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Improved nutrition through vanua vekokolena (community empowerment) in Central Province, Papua New Guinea

A thesis presented in fulfilment of the requirements for the Degree

of

Doctor of Philosophy in Development Studies

at Massey University,

Palmerston North,

Aotearoa New Zealand

Limu Cheryl Mou-Vagi

2026

Dedication

I dedicate this thesis in memory of my husband, Tionivagi (John Anthony Vagi Kalau). I still yearn for your presence and wish you were here to see this come to fruition. It was only an idea we discussed that could benefit the populace after seeing mothers bottle feeding their children in the village. We started this journey together and will now have to finish it off with our children. I appreciate your love, dedication, commitment, wisdom and the father and mother role you played in my absence. You were my cheerleader, a constant source of support and encouragement. I can still hear your voice in mixed languages saying, "ia nori roropau, ah Rakaramana!" [we are not orphans or outsiders, ah Rakaramana!]. Geku raramani goi elemuaia thau thaukuai pene mia vanagivanagi, emau Au Tionivagi, geku raramani! My love for you will always remain in me forever, goodbye Au Tionivagi. Thank you for your support and all those prayers. All to you, my love!

Also, in memory of my dad, Mouaraga Mouaraga Dulama. Dad, what you thought impossible for me to do is not impossible. I know you will be beaming and delighted with this achievement. A special feeling of gratitude to my mother, Varagesisi Gogoni Mouaraga, the cultural values and the Christian principles you instilled in me, the humble and simple ways of your life have shaped who I am today. Thank you so much for your prayers and your belief in us to pursue better education. To my brothers Rai, Dulama, Godu, Bune and Senior Davis (Doge), their wives and children who have assisted and supported me in various ways, you know you will never be far from my thoughts.

To my children, Daryl, Daniel, Jonnelle and Davis, this is to you all! The journey we have taken and trajectories we have encountered have not being easy. Your challenges are my challenges as well. Thank you so much for your patience, sacrifices and support. My deepest gratitude to all my children. I love you all, my children.

Tanikiu ragakamu, tanikiu baralelevagi!! THANK YOU SO MUCH!!

Acknowledgement

Heavenly father, you deserve my praise, and you are worthy to be praised. You have led me with your righteous right hand, held me in the palm of your hands, and watched over me and my family. From the onset of this journey: I can do all things through him who gives me strength (Philippians 4:13) and call to me and I will answer you and tell you great and unsearchable things you do not know (Jeremiah 33:3) and as he promised, it is the Lord who goes before you. He will be with you; he will not leave you or forsake you. Do not fear or be dismayed (Deuteronomy 31:8). God, I give you glory for your steadfast love, wisdom, guidance, strength and faith that has brought me to the end of this journey and the chapter in this life, you are worthy to be honoured!

It has been a PhD journey for me (2020 – 2025). A journey with unimaginable challenges I never imagined could cause so much delay, including the global pandemic (COVID-19). My personal challenges include my health, the passing of my dear husband, the challenges my children encountered in my absence and my mother's health. These were beyond my wildest dreams of sorrow to say the least. However, I am grateful to God for his faithfulness through it all. My praise and my prayers to God, the three quotes from the Bible have been my pendant and have significance in my daily walk and my source of strength throughout my journey.

I am immensely grateful, and it was not by mistake that I have had the support and guidance of two beautiful and awesome supervisors, Dr Maria Borovnik and Professor Tracie Mafile'o. Your encouragement enabled me to learn, take the chance, make mistakes, and grow. You guided me when I was running off the lane and sometimes giving up. I owe my supervisors sincere gratitude for their invaluable time, and knowledge. They were more than generous in sharing their expertise, providing pastoral care, and guidance and supporting me throughout the research. I am indebted to you both for instilling in me the values of being a researcher. I am more than fortunate and humbled to have come under the radar of your tutelage, guidance and leadership to complete this journey in style. You are more than my supervisors, my mentors. I take off my hat to you both and I cannot thank you enough. God bless you and your families!

Gratitude is also extended to the Ministry of Foreign Affairs and Trade (MFAT) for providing the Manaaki Scholarship for financial support, without which this research would not have been possible. Many thanks to the staff of the International Students Liaison Office who have supported me through this journey. A special mention to Jamie Hooper, Micaela Moll, Diane Keisler, Anna Arcega, Tina Yang, and Alison Robinson; your support, and words of encouragement gave me that light of hope to persevere and reach the end of this research journey.

Many thanks also go to the Massey Pasifika Student Association, and Pasifika Post Graduate Learning student support unit particularly to Professor Tasa Havea, Dr Sesimani Havea, and Sunlou Luvae. Your job descriptions are beyond and above your role in supporting all the Pasifika students. I am indebted for your support and prayers.

I also acknowledge the Massey Chaplaincy team for providing pastoral care and support in my lowest moments, in no particular order: Ben and Steph Poulton, Victoria Sibley, Michelle Larnach, Paul and Diane Stock, and to Tony and Janine Rasmussen.

Special thanks go to the participants from the rural villages, Ginigolo, and Gavuone single mothers, women and men leaders of the villages, the Department of Health officers, the Department of Education and the South Pacific Commission (SPC) officer who generously shared their time, expertise, and experiences as research participants in this study. It has been a mega privilege to have heard your stories and views. Thank you for entrusting me with your knowledge and concerns. It has been a tremendous task trying to incorporate your voices as best as I could in the thesis, and I hope that I have done justice to your contribution.

Sincere gratitude is also extended to families who have accommodated and cared for me and my children. You have provided a comfortable, loving and peaceful environment for us to dwell in and have accepted us into your space as part of your family. I acknowledge Ernie Setiawan and her family for providing a homely environment and caring for me while I was going through the initial stages of cancer treatment.

Sincere thanks to Joanne and Brian Burmeister and their family for not only providing a homely environment but supporting me during bereavement of my late husband and having my children, and I became part of your family. Sincere thanks also to Michelle and Neil Benton for your openness, driving me to Massey during early hours so I could not waste time waiting for buses and for providing a place we could call home and recuperate emotionally.

I also thank Hickson and Sina Lome for your support, your prayers and a space to transit. My sincere gratitude is also extended to Estelle and Martin Steinmann for providing not only a space for Davis and me and for the peaceful, welcoming, and loving environment. I appreciate your understanding and support. To you all, I pray that God will continue to bless you all tenfold.

To all the staff of Palmerston North Mid Central, Crest Hospital and the Massey University Health Centre – I am grateful for receiving the best care you possibly could provide. Dr. Jade Robertson and

your team and Dr. Malcolm Anderson and your team, thank you! My thanks go also to the Cancer Society for making sure that I had a vehicle to arrive in time for treatments.

To Diane'e Nomane and Paul Titus, your unwavering support, understanding and collegiality are a testament to your principles of serving people. Thank you so much.

Sincere thanks to Vision Church and the Women's Connect groups you have been the heart of my spiritual strength, growth in my faith, and the warrior I have become. The Sunday sermons and Tuesday connect group meetings have provided the avenue for growth. Thank you so much for the mighty prayers, the intersessions and fellowship and of course, food! Food connects people. Pastors Dale and Rachel Meacheam, Christine and Rick Mooney, Raewyn Loader, Dr Helena, Taffy Chawanji and Iris Nanguzgambo. Also, to the young adults' team, the crèche team and Café team, the many friends whom I have not listed. You know who you are. I pray for God's blessing on you all. Continue to do the good work you do!

My heartfelt gratitude to my family in Dunedin, Agnes Beamish, Helen and Thomas Beamish. I appreciate your support, words of encouragement and constant prayers. My sincere thanks to Rachel Joseph and Negin Nimagole, the two vibrant sisters; there was never a dull moment with you two.

Abstract

Everyone has the right to food and nutrition, and women need attention as they are often the providers of good nutrition. Yet, nutrition awareness and specific policies are amiss in Papua New Guinea (PNG). In PNG, it is important to understand that colonisation was the vehicle for the introduction of Western food. In development thought and practice, improving nutrition is the catalyst for progressing the health and empowerment of women, and poverty reduction. This research explored nutrition by applying an Indigenous knowledge approach and by focusing on women and community empowerment. There is a common understanding among women in rural villages that garden food is nutritious compared to store bought food. The local PNG understanding of food and nutrition, and the role of women in rural communities, necessitates an inclusive approach with strategies to leverage change holistically and that sheds light on mechanisms to improve the livelihood of rural women.

This research utilised an overarching qualitative methodology combining Indigenous knowledge with the new framework of *doi avatuani*. The local conversational method of *tamei guluagulua* was applied to understand the experiences of young rural single mothers who struggle to provide nutritious meals. In implementing participatory observation, interviews and *guluagulua* sessions, this research uncovered a lack of nutrition awareness in rural villages and the lack of a coordinated nutrition system in PNG. Taken together, Indigenous knowledge, skills and values, cultural practices, and religious activities in rural communities of Central PNG all create a cohesive system of support for young single women making food gardens and gathering food.

Women contribute to food production, providing food for cultural activities and in providing nutritious meals for their families. Results have shown that social and cultural factors and expectations of women can inhibit their full capacity within the community. Development programs targeted at young rural single women have not necessarily reached all. The cultural systems of support and values, and specifically the basket-to-basket and *varevare* (sharing), *ve tarikaka* (relationship with immediate relatives), *ve galagala* (relationship with distant relatives) and *veduru* (support) practices were evident as empowering women in the rural communities. From these collaborative practices in rural communities, women are supported to achieve some of their goals. Their direct involvement in cultural activities and contribution to community activities reveal their plea to be independent and self-sustaining and to have enhanced knowledge and skills to improve their livelihood.

The study showed that rural women are resilient, for example, when addressing climate conditions that affect their food gardens. Some women find ways through these disadvantages by strengthening their cultural values. It is recommended to understand and captivate Indigenous knowledge and enhanced

skills as these equip women to prepare nutritious meals in the community. A culturally appropriate framework, *vanua vekokolena*, and a collective approach is proposed to guide government policymakers, community leaders, church leaders, development agencies and donors to create comprehensive inclusive, context-specific programs that will improve nutrition locally and globally.

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Glossary of Non- English Terms

This glossary is arranged according to the English alphabet and includes Rigo and Abau as well as other Indigenous language terms used throughout the thesis. Brief translations are given in this space, but it should be noted that fuller and multiple meanings can be attributed to words depending on the context.

