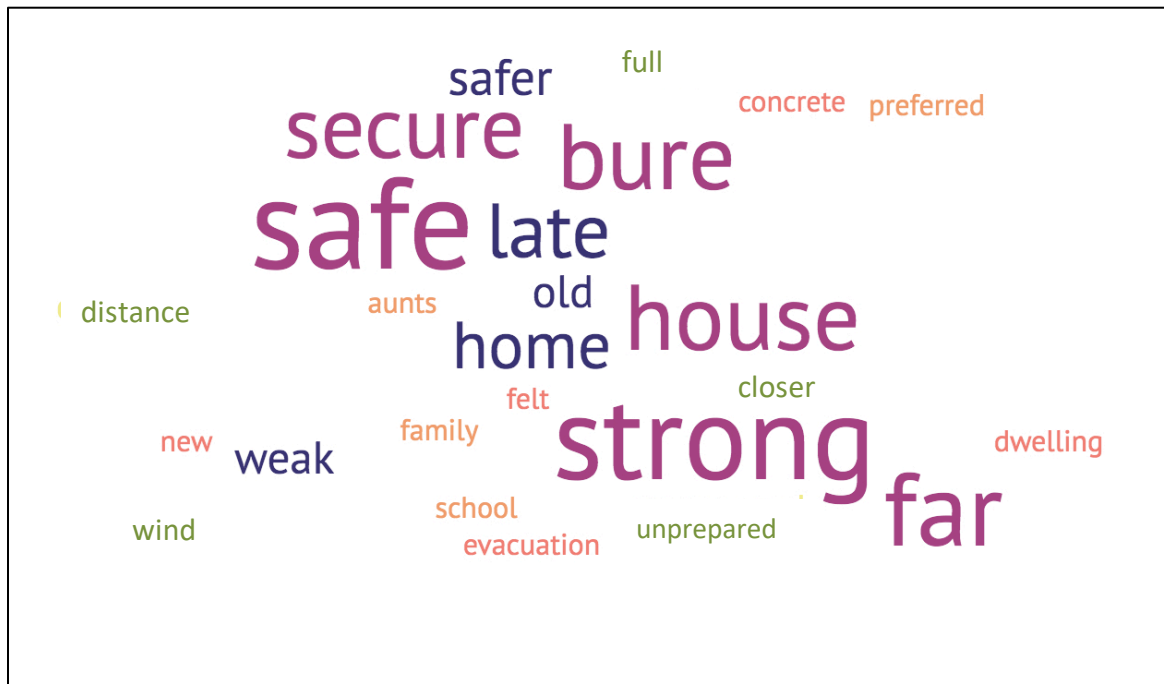
Figure 5. 9 Word cloud showing reasons for not going to the evacuation centers in the sites

5.3.5 House types in each village

Traditional houses in Fiji, are called *bure,* where traditionally they were referred houses that men lived apart from the women and were known by names given to it after it was built (Ravuvu, 1987). This tradition of naming houses is still continuing to this day, whereby the head of the household would give a name to the house and that would be the identity of the house in the village. For instance, a family would be known by their house name in the village rather than giving prominence to their family name. *Bure* are common in Navala village (site 2), as it is the only village in Fiji where majority of the houses are still traditional.

Examples of such types of houses are shown in the figure 5.10. Mixed houses in this sense are those with bamboo walls and corrugated iron sheets for roofing materials, these houses are often temporary and are also common types of kitchens in Navala village. These mixed houses are often regarded as temporary houses, whereby a newlywed couple would move to temporarily whilst waiting for their temporary home to be constructed. In Site 2 the main houses are separate from the main houses, the kitchen houses were often of mixed structures too.

In Sites 1 and 3 the main type of houses is either wooden houses or concrete houses. Houses or dwellings are often referred to in Fijian as *vale kava* (corrugated iron house), *vale kau* (wooden board house), or *vale boloko* (cement house). In the following figures, findings from the field survey are illustrated. Households were asked about the types of houses they had

before and after TC Winston. In some villages the change is very clear, for example in Site 2, the number of *bure*s drastically decreased after the cyclone.

Figure 5. 10 Traditional house (bure); (left) modern house made of corrugated iron sheets (middle) mixed housing structure with bamboo walls, timber structure and CI roof (right) (Source: Mari Miyaji))

House types in the three village sites did not change a lot after the cyclone. The following graphs and tables illustrate the changes in the house types in each of the sites. The materials describe each house the house types are shown in the table following the graphs.
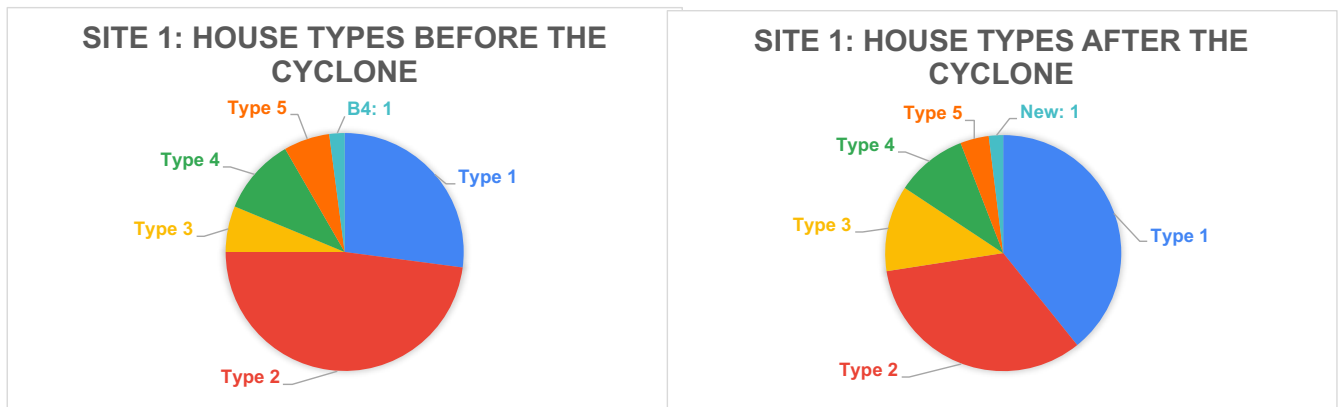
Figure 5. 11 Site 1 house types before and after the cyclone

Site 1: House Type descriptions (Key): N= 51

House type	Structure	Wall type	Floor	Roof	# Before	# After
1	Timber Frame	Corrugated Iron	Earth	Corrugated Iron	13	20
2	Timber Frame	Wooden Board	Wooden Board	Corrugated Iron	23	17
3	Timber Frame	Corrugated Iron	Wooden Board	Corrugated Iron	3	6
4	Timber Frame	Cement	Wooden Board	Corrugated Iron	5	5
5	Timber Frame	Cement	Earth	Corrugated Iron	3	2
B4: 1	Timber Frame	Grass	Earth	Corrugated Iron	1	0
New: 1	Timber Frame	Cement	Cement	Corrugated Iron	0	1
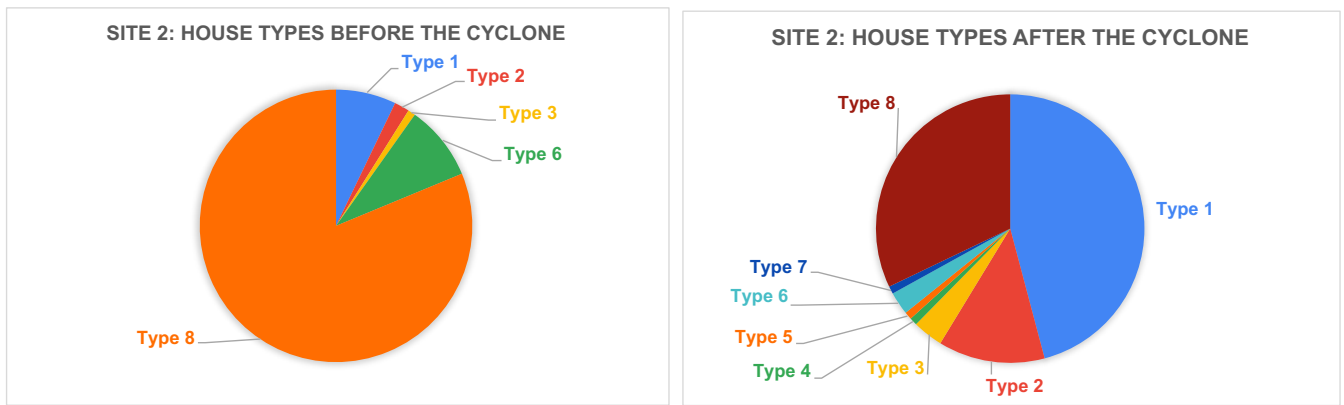
Figure 5. 12 Site 2 house types before and after the cyclone

Site 2: House Type descriptions (key): N= 121

House type	Structure	Wall type	Floor	Roof	# Before	# After
1	Timber Frame	Corrugated Iron	Earth	Corrugated Iron	8	50
2	Timber Frame	Corrugated Iron	Cement	Corrugated Iron	2	14
3	Timber Frame	Corrugated Iron	Wooden Board	Corrugated Iron	1	4
4	Timber Frame	Corrugated Iron	Wooden Board	Corrugated Iron	0	1
5	Timber Frame	Cement & Wooden Board	Cement	Corrugated Iron	0	1
6	Timber Frame	Bamboo	Earth	Corrugated Iron	10	3
7	Timber Frame	Bamboo	Cement	Corrugated Iron	0	1
8	Bure	Bamboo	Earth	Thatched	91	35
B4: 1	Timber Frame	Wooden Board	Cement	Corrugated Iron	2	0
B4:2	Timber Frame	Wooden Board	Wooden Board	Corrugated Iron	1	0
B4: 3	Timber Frame	Bamboo	Earth	Thatched	2	0
B4: 4	Timber Frame	Bamboo	Wooden Board	Corrugated Iron	2	0
B4: 5	Timber Frame	Corrugated Iron	Cement	Corrugated Iron	2	0
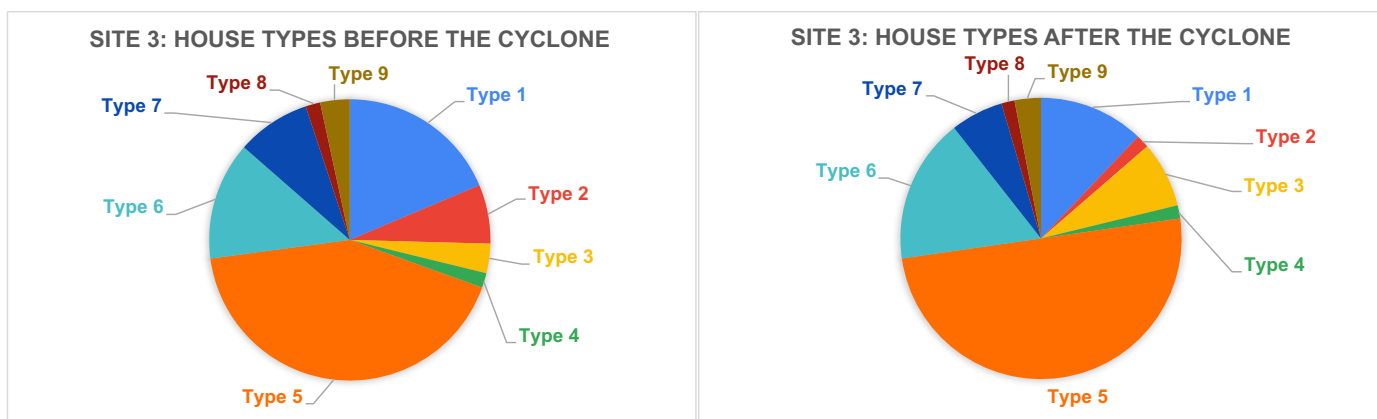
Figure 5. 13 Site 3 house types before and after the cyclone

Site 3: House Types descriptions (Key): N= 66

House type	Structure	Wall type	Floor	Roof	# Before	# After
1	Timber Frame	Corrugated Iron	Earth	Corrugated Iron	11	8
2	Timber Frame	Corrugated Iron	Wooden Board	Corrugated Iron	4	1
3	Timber Frame	Corrugated Iron	Cement	Corrugated Iron	2	5
4	Timber Frame	Cement	Wooden Board	Corrugated Iron	1	1
5	Timber Frame	Cement	Cement	Corrugated Iron	25	33
6	Timber Frame	Wooden Board	Cement	Corrugated Iron	8	11
7	Timber Frame	Wooden Board	Wooden Board	Corrugated Iron	5	4
8	Timber Frame	Cement & Corrugated iron	Cement	Corrugated Iron	1	1
9	Timber Frame	Cement & Wooden Board	Cement	Corrugated Iron	2	2

The house types in the three sites, have all changed after TC Winston. The materials used have also changed in some of the cases. In site 1 (Figure 5.11), earthen flooring in timber frame houses increased after the cyclone, this may be due to the delay in materials arrival in the island. 22 out of the 51 households that responded, indicated this change in flooring material. This can correlate with the decreasing number of houses with wooden flooring in the village, compared to before the cyclone. The main challenge for Site 1 after the cyclone was the delivery of materials from the hardware shops in the main island.

For Site 2 (Figure 5.12), the two main changes are the number of timber frame houses with corrugated wall and roofing (Type 1). From only 8 households with Type 1 houses before the

cyclone, this has increased to 50. This is due to the rehabilitation assistance by the Fiji government (Help for Homes initiative). Type 2 house can also be indicative of the same. However, Type 8, has significantly changed after the cyclone. *Bures* in Site 2 have decreased drastically also because of the Help for Homes assistance after TC Winston. Governments assistance was not appropriate for Bure's as the assistance was for building materials only, those purchased from hardware shops around Fiji. The Help for Homes initiative is described in detail in Section 1.3 of this dissertation.

In Site 3 (Figure 5.13), Type 1 houses decreased after the cyclone. On the other hand, house types 5 and 6 increased in numbers. The interviewees praised the governments rehabilitation initiative as it allowed villages to build and renovate their houses. Site 3 is located the closest to a town out of the three sites, and this is seen in the types of houses built after the cyclone.

5.5.4 Housing immediately after the cyclone (Temporary accommodation)

TC Winston caused extensive damages to the three village sites. This is illustrated in Figure 60. All three of the sites indicated "totally collapsed" or "severe and no longer livable (condemned)" as the extent of the damage on their houses from TC Winston. Site 2, suffered the most in terms of house totally damaged. According to Figure 5.11- 5.13, site 2 also had a big change in house types before and after the cyclone.

Figure 5. 14 (Left) Severely damaged and no longer liable in Site 2; (middle) severe but still liable house in Site 3 and (right) completely collapse house in Site 2 (Source: Mari Miyaji, Sainimere Veitata)
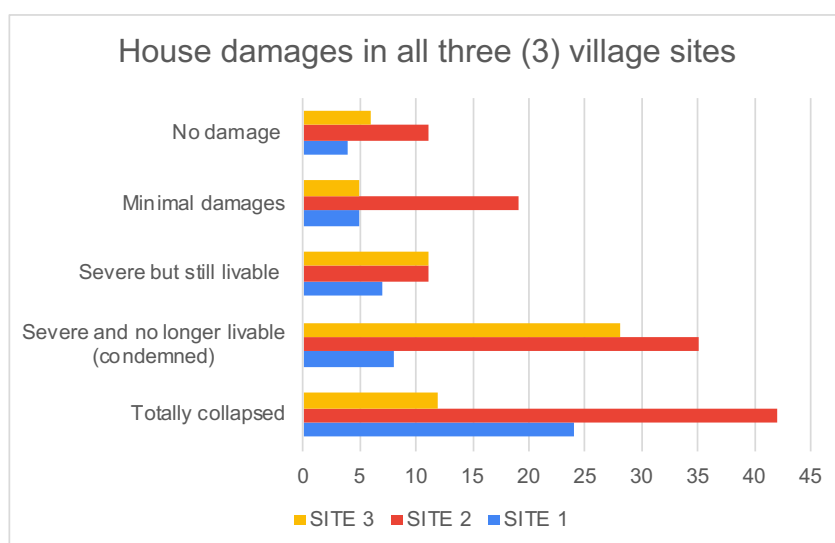
Figure 5. 15 House damages in the three village sites

Households that could not move to the evacuation centers, move to their neighbors' houses. When asked about the reasons why households did not move to the evacuation centers, reasons include, distance, elderlies in the home, safe dwelling, bure is trusted compared to other types of houses in the village. Reasons are illustrated in the word cloud (Figure 5.9).

The following timeline shows in detail the movements of households within the three village sites (Figure 5.16- 5.18). Housing immediately after the cyclone are mainly "MAKESHIFT HOUSES" which means that the house is a tent (from the relief supplies), a shed (from materials collected post cyclone) or a structure made from Tarpaulins. Examples of makeshift houses are shown in the images below (Figure 5.16).

Figure 5. 16 (left) Makeshift house in Site 1 (right) UNICEF tent (Source: Sainimere Veitata and UNICEF)

Key for all the timelines (Figures 5.16- 5.18):

	Stay home		Evacuation centers
	Neighbors house		Makeshift houses
	Outside the village		

In Site 1, 30 out of the 54 households lived in makeshift houses, which were either tents distributed thorough the governments' relief drive or by their own initiative (Figure 5.16).