Avatuani	Verb used in the Ikolu language that means 'I am weaving it'
Bilums	Stringed bags weaved using either nylon or natural fibres. These bags are used to carry goods.
Doi	Food baskets woven by women for women. The basket is used to pack food, water and tools to carry to the gardens or can be used to pack food to give as a gift for feasts.
Doi avatuani	I am weaving the food basket.
Galeka	Local name for a yam species that often grows wild in the bush. This yam is harvested during drought seasons.
Ganigani	Food or anything that is edible.
Golou	Old garden from which people can still harvest their food while the new garden is still growing.
Kavela	Mangrove seeds which are a source of food for the people in the Aroma coast.
Kiroma	Name given to a yam species which grows wild in the bushes and is harvested during drought season or when the prized yams are still in the ground.
Kurumoni	Canna tropicanna plant, the roots of which are edible in Ginigolo and Gavuone villages.
Tamei guluagulua	Verb that invites a person to converse. The term literally means 'let us talk'.
Tauvau karo	Literally refers to white man language and means English language (Keakalo language).
Vabuli	Generic name for the staple food, yam. There are specific names for different species of yams.
Vanua	Village located in the rural areas. The village is occupied by people who are related by blood and share distinct features and common cultural values, and speak the same language and dialect.
Vanua vekokolena	The actions for community empowerment.
Varevare	Verb used in the Ikolu language that means the act of sharing.

Ve duru	Verb that means to assist or support a person or groups or community.
Ve gabi dadamagi	Trust
Ve galagala	Maintaining relationships with extended members of the families and those by blood or not.
Veginitago	A cultural feast where the groom and his family pay brideprice to the bride's family. It is an act of unity and appreciation between the two families.
Ve gubakau	Respect.
Ve gulamagi	Love.
Ve kamolagi geni	Obedience.
Ve kokolena	Verb that describes the act of empowering an individual or a community or strengthening something.
Velekwa	Cultural feasts.
Ve tarikaka	Maintaining relationship with the younger and older siblings and cousins.
Ve vagakava	The act of supporting.

List of Acronyms and Glossary

ADB	Australian Development Bank
ARB	Autonomous Region of Bougainville
BAPNG	Business Advantage Papua New Guinea
CIA	Central Intelligence Agency
DoE	Department of Education
DoH	Department of Health
EHP	Eastern Highlands Province
ESCR	Economics Social and Cultural Rights
FAO	Food and Agriculture Organisation
GoPNG	Government of Papua New Guinea
HE	Home Economics
HRC	Human Rights Commission
IGOs	Inter-Governmental Organisations
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IHRN	International Human Rights Network
LLG	Local Level Government
LMS	London Missionary Society
MFAT	Ministry of Foreign Affairs and Trade
NCD	National Capital District
NCDC	National Capital District Commission
NCDs	Non communicable diseases
NGO	Non-Governmental Organisation
NSO	National Statistics Office
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the High Commission for Human Rights

PCADMIN PNG	Post Courier Administration, Papua New Guinea
PNG	Papua New Guinea
PNGean	Papua New Guinean
PNG-LNG	Papua New Guinea Liquified Natural Gas
POM	Port Moresby
RBA	Rights-Based Approach
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SIL	Summer Institute of Linguistic
SPC	South Pacific Commission
UN	United Nations
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNFPA	United Nations Population Fund
UNICEF	United National Children's Fund

Chapter 1 Introduction: Collecting the Pieces



Figure 1.1: A young woman collecting the basket materials
Source: Daniel Vagi (2023)

> "Vanua vekokolena kavanai be vanua tauia ge gaukala vegogoni geve duruni. Goi bo ve galagala namoni genai, taulimalima bege veduruni. Goi irumu bo waiani genai taulimalima asi bege lakakaini."
>
> Community empowerment is about people working together and supporting each other. But people will support you if you maintain a good relationship. If you pull your nose, people will not come near you. (Eve[1], 2023 interview).

[1] All participant names are pseudonyms in this thesis.

Vanua ve kokolena literally means to strengthen the village. Improved nutrition through *ve duru and ve galagala*, are statements often used by people in the village. The term *ve duru* refers to giving/offering support, *ve galagala* means maintaining relationships. These words surfaced during my fieldwork and are captured in the quote by Eve, which means when we maintain our relationship with our relatives we will receive support from them, and this strengthens who we are in our communities. This quote encapsulates our Indigenous values of community empowerment to improve nutrition in our village communities. Members of the rural villages work collaboratively to organise cultural events and festivities. Nutrition can be improved when community members work together.

In Papua New Guinea (PNG), nutrition is a significant component of strength, health and development. Improved and better nutrition is relative to an individual gaining strength and avoiding diseases or sicknesses. Nutrition-related diseases in PNG have not decreased since the first nutrition research was done in PNG. The initial attempt to investigate nutrition was in 1947 by Hipsley (1950, p. 133) and since then there has not been progress in reaching targets (2022 Global Nutrition Report, 2022; World Bank, 2015). The majority of Papua New Guineans live in rural villages and are reliant on subsistence agriculture (Davies et al., 2024; Landi et al., 2017; Manning et al., 2012; Pamphilon & Mikhailovich, 2019; Pamphilon et al., 2014). The productivity of subsistence gardens is interrelated to overall consumption and nutritional outcomes. However, reports indicate that PNG has the fourth highest child malnutrition (of children under 5 years) prevalence in the world (Hou, 2015; Hurney, 2017), and this is common in rural areas (Stephenson & Lowagipo, 2021). In spite of this situation, other nutritional diseases, such as obesity, are increasing in urban areas in PNG (Pus et al., 2016) and in other Pacific countries (Bell et al., 2017; McGuire, 2009). The pervasive influence of Western consumerism, eating habits and diets has contributed to the change in Indigenous knowledge on food and nutrition (Guell et al., 2021; Pus et al., 2016). According to Pus et al. (2016, p. 1616), unhealthy diets, cultural values systems, low education and social systems contribute to malnutrition in PNG. The need for new aspirations and patterns of eating behaviour is emerging among people living in rural villages and urban areas in PNG. The centerpiece for this thesis is the Indigenous understanding of food and nutrition, and how community empowerment can improve nutrition in rural villages. According to Eve (2023), *ve galagala or* maintaining good relationships is a significant cultural value within the community, as it strengthens the community. When members of the community draw on *ve galagala*, they are able to access *ve duru*, support for cultural festivities, which gives them that strength to pull the activities together.

1.1 Positionality

This research topic was inspired by my personal observation in my role as a Lecturer in Food and Nutrition, Family and Community studies, and as a Home Economics and Food Technology teacher educator at the University of Goroka, also as a secondary school teacher in various institutions in PNG. I have lived in different provinces in PNG (Goroka, Mt Hagen, Rabaul, Morobe, Milne Bay, and Kimbe) and have also lived abroad. My observations during frequent visits to rural villages in PNG have captured the unique cultural festivities, such as kavela garona[2] and feasts, where community members collaborate in, to addressing issues or contributing to cultural festivities, the varying skills and knowledge in preparing, planting and distributing food, the impacts of weather conditions on the food systems, and peoples' laborious efforts harvesting food sources from their surrounding environments. Food in rural villages can be harvested in abundance during different seasons; and yet, I observed that young children are fed noodles, savoury biscuits, and other introduced foods and that infants are bottle fed. This observation led me to ask: Our people own land, and education institutions teach good concepts to prepare good meals for their families, so why do young mothers in rural Central Province feed their children with introduced food of low nutritional value? Hence, my sighting of malnutrition cases in rural villages is a driving force behind this research. The information on rural communities working together to improve nutrition was explored through collecting together my observations, gathering stories of women, and connecting to the cultural understandings of food and the malnutrition data in PNG.

As an Indigenous Papua New Guinean woman, my selection of participating communities was significant. My positionality and relationships with the participants are essential to this research, as they are embedded in indigeneity, they are the compass for this research. Fasavalu and Reynolds (2019) discuss positionality in reference to the context of inter-cultural research spaces. Positionality is relational, multileveled, reciprocal and changes overtime. I have adopted an emic perspective that centres on an insider Indigenous view (St. Hilaire, 2023).

I was born and raised by my parents in the capital city, Port Moresby, PNG. Being native to PNG, I have a deep knowledge of the environment and social and cultural ways of life in the locations of the case study. Having lived and travelled in and out of Gavuone, my husband's village, for more than two decades, I can speak and understand the metaphorical idioms of the local languages. I have also lived in the highland's regions, specifically Mt Hagen and Goroka, and in urban surroundings for more than two decades. This

[2] Kavela garona literally refers to Mangrove seed day. It symbolises a season particularly in February, where people from the Kelerakwa and Gavuone, gather their harvest to sell in the community market. After selling their vegetables and fish, 10% of the earnings is contributed to the Church for thanksgiving or boubou.

knowledge and my relationships allow me to approach these communities with an insider perspective. Incorporating an outsider's perspective is equally important. A diverse viewpoint allows for a broader understanding of challenges and biases and strengthens my positionality.

1.1.1 Who am I? My roots as an Indigenous Papua New Guinean

As much as I would like to dismiss talking about myself, I am obliged to narrate who I am as an Indigenous person, to narrate Indigenous knowledge as part of framing this study. This also enables me to acknowledge my *vanua,* village and my husband's *vanua.*

My name is Limugodu. My father decided to shorten my name when I went to school, to make it easier for the teachers to pronounce and write in the school attendance book. The teachers said it was a long name. I am called by my long name when I am in my parents' village. I was named after my father's sister, Limugodu, and she was also named after her ancestors. This name is unique in our village and in my father's clan. It is a name given to a female child, so when a woman with this name marries and goes to her husband's place, the name links her to where she came from.

My parents come from Ginigolo village in Central province, PNG. My father, Mouaraga Mouraga, is from a mixed parentage. My father was the son of Mouaraga from Dulamagodu tribe in Ginigolo. His paternal grandmother was Magogo Varoi, the daughter of Varoi Gabi[3], from the Gunina tribe in Gabagaba, a Motuan village. And his maternal grandmother, Baguitanu is from Taloa clan in Tauruba village. His maternal grandfather, Gulagagani was from Rigorabana one clan. My grandmother, Valigabi was not born yet when her father, Gulagagani passed away. Baguitanu married Dogemelo from Rigorabana two clan. My father's mother, Valigabi[4], is a woman from the Taloa clan in Tauruba village. My father's parents passed away when he was still a child. He was taken care of by his father's brother and his older siblings. Growing up, dad was a brilliant young man, and it soon was recognised by his missionary teachers that he could go further in educating many young Papua New Guineans. Dad was one of the first young men to have gone out of his village to be educated at Sogeri Education Centre now called Sogeri School of Excellence. He pursued his career in teaching. He chose teaching as a career at that time because teachers were paid higher salaries.

[3] Varoi Gabi was from Gabagaba and is not related to Valigabi. Valigabi was from Tauruba village.
[4] Valigabi my paternal grandmother was from Tauruba village.

My mother is the daughter of late Gogonitau Dalagwagabi, a man from the Magula clan. And his wife, Kenigogo Geigabi was from the Ikolu tribe. My maternal grandmother, Kenigogo was from Gwaibo village, who migrated with her family to Ginigolo village. My maternal great grandmother was Toinakila who migrated from Gwaibo village (also in the Central Province) after marrying her husband, Geigabi from Ginigolo. My mother's paternal grandfather is Dalagwagabi from the Magula tribe, and his wife was Gaogabi who was from the Gamogamaino clan in Ginigolo.

Soon after my parents were married, my father returned to work in Madang province and my mother followed him. My father was a teacher, Principal and School Inspector, and was posted to various schools in Gulf Province. He later moved to Port Moresby city where he was given a prominent role in the Department of Education. Growing up in the city, I went to schools near our home. We lived in a neighbourhood surrounded by expatriates, which gave me an awareness of and interest in cultural differences. I learnt that they spoke a different language and ate different food. I soon became friends with their children and found out that they had to fly on a plane to get to their village.

Acknowledging my husband, John Anthony Vagi, also recognises who I am married to. When a woman is married to a man, she becomes a part of her husband's family, tribe and village. She is identified as a woman by her husband's village or clan. This identifies me as married to his village adopting his cultural perspectives and relationship to his land and village. This relationship also connects who I am as a person and connects my children. His mother, Geno Kapi is from the tribe of Kwaluvouvou in Maopa village (also in Central Province). His maternal grandfather was Kapi Ava from the Kwaluvouvou clan, in Maopa. His father, late Vagi Vagi Kalau was from Keruerupu tribe from Gavuone village. John's grandfather, Vagi Kalau was the second child of the Keruerupu clan chief of Gavuone. This locates my husband who was seen as the chief of the clan who had wisdom and knowledge of the structures of the clan and his land.

Between the two of us are our four children, Daryl Wari John-Vagi, Daniel Kapi John-Vagi, Jonnelle Varage John-Vagi, and Davis Anthony John-Vagi. Daryl and Daniel are twins and are named after John's paternal grandfather (Wariuvau from Gavuone) and maternal grandfather (Kapiava from Maopa). He named his twin sons after his grandfathers, so that they could be linked to their tribe and clans in Maopa and Gavuone villages. Davis's middle name, Anthony, is named after his father, John Anthony, who was named by an Australian man whom John's father (Vagi Kalau) was working for. My daughter's middle name, Varage, is from my mother, being the only daughter of my mother, it was important to maintain my link to my village and tribe. Having narrated who I am as an Indigenous woman, I will now talk about the meaning behind *doi avantuani* 'weaving the basket' and the metaphor imprinted in the introduction of this thesis.

1.1.2 Weaving my basket as an Indigenous woman

Weaving a food basket is a task commonly done by women as her tool and carrier for her to gather her food, water and gardening equipment. As an Indigenous woman, I relate the art of weaving the basket to the processes and framework of this thesis. In this section, I briefly talk about the role of women and connect it to the processes of weaving the basket.

Collecting the pieces from a coconut tree is the first stage of the process of weaving the food basket. In Figure 1.1 a young women collecting her materials for the basket. The art of weaving a food basket is a process that begins by planning how to make the food basket and by identifying where to collect coconut fronds that can be durable. The initial stages of planning and collecting the materials for the food baskets is parallel to my journey in writing this PhD thesis. The initial stages of weaving the thesis together are identifying a problem and planning how to collect information, also include to think about how to present the information and identifying an appropriate style in discussing the research. These are representative of collecting the pieces before weaving an actual food basket.

Women are equal players in their rural communities. Women participate in many roles, such as providing food for the family and participating in household chores. As discussed by Eve (2023) women contribute to cultural festivities and ensure families have reliable access to sufficient quantities of affordable nutritious food. Furthermore, a rural woman contributes to economic activities for her family. Therefore, she impacts food systems and food security, and this impact is represented in the roles a woman plays. For example, planting her yam garden and contributing those yams for cultural festivities is significant. A woman's integrity is shown in accessing reliable resources for the family, maintaining relationships and contributing to the community activities is primarily connected to her society (Carlson & Listhaug, 2007). Another role a woman plays in rural villages is weaving durable food baskets. Food baskets have cultural significance and have many purposes including carrying food, water, firewood and tools. It is a resource that can help women achieve their goals. The process and the art of weaving the food basket (thesis) in my PhD thesis is represented in the conceptual framing and different stages in the writing of this thesis.

In this section, I will describe and illustrate the complex processes of weaving a food basket. First, women plan to collect the materials for the basket – coconut fronds, and basket handle - mulberry fibres, from their land, or they seek permission from owners of the coconut trees and mulberry trees. Permission is sought so that women avoid breaching boundaries or causing trouble. Once the materials are collected, the coconut fronds are taken to a central place and dried in the sun, where the women congregate and share their stories or teach the processes of weaving with other women. The mulberry tree bark is soaked in the river for a couple of day for the fibre to be easily removed. The second stage includes women splitting the coconut frond in half and the excessive thickness of the midrib is removed and refined.

This split is illustrated in Figure 1.2. The coconut frond is split in half in the midrib to produce a left and right side. The left side and the right side indicate how the leaves are lying on the fronds. This process is assimilated to chapter one where the foundation is laid out for the thesis. The third stage is when a woman decides on the length of her food basket, and depending on the size of the food basket, the left and right sides are cut in half having equal length and leaf. Now there are four pieces in making the basket. In relation to my thesis, there are nine chapters, the processes in gathering and weaving together the fronds are applied to writing the thesis. The first stage is laying down the foundation as in this introductory Chapter 1.

The four pieces of the coconut frond represents: i) the conceptualisation of Indigenous knowledge, ii) community empowerment, iii) research methodology and iv) the role of women. In the fourth stage, the two pieces of the leaves lying towards the left are plated together to have a stronger rim. The same is done for the right side. The fifth stage is when the two plated sides are put together and are enhanced with a tie on two sides of the rim. Once this is enhanced, the sixth stage is when the women begin to weave the fronds making beautiful patterns and interlocking the fronds. The seventh stage is when the bottom part of the basket is combined and plated together leaving no gaps or loose ends making a complete basket.



Figure 1.1: Varage Mou splitting a coconut frond in the midrib
Source: Daniel Vagi (2023)

Figure 1.2 illustrates how my mother, Varage Mou, is splitting the coconut frond in half. This image symbolises the significance of older women being knowledge keepers who disseminate knowledge to a younger woman. This research has sought to create an insider perspective of how community empowerment could improve nutrition in Central Province, PNG by using a local community context and Indigenous framework as the research approach. The analogy of weaving the food basket is relevant and appropriate for me as an Indigenous Central Province woman. Because the food basket has cultural significance, it is appropriate to explain its practices in the context of research on food and nutrition. The function of the food basket encompasses the community's strength and ability to work collaboratively. In addition, the food basket relates to weaving the conceptualisation of Indigenous knowledge and community empowerment and using cultural research methodologies to extract the experiences of rural women.

This section also lays down the foundation for the research. The act in laying down the foundation in this context, refers to preparing the Research Aims, research questions, and identifying the approach that will be taken. In relation to food basket weaving, this can be assimilated to preparing the coconut frond to have four sections, and ensuring that the fronds are paired appropriately as shown in Figure 1.3 below.



Key: F=Frond, F1= Frond 1, F2 = Frond 2, F3 = Frond 3, F4= Frond 4

Figure 1.3: Four pieces of the coconut frond represents the foundations of the food basket
One coconut frond cut into four pieces. Each of these pieces of fronds represents Chapter 2 to Chapter 4. And are labelled F1, F2, F3, F4.

Source: Daniel Vagi (2023)

1.2 Research aim, questions and approach

This research aims to explore how community empowerment can improve nutrition in Central Province, PNG. The following questions have guided this research:

1. How are notions of 'community empowerment' and 'nutrition' conceptualised from an Indigenous perspective in Central Province, PNG?

2. What cultural knowledge can be applied to empower communities to address healthy nutrition?

3. How can women be empowered to improve nutrition in their communities?

The questions are addressed through an exploratory qualitative approach and utilise the local context of Indigenous approaches. The main method applied was *tamei guluagulua*[5], to extrapolate the experiences of rural single mothers and the local elders of the communities. The conversations gathered through *tamei guluagulua* (let us talk*)* were then thematically analysed.

The research presented in this thesis is ordered thematically. The theoretical frameworks are explained in Chapters 3 and 4. Frameworks explained in these chapters are linked with the existing interrelationship between community empowerment and Indigenous knowledge. These two frameworks provide the formation of this thesis, a guiding structure as well as a foundation. Parallel to the theoretical framing is the 'weaving the food basket process' analogy. These framing Chapters 3 and 4 are related to the third stage of the weaving process. This stage is where the halved fronds are further cut into two, now having four pieces. These two of the four pieces represent Chapter 3 Community Empowerment and Chapter 4 Indigenous Knowledge.

1.3 Justification for this research

Nutrition is not only important in PNG but globally. As mentioned earlier, nutrition has been neglected in PNG (UNICEF, 2018). As a result, malnutrition is prevalent (Aipit et al., 2014; Hurney, 2017; Landi et al., 2017; Stephenson & Lowagipo, 2021; UNICEF, 2014, 2017; Wilson, 2022), placing PNG as the eighth-highest country in the world (CIA, 2023). The adult population is also confronted with malnutrition

[5] *tamei guluagulua* – come let's converse or let us talk

problems: 36% of women of reproductive age suffer from anaemia, while 15.4% of adult men have diabetes compared to 14.3% of women (Hurney, 2017, p. 7; UNICEF, 2014). So, factors contributing to nutrition-related diseases and strategies to combat these diseases among vulnerable groups in PNG are yet to be explored.