SITE 1 HH MOVEMENTS- FROM EVACUATION TO TEMPORARY HOUSING

House #	Days (1–7)	weeks (2–4) / months (2–12) / Years' (2–5)
1	Stay / Neighbors house	Makeshift house
2	Stay home	Makeshift house
3	Neighbors house	
4	Evacuation center	
5	Neighbors house	
6	Neighbors house	
7	Outside village	Makeshift house
8	Stay home	Makeshift house
9	Outside village	
10	Stay home	Move to Farm house
11	Stay home	Move to farm house
12	Stay home	
13	Stay home	Neighbors house
14	Neighbors house	
15	Evacuation center	
16	evacuation center	
17	Stay home	
18	Neighbors house	Makeshift house
19	Neighbors house	Makeshift house
20	Neighbors house	Makeshift house
21	Stay home	Makeshift house
22	Neighbors house	Makeshift house
23	Neighbors house	
24	Neighbors house	Makeshift house
25	Stay home	Makeshift house
26	Neighbors house	Makeshift house
27	Stay home	Makeshift house
28	Stay home	
29	Neighbors house	Makeshift house
30	Neighbors house	Makeshift house
31	Evacuation center	
32	Neighbors house	
33	Stay home	Move to Suva
34	Neighbors house	Makeshift house
35	Stay home	Makeshift house
36	Stay home	Makeshift house
37	Evacuation center	Makeshift house
38	Stay SCHOOL	Makeshift house
39	Stay SCHOOL	Makeshift house
40	Stay SCHOOL	Makeshift house
41	Neighbors house	Makeshift house
42	Stay SCHOOL	Makeshift house
43	Neighbors / Makeshift house	
44	Stay SCHOOL	
45	Stay home SCHOOL	
46	Stay home	
47	Outside village	Makeshift house
48	Neighbors house	
49	Stay home	Makeshift house
50	Stay SCHOOL	
51	Neighbors house	Makeshift house
52	Neighbors house	Makeshift house
53	Stay home	
54	Neighbors house	

Figure 5. 17 Timeline of temporary house actions for households in Site 1 (Nabuna village)

House #	Days							weeks			months											Years'			
	1	2	3	4	5	6	7	2	3	4	2	3	4	5	6	7	8	9	10	11	12	2	3	4	5

SITE 2 HH MOVEMENTS- FROM EVACUATION TO TEMPORARY HOUSING

House #	Status
1	Neighbors house- 3 weeks
2	Stay home
3	Neighbors house- 3 days
4	Neighbors house- 1 day
5	Stay home / Makeshift house
6	Stay home / Makeshift house
7	Stay home
8	Neighbors house- 2 days
9	Stay home
10	Stay Makeshift house
11	Stay home / Makeshift house
12	Stay home / Makeshift house
13	Neighbors house- 2 weeks
14	Stay home
15	Church- 1 day
16	Stay home
17	Neighbors house
18	Stay home
19	Stay home
20	Stay home
21	Neighbors house
22	Stay home
23	Stay home
24	school
25	Neighbors house
26	Neighbors house
27	Stay home
28	Stay home
29	Stay home
30	Outside the village
31	Stay home
32	Stay home
33	Stay home
34	Neighbors house
35	Stay home
36	Stay home
37	Neighbors house
38	Stay home
39	Stay home
40	Stay home
41	Stay home
42	Stay home
43	Stay home
44	Neighbors house
45	Neighbors house
46	Neighbors house
47	Neighbors house
48	Stay home
49	Stay home
50	Stay home
51	Stay home
52	Stay home
53	Stay home
54	Neighbors house
55	Stay home
56	school
57	Stay home
58	school
59	Outside the village
60	school
61	Stay home
62	Stay home
63	Stay home
64	Stay home
65	Stay home
66	Stay home
67	school
68	Stay home
69	Stay home
70	school
71	Stay home

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Figure 5. 18 Evacuation and temporary house activities per households in Site 2 (Navala village)

In Site 2, most of the households could not recall their movements after the cyclone. Therefore, the data collected from the household survey shows fewer houses in makeshift houses (Figure 5.17). In comparison to Site 1, the details are still fresh amongst the interviewees as the experience was traumatic for those on Koro Island.

In Site 3, majority of the households stayed in makeshift houses up to 1 year after TC Winston. The longest are households 51 and 52, who stayed for up to 5 years'.

House #	SITE 1 HH MOVEMENTS- FROM EVACUATION TO TEMPORARY HOUSING
1	Stay / Neighbors house → Makeshift house (months)
2	Stay home → Makeshift house
3	Neighbors house
4	Evacuation center
5	Neighbors house
6	Neighbors house
7	Outside village → Makeshift house
8	Stay home → Makeshift house
9	Outside village → Makeshift house
10	Stay home → Move to Farm house
11	Stay home → Move to farm house
12	Stay home
13	Stay home → Neighbors house
14	Neighbors house
15	Evacuation center
16	evacuation center
17	Stay home
18	Neighbors house → Makeshift house
19	Neighbors house → Makeshift house
20	Neighbors house → Makeshift house
21	Stay home → Makeshift house
22	Neighbors house → Makeshift house
23	Neighbors house
24	Neighbors house → Makeshift house
25	Stay home → Makeshift house
26	Neighbors house → Makeshift house
27	Stay home → Makeshift house
28	Stay home
29	Neighbors house → Makeshift house
30	Neighbors house → Makeshift house
31	Evacuation center
32	Neighbors house
33	Stay home → Move to Suva
34	Neighbors house → Makeshift house
35	Stay home → Makeshift house
36	Stay home → Makeshift house
37	Evacuation center → Makeshift house
38	Stay SCHOOL → Makeshift house
39	Stay SCHOOL → Makeshift house
40	Stay SCHOOL → Makeshift house
41	Neighbors house → Makeshift house
42	Stay SCHOOL → Makeshift house
43	Neighbors / Makeshift house
44	Stay SCHOOL
45	Stay home SCHOOL
46	Stay home
47	Outside village → Makeshift house
48	Neighbors house
49	Stay home → Makeshift house
50	Stay SCHOOL
51	Neighbors house → Makeshift house
52	Neighbors house → Makeshift house
53	Stay home
54	Neighbors house

Column timeline: Days (1–7), weeks (2, 3, 4), months (2–12), Years' (2, 3, 4, 5)

Figure 5. 19 Evacuation actions and temporary shelter in Site 3 (Rakiraki village)

From the above results we find that most households prefer to either stay home or evacuate to a neighbors' house. Only site 1 out of the three sites only have options for tents as a temporary dwelling. Due to the delay in the material arrival into the villages, families stayed longer in temporary housing. This is clearly seen in Site 1. Some households stayed in makeshift houses up to 2 years' after the cyclone.

Housing is an immediate need after the cyclone. The three sites relied on *solesolevaki* in the clean up immediately after the cyclone and in the management of the evacuation centers. In Site 2, the village committee (Figure 5.20) led the organization of clean up, management of the

evacuation centers and the distribution of relief supplies. The youth, and men organized themselves into groups to fix the toilets, leaking faucets, broken pipes and building materials thorough *solesolevaki*. In Site 1, the village committee from Suva organized the relief and immediate needs thorough the greater *Vanua* Nabuna (Figure 4.3) for those living outside of Site 1, in Fiji and abroad. The response was overwhelming, and this cooperation type is also considered as *solesolevaki* amongst the relatives. During the emergency times, the values of *veikauwaitaki* (caring), *veirogorogoci* (concensus), *veidokai* (respect), *veivakaturagataki (*chiefly manner) and *veivakaliuci (*polite submission) are manifested through the communal nature of *solesolevaki.*
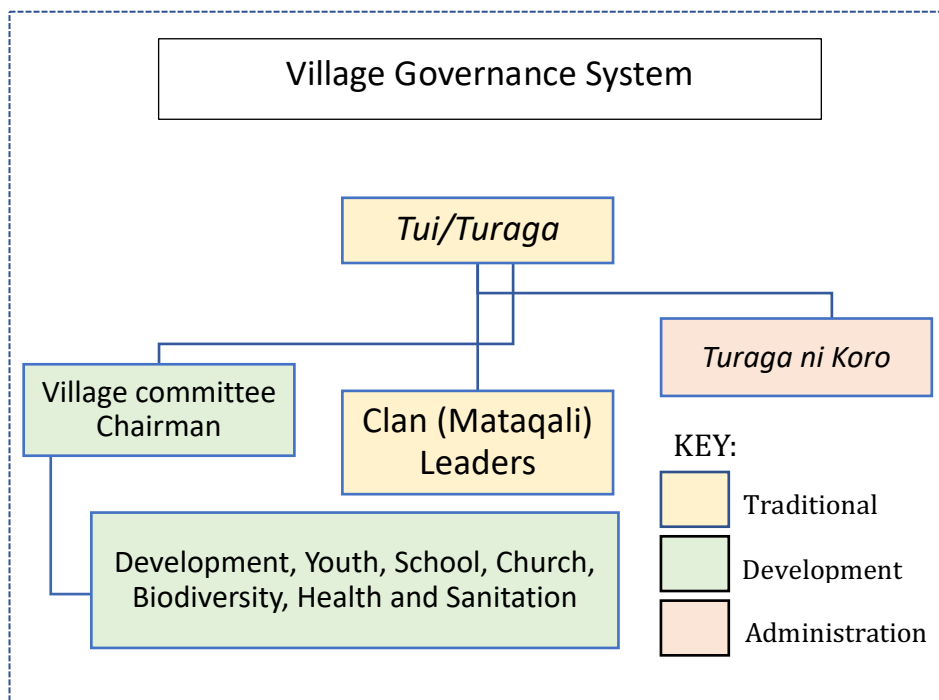

Figure 5. 20 Established village governance system in traditional villages in Fiji

5.5 Housing repairs and reconstruction

5.5.1 Self- fixing of houses

This section highlights the details of how households in the three case study sites, addressed self-repairs and construction. Households that fixed their houses without waiting for governments assistance (Figure 5.20). Some of the repairs were temporary, where resources they had were utilized to provide their families with the needed shelter. Majority of the houses included in the percentage repaired (Figure 5.14) were 'severe but still livable' (Site 1= 4 out of 12 houses, Site 2= 15 out of 25 houses and Site 3= 26 out of 53 houses). However, in site 2, 15 out of the 53 houses that needed repairs were 'totally collapsed'. These houses in Site 2, were mainly *bures* that could be repaired using resources available in the village.

Households were asked about the funding sources and what types of assistance was rendered for the house repairs. Figure 68 illustrated these findings, highlighting majority of the materials used for self- fixing were from recycled materials collected and utilized after the cyclone. Most of the households from site 2, recycled thatching materials for roofing and walls from the cyclone debris. As seen in Figure 5.21, houses in Site 2, mostly lost the thatched roof after TC Winston.
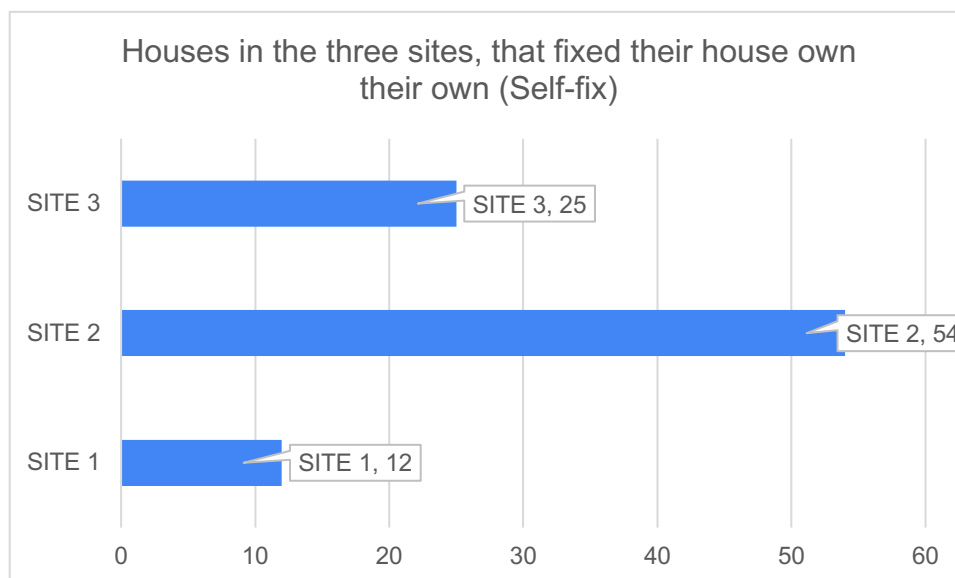
Figure 5. 21 Number of households that repaired their houses on their own in the village sites
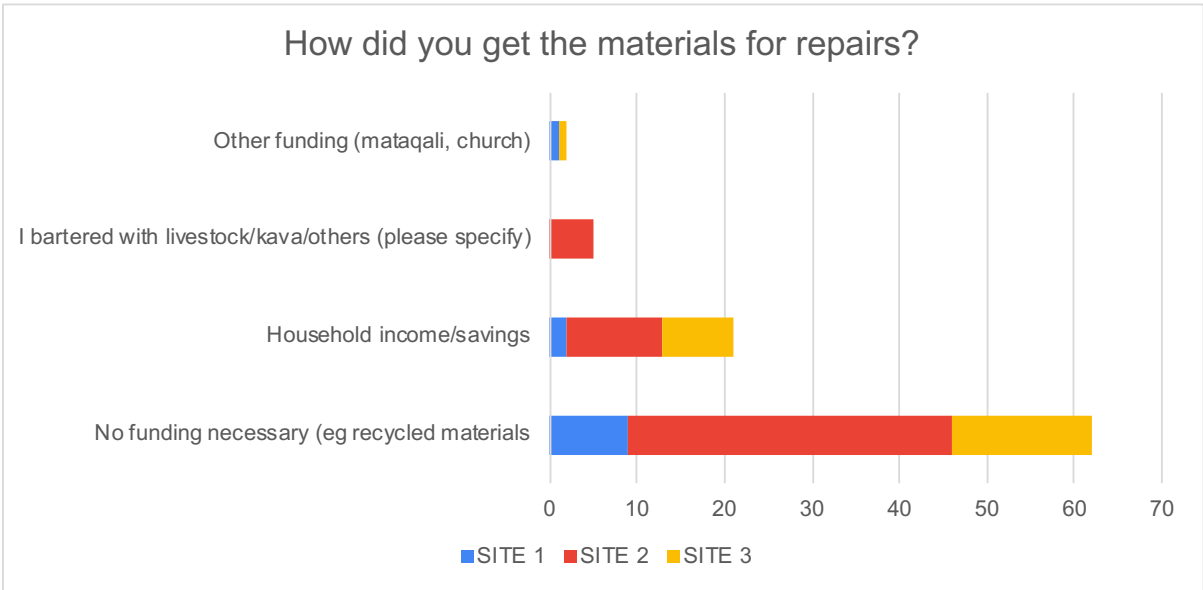
Figure 5. 23 Graph showing resources utilized for self- fixing of houses
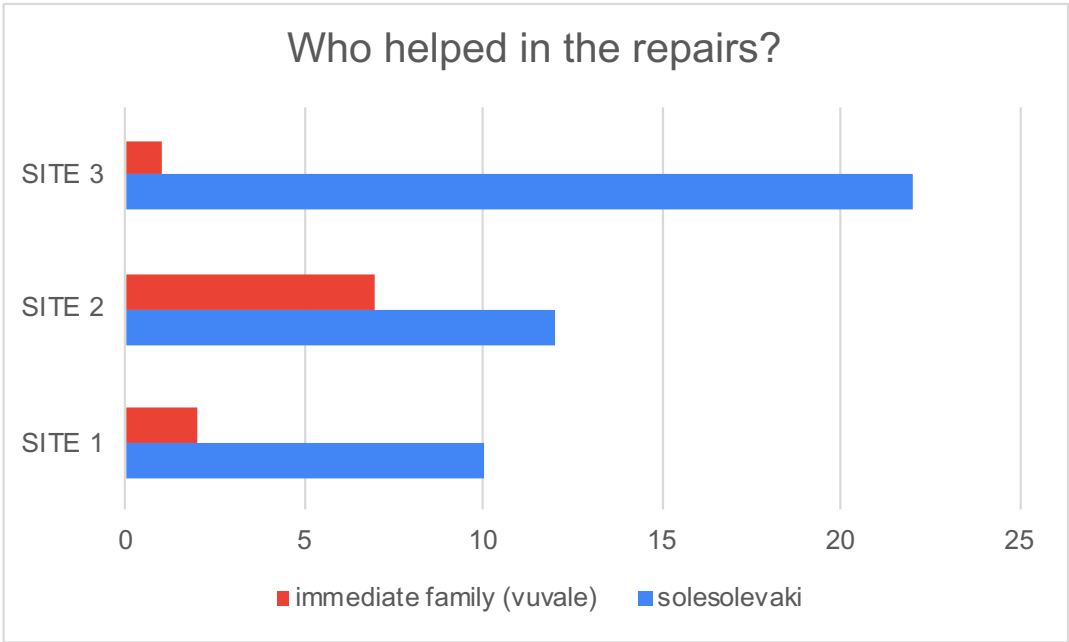
Figure 5. 22 Graph showing how repairs was carried out in the three site

The findings illustrated and discussed above shows communities capacity for self- reliance. Materials utilized the most were from the house materials collected from the cyclone debris. Some of the households utilized their household savings and income to fix their houses. In site 2, some of the households barted kava or animals with carpenters in the village to repair their houses. In figure 5.22, we can see the role *solesolevaki* plays in the 'self- fix' process. All the sites indicated that the cooperation process was key in addressing the damages in their houses. Site 3 showed the most use of *solesolevaki* as the *Turaga ni Koro* together with the village committee had organized themselves to address the immediate repairs needed in the village.

In some households the initial self- fixing of the household dwelling was addressed by the immediate family. In Figure 5. 22, Site 2 utilized more immediate family help compared to the other two sites. In the interview with the *Turaga ni Koro* from Site 2, he stated that the *solesolevaki* immediately after the cyclone was carried out of about 3-4 days a week. Individual households were also expected to clean their homes and salvage households supplies at the same time.

5.5.2 Help for Homes (HFH)

The governments assistance for Help for Homes had helped the households rebuild damaged houses and reconstruction of totally damaged homes in the villages. This section highlights the cooperation (*solesolevaki)* work utilized in the Help for Homes reconstruction process. The Help for Homes assistance is the social protection initiative by the Fiji Government issued after February 2016. Households in the 10 affected provinces in Fiji, were accessible to the HFH assistance given by the government. The process of HFH for villages in Fiji is summarized in Table 5.4.

Table 5. 4 Help for Homes process in Fiji post TC Winston

Month	HFH Activities
February 2016	TC Winston hit villages in Fiji
March 2016	Disaster Damage Assessment (DDA) by technical officers in the Fiji government
May 2016	Application and electronic distribution thorough the Ministry of Women, Children and Poverty Alleviation
August 2016	Households receive materials distributed by the following Hardware companies in Fiji: 1. Dayals Sawmillers Limited, 2. Carpenters Hardware, 3. CBS Power Solutions Fiji Limited, 4. Vinod Patel and Company Limited, 5. R.C Manubhai and Company Limited, 6. Rakiraki Hardware, 7. Local Woods and Hardware Limited, 8. Kasabias Limited, 9. Refrigeration Electrical Services Limited and 10. Haroons Hardware
September 2016	Materials distributions started in villages around Fiji.

Source: Build Back Better cluster Fiji (2016)

There were three types of assistance given to affected households. The categories were:
1. Homes with partial roofing damage will receive 1,500 FJD (690 USD),
2. Homes with complete roofing damage will receive 3,000 FJD (1,380 USD) and
3. Homes that have been destroyed will receive 7,000 FJD (2, 219 USD).
The Fiji government allocated 70 million FJD for this initiative.