Traditional food and embedded cultural knowledge and practices underpin food consumption patterns and food preparations (Alonso, 2015). For example, if a community has more sago, then sago is prepared and consumed in ways the community members are taught. Food underpins health and development throughout the lifespan stages impacting survival, physical and mental development, economic productivity, and overall healthy living (Black et al., 2017; Bump, 2018; Lean et al., 2018; Webb et al., 2018). However, the pervasive influence of Western consumerism, eating habits and diets has undermined Indigenous knowledge of food and nutrition. Given that Indigenous knowledge is rooted in the society's practices, institutions, associations, and rituals, it is inseparable from Indigenous peoples' uniqueness, experiences with the natural environment and territorial and cultural rights (Kipuri, 2009).

Nutrition deficiency is more common in rural villages in PNG (Goris et al., 2018; Siamiak & Emeto, 2017). Moreso, Waken and Paul (2018) highlight that people lack awareness of food with nutritional value, such as local vegetables. Furthermore, Kanua and Bourke (2022, p. 1) claim that assistance for agricultural development and villager's livelihoods in PNG is given to those living in better physical environments and villages that have a greater market access. In addition, food insecurity has increasingly become a threat in Central Province (Allan & Bourke, 2007; Bourke, 2001; Chen et al., 2024; Connell, 2015). This research addresses these issues as it is situated at the intersection of exploring how nutrition could be improved through community empowerment in Central Province, PNG. Citizens have the right to food and nutrition to maintain nutrition for their wellbeing (FAO, 2014). Efforts toward improving nutrition in rural communities strengthens households to improve their health and nutrition situations.

In this study, I will discuss the gaps that need to be bridged to improve nutrition in rural communities through community empowerment in Central province, PNG. In recent years, the Department of Health in PNG disintegrated the nutrition section across all hospitals, including district hospitals (PNG Government, 2015). This means that there is a lack of national and sub-national coordinating bodies and inadequate technical capacity in nutrition throughout health services. In my own observations, I have seen that good nutrition starts with educating and raising awareness in the communities and teaching children in schools the importance of eating good food. However, the Home Economics (HE) subject that is used to teach nutrition and equip young people with skills and knowledge is now streamlined (Vagi & Salley, 2017). The Home Economics (HE) curriculum in secondary schools was compulsory for all female students in the past. The skills and knowledge taught in the Home Economics subjects could be used to equip mothers in rural villages to improve nutrition and the skills could be utilised as an avenue to generate and income (Vagi &

Salley, 2017). If nutrition deficiency is more common in rural villages, there is a need to enhance the avenues for nutrition awareness and the systems for nutrition to be reestablished in PNG. It has been noted that people lack awareness of the nutritional value of traditional vegetables (Goris et al., 2018; Siamiak & Emeto, 2017). Considering the lack of awareness, this research is addressing the issues within communities in Central Province. It is hoped that this study informs efforts and in turn strengthen households and individuals to improve their health and nutrition.

1.4 Research overview and methodological framing

Two rural villages in Central province were selected as case study sites, Gavuone and Ginigolo villages. A qualitative approach merged with methods that are framed by Indigenous knowledge, *doi avatuani*[6]*,* provided the overarching research methodology. Details of the methodology are explained in Chapter 5. Utilising the context specific approach, *tamei guluagulua*[7], local women's experiences in these study sites were extrapolated to clarify their understandings of food and nutrition and the struggles they encounter in accessing resources in rural villages to provide nutritious meals for their families. *Tamei guluagulua* involved 23 participants which comprised of six young single mothers from within the two case study villages – three from each site. Two focus groups, mainly involving five local women leaders, and six key informants from government and non-governmental organisations (NGOs) also participated. This research then thematically analysed the data (Creswell & Creswell, 2018), a technique used to identify emerging themes from the data (Beins, 2018). The data from the research, community empowerment and Indigenous knowledge literature have merged to inform each other and to contribute to the construction of a framework to improve nutrition in rural communities.

Thematic analysis was employed in this study to systematically identify, analyse and interpret patterns of meaning across the dataset. This approach was selected because the primary aim of the research was to explore participants lived experiences and perspectives. Thematic analysis is suitable to this research as it enables the identification of recurring themes that directly address the study's research questions (Braun & Clarke, 2006).

[6] *Doi avatuani,* in Ikolu language in Ginigolo refers to I am weaving the food basket.
[7] *Tamei guluagulua* refers to let us converse or let us talk and can be used formally or informally.

1.5 Study context: Central Province in Papua New Guinea

As noted above, this study was focused on two villages in Central Province. In this section I will first explain the geography and other useful context of PNG, then Central Province, and will then introduce Gavuone village and Ginigolo village.

PNG is an independent nation state situated between the Coral Sea and the South Pacific Ocean, about 200 kilometres north of Australia and shares its western borders with Indonesia's Irian Jaya of Indonesia (see Figure 1.4). Further, it encompasses islands of the Bismarck Archipelago, parts of Solomon Islands and other islands. The country is the second-largest non-continental island in the world and the largest island in the Pacific.



Figure 1.4: Map of PNG and location of Central Province
Source: Derived from (WorldAtlas (n.d)

The above Figure 1.4 is showing a map of Papua New Guinea and indicates the location of Central Province, which is in a peach colour on this map. Port Moresby, the capital of PNG is located in Central Province. The map also shows the locations of the 22 provinces and their boundaries with the other

provinces and countries. PNG is characterised by a diverse geography including dense rainforest, rugged highlands, fertile valleys, and extensive coastlines. PNG has a large resource base, and its economy is heavily reliant on natural resources and the mining sectors. The exposure to natural disasters like high rising waters, volcanic eruptions, earthquakes, and various social issues, can make for a challenging environment. The physical geography and tropical climate provide nourishment, food patterns and way of life of people. The country lies South of the equator. The mainland and the 600 islands have a total land area of 462,840 square kilometres, and a water surface of 9,980 square kilometres. There is a central chain of mountains and valleys that dominate the mainland (CIA, 2023, p. 1).

PNG features four distinct regions: Southern, Momase, Highlands and New Guinea Islands. For administrative purposes, PNG is divided into administrative divisions referred to as provinces. As of 2023, there are 22 provinces plus the Autonomous Region of Bougainville, 96 districts and 333 local level governments. Unfortunately, the expanded levels of government have not generally provided improved services to the villages, despite their efforts in bringing development to the rural villages (ADB, 2012; Bryant. Allen et al., 2005; Duncan & Banga, 2018). It is also important to capture that the 1998 peace settlement in Bougainville after the civil crisis paved an avenue for amendments to the PNG's Constitution. From 2001, Bougainville was no longer considered a province of PNG (McKenna, 2019). Therefore, the Autonomous Region of Bougainville (ARB) is not considered a province of PNG because the citizens of Bougainville voted to become independent from PNG by 2027.

The Papua New Guinea population is growing at the rate of 3.1% (UNFPA, 2014). The last census in 2011 showed 7.8 million people in the country (NSO), to an estimate of over 9.8 million as at 2022 (CIA, 2023), and over 11.78 million in 2024. The World Bank (2024), indicates that the population has increased rapidly in recent years. However, there are serious concerns about the accuracy of the population and other data given the last census in 2011 was considered a failure (Bourke & Allen, 2021; Laveil, 2024). Therefore, it is anticipated that the 2024 PNG National Population Census results confirm the irregularities in the population figures and other data.

PNG is one of the most heterogeneous countries on earth (Reilly, 2004). The country's population is largely comprised of native people who belong to diverse ethnic groups. PNG has immense cultural and natural wealth but faces development challenges. Further, divergence of ethnicity is displayed in 850 indigenous living languages, not dialects (Levil, 2005; Mark Blackwood, 2023) making up 12% of all languages spoken in the world (CIA, 2023). In addition, PNG has more than 10,000 distinct ethnic groups and more than 600 different tribes (Reilly, 2004). Thus, each cultural group has their own unique customs and cultural traditions.

Under the customary principles of landownership, 97% of land in PNG is held by its traditional owners (BAPNG, 2020; Chand, 2017, p. 414). The specific elements and rules of the systems of customary land tenure vary from place to place. For example, in East New Britain and New Ireland Provinces, women play a significant role as the society has a predominantly matrilineal system. This means that land and property rights are controlled by females and their brothers. However, customary land ownership generally recognises the traditional users of land and their personal and clan arrangements for land use. In most areas across PNG, men own the land – this is the patrilineal system of society (Yala, 2019). Most of the country's population live in rural communities and depend on resources accessed from the land and sea, coupled with agricultural systems as a means to their livelihood (Allan & Bourke, 2007; Bourke et al., 2019; Kwapena, 1984).

The following sections will explain the specific study locations. Given the lack of literature available about the study locations, some context discussed in the following sections will draw from my lived experience as an Indigenous woman from Central Province, Ginigolo village, who married into the Gavuone society.

1.5.1 Central Province in Papua New Guinea

Central Province is in the Southern part of PNG and occupies the southern side of the Owen Stanley Ranges, bounded by the Coral Sea. It has a landmass of 299,998 square kilometres (Hanson et al., 2001). The province accounts for 3.7% of PNG's total population of 10,648,357 and national estimates of 2021 show that the province has a population of 362,768; of which 192,088 are men and 170,680 women (National Statistical Office, 2011; World Bank Group, 2021). Fitzpatrick (2011) rgues that these population figures are well out of date, because the census figures are normally unavailable until two to three years after a census has been organised. Furthermore, migration and rapidly escalating birth rates in Central Province make extrapolation from the census figures problematic; there is anecdotal evidence that population increase rates are much higher than recorded (Fitzpatrick, 2011).