A study by Miyaji (2021) in Navala village (Site 2) investigated the HFH assistance issued after TC Winston. The study found that the increase in 'modern houses' in the village was due to the HFH assistance received from the government. Households were able to build new homes and rebuild timber framed houses in the *bure* foundations.
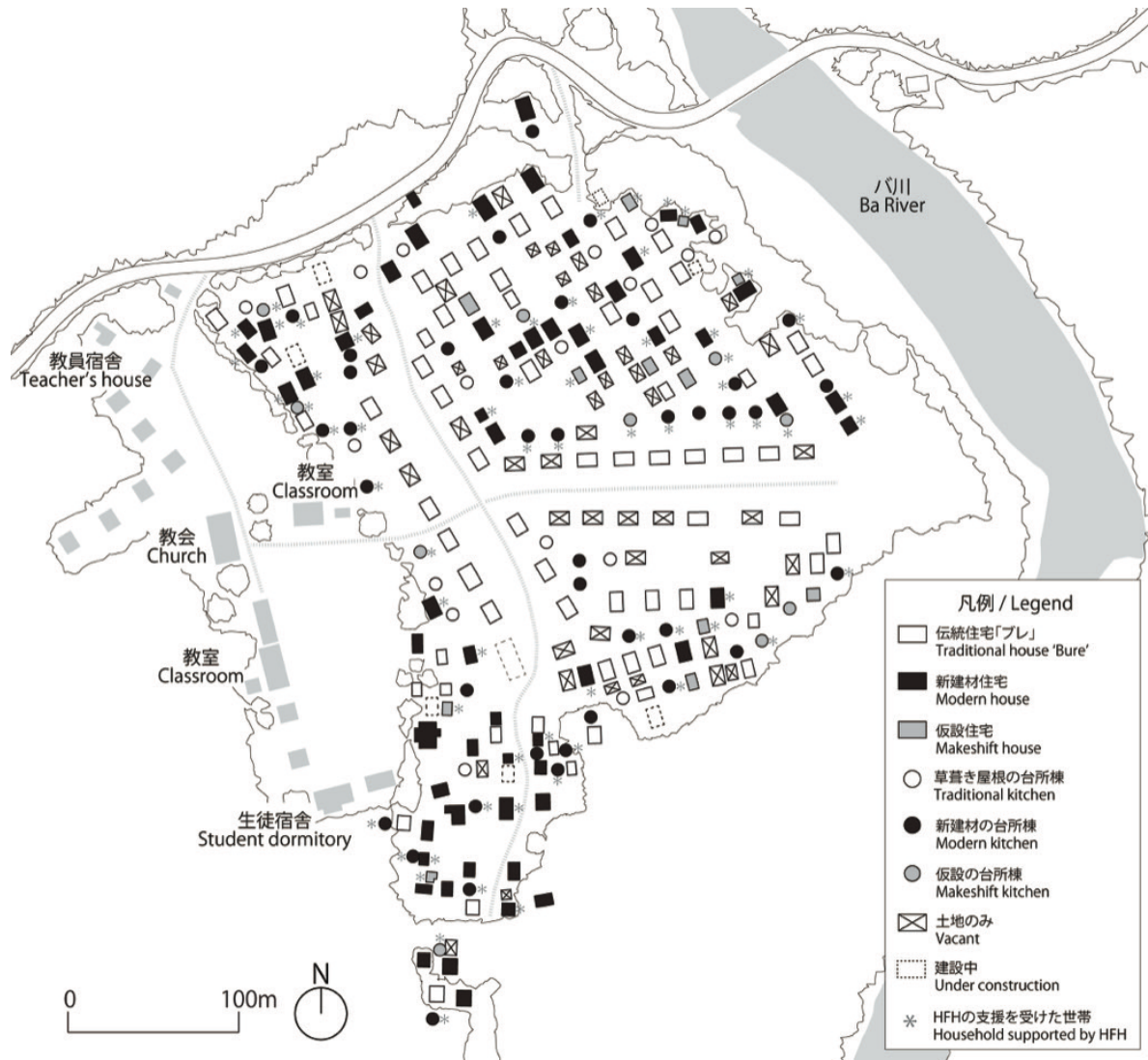
Figure 5. 24 Map of Site 2 (2018), showing HFH assisted houses (Miyaji et al, 2021)

The household interviews conducted confirmed the dissemination of HFH funds to the affected households in the three village sites. Due to the excessive damage to the houses in Site 1, 44 of the 47 respondents confirmed receiving 7,000 FJD. None of the households received 3,000 FJD and only 3 households had partial damages. Figure 5.24 shows the difference in assistance received in the three village sites. Some interviewees stated that the HFH assistance was a "Blessing in disguise, as they were able to get a free house thanks to the government (Male, 60, Site 2).
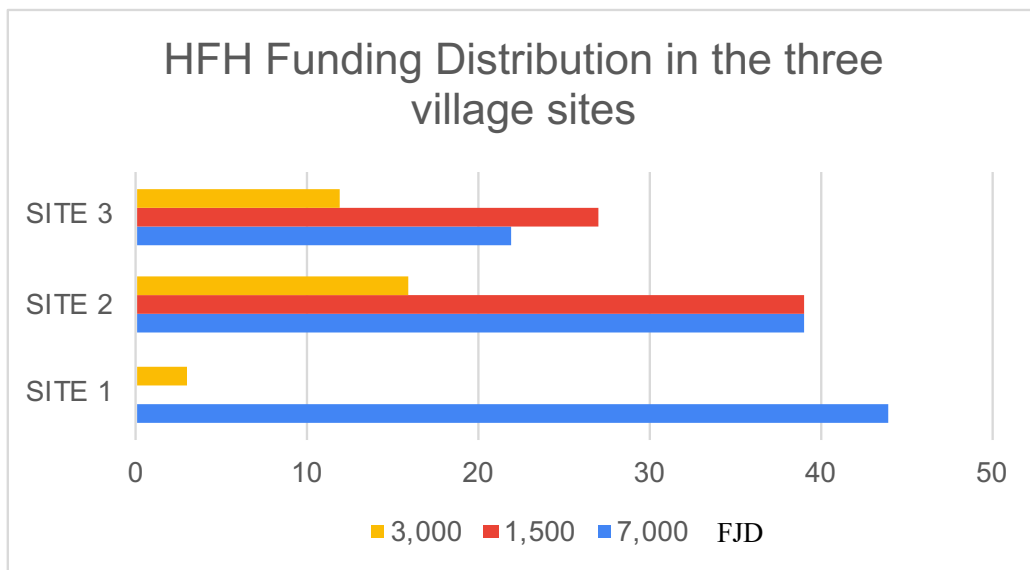
Figure 5. 25 HFH funding in all the three village sites

To receive HFH funding a carpenter has to issue a list of materials needed for the house repair or reconstruction. The items are signed by the *Turaga ni Koro* and the carpenter before it is presented to the hardware stores for delivery. The e-cards issued by the government thorough the ministry of social welfare are redeemed at the shops. The HFH funding's was utilized in two main ways in the village sites. It was used to either (i) repair the existing house or (ii) reconstruct a new house (Figure 5.25).
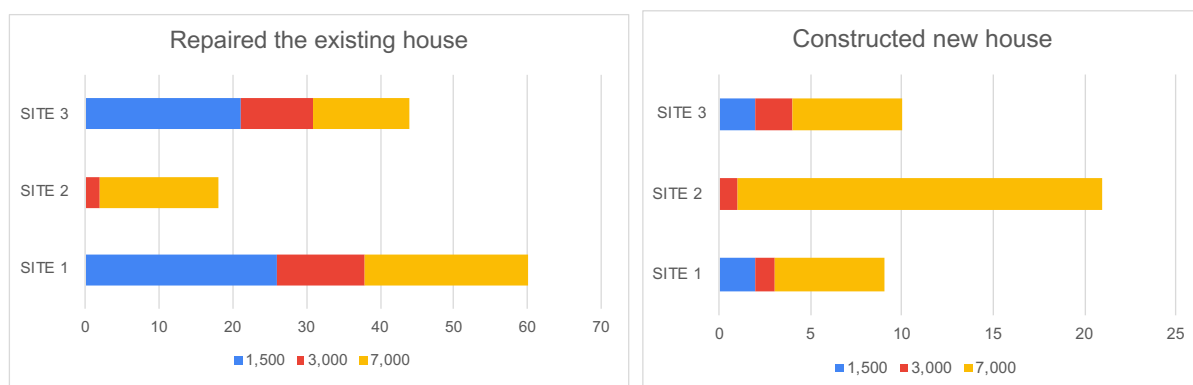
Figure 5. 26 Repairs and reconstruction of houses using the HFH funding

Carpenters in all the three village sites, are either trained at a vocational institute in Fiji or are traditional builders. The traditional builders are the *mataisau,* who's traditional role is to build traditional houses or boats in the indigenous villages. The Habitat for Humanities constructed a demonstrating house in all the three village sites. The purpose of the Habitat for Humanities' assistance is to train anyone who is interested in the villages. This was the shelter clusters effort to address the vast amount of houses that needed reconstruction/construction in Fiji. The HFH assistance from the government did not account for a wage or payment for the carpenter.

Households had to pay for the carpenter as their own household initiative. the following sections will discuss the roles of the carpenters, how they were paid and the *solesolevaki* activities towards the house building activities in each of the village sites. The carpenters that were engaged in house building in the three sites are shown in Table 5.5 below. *Solesolevaki* can also be observed in the payment of the carpenter. For example, in Site 1, the village fund used to pay for the carpenter was from the village investment. The investment was possible thorough fundraising in the village and for everyone from Village site 1 living outside of the village.

Table 5. 5 Carpenters and how they were paid in the three sites

Village site	Carpenter	How much they get paid
SITE 1	6 Carpenters in the village (SF, JR, B, SB, WR, PT)	**Village fund**. $600 ($300 for laying the foundation and the cement base of the house and $300 is given upon completion of the house)
SITE 2	10 carpenters in the village (JL, V, VL, AT, LN, VD, RP, NV, RN)	It varied amongst the carpenters. (1) **Bartered**: - 2 goats (1 female and 1 kid) - 1 cow (female), 1 whales' tooth - 1 chainsaw - planted 500 kava plants - 1 horse (2) **Cash** – from savings, varied from $300-$800 (3) **not paid**- those that are related to the household or immediate family.
SITE 3	5 carpenters in the village (WS, LV, BE, SN, AS), carpenters were also hired from town and outside the village.	Carpenters from town (professional) were paid: (1) **cash** - $30/day for 2 months or $70/week for 8 weeks - some were given lump sum from $500-$5,000 (2) **not paid** – most of the village carpenters. BE- was never paid. Just food for lunch and tea during the breaks. (3) **barter**: 1 pregnant cow

Solesolevaki is key in the completion of the houses built in the village. Cooperation is thorough immediate family help (extended and nuclear family in the village) and also thorough the *solesoelvaki* efforts in the community. In Site 3, immediate family was identified as the main help given to the households in the reconstruction phase. This is different from Site 1 and 2, where the community *solesolevaki* effort played a big role in the construction process. In the

observations and conversations in the sites, the traditional values of *veilomani, veirogorogoci and veivukei* were the main influences in why people participated in *solesolevaki.*

A statement by one of the village elders reiterated this point…
"Keimami raica tikoga ni tara tiko na vale, sa keimami lei veivuke kina. Eda seg ani rawa ni tikoga mai ena lomani noda vale me da sarasara tiko mai. E sega ni nodai tovo nai Taukei oya. Keda da veivukei. Ke sega madaga ni da lei kana, da lako madaga me da lei veivuke ena tar ani vale" (Male, 65, Site 2).

(Translation) We cannot just sit and observe from our homes when someone is building their house in the village. That is not our culture. We will go and help even if we are not fed. We will go and help out because it is the right thing to do.

As discussed in Chapter 4, when a house is built the household members, especially the women have to prepare food to feed the workers. When asked about this in the questionnaire, all the households that had their house build, "Feed the workers. How, Yaqona for the workers". The head of the household had to harvest and prepare kava for the construction process and also make sure that food was available to feed the workers. Another form of *solesolevaki* in the construction process, is women working together to help cater for the workers' lunch. The ladies in the village stated that if their husband is helping build a house, she will also cook lunch or make something for tea and bring it to the lady of the house to help with the catering (Female, 54, Site 2). This also brings to light the important roles women have in cooperation activities in the village.

5.6 Agriculture cooperation activities observed from the sites

Agriculture is the primary livelihood source within Fiji villages, and it is currently valued at approximately $690 million (FJ$1.5 billion). It accounts for about 8.1 percent of Fiji's GDP (2021), including the sugar industry (1.1 percent). The sector supports the livelihoods of 27 percent of Fiji's population and is the primary source of work for more than 83 percent of Fiji's rural population (Fiji government, 2017). In Fiji, villagers along the coast of the main islands also have tourism as a source of livelihood. When there is a disaster, this industry is badly affected. In villages, this would mean the loss of basic food supplies, building materials, and contributions to village activities. Apart from housing, one of the sectors that need a lot of attention is the village farms and gardens. The communal ownership of land falls on the men in the *mataqali* to maintain plants. Traditional cooperation is critical in the establishment of the farms through the following process: (i) land clearing, (ii) plowing and land preparations, (iii) planting, (iii) weeding and general maintenance, and lastly, (iv) harvesting. Cooperation is needed in land clearing, plowing, planting, and weeding. Farms are maintained at least once a month.

After a cyclone, the damaged farms are attended to simultaneously while rebuilding houses. In one of the village sites, men would listen to the farm two (2) days a week and spend three (3) days in house-building activities. In badly affected communities, more attention is given to

rehabilitating the farms as their food source and livelihood. It is a general understanding that after any cyclone, farms take 3-5 years to return to what it was before the cyclone. In Site 1, all the *yaqona* (*Pipers methysticum*) farms were destroyed together with their *taro (Colocasea esculanta)* farms. These were their two primary sources of livelihood. Youths had to travel to another island (Vanualevu) to collect cuttings of the *yaqona* plant to use in their gardens, as they could not salvage any existing plants. This utilized the inter-community cooperation or *veiwekani* (kinship) in the traditional Fijian sociocultural system. Campbell (1987) also described this in his research as the primary response method that villagers used before the colonial leadership in Fiji.

In the same community, the youths and men organized themselves within their *mataqali* in a scheme that was also under the guidance of the Department of Agriculture on the island. They form groups called *lala* (groups of 6-10 working together to complete a task) to attend to the farms and take turns accordingly. Money gained from selling their crop was used for development projects and obligations within the village. These groups would spend up to three (3) days clearing and preparing the land for planting. Planting would take about the same time, together with harvesting. According to the men in site 1, time is needed to weed and maintain crops. The success of the farms would depend on how well each *lala* organizes themselves and dedicate time to tend to the *mataqali* farms. Each *mataqali* has a leader who oversees the organization of the *lala* and holds everyone accountable. Farmers have observed that soil is fertile after the cyclone. Soil fertility can be due to the accumulation of minerals on the topsoil. There have been stories of pumpkins and other vegetables growing healthy and much closer to the houses in Site 1.

With the many experiences within the communities, there is a need for strengthening policies and actions toward agricultural livelihood in indigenous Fijian villages. There is a strong focus on providing salt-tolerant crops to adapt to sea level rise for coastal communities. These crops include sweet potatoes and giant swamp taro.

Figure 5. 27 Taro farm in Nabuna village (Left) Kava farm in Nabuna village (Right) (Source: Sainimere Veitata)

Women also have *lala* in the village, where they weave mats, plant pandanus for their mats, and participate in expected village commitments together. The same women grouped plant pandanus (*Pandanus sp*) after the cyclone to rehabilitate their supply for mat weaving. All Pandanus (*voivoi*) plants in the village were severely damaged after TC Winston in Site

1village. Each lady plants 25 pandanus plants, and they can request help from the youths and men in the town. The Pandanus produced in Site 1 is of good quality and sold to many major markets in Fiji. This cooperation process is also a source of family livelihood and community well-being. The women's group organize their *lala* according to *Mataqali*. There are six (6) *solesolevaki* groups (*lala*).

Peterson (2007) stated in his study that women, boys and girls are 14 times likely than men to die during a disaster. In villages, youths need to work together with the village to ensure the vulnerable groups with villages are assisted when a cyclone occurs. Women tend to think more about their property thus, taking time to make sure everything is secure before evacuating. Women as the care giver in the house, are often responsible for cooking and cleaning. In *solesolevaki* for house building the women's role is key in making sure meals are prepared and served on time. Women's groups are also vital in catering for big occasions in the village, such as youth rallies (church related), provincial meetings, government dignitaries visiting. In Site 1 and 2, there is a women leader (*Vanua)* the leader then delegates that task that needs to be addressed to the *mataqali* women's leaders (often is the wife of the head of the *mataqali),* who then disseminates the information to women in their clan. The *lala* group is also used to carry out the expected tasks in the village.

5.6.1 Natural resource management as a potential for resilience

With the onset of cyclone and its effects on natural resources, house building can also be further affected. Sites 1 and 2 used timber from their *mataqali* land for timber frames in their houses. The assistance received from the HFH was used to buy nails, corrugated iron sheets, tools, etc. From this experience, there is a need to factor in resource management in building communities' resilience. In an emergency, the Red Cross Federation in Fiji, are responsible for pre-positioning relief supplies around Fiji under the guidance of the NDMO. Community based disaster management should also include natural resources as key elements to building community resilience.

From the experience faced by Site 2 villages, *bure* has been lost, from 91 before TC Winston to 35 after the cyclone. If the village had avenues for grass, timber, bamboo for walls it could have mitigated the loss of *bure* to a certain extent. After the cyclone, most trees are destroyed. In having pre- positioned timber and basic house building materials, villages strengthen their capacity to prepare for cyclones. Site 2 has had tree planting projects by NGO's in Fiji. One that was unsuccessful was the ACP FORENET Project[2] (Establishment of a Forest Research Network for Africa, Caribbean and Pacific Countries). This project implemented a nursery for the youth to maintain. The objective of this project was to rehabilitate the grassland behind the village. All this came to an end after the nursery caught fire. Site 2 is part of a national forest restoration and rehabilitation efforts by the government, this project is aimed at restoring the highly degraded catchment[3] that Site 2 is located. Similar efforts in collaborative project by NGO's and the government to manage natural resources and forests in Fiji.

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[2] https://www2.cifor.org/forenet/_pf/1/_ref/about/index.html

[3] https://www.pacific-r2r.org/news/communities-benefit-forest-restoration-and-rehabilitation-efforts

Additionally, there is great opportunity that Kava has for building community resilience. The Nayarabale million-dollar farm project highlighted in Vunibola's (2021) study can be replicated and tested in Sites 1 and 2. The Methodist church of Fiji initiated this project, and also piloted it in Gau (an island close to Site 1). This was implemented as part of their community outreach. Initiatives that are ongoing similar to this can be targeted towards strengthening communities' resilience thorough (i) enhancing *solesolevaki* with the youth groups, (ii) opportunity for investment targeted towards response and recovery actions after any future disasters.

5.7 Community Based Response to TC Yasa

Additional community-based responses is observed after TC Yasa. TC Yasa made landfall in Fiji in January 2020, with total damage amounting to $250 million USD. The most affected part of Fiji was Vanua Levu, the second largest island located in the north of Fiji (Figure 23). There are 3 provinces on the island: (i) Bua, (ii) Macuata and (iii) Cakaudrove. For most of the villages in these provinces, flooding and strong winds was the most damaging. Relief operations was affected by the COVID response and situation Fiji was facing during that time.