There are five districts in Central Province including Abau, Goilala, Kairuku, Hiri and Rigo (see Figure 1.5). Central Province has 13 Local Level Government (LLG) and 205 wards which are split into electorates and census units. Also, in Central Province, there are 33 islands, coral reefs, and several natural harbours. Out of more than 850 languages, 35 are spoken in Central Province (SIL, 2021 para. 1). The bulk of the Central Province population lives in rural villages and maintains a subsistence lifestyle (Rannells, 1995; The World Bank, 2015)

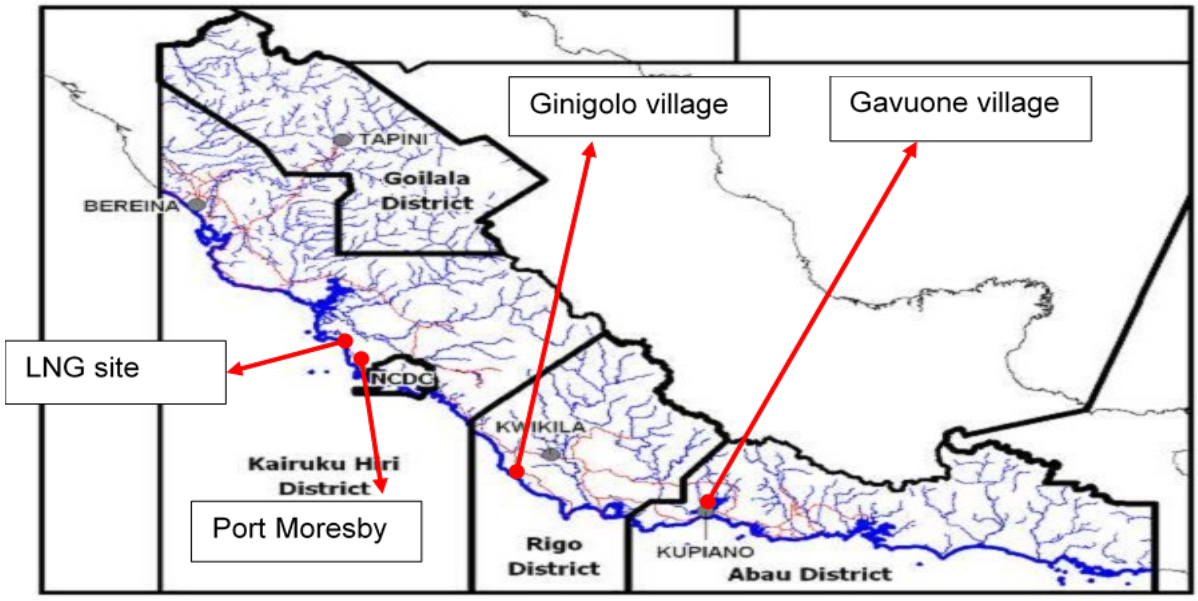


Figure 1.5: Central Province subdivided by district. Location Ginigolo and Gavuone
Source: Derived from Chang et al. (2015, p. 3)

People in the Central Province have had a more significant amount of continuous contact with Europeans than other PNG villagers. Christianity was first introduced to PNG through the Central Province in 1871, when MacFarlane with eight Indigenous pastors and students landed in Hood Point in Central Province (Archives Hub, 1871-1970). In 1872, the first London Missionary Ministers from Polynesia who trained in Rarotonga were brought to Papua. The six pioneers, including Ruatoka, Rau, Adamu, Eneri and Piri with their wives, landed at Manumanu in Central Province. Then in 1874, Reverend William George Lawes, a London Missionary Society (LMS) pioneering missionary, arrived in Papua and visited many villages, and established churches in Central Province (Bala, 2019; PCADMIN PNG, 2024). Also in 1874, Reverend Lawes founded Vatolata Pastoral College in Tagana village, where my extended relatives inhabit. The colonial period unleashed a Westernisation package, including dietary habits, fragmentation of cultural foodways, systematic disempowerment that affects most people, and multiple dimensions of power (cultural, social, economic and political) (Heywood, 1983, 1986; Levett et al., 1983). Because of the proximity to Port Moresby (see Figure 1.6), they have been at the centre of social change, dominating the social and economic life of Central Province.



Figure 1.6: The proximity of Port Moresby from the Central Province and its boundaries.
Source: Extracted from (Chang et al., 2015, p. 11)

People's daily lives are centred around the cultural festivities organised throughout the year. These include church celebrations (Easter, Thanksgiving, Christmas) and customary activities (canoe racing, food festivals and brideprice). The bride price is traditionally the most notable festivity. A brideprice ceremony refers to the exchange of gifts of food (cooked and raw), traditional ornaments, and traditional forms of money amongst the two families, clans, and tribes to show acceptance and unity between a bride and groom (Dulama, 2013). However, Western influences have transformed this traditional custom in paying a brideprice where significant monetary values in cash and processed food products such as rice, flour and sugar are given to the bride's family. There are some disadvantages that relate to paying a brideprice. For example, when the groom and the family pay a brideprice, it becomes an economic burden to the groom's family and because of having paid a price, after marriage the woman is sometimes disempowered from decision making and is prone to violence. A woman is culturally expected to work harder to provide for her family by working with the groom's family on the fertile land.

Central Province is a resource rich area. However, the development process is infringing upon the traditional lifestyle of rural communities. This province has some of the largest rubber plantations and rainforests. The logs from the rainforest are harvested from the hinterlands and transported directly to overseas markets (Orere, 2020). Similar occurrences of economic development have disoriented the cultural and daily lives of the rural villages. For example, in West Hiri, the PNG-Liquified Natural Gas (LNG) project (Figure 1.5), an integrated development that commercialises PNG's gas resources (LNG PNG, 2022), has caused environmental pollution, deforestation, water pollution and disturbances to social wellbeing. Such activities exemplify modernisation, acculturation and continuous exploitation and

infiltration of outside influences in the traditional rural settings (Pollock, 2009). For example, Gavuone had a lush forest, where people would go hunting and gather food but the trees in the forest are being harvested for timber. The nearby rivers are polluted from the timber residues and chemicals used to treat the timbers have destroyed the food sources gathered from the river. These factors contribute to meaningful reasons for establishing a study on nutrition, because they provide insight of the transitions that transform people's lives and the role of economic development within the province.

The rapid pace of modernisation and exposure of traditional communities to cash income impact on people's health. Consequently, some nutrition-related diseases – overweight and obesity – are prevalent in Central Province (Patel et al., 1986; Pus et al., 2016). Furthermore, climatic conditions contribute to household food shortages (Pham et al., 2021; Rarau et al., 2017; Vengiau, 2020). Hence, the high occurrences of nutrition-related diseases warrant this research to be established in Central Province towards empowering the communities to employ their local, Indigenous knowledge to improve their diet and health.

Central Province has a primarily dry climate. Cash crops depend on seasonal changes (Bryant. Allen et al., 2005), and between May and November, no rainfall typically occurs. Consequently, drought causes a persistent shortage of quality food, disruption of food supply, minimising quantity and quality and there are risks to food security domestically (Rannells, 1995). According to Pham et al. (2021), Central Province has the highest food shortage, which contributes to wasting and stunting. Moreover, the introduction of cash crops continues to influence the wealth of rural households as it is associated with the consumption of good quality foods that can assist in alleviating nutrition deficiencies in the households (Mikhailovich et al., 2016).

1.5.2 Gavuone Village, Abau District, Central Province

Gavuone is a rural village located in the Abau District and is situated in the Southeast of Central Province (see Figure 1.7). It is situated near Kelerakwa and the town, Kupiano. The Abau district covers the coastal areas west of Milne Bay and the mountains and valleys of the Owen Stanley Range. Abau district alone occupies 7,124 square kilometres with a population of 55,569 people (National Statistical Office, 2011, p. 18). According to the last National Census, however, the population estimates for 2021 is 57,542 people (National Statistical Office, 2021, p. 5)



Figure 1.7: Abau District map. Locating Gavuone village
Source: Derived from the PNG National Population and Housing Census (NSO, 2013)

This District has three Local Level Governments (LLG) and forty wards. Gavuone is one of the major villages in the district. It is located 10º5'23" South, and 148º10'34" and 18 meters above sea level (Fallingrain, 2024). Although the 2011 National Statistical Office indicates that Gavuone village has a population of 3,668 this figure has doubled to more than 5000 people in the village (EMTV, 2020). The village is comprised of twelve clans and 26 sub-clans. The clans are comprised of family members related by blood and are usually from those who come from the same lineage or the great grandfather.

In Gavuone village are two mainstream churches: The United Church and Seventh-Day Adventist (SDA) church. The village has seven United Church chapels that cater for the different clans and a main church that caters for the United Church congregation. Recently, the Church of Nazarene was introduced in Gavuone village and has established its calling to embrace the disenfranchised including the single mothers. According to the Gavuone village Pastor, the disenfranchised people are often neglected by the community, therefore a new church was established to cater for the needy (Church of the Nazarene, 2022).

The village is distinctly demarcated by these mainstream churches. The members of the SDA church live on one side of the village according to their land, while the people who attend the United Church live on the other side of the village, but according to their land ancestry. There are also two primary schools that the children attend depending on what religion their parents belong to. Most of the children from the Abau district who pass the examinations are selected to attend Kupiano Secondary School near to the village or

are sent to other secondary schools like Kwikila Secondary School, or Iarowari Secondary School in Central Province.

1.5.3 Ginigolo village, Rigo District, Central Province

Ginigolo is also a rural village situated in the Rigo District which lies in the southeast of Central Province (see Figure 1.8). The Rigo District has three LLGs, 67 wards, and a total population of 56,509 people: with 29,539 men and 26,070 women (National Statistical Office, 2011, p. 18). This district occupies a total area of 5,072 square kilometers (Fallingrain, 2024). The Rigo district is known for its rich cultural heritage and diverse natural landscapes. The village is part of the wider Rigo Coastal areas and is characterised by its proximity to the coast and its lush tropical surroundings. The 2011 National Statistics Office indicates that Ginigolo village has a population size of 859: with 436 men and 423 women (National Statistical Office, 2011, p. 18). However, the population for this village has grown since the last census. The population count for the village before the election in year 2022 was estimated to be 1500 people (National Statistical Office, 2021). Ginigolo village is geographically located 9° 49' 53" South, and 147° 33' 12" East; it is 137 meters above sea level (Fallingrain, 2024). Figure 1.8 outlines Ginigolo village.



Figure 1.8: Map of Rigo District. Locating Ginigolo village
Source: Derived from the PNG National Population and Housing Census (NSO, 2013)

From Ginigolo village, it is approximately a one-hour drive into Port Moresby, the nearest city. Ginigolo village is on a high altitude making it difficult for the families to reach their gardens. Therefore, some families have migrated to the lowlands closer to their land, gardens and the water source. Most of the people live in the village and commute to Port Moresby to work every day because of its close proximity.

Traditional staple foods are used in local ceremonies and are still highly regarded not only for sustenance but as a basis for meaningful exchanges of culture. Staple foods are used in traditional ceremonies and shared between tribes or family groups (Bre, 2006; Gwatirisa et al., 2017; Malolo et al., 1999). Provision and exchange of staples, such as yams, taro, banana together with pigs, chicken, cows, and wallabies/kangaroos in ceremonies is a token of respect, acceptance and goodwill.

Yam is a significant symbol for religious and cultural events (Coupaye, 2009; Risimeri, 2001). Yam is an important staple food crop, yet consumers in urban areas eat little yam in their diet (Risimeri, 2001). In rural areas, people rely heavily on staple crops of sweet potato, yams, taro, sago and banana. However, imported food, such as rice, meat and wheat-based food also supplement the meals. Similar to villages in some areas of PNG, people are vulnerable to malnutrition because their diets are rich in carbohydrate but lack protein food sources and vitamins (Mueller et al., 2001). Although protein such as pigs are raised by the families in rural villages, traditional practices prevent families from consuming as they are kept for ceremonial and cultural purposes. In some instances, fish from the creek or from the sea (mostly those from the coastal areas) are added to the diet; when convenient, tinned protein such as fish and meat are purchased.

Members of the village belong to a tribe, a clan, and they claim land (Hardin & Kwauk, 2019). The village society is patrilineal, where men claim land as passed on through their lineages. Gardening has always been part of the daily activities in the rural villages. The skills and knowledge for gardening have been passed down from generation to generation (Johnson, 2017). There are gendered roles in the villages, it is the men's responsibilities to clear the new gardens, plant banana suckers, and wrap the bananas when they are ready. While the women, plant yams and other food and make sure that the yam garden is maintained and weed are cleared. Gathering, producing, and giving food is a way of life in the village.

Sharing and distributing food from people's harvest of abundance is a way of representing generosity and sustenance for family and village (Handy & Handy, 1972; Hardin et al., 2018; Kittler et al., 2017). Kittler et al. (2017) state that giving food is a way of expressing prosperity or social standing. Similarly, in Fiji, for instance, the status of an individual is raised when an abundance and quality food is provided (Jansen et al., 1990; Parkinson, 1990). Furthermore, food is the way of expressing respect and love to the person to whom the food is gifted (Handy & Handy, 1972; Kinloch, 1985). The trait of giving food exposes the love and belongingness for people in the community. In yet another example, food is part of the cultural value when a gift in the form of a food basket or dish of food is given to a person, it is an act of acknowledging

a person's support. In an event such as a cultural feast, support in the form of a food basket means that it will be reciprocated in the future. However, rejecting food that is offered is considered as rude, insulting, and a refusal of the respect and love offered. Ceremonies and events are celebrated with feasting. Food is eaten in excess as part of the ceremony. Gifts of food are given and shared or exchanged during these ceremonies. Although gifts are given without anticipation of reciprocity, consequences may arise if gifts are rejected.

It is in the context of these two village sites, that this thesis explores community empowerment to improve nutrition. The final section of this chapter explains the thesis structure.

1.6 Thesis structure

This thesis is comprised of nine chapters. The following shows the outline of each chapter and Table 1.1 (further down) illustrates the *doi avatuani* framing symbolism as applied to each chaper.

Chapter 1: Introduction Collecting the pieces has introduced this thesis and has presented the research aim and questions, and the justification for this study. It has also presented the context for the study area and a thesis overview. The first stage of the thesis is an important part that required planning focus, framing and methods of the research and developing research aim and questions.

This process is symbolised by the first stage of weaving a food basket, which begins with planning, collecting resources for the food basket and the basket handle, and preparing the resources.

Chapter 2 – Conceptualising Indigenous knowledge and its relationship to food and nutrition: This chapter is the first of three literature review chapters (Chapters 2, 3 and 4). Chapter 2 situates this research within the Indigenous understandings of food and nutrition among women in rural villages. This chapter outlines the different understandings of Indigenous knowledge, in the context of the provision of nutritious meals for the family. Chapter 2 also explains the historical perspectives and the influence of colonialism on the rural communities and their food sources. The chapter addresses the local women's understandings of food and the food systems.

Continuing the *doi avatuani* (weaving a basket) symbolism, this Chapter 2 builds one part of the foundation, or framing of the research. Therefore, at the onset of laying out the the basket foundation, the first frond represents Chapter 2. The leaves of this Frond 1 depict cultural identity, spiritual beliefs, cultural knowledge, understanding climate patterns, understanding cultural food systems.

Chapter 3 – Conceptualising community empowerment towards improving food and nutrition. This chapter focuses on a community empowerment approach, centering on young, rural, single mothers. This chapter explains the significance of community empowerment in the context of young women's need and role in providing nutritious food. It situates empowerment as the instrumental value for rural communities to achieve improved nutritional outcomes. The access to understanding good nutrition in communities will be discussed in relation to Indigenous people's understanding of food systems.

As Chapter 3 is a second framing chapter, the *doi avatuani* symbolism has assigned a second frond (Frond 2) to represent Chapter 3 and the framework of community empowerment.

Chapter 4 – Food and nutrition, and cultural food practice in PNG, will explain the role of women and their influence on the food systems and how they contribute to community empowerment in the rural villages. The chapter also discusses the climate hazards and their impact on access to nutritious food.

Two fronds are assigned to Chapter 4, one that depicts the chapter itself (Frond 3). Here, each leaf in the frond speaks about the different aspects of the chapter. The other frond (Frond 4) symbolises the discussion on the role of women in Central Province.

Chapter 5 – Research methodology: Weaving the research baskets – *doi avatuani.* This chapter details the methodological approach that was utilised and introduces the *doi avatuani* use as my methodological framing of this research. *Doi avatuani* refers to 'I am weaving the food basket' and is representative of the methodology that is grounded in the overarching Indigenous framework of *doi avatuani.* This chapter also describes the Indigenous method of drawing the experiences from rural mothers, by applying the method of *tamei guluagulua*, formal and informal conversations in this research. And as Gegeo (1998), Sillitoe (2006) and Thaman (2006) state: people from the rural villages respond in their own unique ways of doing things. Using the *doi avatuani* framing both as symbolism of the research process and as methodological framework, was an effective way of capturing the voices of participants. Chapter 5 also describes the details surrounding the occurrences in preparing entrance to the field, while in the field and the cultural influences in the process of collecting data.

The actual 'weaving' process (activities of the research) begins in Chapter 5. Two of the fronds are woven together separately to enhance the rim of the basket.

Chapter 6 – Cultural perspectives of nutrition in village communities is the first of the three findings chapters. Drawing from data, this and the succeeding chapters show the analysis of the skills and knowledge in Central Province, which is based on local worldviews among women and community leaders in our discussion how to improve nutrition in the villages. This Chapter 6 elaborates on local core values of

maintaining relationships: *ve tarikaka*[8], (relationships with immediate family members) and *ve galagala*[9] (maintaining relationships with distant relatives), and *ve vagakava*[10] (act of supporting individuals or groups in activities).

Once the separate (two fronds each) are woven together, the two separately woven sections, each containing of two fronds, are interwoven and secured together by tying the sides. This process joins the two rims, formed from the four fronds, creating a stronger and more durable basket structure. This enhancement of the rim plays a vital role in enhancing the basket's strength, providing greater structural stability and durability (see Table 1.1 below). This also symbolises cultural values and knowledge as important features of their cultureal identity and contribution to family and community livelihood.

Chapter 7 – Food availability and food production practices is the theme of the second findings chapter, which describes the experiences of women in accessing food and their role in food production in their rural villages.

At this stage as seen in Table 1.1, I compare Chapter 7 to the weaving of the sides of the basket. Women fill their baskets, and what goes into a basket is dependent on the availability of food, the environment where food is produced, and how women are using their knowledge and skills to harvest the food.

Chapter 8- Empowering women in community nutrition is the third findings chapter and the experiences of women and the issues affecting their livelihood in the villages. A disconnection is observed between the government systems, the rural village systems, and the women addressing nutrition related issues. The concept of 'basket-to-basket' or reciprocity are main tools used to supporting each other. In the Central Province villages, there are varying skills that may be used to community empowerment and extending support towards nutrition in communities.

In relation to the *doi avantui* weaving process, the bottom of the basket is located in Chapter 8. The bottom is an essential 'holding' part of the basket. The process of women's empowerment in Chapter 8 is compared with pulling together the leaves to weave the bottom of the basket, and the basket is enclosed at this stage. When these bottom strands are well pulled together, a basket is strong. Similarly, the women are empowered when there is support within the community; then they can actively provide good nutrition to the families.

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[8] *Ve tarikaka* refers to maintaining relationships with the immediate members of the family.

[9] *Ve galagala* refers to maintaining relationships with extended and distant relatives.

[10] *Ve vagakava* refers to extending support

Chapter 9 – Discussion and Conclusion is the final chapter. This chapter draws from the literature presented in Chapters 2, 3 and 4, and discusses the implications of the findings that were presented in Chapters 6, 7 and 8. The basket-to-basket practice in Central province is emphasised as it exposes the notion of community empowerment with the underlying cultural values and skills as appropriate to improving nutrition. This chapter also has recommendations for more inclusive programs and transparent processes in community approaches.

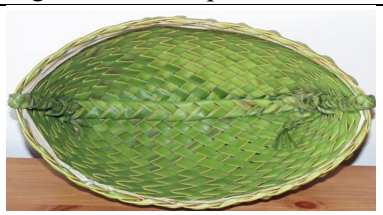
In this final Chapter, the food basket is completed. A basket is not functional without handle. The handle is woven as a separate item, and then it is attached to the basket. If the handle is long in length and strong, it can withstand pressure, and women are able to add additional layers of food and other items in the basket. This chapter will also discuss the *doi avatuani* methodological framing, an Indigeous framework that conceptualises cultural relationships and interconnection and collectively contructed. By grounding the analysis in local cultural understandings and the *doi avatuani,* basket weaving metaphor, the study provides a culturally authentic approach to knowledge and interpretation, contributing a distinct Papua New Guinean perspective to Indigenous research methodology.

The following Table 1.1 presents a summary of the thesis outline that is associated with the process of weaving the food basket and the images used throughout the different chapters, as shown in the table.

Table 1.1 Chapter outline and associated images of the process in weaving the food basket, *doi avatuani*.

Chapter	Associated image for each Chapter (or Section)
Chapter 1: Collecting the pieces together: Improving nutrition in rural villages	 Figure 1.1: Collecting materials
Section 1.2: Research aim, questions and approaches	 Key: F=Frond, F1= Frond 1, F2 = Frond 2, F3 = Frond 3, F4= Frond 4 Figure 1.3: Four pieces of the coconut frond represents the foundations of the food baskets.