Bua Lomanikoro, is the chiefly village in the Bua district and the chief is the head of three *yavusa*'s; Tiliva, Dalomo and Bua. As indicated in the map on Figure 5.28. The major infrastructural need of the villages in these three *yavusa* was their village bridge (Figure 5.29). All of the three villages rely on a bridge for transfer to the mainland. This bridge was badly damaged by TC Yasa. School children in the three village use this bridge daily to commute to school. Despite requests to the government, they have never been assisted financially. A few months after the cyclone, the village headman requested the help of their family outside of village to fundraise for financial support. According to an interview with the youth representative from Tiliva village (Mr J), the main expense was the cost of fuel for the village chainsaw. Timber in the village land was used to build the bridge. The timber used is called *Geyali* (*Podocarpus neriifolius)* as this is durable and last for up to three years.

Figure 5. 28 Map of Fiji showing Bua village including Dalomo and Tiliva (Source: Nunn, 2021).

There were 50-70 men involved in this rebuilding process, working together for 4 days to complete bridging the wooden bridge. The construction was coordinated by the *Turaga ni Koro* and village youths. A village carpenter guided the construction and the village women cooked and fed the men who worked in the process. This construction was supported by three of the biggest sawmills in Vanua Levu, Jaydils Sawmill, Raviravi Sawmill & Prasad Sawmill. They donated a chainsaw and the service of their sawmill for the timber. Bua Lomanikoro is also situated near a big farming community in Vanua Levu. During the construction process, the villagers were visited by the farmers who farm in the land near the village. These Indo- Fijian communities supplied the villages with nails, refreshments and supplies to help the village rebuild after the cyclone.

After the completion of the project, the women participated in the opening as seen in Figure 32. The village was the first in Fiji to have a suspension bridge, prior to being damaged. This act of *solesolevaki* has being on going for a whole, as the community have reconstructed the bridge for the 5th time. The lack of positive response from the government, resulted in this community *solesolevaki* activity. This is an example of how community can utilize their social networks, capital and resources for development. Villages in Fiji have also undergone similar situation whereby village leadership, family networks, private sector assistance have been vital in completing village project needs.

Figure 5. 29 Women in Bua celebrating the bridge opening (Top to bottom) (Source: Mr J).

Apart from the bridge construction project, the village youth also have several plots of yams *(Diascorea. sp)*. These yams are part of the communities Food Security initiative. The interviewee stated that after the cyclone, food was one of their immediate needs. Having the yam farm also enables them to preserve farming techniques and have a community food bank for future disasters. Yams are integrated with corn and other vegetables as seen in Figure 5. 30. The initiative is coordinated by the youths in Tiliva for all the three *yavusa*.

Figure 5. 30 Yam farm in Bua, food security initiative for CBDRR (Source: Mr J).

5.8 Emergency committee and response to TC Yasa

This section highlights the role of the Village emergency committee. Village committee are important especially in the evacuation and immediate response phase of any disaster. The Bua youths were instrumental in the community's disaster preparations before TC Yasa and TC Ana made landfall. The village have an emergency committee who helped support the role of the *Turaga ni Koro* in evacuating and giving the cyclone warning to the households in the villages.

> *"E tiko na komiti ni leqa tubukoso ena loma ni koro ni sa dau vaka roti mai na cagilaba se uca bi eratou sa dau wavoki ena vei valevale yadudua na komiti ka nodratou i liuliu tiko na Turaga ni Koro,sa dau kainaki vei ira mera vakavakarau ka gole enai drodro,kara dau sagai saraga e liu mera kau na qase se o ira na malumalumu kei ira era vakaleqai na ituvaki ni yagodra,ira na tinani gone sucu vou kei ira na marama"*

> We have an emergency committee in the village. Whenever there is a warning issued for a cyclone or a heavy rain, they go to every households to relay the news. Their leader is the village headman. Households are asked to prepare their belongings and take them to the evacuation centers. The elderlies are the first to be evacuated together with the disabled, the sick, nursing mothers, women and children. (translation)

The committee worked with the youth and the *Turaga ni koro* to ensure that all are evacuated on time. The village also considered the disabled and the elderlies in the evacuation process. When asked about what all is prepared by each households' to take to the evacuation centers. The response by Mr. J was:

> *"Dau vakarautaki talega na kakana mei vei tauri ena gauna ni leqa tubu koso, kina vei valevale era dau vesuvesuka ka vakadre na doka ni vale ena dali kara biu vakamatau nai iyaya ena loma ni vale. Enai drodro esa dau vakarautaki na cina tabucagi, se solarlights na kadrala na bitiri kei na retio ena kena vaka rogoci nai tukutuku ni draki mai vale ni walesi."*

> We encourage families to have enough food prepared during the disaster. All households are encouraged to reinforce their houses, and safely put their belongings nicely. At the evacuation centers solar lights, kerosene lamps and candles are usually available. There is also a radio, with batteries for the weather update. (translation)

The village of Bua are very organized and the villagers, work well with the village committee and the leaders to ensure their safety. In addition to the preparations highlighted above, villages committee ensure that everyone is safe and accounted for at the evacuation centers. Prior to the evacuation during the warning stage, villages are told to release their animals (cows, horses and goats) and to make sure they are not tied up. This is described in a statement by Mr J:

> *"E levu tale ga na neimami manumanu vaka vuvale se va koro, keimami dau sereki ira me vaka na vuaka se bulumakau se ose baleta mera ka keimami kauti ira ena vei vanua*

cere. Ena neimami i teitei keimami sa dau musuki ira na taba ni tavioka vaka vei mama kei na vunivudi me musu vaka lekaleka na drauna me rawa ni kua ni vaka cacani vakalevu ena cagi kei na tavioka ena bulabula vinaka tale ni oti na cagi ka na sega ni gaga kina na leweni tavioka".

Most of us have animals, at the household levels and for the village too. We always release them to roam free. This includes cows, horses, and pigs and we are encouraged to take them to higher grounds. We are also told to cut branches off our cassava plants and plantain. This is to prevent the plants and cassava from damages. After the cyclone passes cassava that are cut short, are not damaged and we can eat the flesh (crop) afterwards. It will not be spoilt or bitter. (translation)

Traditional knowledge and food preservation techniques are vital in the evacuation and preparation phase. Cassava (*Manihot esculanta)* lasts longer after the cyclone when the plant is cut in half. This provides an essential food source for the village in the evacuation centers also.

After the cyclone has passed, the village committee together with the *Turaga ni koro* carried out an initial disaster assessment. When asked about the details of the committees' activities, Mr J, recalled the following:

> *Ni oti ga na cagilaba ena kena mataka sa kimami wavoki saraga ena vei yasa ni koro ka laurai na cava soti e vaka cacani,kevaka eso na mavoa bib dau qai kau ena valenibula. Taumada keimami sa dau tekivu saraga ena vaka savasava koro,laurai na i vaka so ni wai me savati vinaka qa dau keimami saga me keimami vaka vinakataka ka sema saraga eliu na vaivo ni wai mai na WAF (Water Authority).*
>
> *Keimami sa dau qai solesolevaki vakoro ena kena tarai cake tale na vei valevale.Keimami sega ni dau qai waraka na veivuke ni matanitu ena iyaya ni vale keimami sa dau kauta ga mai eso nai iyaya e vo me keimami veivakacokotaki tale kina.Da kila vinaka ni dau taura tu na gauna dede na matanitu ena nona veivuke,kaya mada ni oti o Yasa kei Ana se sega ni dua na veivuke e yaco mai me baleta na vei vaka valetaki me yacova mai na gauna saraga qo.*

The next day after the cyclone we always survey the village and the surroundings to assess the damages. This includes taking into account all those injured, and we try and take them to the hospital. The first thing we do is to clean up the village and, fix the water sources installed by WAF (Water Authority of Fiji).

We work together using *solesolevaki* to build-up each family in the village. We do not wait for the assistance and relief supplies by the government. We use supplies we can salvage and also have available to rebild and fix damaged houses. We all know that it always takes a while for government supplies to reach us. As of now, no government assistance for housing have reached us for both TC Yasa and TC Ana.

This example of how the village focused on how they can rehabilitate their houses and address individual family needs is the same for most villages in Fiji. TC Winston response was different in that the government gave out a lot of support to people for housebuilding and farming as seen in Figure 1.4, on the government's social assistance program. The inconsistency in governments aid responses should be a big motivation for helping community become self-reliant and administer self- help techniques to respond and recover from disasters.

Assistance was given to the villages in Bua from NGO's, and from the greater social network of people associated with the village. As stated in the interview, the government just assisted with food rations after the cyclone. Other assistance listed in the table below:

Table 5. 6 Relief supplies and networks in the village

Organization/network	Assistance type
Wildlife Conservation Society (WCS), Food & Agriculture Organization (FAO), Fiji Locally Managed Marine Protected Area (FLMMA), University of the South Pacific - Pacific European Union Marine Partnership Program (USP- PEUMP)	Seeds, food, gardening tools (spades, forks, rakes, knives, wheelbarrows), hygiene kits, tents, kitchen dishes, cooking appliances.
Bua villages who live outside the village	Food, school supplies for children, clothes and some other supplies.

5.9 Key findings

Livelihood avenues in the villages provides an opportunity for investment and financial resources for building community resilience. There are loan and personal savings mechanisms that can help households prepare for emergency situation.

Solesolevaki actions and activities in the villages vary. Households have the avenues to support themselves during an emergency. Since most of the villages heavily rely on agriculture produce for livelihood, there should be more focus placed on developing this sector.

The house type changes in the three villages, is an indication of the opportunities and challenges from the Help for Homes initiative by the government. In Site 1 and 3, this was more an opportunity with the increasing number of corrugated iron and wooden board houses in the village. In Site 1 the delay in the supplied in the village can be seen by the earthen floor houses increasing after the cyclone. In Site 2, the drastic decrease in *bure* is seen in the decreasing number of bures after the cyclone.

Solesolevaki is seen in all the disaster activities in the three sites. In Evacuation it is vital, in the organization and support for the *Turaga ni Koro* and youths (Site 1). In Site 2, the

management of the evacuation center and the dissemination of the relief supply is dependent on *solesolevaki* between the village leaders and the villagers.

Solesolevaki is key in the completion of houses in the three sites, in both the self- fixed house and the HFH house. Women are also important in feeding the groups of men carrying out the construction work.

There are successful CBDRR projects in indigenous villages, where lessons can be shared with all villages in Fiji. *Solesolevaki* was key in the success of the kava farm business.

The village show community ownership in their response and preparatory activities thorough the work carried out by the village committee and youth volunteers. Local knowledge is utilized in the food preservation techniques. There is an indication of the multi- stakeholder participation thorough the *solesolevaki* process within the village and the involvement of family networks, NGO's and business in the response and recovery process. Households knowing what to do when a warning is given is subjected to experience and education. Evacuation process is gender and socially inclusive, in that priority is given to women and those with physical impairments.

Location may play a role in this is seen in the delay in building material to site 1. There is an opportunity to conserve and manage the natural forest resources to focus on rebuilding houses after a cyclone. The table below summarizes key field work findings.

Table 5. 7 Summary of *Solesolevaki* activities in the three sites

Activities/Actions	Site 1	Site 2	Site 3
Main livelihood activities	Farming	Farming	Salary paying jobs
Loans and emergency funds available	Village funds, relatives in the village, women's fund and *mataqali* fund	Village funds, relatives in the village, youth fund, women's fund, friends and family outside the village	Relatives in the village
Main house type before and after the cyclone	Types 2- Timber frame, with wooden wall and floor and corrugated iron roof.	Bure was the main type of house before the cyclone. After the cyclone it was Type 1- Timber frame, corrugated iron wall, earthen floor and corrugated iron roof.	The main type of house before and after the cyclone was Type 5- Timber frame, cement wall and floor and corrugated iron roof.
Solesolevaki in the village dialect	*Lala*	*Vikirukiru*	*Duadua*

Main *solesolevaki* activities	Planting yaqona and dalo. Weaving mats for the women. House building after TC Winston	Building houses (including bure), planting cassave (during covid they had families out in the cassava plantation planting as a group)	Planting cassava and sugarcane
Alignment with any government program	Agriculture scheme an initiative by the Ministry of Agriculture.	No scheme	No scheme
Fund for rehabilitation	Yes	No	No
Committee for disaster	Yes	No	No
Evacuation actions	Many evacuated to the school or stayed at their neighbor's house.	Many stayed home then tried to go to the evacuation center when the wind picked up.	Many stayed home then tried to go to the evacuation center when the wind picked up.
Temporary shelter	30 out of 54 houses stayed in makeshift houses after the cyclone.	10 out of 125 houses stayed at temporary shelters after the cyclone.	14 out of 72 houses stayed in temporary shelters after the cyclone
Self- fixing	23% of the total houses indicated self- fixing	43% of the total houses indicated self- fixing	34% of the total houses indicated self- fixing
Solesolevaki in self-fxing	All stated that *solesolevaki* was used in the repairs and house reconstruction		
Help for homes initiatives	Many received 7,000 FJD in HFH assistance	78 of the 125 houses received both 7,000 and 3,000 FJD	Many received only 1,500 FJD (27 of the 72 houses)
Solesolevaki in HFH construction	*Solesoelvaki* efforts organized by the *Turaga ni Koro* and the elders in the village	*Solesoelvaki* efforts organized by the *Turaga ni Koro* and the elders in the village	Immediate family were the main help

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Chapter 6: Discussion

6.1 Importance of Communities' Capacity in Disaster Risk Reduction

People in communities will be the first affected by disasters, whether major or minor, especially for "poorer communities" because they have low levels of coping capacities (e.g., financial and physical) and are more vulnerable compared to "richer countries.". Communities are often stand alone to cope with disasters before any external aid comes along. The amount of time when resource comes will determine the survival of the individual's community, especially after tragedies Community-based- Disaster Risk Management (CBDRM) is a process that leads to a locally 'owned' approach to disaster preparedness and risk reduction. Villages can respond to and recover from disasters, as seen in the evidence discussed in the dissertation.

Many gaps between policy and institutional arrangements at the national, local, community level. The two guiding principles discussed in Chapter 3, directly affects communities and the need to enhance community capacity. Coordination is critical in addressing and coping with disasters. Safety net is also key in villages, as they are social lifelines that are safety mechanisms within communities to assist with internal disaster response. This includes community-based local systems, systems in health and education.

To address the coordination mechanism in the policy. The need for capacity building and technical resources at the national, local government and at the community level. There needs to be a shift from enhancing the capacity of national and local level staff within Fiji's disaster management system and in other government ministries. Disasters are projected to intensify in the future, and if alternative steps are not taken Fiji will always have the safe problem within its policy environment. With that in mind this research, strongly pushes the need to strength community-based mechanism to support the government framework.

Stage 1 of this dissertation addresses bridging the gap between national policy and communal reality or practices (Figure 6.1). The main finding from this stage is the need to strengthen the communities' capacity by implementing Emergency committees and disaster volunteers in the village. Secondly, the *Turaga ni Koro,* as the village's gatekeepers and government administrator, play a significant role in the day-to-day running of town by-laws and activities.

Within the traditional social structure and safety-net mechanisms in place in indigenous villages, there is room for improvement needed in the governance and organization on community-based cooperation systems. Pre-colonial times, villages were relying on traditional food preservation techniques, intra-island networks and inter- island networks for support. There is a need to revisit these practices and effort should be placed on relearning and conserving the traditional knowledge and practices that are still existing in Fiji, to enhance communities' capacity for disaster risk reduction.
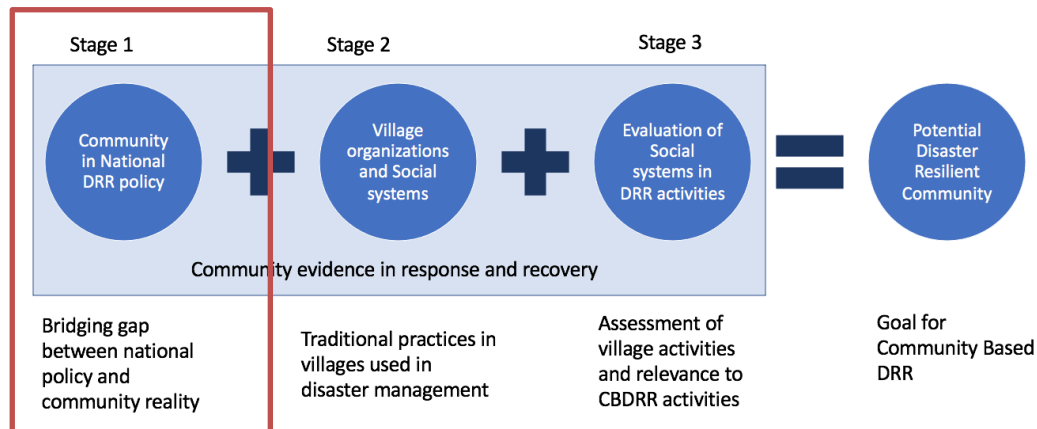
Research Framework

Figure 6. 1 Stage 1 of the Research framework

Increasing communities' awareness and education on preparedness and evacuation are necessary. This can be included in the emergency committee, *Turaga ni Koro's* Standard Operating Procedures (SOP), and volunteer handbooks. Including the roles of the *Turaga ni Koro* together with the formalization of village emergency committee is necessary for Fiji. The current policy structure highlights the role of the District officer (DO) as the liaison to the village level. The policy also stipulates that the Disaster Damage Assessment is to be carried out by the technical team from government with the leadership of the DO. The *Turaga ni koro* is expected to carry out the Initial Disaster Assessment within 48 hours after the disaster strikes. There is mixed opinion and finding from the field, as communities feel that the *Turaga ni koro* should be given more support.

As seen in chapter 5 villages have emergency funds available. Building temporary shelters for some households comes from their savings and income. There are also avenues for borrowing money when needed for household emergencies. These avenues provide a way to start a separate fund for disaster response. The *iTaukei* Affairs and CSOs have previously worked with CSO's to provide trainings for village communities (Johnson, 2016). This can be reintroduced and revisited based on lessons from TC Winston and TC Yasa. Agricultural products and other livelihood avenues can be enhanced to provide options for strengthening communities' disaster response and recovery capacity. Kava (*Pipers methysticum)* has a high potential as a money-making avenue for villages on the islands and in the highlands.

Therefore, communities' capacity should be included in the policy framework to address CBDRR for Fiji. This research shows that social, economic, and physical ability are also crucial in increasing the potential of resilience in Fijian villages.

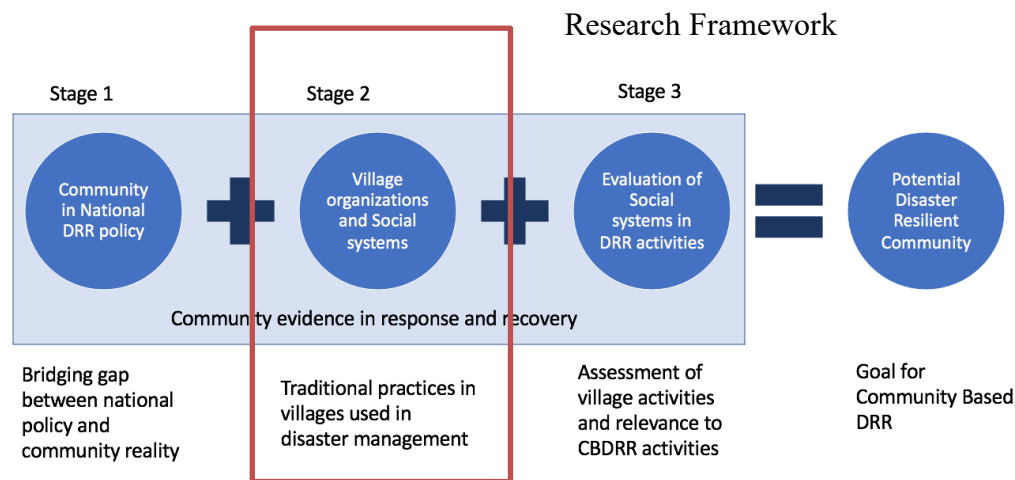## 6.2 Community Resilience Based on Fijian Context

Figure 6. 2 Stage 2 of the research framework

As mentioned in Chapter 4, communities' resilience in the traditional Fijian context is *solesolevaki* and the existing social systems in villages. According to previous research on resilience, as discussed in Chapter 2, attributes that reflect resilience in Fijian villages Incorporate aspects of psychosocial well-being. Literature shows that there is a limited acknowledgment of other elements of resilience. This research, through community-based evidence, establishes that community well-being and psychosocial support are gained through the traditional relationships, groups, and safety- nets available within traditional villages. Resilience is achieved through; (1) Interactions experienced as a collective group or community, (2) Expressions of a sense of community, and (3) Community action. Increasing communities' capacity for disaster risk reduction thorough policy implications will be further strengthened by understanding indigenous villages social- cultural norms and practices (Figure 6.2).

Community actions through the ceremonies and the festivals that are maintained in villages are the central aspect of the community's potential for resilience. Chapter 4 clearly articulates this aspect of the research. Through the actions and the case studies explained in the chapter, there is excellent potential for strength in the traditional Fijian context. Tobin (1999) describes this in their research findings stating that resilience is achieved through the three following factors:
1 –Mitigation model: reducing community risk through policies and standards.
2 – Recovery model: guidelines to aid in relief and recovery operations, leading to re-accumulation of capital/resources.
3 – Structural/Cognitive model: includes societal changes, situational factors (i.e., socio-demographics, community characteristics), and cognition (psychological/attitudinal).
All three are evident in traditional Fijian villages.

The *iTaukei* worldview theorizes indigenous Fijian whereby *Lagi, vuravura,* and *bulu* combine to form the basic *iTaukei* epistemology and worldview. In the *iTaukei* worldview, everything

physical, social, or spiritual is included in the *vanua.* Physically, it embodies *tamata* (people), *qele* (land), and *qoliqoli* (fishing grounds) in the three dimensions that Nabobo (2006) and Ravuvu (1987) described. The *iTaukei* epistemology enables the *iTaukei* (indigenous Fijians) to conserve, preserve and carry out their traditional roles and responsibilities in their daily lives. As discussed in chapter 4 and 5, the examples of the Bure building, the *solevu and the Tako-Lavo* relationships, food security, and bridge-building project in villages highlight this critical aspect of the indigenous Fijian culture. Ensuring that these social norms and practices are followed in villages day to day lives provides resilience through the training of *solesolevaki* within villages. The *Vanua* concept, where land is significant, is the key that strongly influences these practices.

Therefore, in the second stage of this research framework, ensuring that the traditional practices are utilized in any villagers' daily life through the traditional concepts described in chapter 4 is key to community resilience. Knowing how these practices are also used after a disaster is vital for community-based disaster risk reduction in Fiji.

6.3 Indigenous Social Systems in Disaster Risk Reduction Activities
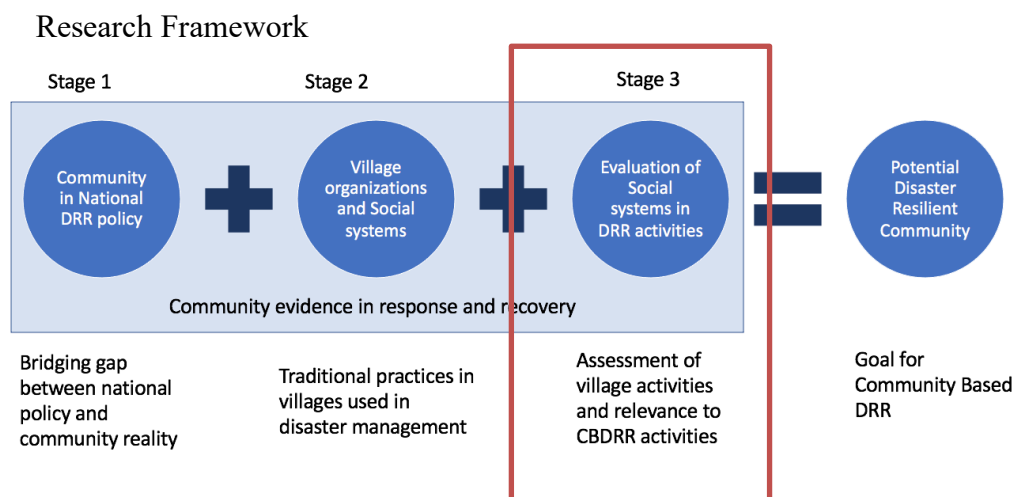
Figure 6. 3 Stage 3 of the research framework

Traditional social systems and classes within indigenous villages are vital in maintaining cohesiveness and resilience. Stage three (3) of this research framework aims to highlight the roles and the assessment of the village's actions in response to TC Winston emphasizes the importance and function of these traditional systems (Figure 6.3). The findings for the three sites highlight how households utilize these traditional social systems in DRR activities. Community actions were evaluated on the disaster management actions (DRM phases) of (1) evacuation, (2) temporary shelter and self-fixing of houses, and (3) the Help for homes (HFH) initiative by the government. In these three activities, the following was highlighted and compared between the three site;

1. Characteristics of the actions in the three different sites

2. The utilization of *solesolevaki* through the three DRM phases
3. Avenues of assistance available within the villages and outside Help

Findings from this chapter reiterate the fact that indigenous Fijian villages are resilient through the utilization of their traditional systems and cultural norms.

During the evacuation phase, most households "stayed home." Types of houses (materials, strength), their faith in the power of the building, and the presence of family during the crisis are some reasons for the choice of evacuation actions. The assessment of the three sites shows that island communities received supplies later than the other two villages. They were the most well-organized out of the three sites. The presence and assistance of family members on the main island allowed for more vital coordination among the friends and family of Koro.

The activities that were assessed in the three sites, all showed that family links, networks and cooperation is vital in indigenous families, response activities. Although, the findings may not be a surprise, it shows the details of how exactly these traditional roles and links are utilized in traditional villages. There are carpenters that were trained by Habitat for Humanities and traditional *matai*'s or carpenters in every village. This research highlighted how these matai's work in the village. In Site 1, they were more organized in how they addressed rebuilding in the village. The emergency committee was instrumental in this regard. In the other two sites, traditional carpenters were utilized more.

The evaluation highlights the need for resources, a committee, policy consideration and events to allow community leaders, volunteers to train and access information that is relevant to their work in the community. This is explained in section 6.4 of this chapter.

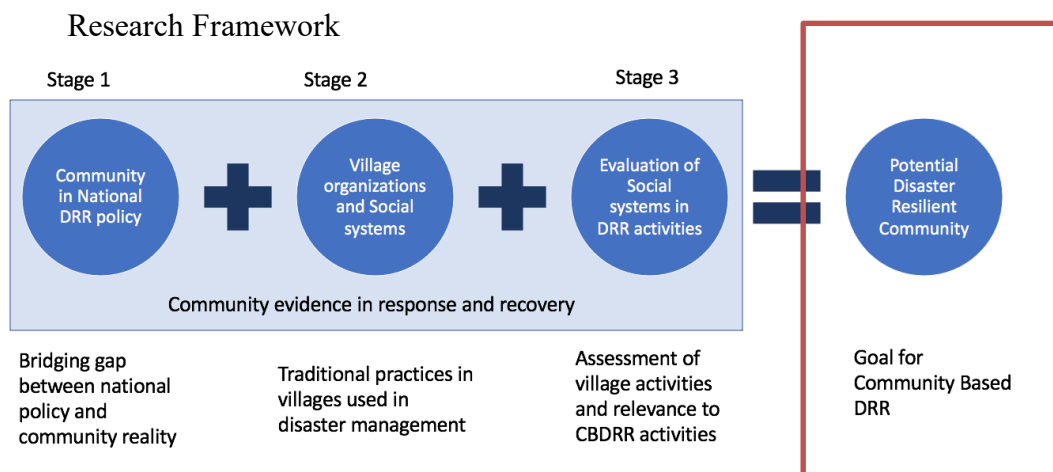6.4 Proposed frameworks for CBDRR in Fiji

Figure 6. 4 Potential for disaster resilient community

The final outcome of this dissertation is the recommendations and a framework to illustrate the potential for building disaster resilient communities in Fiji. The main findings show that there is a need for an organized CBDRR framework and intervention in Fiji. The main goal of which is to prepare communities well for future intensive disasters.
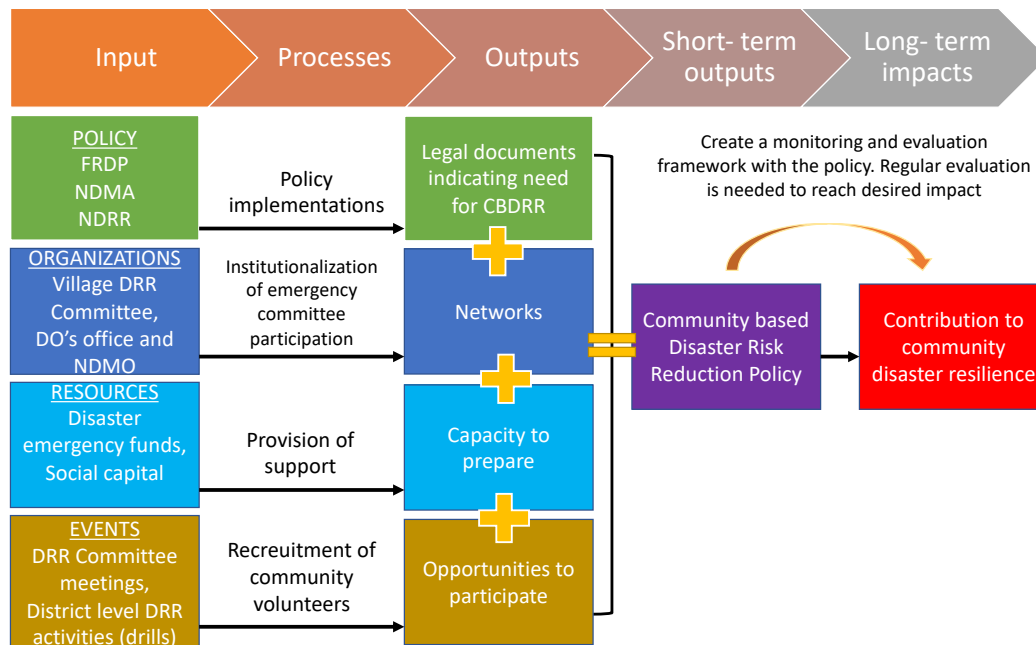

Figure 6. 6 Proposed framework for CBDRR for Fiji

It is vital to have an integrated policy; the organization is essential within the villages, too. This has to link and complement the work at the divisional and national levels. Networks in key, CBDRR is a network of village emergency committees that can work together to strengthen the actions and CBDRR plans in the individual villages.

Resources are key. Every village needs an emergency fund that is for response and immediate needs. Funds should also be allocated for preparations. This research shows community actions from the household level. Social capital is also essential in addressing community needs. This research highlights bonding and bridging social capital in villages and how they played a vital role in communities' response to TC Winston. Lastly, events are also important. In Japan, everyone is invited to participate in Emergency drills and evacuation. The city offices organize this. Community volunteers and the village committee should be able to carry out the same in the villages where they work.

This research is applicable to other Pacific island countries. We know from the discussion in Chapter 4 that similar social systems exist in other countries like Samoa, Kiribati, Solomons, and Vanuatu. I know this is similar in other Pacific islands that are not mentioned in the research. Localized research and understanding is critical in making informed decisions that affect grass root people. The Pacific has the FRDP currently implemented. However, monitoring and evaluation recently became available to countries. Through the understanding of community-based actions during disasters, assumptions should not be the basis of these

evaluation frameworks. This research reiterates that to enhance resilience, community-based disaster risk reduction policy and actions needs to be a priority.

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Chapter 7: Conclusion

7.1 Chapter conclusions

Chapter 1 summary: Communities in Fiji have the potential for resilience because of their available social safety nets and social capital that can support responses and recovery actions after a disaster. Based on the national and community interventions discussed in this chapter Fiji shows evidence that supports the findings highlighted in the IPCC report. Whereby some small islands are resilient because of the available strong social safety nets and social capital. The community level is considered appropriate for disaster preparedness interventions, where community members experience different degrees of access to community institutions and resources. Because of its location, Fiji is highly vulnerable to many intense cyclones. Communities need to be appropriately equipped and informed on how to act. The latest IPCC Working group II reports and the experiences from past research should be the main drive towards the need for building resilient and prepared communities. Indigenous communities are more at risk with the traditional knowledge and resources they hold. This cements the importance of this research for Fiji and also for other small islands.

Chapter 2 summary: The process of disaster recovery in a community requires three things, (i) political power/governance, (ii) the knowledge on what to do and (iii) the ability to act. To act a community must have the resources and the technical knowledge on how to respond. Participatory DRR is meant to integrate the views of multiple actors and stakeholders, including the national government, local governments, national and international NGOs, UN agencies, academia, mass media, business sector, faith-based organizations, and community-based organizations. Each stakeholder has its own important role to play in the DRR process. Partnership between the vulnerable and less vulnerable sectors is important. The less vulnerable sectors are able to contribute resources like finances, leadership, technical skills, intellectual thinking and material resources which are much needed to sustain CBDRR. There are many examples around the world that shows how community based DRR can be effective. Elements on what makes these community practices a success needs to also be taken into consideration.

Chapter 3 summary: Traditional governance and leadership networks and time-testing strategies to prepare for, respond to, and recover from emergencies need to be well understood. DRR strategies that are implemented with a top-down approach often fail to strengthen the capacities of those in communities. The most vulnerable are also the custodians of traditional knowledge skills and, resources, and their capacity is often overlooked. We find that the coordination between government and communities needs to be strengthened through the role of the *Turaga ni Koro* (village headman). *Solesolevaki* (community cooperation) is a system that works very well in communities. This needs to be enhanced through the enforcement of disaster committees and disaster funds in villages. It is also prevalent that communities' livelihood capacity is enhanced as most towns rely on agriculture for income.

Chapter 4 summary: Key findings from this chapter are the function and the role of *solesolevaki* in the *iTaukei* culture. This chapter describes the background to understanding the indigenous Fijian communities and the importance of family ties and community cooperation to the functioning of the village in daily life. The online survey that was conducted showed that *solesolevaki* is still practiced in all the provinces in Fiji. It would be interesting to map all the villages and their activities using *solesolevaki*. Maintaining these cultural practices is critical in strengthening Fiji's community-based disaster risk reduction (CBDRR). The chapter also discusses the role of *solesolevaki* as resilience in the local context. chapter also concludes that *solesolevaki* is maintained by formal relations that are subject to locations. This highlights the *Tako- Lavo* relationship that is common in highland villages on the main island of Viti Levu.

Chapter 5 summary: To summarize the findings from the case studies, *solesolevaki* actions and activities in the villages vary. Location may play a role in this. However, evidence from the field shows that indigenous villages have adapted and can create a cohesive environment. The table below summarizes critical fieldwork findings. This chapter still needs to be comprehensively written, and there is more evidence to show regarding temporary shelter and Help for Homes initiatives.

Chapter 6 summary: In summary, the findings in this discussion chapter show that there is resilience in indigenous communities in Fiji. In addressing the three stages of the research, resilience is achieved through a comprehensive approach to CBDRR. CBDRR is vital as the policy will help communities mitigate risks and standards within their capacity. Community leadership is critical for this process, reiterating the need to enhance the role of *Turaga ni Koro* and the communities' emergency committee should be mandated. The four factors ensuring effective CBDRR are policy, organization between the village and other stakeholders, resources, and events.

7.2 General conclusions

This study concludes that solesolevaki, traditional relationships, social capital, kinship, and family must be considered when considering safety net in national policies. Therefore, incorporating indigenous knowledge into policies and plans would strengthen governments approach. This dissertation shows the gap between the policy and the reality at the community level to try and address ways to strengthen community-based disaster management (CBDRM) in Fiji.

The policy is focused on strengthening the national level structures, and the focus is still viewing disasters as natural events disrupting everyday lives and property. The shift in paradigm for disaster management in Fiji is still response-focused, considering disasters as natural events disrupting daily lives and property. This is evident in the lack of focus on community-based disaster governance and strategy within the government policy and procedure.

The indigenous Fijian communities are resilient because of their iTaukei norms and practices. The potential for creating disaster resilient communities in Fiji is confirmed thorough the practice of solesolevaki and how the Fijian social structure facilitates this. CBDRR is vital to formalize and institutionalize emergency committees' roles and the factors and resources needed. This thesis concludes that *solesolevaki, kerekere, solevu, tako-lavo* relationships, social capital, kinship, and family must be considered when considering safety net in national policies. This thesis has confirmed how these traditional factors are actioned within indigenous villages. Therefore, incorporating indigenous knowledge into policies and plans would strengthen the contextual relevance of the approach and encourage iTaukei people to link their regular practices to enhance their disaster resilience. National DRR policies can broaden their impact by including a strategy addressing CBDRR in formulating such policies by considering communities and their experiences.

This research has provided a better understanding of community post-disaster recovery actions utilizing traditional norms and practices.It has confirmed how traditional factors are actioned within indigenous villages. There is a need to shift the focus toward CBDRM and create a framework to strengthen community-based disaster management. As mentioned above, there are opportunities to enhance this through the realities within communities. Communities, first responders to disasters, must be well-equipped and ready to face future disasters. Experiences from TC Winston and TC Yasa have shown that the *iTaukei* villages have addressed infrastructure damages and rehabilitation in the villages with *solesolevaki,* family links, and assistance from business partners nearby for resources. All the 14 elements of CBDRR mentioned by Shaw (2014) can be related to Fiji's experience in strengthening communities' resilience.