Chapter 2: Conceptualising Indigenous knowledge and its relationship to food and nutrition	 Figure 2.1: F1 – Frond 1 represents Chapter 2.
Chapter 3: Conceptualising community empowerment towards improving food and nutrition.	 Figure 3.1: Frond 2 of the coconut leaf assimilates community empowerment.
Chapter 4: Cultural food practices in Papua New Guinea	 Figure 4.1: Frond 3 represents Cultural Food practices in Papua New Guinea
Section 4.4.1: Role of rural Indigenous women participating in nutrition projects	 Figure 4.4: Frond 4 is related to role of Indigenous women in villages
Chapter 5: Research Methodology: Weaving the basket – *doi avatuani*	 Figure 5.1: The process of weaving and enhancing the rims.
Chapter 6: Cultural perspectives of nutrition in village communities	 Figure 6.1: Joining the ends of the separate rims. Then tying together, the two rims to enhance the rims.

Chapter 7: Food availability and production practices	 Figure 7. 1: Completed woven sides of the basket
Chapter 8: Nested cultural values in rural communities	 Figure 8.1: Inside view of the basket, leaves from the side of the basket are pulled together and plaited to enhance the base of the basket
Chapter 9: Discussion and conclusion	  Figure 9.1: Left: woven basket handle. Right: young girl carrying the basket on the head.

Chapter 2: Conceptualising Indigenous knowledge and its relationship to food and nutrition



Figure 2.1: Frond 1 (F1) represents Chapter 2
Source: Daniel Vagi (2023)

2.1 Introduction

Indigenous systems of knowledge have existed over many generations and are constructed from many learned experiences. The concept of Indigenous knowledge and cultural connections to food and nutrition are explored in this chapter. The concepts presented in this chapter form a segment of the theoretical lens from the viewpoint of an Indigenous understanding - the cultural norms, traditions, beliefs, and practices that influence the wellbeing of people in rural villages. There is much to be achieved from engaging Indigenous knowledge when looking at community empowerment in the context of nutrition in rural villages, because Indigenous knowledge can contribute to development through community engagement (Gorjestani, 2001, 2004).

Indigenous knowledge has become a subject of relevance to development theory and practice in recent years. This chapter outlines how Indigenous knowledge is applied and understood. The chapter also explores scholarly understanding of Indigenous knowledge in development. This chapter is structured as follows: The next section will conceptualise Indigenous knowledge and its relevance to the transformation of Indigenous people's way of life including their diets. This will be followed by a section that analyses Indigenous knowledge in development spaces with some view on the implications of colonisation. And the last section will conceptualise Indigenous knowledge of food practices and food systems in some detail. From an Indigenous perspective, women play a prominent role in preparing a meal. This chapter lays the foundation for addressing Indigenous knowledge in food practices throughout this thesis. Also, the chapter draws on Pacific Island frameworks related to wellbeing, and community empowerment approaches related to Pacific peoples.

This chapter responds to how nutrition is conceptualised from an Indigenous perspective. At the same time, this chapter locates the understanding of Indigenous women's knowledge of food and the food systems. It is from these understandings that I lay out the analogy of weaving the food basket in reference to Indigenous knowledge. As mentioned earlier, there are different steps involved in preparing a food basked. Each leaf in the piece of the coconut frond (see Figure 2.1 above) will capture different aspects of Indigenous knowledge and its relationship to food and nutrition.

2.2 Conceptualising Indigenous knowledge in the context of development

The term Indigenous is undefined through a static, universally binding checklist. According to United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP, 2007, pp 1-2), the term Indigenous relies on self-identification, historical continuity and connect to land, emphasising the rights of Indigenous people to determine their own identity. In addition, recognises Indigenous peoples through characteristics, collective rights, rather than imposing a restrictive legal definition. The term also can refer to a person who is a native born in a country. Indigenous are people who have common patterns of life in their geographical areas (Gope et al., 2017, p. 887). Stewart (2018, p. 740) states that Indigenous is the notion of a place-based human ethnic culture that has not migrated from its homeland and is not a settler or colonial population. Another definition was used within the establishment of UNDRIP defines…

> people as indigenous according to their descent from groups already established within the country's territory at the time of the arrival of other groups with different

> cultures and ethnic origins, who due to their isolation from other sectors of the society have retained the customs and traditions of their ancestors virtually intact, traditions which are similar to those considered to be indigenous, and because they are subject, albeit formally, to a state structure that incorporates national, social and cultural features other than their own (in Regino Montes and Torres Cisneros 2009: 153).

Indigenous is a generic term that relates to a group of people who link to a tribe or land. Cunningham and Stanley (2003, p. 403) identify Indigenous as combined experiences shared by a group of people who have inhibited a country for many years in contrast to people who have resided in the same country but for a lesser number of years. The varying definitions of Indigenous all point to the fact that Indigenous peoples are native to a country and have a distinct relationship with its environment (Durie, 2005). As an Indigenous researcher, who comes from a country with a thousand tribes, and multiple languages and ways of doing things, my notion of Indigenous knowledge extends from Durie's (2005) definition. Hence, Indigenous can be identified as one where native people who live within their ancestral boundaries, have unique relationship with the environment, speak a common language and have distinct cultural ways of doing things.

Indigenous peoples are comprised of cultural groups who live in an environment and produce their subsistence foundation from available natural resources (Kuhnlein & Receveur, 1996). Stewart and Strathern (2004) describe this relationship and intimacy with the environment that allows Indigenous people to potentially detect often subtle, micro-changes and to base decisions on a deep understanding of patterns and processes of change in the natural world of which they are part. Therefore, as Sillitoe (2006) states, the information and cumulative historical and cultural ecology contained within Indigenous languages, practices, values, place names, songs and stories hold data and knowledge that are relevant today. Similarly, Waiko (1991) and Gegeo (1998) state that Indigenous knowledge informs local-level decision-making, and the traditions, identities, and behaviours of Indigenous people and their foodways and food systems (see also Kuhnlein & Receveur, 1996; Kwapena, 1984; Lau, 2019; Mead, 1970; Roche et al., 2017). For all these reasons, Gorjestani (2004), Sillitoe (2006), Mendoza-Mori (2025) argue that development programs should include Indigenous knowledge in all their practices and policies. In the same way, like Narokobi (1983), a Papua New Guinean, I argue to forge our own unique path of development by blending PNG customs and practices with Western practices, rather than blindly adopting a foreign culture as our own before first drawing from the wisdom and good traditions of our ancestors, grounded in Indigenous values, culture, and knowledge systems.

Indigenous knowledge is referred to as traditional knowledge, local knowledge or traditional ecological knowledge. The body of literature acknowledges Indigenous knowledge as a cumulative body of all

knowledge rooted in local culture that is unique to that society and informs the interpretation of concepts and ideas (Durie, 2004a; Sengupta, 2015; Sharma & Kumari, 2021; Sillitoe, 2006; Smith, 2021; Thaman, 2006). Grenier (1998, p. 1) defines Indigenous knowledge as "all knowledge, including traditional or local knowledge that captures specific indigenous locales and cultures developed around specific conditions of women and men". In this context, Fernandez & Tick, (1994, p. 2) allude to understanding the role of gender and the intrinsic value of Indigenous knowledge as vital for finding the answers to situation-specific problems and state that women's Indigenous knowledge can differ from that of men.

Indigenous epistemology guides the social construction of Indigenous knowledge, and Indigenous knowledge is the result of the practice of Indigenous epistemology (Gegeo, 1998, p. 289). Epistemology is the cumulative body of knowledge including strategies, practices, techniques, explanations, beliefs, and values that are particular to the locality without the intrusion and obligations of external hegemonic forces (Emeagwali, 2014, p. 1). Therefore, for the purposes of this research, I will define Indigenous knowledge as knowledge that encompasses the holistic values and principles unique to the people within local and cultural settings that interpret concepts, ideas, and their understanding of their daily activities.

Furthermore, the literature (Sengupta, 2015; Sharma & Kumari, 2021; Thaman, 2006; Sengupta, 2015; Veitayaki, 2002) contends that Indigenous knowledge emanates from intergenerational experiences, observations, oral and written knowledge, practices, beliefs, skills and understandings of Indigenous people, collectively referred to as Indigenous knowledge systems (IKS). Nonetheless, Finnegan (2020) and Smith (2021) state that Indigenous knowledge is stored in the memories and practices of Indigenous peoples and is shared amongst the generations through word of mouth, observations and other culturally appropriate narrative methods such as songs and dances. However, Stilwell (2010, p. 1) attests that Indigenous knowledge is not shared equally in the communities, due to issues relating to power relations and cultural differences. Therefore, the extent of the quality and quantity of Indigenous knowledge a person possesses varies according to factors such as age and gender (Grenier, 1998) inheritance, status, wealth and varying cultures (Stilwell, 2010); also, attitudes, perceptions, values, and belief systems inherent to Indigenous people matter in terms of how Indigenous knowledge is expressed (Meyer, 2009). Another influencing factor is how much Western or Christian education people have had that caused them to dismiss their Indigenous knowledge as worthless or demonic.

In many societies, the idea of a private domain of knowledge is inevitable. For instance, in Melanesian societies, some Indigenous knowledge is not accessible to everyone in the community. Nongkas and Tivinarlik (2004, p. 65) assert that knowledge and rituals are restricted to the members of a clan or guardianship by one or more who are 'in the know', and these are "kept secret and private knowledge" In addition, Smith (2021) states that Indigenous Knowledge Systems are interrelated with spiritual and

intangible dominions of existence and are not confined to the material spheres. Indigenous knowledge systems cannot be separated from people. Firstly, Emeagwali (2014) clarifies that knowledge systems promote sustainability and the responsible stewardship of cultural and natural resources through relationships between people and their landscapes. Secondly, Sharma and Kumari (2021) argue that Indigenous knowledge has been the foundation for agriculture, health and nutrition, food preparation, festivals and many activities that sustain societies globally. Hence, Indigenous knowledge covers biological, physical, social, cultural, and spiritual systems. Therefore, Indigenous knowledge cannot be separated from the people since they are inextricably connected to that knowledge.

Indigenous knowledge is unique to a society, culture and region. For instance, Sharma and Kumari (2021) elaborate that Indigenous knowledge is a cumulative knowledge system that is acquired from multiple generations of experiences, extensive observations, lessons, skills and understandings of Indigenous peoples. As a consequence, Hart (2010, p. 3) posits that these systems of knowledge are inextricably interconnected with Indigenous worldviews, which perceive knowledge as holistic, cyclic and dependent on relationships and connections to living and non-living beings and entities. However, Du Plessis and Raza (2004) explain that Indigenous Knowledge Systems borrow from external sources of knowledge, it is dynamic and consistently evolving and adapting to the changing circumstances. Traditional knowledge is the structure of a specific community fixed in a society's belief systems and passed on to descendants (Gegeo, 1998; Sillitoe, 2006; Veitayaki, 2002). Kuhnlein and Receveur (1996) argue that there is an association between the Indigenous communities' cultural relationships with nature, particularly food and nutrition, see Figure 2.2. Hence as Kipuri (2009) states, Indigenous knowledge remains rooted within…

> community practices, relationships, and ceremonies [that] are connected to Indigenous peoples' identity, skills with the natural environment, and provincial and cultural rights (p.65).