There is a need to empower villages. So, while local and national authorities have vital responsibilities for civil protection in hazard events, communities are always the first responders and should be assigned to that role. Solid and practical community-based DRR requires grassroots support and linkages to the community's day-to-day life. Linking disaster risk awareness and preparedness activities to local cultural events can effectively maintain a culture of preparedness.

In addition to grassroots support, building effective and sustainable capacity for community-based DRR requires local and national authorities' formal recognition and support. In addition to providing financial and technical assistance, local capacity.

The framework below is proposed to contribute to the potential of community disaster resilience in Fiji. The framework highlights the need for policy inclusion, strengthening networks (through the role of *Turaga ni Koro* and village DRR committee), resources, and providing opportunities for volunteers to practice and better their response to future cyclones. The framework reiterates the need to have and propose the CBDRR policy as the first step in formalizing the focus on building disaster-resilient communities.
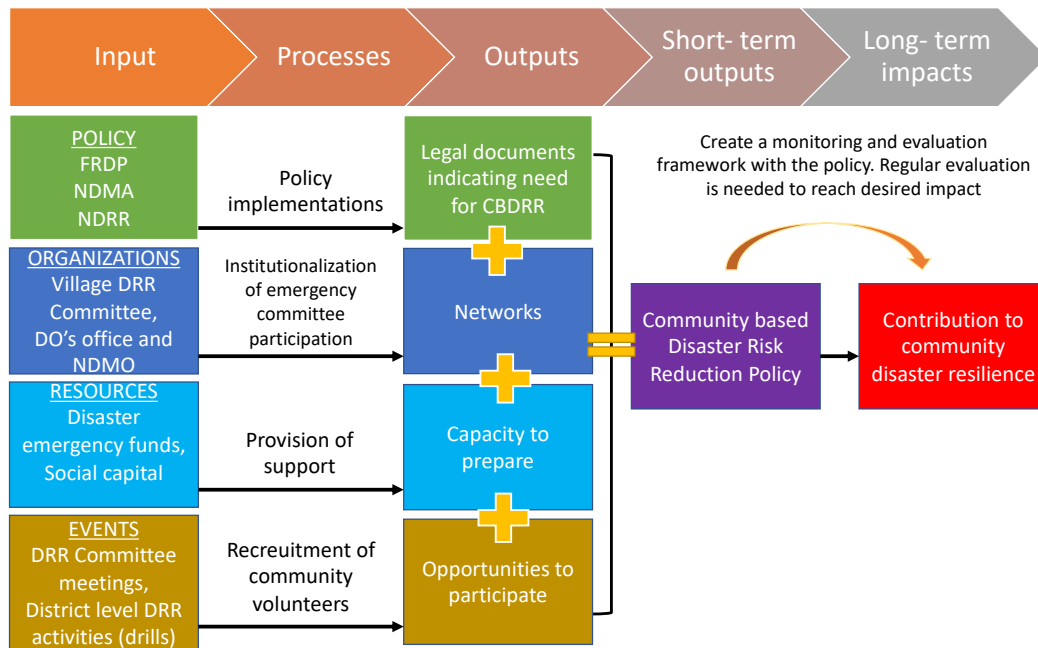
Figure 7. 1 Proposed Framework for formalizing CBDRR in Fiji

The findings of this research are expected to fill a significant gap in existing knowledge about indigenous community actions in CBDRR in Fiji and provide the much-needed evidence base for formulating and implementing future policies to enable and improve communities' participation in DRR. The three case studies presented in this thesis try to contribute to empirical research on the visibility and significance of the traditional links and norms in DRR.

The recommendations from this dissertation are:
- Government policy should be strengthened, highlighting more community based approaches.
- Government policy should be more flexible to address different village situations (e.g, Site 2 with the existence of *bures*; Site 1- the distance).
- Government policy should intergrate other sectors, like the *iTaukei* affairs – to push for the inclusion of *bure* in post disaster rehabilitation.

7.3 For Further Research

CBDRR for Fiji should also include other types of communities that are there. This includes settlement in urban and rural areas and farming communities. Most of these settlements are inhabited by Fijians of Indian descent. There is also a need to capture their experiences and include lessons to the proposed framework in Figure 7.1. Further to this, further research is needed for the pacific to evaluate the effectiveness of the FRDP policy and measure it by community practices for effective implementation.

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APPENDIX

Appendix 1: Online Google from survey questionnaire
Appendix 2: Household survey questionnaire
Appendix 3: Interview heet (farmer and Turaga ni Koro)
Appendix 4: Household survey participants information

Appendix 1: Online Google from survey questionnaire

Questionnaire for Fijians on Solesolevaki

Bula vinaka and Thank you for taking time to answer my questions. My name is Sainimere Veitata-Waqalevu, I am a PhD student at Kyoto Univeristy. This questionnaire aims to understand solesolevaki in the indigenous Fijian communities and will be utilize in my research. You can choose to take the survey in either English or iTaukei. There are 7 questions in the survey, and it will take you approximately 10 minutes to complete it. Please read the next section for more information and how the information will be utilised and treated.

Bula vinaka! Vinaka sara vakalevu na nomuni solia na nomuni gauna mo ni sauma kina na noqu lavelave ni tauri tukutuku oqo. Na yacaqu o Sainimere Veitata- Waqalevu, ka'u gonevuli tiko ena Kyoto University, Japani. Nai usutu ga ni vakadidike oqo, me kilai ga kina vakavinaka na kena qaravi na solesolevaki ena noda dui dela ni yavu. E vitu tikoga na taro ena tarogi tiko, ka ni na taura tiko e rauta ni 10 na miniti me na vakacavari kina na tauri tukutuku oqo.

* Required

**Information
sheet about
the
questionnaire
(English only)**

TITLE OF MY RESEARCH: Social resilience in the Fijian context: A study of iTaukei communities post-disaster

Before you decide to participate in this survey, you need to understand why the research is being done and what would your involvement mean. Please take some time to read the following information and feel free to reach out in the email address provided.

There are no possible risks associated with this study, as the questions are related to our everyday activities in the village.

***WHAT IS THIS STUDY ABOUT?
My name is Sainimere Veitata-Waqalevu and I am conducting research on the importance of social resilience- the capacity of people and communities to deal with external stresses and shocks—and how it contributes to community preparedness, disaster response, and post-disaster recovery in Fiji.

Social resilience has been examined by researchers across many academic disciplines. In my case, to better understand social resilience at the community level, I will investigate how this is understood and explained in the Fijian context. From the literature review and my own research experience, we see that Solesolevaki is an important driver in itaukei communities in ensuring community development and progress in the villages. Although there are values and ethos that help sustain and uphold the communities, I wanted to know more about these activities, and whether they are maintained or lost in our communities.

This questionnaire is for the fulfillment of one of my Ph.D. research objectives which is to find out "How social activities are maintained or developed in iTaukei communities in normal times". This questionnaire mainly focuses on solesolevaki, and its aim is to;
i. Understand solesolevaki activities practiced in the villages in Fiji
ii. To identify which activities are still practiced (maintained) and those that have been lost or has been adapted/changed?

***HOW WILL THE INFORMATION BE TREATED?
Information gathered from this survey is confidential and participants will choose whether they want to participate or not. If you agree to be interviewed you can put in your information at the end of the survey for further contact. Your answering this questionnaire is an indication of your willingness to participate.

The information will be analyzed and reported in my Ph.D. Dissertation and related academic publications.

Thank you very much for your kind participation. Should you wish to contact me please email me at: saivwaqalevu@gmail.com and I will be happy to discuss or answer any query you may have.

1. Please choose which questionnaire you will want to fill in *

   Mark only one oval.

   ◯ English   *Skip to question 2*

   ◯ iTaukei   *Skip to question 16*

   English version   Please answer as best as you can

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2. Age *

    Mark only one oval.

    ⬭ <20 years old

    ⬭ 20-29

    ⬭ 30-39

    ⬭ 40-49

    ⬭ 50-59

    ⬭ 60-69

    ⬭ >70 years old

3. Gender *

    Mark only one oval.

    ⬭ Male

    ⬭ Female

    ⬭ Prefer not to say

    ⬭ Other: _____

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4.   Occupation - livelihood activity last week *

Mark only one oval.

◯ Employer (Producing goods or services for sale, running a business with paid employees)

◯ Self-employed (Producing goods or services for sale, running a business without paid employees)

◯ Employee, working for wages / salaryin public sector (incl. NGO, UN agencies)

◯ Employee, working for wages / salaryin private sector

◯ Producing goods for own and/ or family consumption (subsistence)

◯ Unpaid family worker (family business/plantation)

◯ Unpaid worker, helping other Households with basic HH duties inside (washing, cooking,cleaning, etc.) and outside (gardening, maintaining lawn, etc.)

◯ Volunteer work (community, church, etc.)

◯ Student - full time

◯ Student - part time

◯ Home Duties Retired / pensioner

◯ Welfare recipient

◯ Old Age

◯ Fuctioning challenges

◯ None - did not pursue any activity(no work)

◯ Other: _____

5.   Where are you currently located? (eg, name of village, town, settlement, city) *

_____

6.   Name of your village, district, province? (Koro, tikina, yasana) *

_____

7. **(Level of participation) Q1 Have you participated in any of these activities and how often? Q2 and at which level of the village (please CHECK 1 option for Q1 & and 1 OPTION for Q2 as seen in the picture below) ***

	Q1 Always	Q1 Sometimes	Q1 Rarely	Q1 Never	Q2 Koro	Q2 Mataqali	Q2 Tokatoka	Q2 Vuvale
Traditional house construction	☐	☐	☐	☑	☐	☑	☐	☐
House construction	☑	☐	☐	☐	☑	☐	☐	☐
Church construction	☑	☐	☐	☐	☑	☐	☐	☐

Check all that apply.

	Q1 Always	Q1 Sometimes	Q1 Rarely	Q1 Never	Q2 Koro	Q2 Mataqali	Q2 Tokatoka	Q2 Vuval
Traditional house construction	☐	☐	☐	☐	☐	☐	☐	☐
House construction	☐	☐	☐	☐	☐	☐	☐	☐
Church construction	☐	☐	☐	☐	☐	☐	☐	☐
Planting yam	☐	☐	☐	☐	☐	☐	☐	☐
Harvest yams	☐	☐	☐	☐	☐	☐	☐	☐
Planting yaqona, dalo, tavioka	☐	☐	☐	☐	☐	☐	☐	☐
Harvest yaqona, cassava, dalo	☐	☐	☐	☐	☐	☐	☐	☐
Baby shower	☐	☐	☐	☐	☐	☐	☐	☐
Boys circumcision	☐	☐	☐	☐	☐	☐	☐	☐
Girls first	☐	☐	☐	☐	☐	☐	☐	☐

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period

Man's family asking for a girls hand in marriage)	☐	☐	☐	☐	☐	☐	☐	☐
Wedding ceremony	☐	☐	☐	☐	☐	☐	☐	☐
Tevutevu	☐	☐	☐	☐	☐	☐	☐	☐
Burial of the hatchet	☐	☐	☐	☐	☐	☐	☐	☐
Funeral	☐	☐	☐	☐	☐	☐	☐	☐
Weave mats together	☐	☐	☐	☐	☐	☐	☐	☐
Soli (fundraising)	☐	☐	☐	☐	☐	☐	☐	☐
Village works	☐	☐	☐	☐	☐	☐	☐	☐
Cooking in school	☐	☐	☐	☐	☐	☐	☐	☐
School management	☐	☐	☐	☐	☐	☐	☐	☐
Canteen management	☐	☐	☐	☐	☐	☐	☐	☐
Hunting wildboar	☐	☐	☐	☐	☐	☐	☐	☐
Havesting yam	☐	☐	☐	☐	☐	☐	☐	☐
Harvesting yaqona, dalo, tavioka	☐	☐	☐	☐	☐	☐	☐	☐
Ecotourism management	☐	☐	☐	☐	☐	☐	☐	☐
Gathering fish as a community (yavirau)	☐	☐	☐	☐	☐	☐	☐	☐

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8. What other solesolevaki events are practiced in the village, that's not in the above list? Please add here

_____

_____

_____

_____

_____

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9. Please check whether these activities are maintained, is carried out less than before, or lost in your village *

Check all that apply.

	Same as before	Less than before	Lost	Never happen in my village
Traditional house construction	☐	☐	☐	☐
House construction	☐	☐	☐	☐
Church construction	☐	☐	☐	☐
Planting yams	☐	☐	☐	☐
Harvest yam	☐	☐	☐	☐
Planting yaqona, dalo, tavioka	☐	☐	☐	☐
Harvest yaqona, dalo and cassava	☐	☐	☐	☐
Boys circumcision	☐	☐	☐	☐
Girls first period	☐	☐	☐	☐
Man's family asking for a girls hand in marrige	☐	☐	☐	☐
Marrige	☐	☐	☐	☐
Tevutevu	☐	☐	☐	☐
Baby shower	☐	☐	☐	☐
Weave mats together	☐	☐	☐	☐
Soli (fundraising)	☐	☐	☐	☐
Village work	☐	☐	☐	☐
Cooking in school)	☐	☐	☐	☐
School management	☐	☐	☐	☐
Canteen management	☐	☐	☐	☐
Gathering fish as a community (yavirau)	☐	☐	☐	☐

10. Any other comments?

_____

_____

_____

_____

_____

11. Will you be available to be interviewed? *

Mark only one oval.

◯ Yes   *Skip to question 12*

◯ No

Contact
information

Thank you for giving consent to be interviewed. You are being invited to participate
in a research study titled Social resilience in the Fijian context: A study of iTaukei
communities post-disaster. This study is being carried out by Sainimere Veitata-
Waqalevu from the Graduate School of Global Environmental Studies of Kyoto
University.

The purpose of this research study is to investigate how the social norms in itaukei
villages, change or utilised during a disaster event. These social norms include the
values that drive solesolevaki for eg, family networks, social structures, and village
governance. This is a follow up from the questionnaire you answered earlier. If you
agree to the term and participate in the study you may be asked to complete
another online survey/questionnaire.

By clicking "I agree" below you are indicating that you have read and understood this
consent form and agree to participate in this research study.

For any inquiry or questions please feel free to contact me on: saivwaqalevu@
gmail.com. Vinaka sara vakalevu.

12. Agreement to the term and conditions

Mark only one oval.

◯ I agree to the terms and conditions

◯ I disagree

13. Name *

_____

14. **Preferable way to contact you?** *

Check all that apply.

☐ Email
☐ Facebook
☐ Phone/mobile phone
Other: ☐ _____

15. **Email address, FB name or phone/mobile number - please check to see that there is no mistake in your entry** *

_____

iTaukei version (translated)	Au kerea mo lavetaka vakavinaka ka vakadodonu na nomuni saunitaro

16. **Nomuni yabaki ni bula** *

Mark only one oval.

⚪ < 20
⚪ 20-29
⚪ 30-39
⚪ 40-49
⚪ 50-59
⚪ 60-69
⚪ >70

17. **Gender** *

Mark only one oval.

⚪ Tagane
⚪ Yalewa
⚪ Au kerea me'u kua ni vakaraitaka
⚪ Other: _____

18. Na nomuni cakacaka- nai vurevure ni lavo ena macawa rua sa oti *

    Mark only one oval.

    - ( ) Vaka bisini ka saumi tamata kina (employer)
    - ( ) Vaka bisini se rawa i lavo vakai koya ga (self- employed)
    - ( ) Cakacaka saumi ena tabana ni cakacaka (civil servant, TFL, WAF, EFL, NGO, INGO)
    - ( ) Cakacaka saumi ena tabana ni cakcaka tu vakataki koya (private company)
    - ( ) Rawa i lavo mai na teitei se na qoli (subsistence)
    - ( ) Cakacaka sega ni saumi, veiqaravi e vale (me vaka na sasamaki, savasava, koti co)
    - ( ) Cakacaka vaka volunteer vakataki ira era cakacaka ena vei koronivuli, valeni lotu
    - ( ) Tauri peniseni
    - ( ) Au tauri lavo ni malumalumu
    - ( ) Au sa qase ka sega ni cakacaka
    - ( ) Au mavoa se tauvimate ka'u sega ni rawa ni cakacaka
    - ( ) Au sega ni cakacaka- e sega ni dua na noqui vurevure ni lavo
    - ( ) Other: _____

19. Ni vakai tikotiko beka e vei (me vaka na, yaca ni koro, yacani tauni se na siti) *

    _____

20. Na yacani nomuni koro (Koro, tikina, yasana) *

    _____

21. Q1- Ni sa vakaitavitaki kemuni beka ena so nai ka era lavetaki tiko qo, ni rawa ni toqa talega na levu ni gauna ni raica kina ni qaravi nai tavi oqo? Q2- Ena wasewase ni koro cava e dau qaravi kina? (Ni toqa na sauni taro e donu vei kemuni, me vaka nai taba e toko qori. Me dua na saumi taro ena Q1 ka me dua ga ena Q2) *

	Q1- Veigauna kecega	Q1- Sega ni yaco vakawasoma	Q1- Vakavudua	Q1- Sega vakadua	Q2- Koro	Q2- Mataqali	Q2- Tokatoka	V
Tara valevakaviti	☐	☐	☑	☐	☑	☐	☐	
Tara vale	☑	☐	☐	☐	☐	☑	☐	

Check all that apply.

	Q1- Veigauna kecega	Q1- Sega ni yaco vakawasoma	Q1- Vakavudua	Q1- Sega vakadua	Q2- Koro	Q2- Mataqali	Q2- Tokatoka
Tara valevakaviti	☐	☐	☐	☐	☐	☐	☐
Tara vale	☐	☐	☐	☐	☐	☐	☐
Tara valeni lotu	☐	☐	☐	☐	☐	☐	☐
Tei uvi	☐	☐	☐	☐	☐	☐	☐
Keli uvi	☐	☐	☐	☐	☐	☐	☐
Teitei (yaqona, dalo, tavioka)	☐	☐	☐	☐	☐	☐	☐
Roqoroqo	☐	☐	☐	☐	☐	☐	☐
Cavu dalo, tavioka, yaqona	☐	☐	☐	☐	☐	☐	☐
Curu i bure	☐	☐	☐	☐	☐	☐	☐
Butudravu	☐	☐	☐	☐	☐	☐	☐
Duguci	☐	☐	☐	☐	☐	☐	☐
Vakamau	☐	☐	☐	☐	☐	☐	☐

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Tevutevu	☐	☐	☐	☐	☐	☐	☐
Bulubulu	☐	☐	☐	☐	☐	☐	☐
Funeral	☐	☐	☐	☐	☐	☐	☐
Talitali vakoro	☐	☐	☐	☐	☐	☐	☐
Soli	☐	☐	☐	☐	☐	☐	☐
Cakacaka vakoro	☐	☐	☐	☐	☐	☐	☐
Vasaqa i koronivuli	☐	☐	☐	☐	☐	☐	☐
Qaravi ni koro ni vuli	☐	☐	☐	☐	☐	☐	☐
Qaravi ni sitoa ni koro	☐	☐	☐	☐	☐	☐	☐
Vakasasa vuaka ni veikau	☐	☐	☐	☐	☐	☐	☐
Kena qaravi nai veitavu ena vuku ni saravanua e nakoro	☐	☐	☐	☐	☐	☐	☐
Yavirau	☐	☐	☐	☐	☐	☐	☐

22. Kevaka e dua tale beka na ka, au sega ni vakaraitaka toka e cake me baleta na solesolevaki, au kerea ga moni qai lavetaka tikoga e ke?

_____

_____

_____

_____

_____

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23. Ena veiqaravi kece e toqai toka qo e ra, au kerea mo ni toqa na kena e donu vei kemuni enai yasana i matau *

Check all that apply.

	E se vakayacori tikoga me vaka na kena dau yaco mai liu (maintained)	E se tikoga ia sa caka vakalailai (less than before)	E sa yali se takali yani (lost)	E sa mai veisau na kena qaravi nai tavi oqo (changed/adapted)
Tara valevakaviti	☐	☐	☐	☐
Tara vale	☐	☐	☐	☐
Tara valeni lotu	☐	☐	☐	☐
Tei uvi	☐	☐	☐	☐
Keli uvi	☐	☐	☐	☐
Teitei (yaqona, dalo, tavioka)	☐	☐	☐	☐
Cavu dalo, tavioka, yaqona	☐	☐	☐	☐
Curu i bure	☐	☐	☐	☐
Butudravu	☐	☐	☐	☐
Duguci	☐	☐	☐	☐
Vakamau	☐	☐	☐	☐
Tevutevu	☐	☐	☐	☐
Roqoroqo	☐	☐	☐	☐
Talitali vakoro	☐	☐	☐	☐
Soli	☐	☐	☐	☐
Cakacaka vakoro	☐	☐	☐	☐
Vasaqa i koronivuli	☐	☐	☐	☐

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Qaravi ni koronivuli	☐	☐	☐	☐
Qaravi ni sitoa ni koro	☐	☐	☐	☐
Kena qaravi nai veitavu ena vuku ni saravanua e nakoro	☐	☐	☐	☐
Yavirau	☐	☐	☐	☐

24.   E dua tale beka na ga ni via vakaraitaka

_____

_____

_____

_____

_____

25.   E rawa beka ni ko ni solia na veivakadonui moni soli itukutuku tale ena gauna mai muri?)

Mark only one oval.

◯ Io   *Skip to question 26*

◯ Sega

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Na gaunisala ni veitaratara

Vinaka sara vakalevu na nomuni solia na veivakadonui mo ni soli itukutuku ena veitalanoa ni ulutaga oqo. Ni sa sureti saka tiko mo ni soli tukutuku ena vakadidike ka vaka tokai tiko; "Social resilience in the Fijian context: A study of iTaukei communities post-disaster". E vakayacora tiko na vakadidike oqo ko Sainimere Veitata-Waqalevu ka e vuli tiko ena koroni vuli ni veikarautaki na Kyoto University.

Nai naki tikoga ni vakadidike oqo, o ya na kena gadrevi me vaqaqai ka me kilai vakavinaka na veikakece e dau vakavuna tu na noda bula vata vakai taukei ena noda vei korokoro. Qo e vakatabaki dua tiko ena gauna e da dau lako curuma kina na leqa tubu koso. Me vaka na noda veivukei ga vakai keda ena lomani koro, na veivuke ni matavule ena taudaku ni koro vata kei na veiliutaki ena lomani koro. Qo ga e sala muria tiko yani na veitalanoa ni solesolevaki eda sa qai mai vakalewena oti qo.

Kevaka ni solia na nomuni veivakadonui mo ni solitukutuku ena gauna mai muri, au qai kerea ga mo ni digitaka ni ko ni "solia na veivakadonui" kevaka ni sega ni solia na veivakanonui au qai kerea mo ni digitaka ni ko ni "sega ni solia na nomuni veivakadonui".

Kevaka ni via vakatataro se veitaratara mai na nqu imeli ga qo; saivwaqalevu@ gmail.com. Vinaka sara vakalevu.

26. Kevaka ni dua vata ena tauri ni nomuni tukutuku, au kerea mo ni solia na nomuni veivakadonui

   Mark only one oval.

   ⬭ Au SOLIA na noqu veivakadonui

   ⬭ Au SEGA NI SOLIA na noqu veivakadonui

27. Na yacamuni *

   _____

28. Gaunisala cava beka e rawarawa vei kemuni moni tarai yani kina *

   Check all that apply.

   ☐ Imeli
   ☐ Volamata (Facebook)
   ☐ Naba ni talivoni veikauyaki (mobile number)

29. Qai kerea ga moni toqa e ra na nomuni imeli, na yacamuni ena ivola mata, se na nomuni naba ni talevoni. *

   _____

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Appendix 2: Household Survey Questionnaire

Household Survey Questionnaire
What is social resilience in the Fijian context? A study of Fijian community's post disaster recovery

Before you decide to participate in this survey, you need to understand why the research is being done and what would your involvement mean. Please take some time to read the following information and feel free to ask if you have any questions.

There are no possible risks associated with this study, as the questions are related to our everyday activities in the village.The purpose of this research study is to investigate how the social norms in *iTaukei* villages, change or utilized during a disaster event. These social norms include the values that drive *solesolevaki* for e.g., family networks, social structures, and village governance.

By agreeing to participate in this survey, you are indicating that you have understood this consent form and agree to participate in this research study.

For any inquiry or questions please feel free to contact me on 679 8018673. Vinaka sara vakalevu.

Date:		Interviewer	
Interviewee:		Age:	

PART A: DEMOGRAPHIC INFORMATION

Housename:		Mataqali:	
Homeowner:		Gender:	
Age:			
# in Household:		* please indicate in the map where the house in located	

Please draw the family tree of those living in the house with relation to age, gender, and relation to the interviewee

* add age, relation, and gender (note down if there are children reside outside of the village)
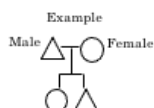
PART B: EVACUATION ACTIONS (Probe: <u>Any recent cyclone they remember, also take a note of the name</u>)

What cyclone and date: _____

Evacuation during the cyclone (Probe: <u>Ask house name and how they relate</u>)

1. How did you find out about the cyclone (cyclone warning)? Please tick (√)

	Turaga ni koro	
	Radio	
	Neighbor. Who?	
	Family outside the village. Who?	
	Others (specify)	

2. Where did you evacuate during the cyclone? And why? (circle the correct option and complete the why part)

    a. Stay home. Did anyone evacuate at your house with you? (yes or no) * ask question 3

If Yes, who?	

    b. Evacuation center.

Where (church, school, others)	
How long for?	

    c. Neighbors house. *ask question 3

Where (which house)?	
Who? (relation)	
Why (eg, distance, relation (exactly who), safety)	
How long?	

    d. Others * ask question 3

Where	
Why?	
How long?	

Why not go to the evacuation center (if did not evacuate to the evacuation center)

_____

_

Housing immediately after the evacuation

1.   Were you able to live in your house/kitchen/other structures (with very minor/without repairs) immediately after the cyclone passed?
    a. Yes
    b. No

2.   Where did you stay while waiting for your house repairs/reconstruction to be completed?
    a. Stay in evacuation center (e.g., school, church)
    b. Lived in a tent
    c. Moved to neighbor's house. Where? _____ and why? _____
    d. Other _____

3.   How long did you stay there for? (eg 1 month to 1 year) when? (eg May 2016 to September 2017)
        _____

Food source immediately after cyclone

How were your family eating, after the cyclone? (can tick several)

	1 day	1 week	1 month
Harvested in advance from my garden/farm			
Salvaged food from my garden/farm			
My neighbor gave me food Who?			
I had some food prepared at home (emergency food)			
I ate at the evacuation center			
Got food from relief supply (government, NGO, etc)			
Others:			

PART C: HOUSING (Refer to TC Winston as it is a follow up- use google earth image to guide)

Basic house information and damages after the cyclone

B= Bamboo	C= Cement	CB= Concrete block	CI= Corrugate iron
E= earthen floor	TF= Timber frame	TH= thatched	WB= Wooden board
OT= others			

1.   **Housing condition now**

Building number	Purpose	Structure TF/CB/Bure	Wall B/WB/CI/OT (specify)	Roof CI/TH/ OT (specify)	Floor WB/E/C/ OT (specify)	When it was built (before or after Cyclone)

2.   **Housing condition before the cyclone**

1= Totally collapsed	2= Severe and no longer livable (condemmend) * not possible to live in	3= Severe but still livable *can still live with repairs	4= Minimal *minor damages/can use with minor repairs	5= None

Building number	Purpose	Structure TF/CB/Bure	Wall B/WB/CI/OT (specify)	Roof CI/TH/ OT (specify)	Floor WB/E/C/ OT (specify)	Damage level

Self- fixing and reconstruction phase

1.   Did you repair and/or reconstruct your house before Help for Homes (HFH) assistance?
   a.   Yes
   b.   No. **why? (check**: (i) no need to repair and /or reconstruct **OR** (ii) I just waited for HFH) **OR** please specify _____

2. Only ask if **a. Yes** from 1.

What did you do on your own?			
	Repair my house.	Built a makeshift house.	Reconstruct my house.
Building number			
When			
Repairs and/or reconstruct and cost			
What did you repair?			
Approximately how much did you need			
How did you finance the repairs and/or reconstruction? (please write where appropriate in the space provided)			
Household income/savings.			
I bartered with livestock/kava/others (please specify)			
Donations. From whom?			
Remittance. From whom?			
Loan. From where?			
Village funding			
No funding necessary (eg, recycled materials)			
Others. Specify			
Who carried out repairs and/or reconstruction			
Immediate family (*Vuvale*). Who?			
Community cooperation (*solesolevaki* efforts)			
Community members other than a. or b. Who?			
Outside of the village. Who?			
Others. Specify			

Help for Homes (HFH)
1. Did you receive HFH funding? And how much?
    a. Yes (7,000 FJD, 3,000 FJD or 1,500 FJD)
    b. No

2. What did you do with the HFH assistance?
    a. Repaired the existing main house
    b. Constructed new main house. Where _____ (locate on the map on top if possible)
    c. Constructed separate building (eg, kitchen, tool shed, toilet).
    d. Repair or construct another family house because mine was OK. Which house:
       _____
    e. Others _____

3.   Please fill in the answers in the space provided

Carpenter – choice and payment and labors	
Did you hire a carpenter?	Yes or No
How much did you pay for the carpenter?	
Where did he come from? (name the exact place he came from or House name)	
Why did you choose this carpenter? (eg, qualifications, *matai,* family member)	
How did you pay for the carpenter	
Household income/savings.	
I bartered with livestock/kava/others (please specify)	
Donations. From whom?	
Remittance. From whom?	
Loan. From where?	
Village funding	
No funding necessary (eg, same household)	
Others. Please specify	

4.   Laborers and workers that assisted in the house construction/repairs?

Who helped in constructing/repairing your house? (choose 1 option)	
Immediate family (*Vuvale)*. Who?	
Community cooperation (*solesolevaki* efforts)	
Community members other than a. or b. Who?	
Outside of the village. Who?	
Others. Please specify	
How did you pay for workers mention in (v)? Can choose more than 1 option	
Feed the workers. How? Who helped to cook?	
Yaqona for the workers	
Paid cash	
Working exchange. What kind?	
Not paid	
Others. Specify	

PART D: LIVELIHOOD / INCOME

1.　　　　Income source

Occupation/Livelihood activities	Tick if source	Who in the household is involved/responsible (relation to houseowner)	How much money do you earn from these jobs? * get the unit if possible	How regular do you earn from these jobs? (daily, weekly, yearly, seasonal...)
ARGRICULTURE RELATED				
Fishing				
Farming kava				
Farming staples (dalo, cassava, kumala, vudi)				
Farming vegetables and fruits				
Animal husbandry (cows, pigs, chicken, goats)				
Timber products				
PAID JOBS				
Canteen business (groceries, kava, cigarettes, etc.)				
Tourism related business (in the village)				
Handicraft/ mat/basket weaving				
Sugar cane farm worker				
Works at the FSC				
Pastor				
School teacher(s)				
Civil servant (police, military, nurse, administrator)				
Taxi driver				
OTHERS				
Land lease from farmers and hotel				
Social welfare				
Pension				
Remittance overseas				
Remittance local				
Other income please specify				

2.　　　　What do you do when you need cash for emergencies or events in your household?
   a.　Household income (selling products)/savings
   b.　I bartered with livestock/kava/others. (please specify)
   c.　Donations.
       From whom? _____
   d.　Remittance.
       From whom? _____
   e.　Loan.
       From where? _____
   f.　Village funding
   g.　Others please specify. _____

PART E: AGRICULTURE AND FOOD
1.   Agriculture produce/Use and impacts
Please tick where appropriate

	BASIC INFORMATION			PURPOSE	
	Farm	Household garden	Communal	Eat	Sell
Yaqona					
STAPLE					
Dalo					
Tavioka					
Vudi					
Kumala					
Others					
VEGETABLES					
Bele					
Rourou					
Cabbage					
Eggplant					
Chiilies					
Others					
FRUITS					
Banana					
Watermelon					
Mango					
Pineapple					
Moli					
Coconut tree					
Wi					
Other:					
OTHERS					
Voivoi					
Masi					
Others					
	BASIC INFORMATION			PURPOSE	
	#			Eat	Sell
LIVESTOCKS					
Cow					
Pigs					
Chicken					
Goat					
Horse					
Ducks					
Others					
FISHERIES					
Fish					
Shellfish					
Seaweed					
Beach-de-mer					
Others					

2.   How big is your farm? (acre, hectare, meter squared)

_____

3.   Ownership/Use of Farmland
Please indicate where appropriate

	Ownership		
	Own mataqali	Another mataqali within the village	Land owned by outside village
Yaqona			
Dalo			
Tavioka			
Fruits			
Others (specify)			

4.   *Solesolevaki* farming activities

		1. WHEN AND HOW LONG 2. WHO HELPED/BY THEMSELVES			
Specify what kind of farm or garden		Clearing the farmland Burning of the rubbish	"ploughing" the land (preparing the soil)	Collecting seeds, seedlings, and cuttings	Replanting of crops/vegetables
Farm	1				
	2				
Household garden	1				
	2				
Others. (specify)	1				
	2				

PART F: Perception of *Solesolevaki*

1.   What does *solesolevaki* mean to you and your family?

2.   List 10 activities that you utilized *solesolevaki* in last year

Appendix 3: Interview Sheet

INTERVIEW GUIDING QUESTIONS – FARMER TO MAP THEIR FARM

Date:		Interviewer	
Interviewee:		Mataqali	
Age		Role in the village (if any)	

LIVELIHOOD AND FOOD

Be sure to do the following:

Got to the farm and identify the farm border by doing the following.

      (i)   drone picture

      (ii)   walk around the farm perimeter and use the GPS to take way points in the farm perimeter

      (iii)   take photo of the farm and check what they grow and how much they grow (per crop/vegetable), how much apart

      (iv)   do this for all the farmland that one family have (all farm and gardens of one household)

1.   Who owns this land you are farming in?

2.   How long have you been farming here?

3.   Who usually helps you out in the farm?

4.   Do you sometime sleep in your farm? If yes, do you have a farmhouse/shed?

5.   How do you go to your farm?

6. What does your normal daily routine look like- if you are doing farm work?

Time	Activity	Who helps?

INTERVIEW GUIDING QUESTIONS – TURAGA NI KORO/VILLAGE LEADER

Date:		Interviewer	
Interviewee:		Mataqali	
Age		Role in the village (if any)	

A. EVACUATION CENTER MANAGEMENT

7. Do you have a designated evacuation center within the village? which building?

8. Was the evacuation center used during the cyclone? If not, why?

9. Who is responsible for managing the evacuation center?

10. How long did the evacuation center stay open for the villagers?

11. What activities has been carried out in the evacuation center? (eg, sleeping, cooking, relief supply distribution)

12. Who is responsible/involved for each of the activities? (eg, sleeping, cooking, relief supply distribution, security)

B. RELIEF SUPPLY

Supplier (network/cooperation)	Approximately when?	Item?

C. VILLAGE INFRASTRUCTURE

WHAT ARE THE INFRASTRURES IN YOUR VILLAGE?	HOW WAS IT DAMAGED?	WHAT WERE SOME OF THE ACTIVITIES YOU DID TO REPAIR/RECONSTRUCT IT	WHO WERE ENGA WITH THE REPAIR RESONSTRUCTION
Church building (confirm if evacuation center)			
School (confirm if evacuation center)			
Village shop			
Dispensary			
Access to the village (road)			
Water supply			
Electricity			
Village truck/boat			

		213		
Others				

Appendix 4: Household survey participants information

SITE 1: Household Survey information

ID Number	Interviwer	Interviewee	Age	Gender	Housename
Bunirea	Sai	Solomone Kaloutani	28	male	Dakuidriti
48	sai	Seru Tavola	42	male	Nadrano
44	Sai	Sitiveni Areibuli	55	male	Saioni
51	sai	Meli Finau	54	male	Munia
28	sai	sailosi koroimua	66	male	Matanuku
32	sai	Rt Tomu Baca	32	male	Nasavuti
16	sai	Sailosi Qaloiwai Buliruarua	51	male	Canaika
57	sai	Maika Komaitomasi	64	male	Niusawa
60	sai	Leba Kafoa	29	female	Namata
64	sai	Ravu Vakaliwaliwa	52	female	Narikoso
8	sai	Emori Tudia	30	male	Tivitivi
37	sai	Pita Tabua	62	male	Driti
2	sai	Samu Bolobolo	29	male	winston
25	sai	aminiasi masima	62	male	Nukucagina
55	sai	finiasi cola	48	male	Muairewa-Lena's house
36	sai	Vilitati Veitala	51	male	Peceliema
17	sai	Laisiasa Qiolevu	64	male	Vunisei
17	sai	Sekaia Bolobolo	42	male	Nakorobalabalavu
65	sai	Esava Kobiti	46	male	Wainikeli
42	sai	Eroni Baleinabola	62	male	Sarailolo
33	sai	Malakai Gadai	41	male	Vuniivi
31	sai	Ana Maria	58	female	Nasima
26	sai	Jone Buliruarua	77	male	Namosi
61	sai	Leone	54	male	Nayaulevu
50	sai	Jeke Raturaga	61	male	Baleiwai
63	sai	Ratu Koli	52	male	Delaiyatova
47	sai	Filomena Volau	57	female	Niurea
	sai	Litiana Tavola	53	female	Lewasa
53	sai	Rameli	52	male	Wakayama
59	sai	Saiasi Waqabilo	49	male	Matanawaido
22	sai	Sikeli Vakliwaliwa	38	male	Daviqele
18	sai	Emori Komainasegai	68	male	Rijimodi
6	sai	Vilimone Daunabuna	75	male	Iteni
8	sai	Tomasi Buliruarua	48	male	Naiqoro
43	sai	Alifereti Ratuwere	43	male	Cawalailai/24/7 Homestay
35	sai	Kalesi Dimakoi	37	female	Namosusu
	sai	Timoci Tawake	33	male	Matapule

24	sai	Sireli Tawake	50	male	Nalo
21	sai	Tikiko Vakaliwaliwa	68	male	Kirisimasi
62	sai	Samuela Komaivu	47	male	Fatima
14	sai	Leone Domonaibau	75	male	Natarawau
12	sai	Sekaia Buliruarua	49	male	Vatukoula
39	sai	Savenaca Qreqeretabua	43	male	Cakaubulisova
	sai	Litiana	38	female	Loa
	sai	Ratu Peni Rakalavo	62	male	Wainunu
	sai	Seremaia Daunicocoka	40	male	Naduruvatolu
	sai	Tapeta Morgan	43	female	Dakuilomaloma
	sai	Usaia Botea	38	male	Nakeba
	sai	Asinate Batiki	35	female	Lovelove
	sai	Tevita Bolabola	67	male	Saolo
	sai	Mua	37		Vunimaba
	sai	Rotacoqa Bula	49	female	Lovowaqa
	sai	Vesikula	18	male	Delaiyatova 2
	Sai	Ratu Sikeli Vakaliwaliwa	66	male	Bareki

SITE 2 – Household Survey information

ID Number	Interviewer	Interviwee	Age	Gender	Housename
1	Sai	Pio Nasauvou	60	Male	Navuniyasi
2	Sai	Pio Nasauvou	48	Male	Visakikilevu
3	Efe	Viliame Caudruvolili	36	Male	Uluitei
4	Sai	Filomena Racea	28	Female	Bakanawa
5	Sai	Maikieli Vosavoto	41	Male	Dakuda
6	Efe	Romulo Laitia	26	Male	Vosaya
7	Efe	Fabiano Naleqa	39	Male	Nataoni
8	Efe	Amele Silivia	27	Female	Tubou
9	Efe	Suliano Natadra	65	Male	Vanuakula
10	Efe	Miliakere	47	Female	Waidere
11	Efe	Ana Maria	33	Female	Vucilevu
12	Efe	Sainiana Kelera	44	Female	Lololevu
13	Sai	Alavina	45	Female	Sawailau
14	Efe	Lekima Romulo	24	Male	Lesutale
15	Sai	Sabina Marina	44	Female	Nacula
16	Efe	Nai Serona	37	Female	Tacirua
17	Sai	Ivona Mausa	60	Female	Veresia
18	Sai	Ranadi	25	Female	Natawa
19	Sai	Mereseini Vosaboto	48	Female	Vunito

20	Sai	Iosefo Ratubusa	76	Male	Isireli
21	Sai	Ratu Semi Nalawalevu	83	Male	Sanilava
22	Efe	Salote Tabua	62	Female	Nukuveiwaqe
23	Sai	Vasenai Nalibu	25	Female	Tuvu
24	Efe	Joape Seavula	30	Male	Korea
25	Efe	SULITA lAISA	36	Female	SOVUKOLAI
26	Efe	Vilisita Sukulu		Female	Wavuwavu
27	Efe	Setevano Mure	56	Male	Nairai
28	Sai	Kusitino	29	Male	Loredesi
29	Efe	Semi Sasai	43	Male	Namuanivatu
30	Sai	Ivamere Katarina	43	Female	Vatumaragi
31	Efe	Verenaisi Waqali	50	Female	Narukutabua
32	Sai	Basilio Naqesa	52	Male	Davuilevu
33	Sai	Asilika Nasiga	37	Female	Oneata
34	Sai	Kolaiasi Naleqa	71	Male	Nacokula
35	Sai	Sipiriano Tuinakauvadra	57	Male	Vatuse
36	Sai	Basilio	78	Male	Nagadele
37	Sai	Petero Mosia	39	Male	Qalotu
38	Efe	Uliana Taga	54	Female	Bosnia
39	Efe	Teresia Naica	63	Female	Vatuvui
40	Efe	Sisilia Narai	25	Female	Bombay
41	Sai	Mariana Nai	43	Female	Mateibau
42	Sai	Basilio Sailoma	60	Male	Neilaumata
43	Sai	Ratu Semi Nakautoga	60	Male	Tokalau
44	Sai	Filomena Racea	39	Female	Naqera
45	Sai	Tevita Vuniivi	40	Male	Davetalevu
46	Sai	Sulueti	39	Female	Korowabuta
47	Sai	Basilio Bulakosi	62	Male	Nalivodo
48	Sai	Nario Belo	78	Male	Luva
49	Sai	Filomena	48	Male	Vatima
50	Sai	Semi Nasauvou	43	Male	Seatura
51	Efe	Koleta Raseka	28	female	Nakerekere
52	Efe	Joti Bilawalu	36	male	Lomanibai
53	Sai	Petero Navula	58	Male	Tahiti
54	Sai	Josivini	38	female	Nayau
55	Efe	Keasi Rayasi	31	female	Nakasamai
56	Sai	Romanu Radrevu	52	male	Delailagi
57	Efe	Filipo Seavula	21	Male	Burotu
58	Efe	Makelesi Uqe	40	female	Nabulo
59	Efe	Keveri Loganimoce	36	Male	Wakaya
60	Efe	Epeli Sauvatu	22	male	Tuvainia
61	Efe	Adi Vika Marama	48	female	Nakasekula
62	Efe	Penasio Bebe	62	male	Natovolea

63	Sai	Taitusi	42	male	Sasawene
64	Sai	Filomena Sisilia	49	female	Biausevu
65	Sai	Iliesa Niulele	54	male	savatu
66	Efe	Abele Ramasei	55	male	Lomeri
67	Sai	Jope Saunivalu	32	male	Nukusuka
68	Sai	Iokimi Radila	69	male	Dreketi
69	Sai	Karolina Naseka	43	female	Nagatagata
70	Sai	Aqela Ratu	52	female	Wainisomu
71	Sai	Tavite	42	male	Cokobasaga
72	Sai	Ruci Waqaniu	49	female	Qaunagaga
73	Sai	Elena Rakoto	42	female	Namasa
74	Sai	Masilina Rakai	69	female	Cikobia
75	Sai	Ratu Peni Qarita	41	male	Lavevatu
76	Sai	Paterisio R.	50	male	Tamavua
77	Sai	Senimili	60	Male	Mosi
78	Sai	Nanise	44	Female	Urata
79	Sai	Makirina Nakautoga	23	Female	Navesi
80	Sai	Viliame	33	Male	Lonaqai
81	Sai	Iosefo Drole	38	Male	Senicoko
82	Sai	Losalini T.	60	Female	Naroyasi
83	Sai	Mikaele T	77	Male	Solevu
84	Sai	Mere K.	45	Female	Namacuku
85	Sai	Mosese Tabulevu	39	Male	Bakanawa
86	Sai	Mereseini S.	57	Female	Saliawalu
87	Sai	Asela Sami	57	Female	Rotuma
88	Sai	Tucake	38	Male	Burenikau
89	Sai	Ratu Siviriano Tuinakauvadra	71	Male	Veresia
90	Sai	Asela S	49	Female	Nabouvuga
91	Sai	Asilika N.	23	Female	Tubeitoga
92	Sai	Eneriko	66	Male	Boubasaga
93	Sai	Amelia N	31	Female	Vutosara
94	Sai	Litiana	19	Female	Tarivo
95	Sai	Sevuloni	40	Male	Nasasau
96	Sai	Koleta	36	Female	Nanuya
97	Sai	Epeli	35	Male	Naulunitei
98	Sai	Miliakere Sura	30	Female	Makuluva
99	Sai	Elena	31	Female	Lagi
100	Sai	Viniana M	42	Female	Gaunavou
101	Sai	Asela	56	Male	Lololima
102	Sai	Ivamere	58	Female	Verata
103	Sai	Alesi Ranadi	48	Female	Nukuciri
104	Sai	Leone	35	Male	Navunitivi
105	Sai	Merewalesi N	64	Female	Vatikano

106	Sai	Meresiana N	56	Female	Vuaki
107	Sai	Mikaele Kubu	60	Male	Namaqei
108	Sai	Setareki Nativi	42	Male	Tamayawa
109	Sai	Tevita Serulevu	36	Male	Japata
110	Sai	Ratu Vilimoni	43	Male	Sainiai
111	Sai	Udite N	46	Female	Labasa
112	Sai	Teresia L	42	Female	Silinavou
113	Sai	Luisa C	61	Female	Muanikau
114	Sai	Navulavula?		Female	Tahiti
115	Sai	Miriama Vula	34	Female	Tokou
116	Sai	Akeneta V	53	Female	Lumuni
117	Sai	Karolina Naseka	57	Female	Doilevu
118	Sai	Eremasi	64	Male	Ovalau/Nabou walu
119	Sai	Simione	55	Male	Qwaliyasi
120	Sai	Kinisimere Sarovi	53	Female	Baivaoni
121	Sai	Sipiriano Tuinakauvadra	43	Male	Mataibau
122	Sai	Ratu Tevita	40	male	Somolevu
123	Sai	Verenaisi Katarina	45	Female	Cuvu
124	Sai	Moi	36	Female	Solevu 2
125	Sai	Karalaini	68	Female	Roma
126	Sai	Elisio Nabe	39	Male	Namotutu
127	Sai	Ioane	52	Male	Vatikano

SITE 3: Household Survey information

ID Number	Interviewer	Interviewee	Age	Gender	Housename
37	Sai	Raijieli	62	male	Namuanicula
31	Sai	Sera	54	female	Tavunasici
138	Sai	Joeli Namatasere	78	Male	Vatucere
137	Sai	Ilai Tuisawau	59	Male	Nasi'oa
74	Sai	Susanna		female	Nuku
82	Sai	Tokasa	53	female	Driodrio 3
83	Sai	Latu. R	31	female	Driodrio
108		Momo Qarase	63	Male	Boubei
106	Sai	Filise Vulavou	64	female	Noatau
73	Sai	Losalini	34	female	Koronubu
39	Sai	Kelevi Naicagu	63	Male	Naduruvesi
60	Sai	Lusiana	62	female	Saioni
135	Sai	Ana	38	female	Yasawa
21	Sai	Marika V Macuata	49	female	Natuicake
109	Sai	Malamala Waqa	60	Male	Nawaka
36	Sai	Arieta Tinaitubuna	63	Female	Nacoribila
67	Sai	Aisea Raiyawa	32	Male	Gusunidaveta
79	Sai	Mere Waqalevu	64	Female	Nadomole

26	Sai	Joape Sadonu	60	Male	Blue House
25	Sai	Nacanieli Naduva	69	Male	Tokalau
52	Sai	Fereteri Moceyawa	70	Male	Navunirara
53	Sai	Ratu Epeli	42	Male	Vunirara
117	Sai	Eparama Dina		Male	Navunibitu
91	Sai	Bubu Sarasaro	68	Female	Vesivagavaga
92	Sai	Vani N	35	Female	Bubu's house
88	Sai	Veniana	38	Female	Nakeba
102	Sai	V. Sera	50	Female	Nakeba
79	Sai	Veniana. N	49	Female	Na'uvu
40	Sai	Mereseini Rasagavi	51	Female	Naba
12	Sai	Eremasi Dakui	29	Male	Malolo
65	Sai	Eroni Ledua	28	Male	Matanisiga
7	Sai	Belo	53	Male	Nayavulagilagi
118	Sai	Ratu Luke Vatuqica		Male	Vatunimaravu
49	Sai	Lavenia Nova	52	Female	
61	Sai	Adi Laite Naiceru	72	Female	Natubari
51	Sai	Rokocagi Timaleti	64	Female	Nakauvadra
57	Sai	Maraia Adicaca	52	Female	
78	Sai	Siteri	62	Female	Na Korowaiciri
77	Sai	Arieta Waqalevu	39	Female	Matavotu
68	Sai	Epeli Sigalekaleka	52	Male	Vuniwi
46	Sai	Losena	32	Female	Natunuku
113	Sai	Aisake Sukuna	61	Male	Namalata
114	Sai	Etuate Naucukidi	62	Male	Tavea HS
124	Sai				Bolatagane
103	Sai	Nemani		Male	Nakovu
122	Sai	Amele Sukuna	77	Female	Savaivai
84	Sai	Maciusela Ravula	55	Male	Driodrio
55	Sai	Sikeli	82	Male	Nayalavatu
85	Sai	Lusiana. A	57	Female	Burenicagi
27	Sai	Sakaraia Tabara	72	Male	White house
28	Sai	Iliana Tunavuga	45	Female	**no name
48	Sai	Watisoni Raikoti	51	Male	Narauyaba
69	Sai	Seleima	45	Female	Dereinima
66	Sai	Mikaele Vakasilimi	65	Male	Vunidawa
35	Sai	Lusiana	60	Female	Navosota
2	Sai	Lavenia Novu	60	Female	Mada
99	Sai	Marica	31	Female	Davuilevu
33	Sai	Sera Ralawa	72	Female	Vunisakelu (Seutova)
58	Sai	Atunaisa Nanewa Lacadamu	76	Male	Droadroceva
45	Sai	Salanieta Civa	72	Female	
86	Sai	Sioana Ralikuwalu	33	Female	
54	Sai	Sokoveti Vulaca	50	Female	Nagaunavou
18	Sai	Ilisapeci	43	Female	* no name
15	Sai	Joeli Nakuta	43	Male	
1	Sai	Abele Turaga	59	Male	

14	Sai	Lusi	31	Female	Savusavu
5	Sai	Maikeli	28	Male	
13	Sai	Ananaiasa Korowaqa	57	Male	
133	Sai	Apenisa Delaibau	56	Male	Matainavaya
11	Sai	Paulini Dakui	55	Female	Vukivakawalu
9	Sai	Ratu Filimoni Dakui	48	Male	Korolevu
10	Sai	Maleli Dakui	50	Male	Sekoula
37	Sai	Raijieli	62	male	Namuanicula
31	Sai	Sera	54	female	Tavunasici
138	Sai	Joeli Namatasere	78	Male	Vatucere
137	Sai	Ilai Tuisawau	59	Male	Nasi'oa
74	Sai	Susanna		female	Nuku
82	Sai	Tokasa	53	female	Driodrio 3
83	Sai	Latu. R	31	female	Driodrio
108		Momo Qarase	63	Male	Boubei
106	Sai	Filise Vulavou	64	female	Noatau
73	Sai	Losalini	34	female	Koronubu
39	Sai	Kelevi Naicagu	63	Male	Naduruvesi
60	Sai	Lusiana	62	female	Saioni
135	Sai	Ana	38	female	Yasawa
21	Sai	Marika V Macuata	49	female	Natuicake
109	Sai	Malamala Waqa	60	Male	Nawaka
36	Sai	Arieta Tinaitubuna	63	Female	Nacoribila
67	Sai	Aisea Raiyawa	32	Male	Gusunidaveta
79	Sai	Mere Waqalevu	64	Female	Nadomole
26	Sai	Joape Sadonu	60	Male	Blue House
25	Sai	Nacanieli Naduva	69	Male	Tokalau
52	Sai	Fereteri Moceyawa	70	Male	Navunirara
53	Sai	Ratu Epeli	42	Male	Vunirara
117	Sai	Eparama Dina		Male	Navunibitu
91	Sai	Bubu Sarasaro	68	Female	Vesivagavaga
92	Sai	Vani N	35	Female	Bubu's house
88	Sai	Veniana	38	Female	Nakeba
102	Sai	V. Sera	50	Female	Nakeba
79	Sai	Veniana. N	49	Female	Na'uvu
40	Sai	Mereseini Rasagavi	51	Female	Naba
12	Sai	Eremasi Dakui	29	Male	Malolo
65	Sai	Eroni Ledua	28	Male	Matanisiga
7	Sai	Belo	53	Male	Nayavulagilagi
118	Sai	Ratu Luke Vatuqica		Male	Vatunimaravu
49	Sai	Lavenia Nova	52	Female	
61	Sai	Adi Laite Naiceru	72	Female	Natubari
51	Sai	Rokocagi Timaleti	64	Female	Nakauvadra
57	Sai	Maraia Adicaca	52	Female	
78	Sai	Siteri	62	Female	Na Korowaiciri
77	Sai	Arieta Waqalevu	39	Female	Matavotu
68	Sai	Epeli Sigalekaleka	52	Male	Vuniwi
46	Sai	Losena	32	Female	Natunuku

113	Sai	Aisake Sukuna	61	Male	Namalata
114	Sai	Etuate Naucukidi	62	Male	Tavea HS
124	Sai				Bolatagane
103	Sai	Nemani		Male	Nakovu
122	Sai	Amele Sukuna	77	Female	Savaivai
84	Sai	Maciusela Ravula	55	Male	Driodrio
55		Sikeli	82	Male	Nayalavatu
85	Sai	Lusiana. A	57	Female	Burenicagi
27	Sai	Sakaraia Tabara	72	Male	White house
28	Sai	Iliana Tunavuga	45	Female	**no name
48	Sai	Watisoni Raikoti	51	Male	Narauyaba
69	Sai	Seleima	45	Female	Dereinima
66	Sai	Mikaele Vakasilimi	65	Male	Vunidawa
35	Sai	Lusiana	60	Female	Navosota
2	Sai	Lavenia Novu	60	Female	Mada
99	Sai	Marica	31	Female	Davuilevu
33	Sai	Sera Ralawa	72	Female	Vunisakelu (Seutova)
58	Sai	Atunaisa Nanewa Lacadamu	76	Male	Droadroceva
45	Sai	Salanieta Civa	72	Female	
86	Sai	Sioana Ralikuwalu	33	Female	
54	Sai	Sokoveti Vulaca	50	Female	Nagaunavou
18	Sai	Ilisapeci	43	Female	* no name
15	Sai	Joeli Nakuta	43	Male	
1	Sai	Abele Turaga	59	Male	
14	Sai	Lusi	31	Female	Savusavu
5	Sai	Maikeli	28	Male	
13	Sai	Ananaiasa Korowaqa	57	Male	
133	Sai	Apenisa Delaibau	56	Male	Matainavaya
11	Sai	Paulini Dakui	55	Female	Vukivakawalu
9	Sai	Ratu Filimoni Dakui	48	Male	Korolevu
10	Sai	Maleli Dakui	50	Male	Sekoula