There is an interconnection between different aspects, where Indigenous knowledge remains the core of food, food systems, cultural practices and community practices (see Figure 2.2).

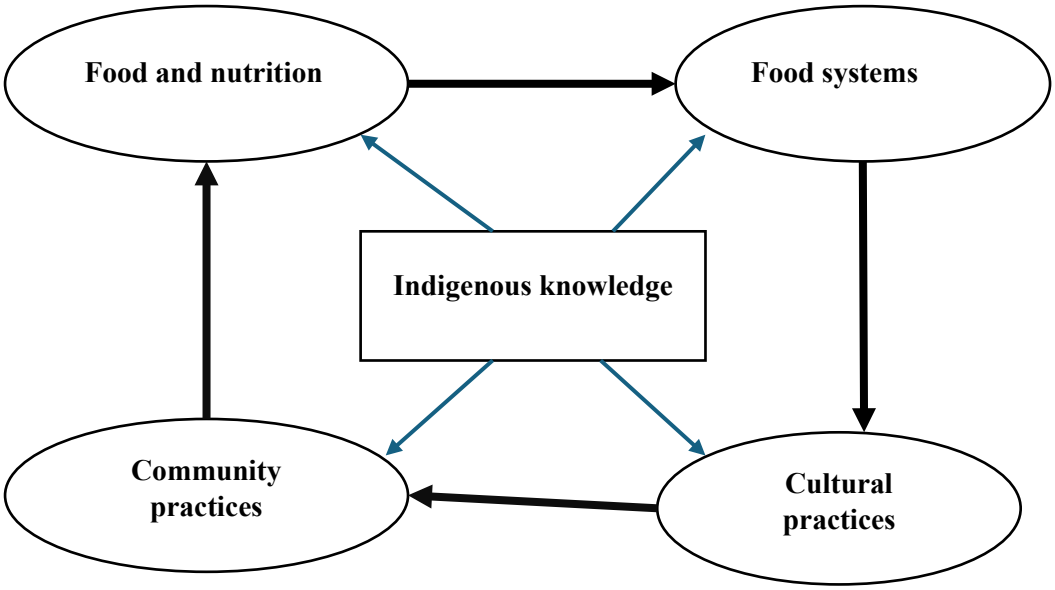


Figure 2.2: Connection between Indigenous knowledge, food and cultural practices and communities.
Source**:** Adapted from Kipuri (2009)

As displayed in Figure 2.2, an individual's consumption of food depends on the food systems of the community, and the cultural understandings of a food system that enables community members to plant and gather food within their surrounding environment. Further, community practices such as religious activities, and cultural practices and festivities influence decisions on how food is consumed. Sillitoe (2006) posits that Indigenous knowledge shapes living habitats, livelihood choices, health and illness. Also, Aluko (2016) argues that Indigenous knowledge, customs and culture are associated with local foods and are constantly changing. However, Englberger et al. (2007) assert that serious implications are encountered when there is a loss of traditional knowledge, customs and culture related to local food and the neglect of traditional food systems. Authors such as Marrero and Mattei (2022), Orr (2018) and Evans et al., (2001) contend that abandoning local food systems is associated with a nutrition transition that leads to concerns about nutrition and health problems, such as diabetes and obesity, characterised by increased consumption of imported and processed foods. The illustrations of Orr's (2018) and Evans et. al's (2001) can be identified in many rural Pacific Island communities where traditional food systems are replaced by imported, processed foods (see also chapter 6). Historically, local diets were primarily roots crops and those found in the nearby environments such as locally sourced fish. These food systems were embedded in subsistence gardening, reciprocal exchange, and seasonal harvest, which supported both nutritional balance. The next section explains how colonisation has impacted Indigenous knowledge and how this frames development.

2.3 Conceptualising Indigenous knowledge in development spaces

In this section, I will describe the implications of colonisation that permeated developing countries in the form of Christianity, which altered Indigenous knowledge under the pretext of development. Indigenous knowledge is an aggregate body of knowledge that is unique to the community and informs the interpretation of ideas and ways of doing (Durie, 2005). The Indigenous knowledge has an implication on Indigenous people's food practices and food systems.

There is a growing amount of literature on Indigenous knowledge in the development space (Blaikie, 2000; Kothari & Minogue, 2001; Magni, 2017; Omar, 2012; Simon, 2006; Ziai, 2012). Several authors like Simon (1997) and McEwan (2008) claim that the rhetoric of Indigenous knowledge was observed as an impediment to development. However, Briggs and Sharp (2004) and Escobar (2004) argue that globalisation had a significant influence on development as a theory and practice. Similarly, Mafile'o and Walsh-Tapiata (2007) allude to the fact that colonisation had a significant impact on Indigenous people and depreciated the value of Indigenous knowledge. In the words of Blackwell (2003, p. 447): "it is important when considering how we are affected by history to identify where we are coming from in relation to that history". Therefore, it is important to understand the historical context of how colonialism had an impact on Indigenous peoples and Indigenous knowledge. This section will discuss some of the accounts and challenges that have impacted on Indigenous peoples in the light of development.

2.3.1 Framing colonialism and Christianity in Indigenous communities

It is no secret that colonisation left an indelible mark on the foodways and food practices of many nations in the Global South. Therefore, the historical context is pivotal to any understanding of Indigenous knowledge in development since colonisation had significant devastating impacts on Indigenous people. The early traders and explorers, such as Captain James Cook (1769), initiated the advance of Christianity in Oceania (Garrett, 1982). Also, Miller (2019, p. 35) contends that the "Doctrine of Discovery" was applied by European nations to substantiate their desire to acquire riches and empires around the world. The "Doctrine of Discovery" is a legal concept that gave European nations the right to claim sovereignty over Indigenous peoples and their lands. In doing so, European powers predominantly warranted these acquisitions and their ambitions by ethnocentric allegations of cultural, racial, governmental, and religious superiority over the rest of the world. The colonised people experienced colonialism in diverse and multiple ways. Mafile'o and Walsh-Tapiata (2007, p. 131) clarify the fact that the desire for land drove people with foreign values and beliefs forcing their ways on the

inhabitants living in the Pacific for centuries, thus imposing a mystified image of their own patterns of producing knowledge and meaning (Quijano, 2007).

European colonisation was codified with the aim of dispossession and systematic expropriation of Indigenous land, resources and labour (Kothari & Klein, 2023). Beyond material extraction, Blackwell (2003) demonstrates, colonialism was a system of supremacy to which the colonised were required to submit. The colonisers' superior view of the world and their version of history as the only true version subdued other understandings, thereby marginalising and silencing alternative knowledge systems and understandings of the world (Blackwell, 2003). As Kothari and Klein (2023, p. 16) argue, colonisation aimed at suppressing resistance to ongoing settler expansion by modifying Indigenous norms into more submissive settler ways of thinking and governance. For example, Dimkpa (2015) illustrates how colonisation sprouted from when the West and Europe saw Africa as a land littered with clueless people who were failing to manage and maximally utilise their unlimited resources. As a consequence, King (2023) and Battiste (2005) allude to European powers, in their pursuit of wealth and power, which viewed Indigenous people's knowledge systems as inferior to the civilised West. In this event the ethnocentric perspectives justified the systematic exploitation, dispossession, and oppression of the Indigenous peoples and their lands.

In the Pacific, Christianity was used as the channel for the colonisation of the islands in each of their natural resources and strategic military bases, as well as a colonisation of the mind to "Western" ideals (Nokise, 2009). Furthermore, Campbell (2015) asserts that colonisation introduced new religions, and the spread of capitalism saw many of the traditional practices in the Pacific declining and it has in essence hampered development (Heldring & Robinson, 2012). The notion of coloniality links with capitalism, patriarchy, and epistemic violence where Indigenous knowledge is devalued (Mignolo, 2011; Quijano, 2007). Davies (2002) and Dowling (1998) have found that the arrival of the colonists to the environment introduced infectious diseases. The diseases became the central cause of concern in the settlements where malaria and poor nutrition began to have an effect as increasing numbers of labourers were brought into the settlements.

Missionaries were deployed to the settlements for various reasons including maintaining the fragile peace and to change societies (Lineham, 2011). For the missionaries to be deployed to various settlements, they had to be skilled. For example, Van der Grijp (1993, p. 147) states that "in Tonga, the missionaries had to be doctors as well as pharmacists. The medicines were not only to heal the sick but also to win souls". Van der Grijp (2007) also highlights that the missionaries from the London Missionary Societies (LMS) sent a party with the aim of converting the chiefs. While the English and U.S missionaries tried to win over more chiefs; the Indigenous converts were sent to other Pacific islands including PNG to spread the Gospel. The missionaries travelled with their wives and as Lineham

(2011) highlights, the wives helped to create a more stable settler-type local community with neat cottages, schools, and medical care. Langmore (1989) emphasises that the missionaries' wives who were located in Papua taught at schools and clinics in the stations. Furthermore, Langmore (1989, p. 165) clarifies that the wives of the missionaries taught a range of skills in reading, writing, and domestic skills such as sewing and cooking. At the same time, domestic training had the purpose of initiating women into the "skills of European housewifery" (Langmore, 1989, p. 170). The following section will discuss concepts from postcolonial to post-development in response to colonialism.

2.3.2 From postcolonial to post-development concepts

Postcolonialism has necessitated a complex approach to development. Therefore, a discussion of postcolonialism and assumptions is necessary to understand its influences and impacts on the food and nutrition of rural communities. Generally, postcolonial scholars strive to establish an adequate understanding of culture after the influence of imperial dominance (Goss, 1996; Kothari, 2006; Said, 1989; Spivak, 2023). Thereby, scholars are interested in the idea of knowledge as power (Booth, 1993; McGregor, 2009). The literature observes the rhetoric of Indigenous knowledge being seen as an impediment to development (Blaikie & Brookfield, 2015; Said, 1989; Sillitoe, 2002a). Battiste (2004) contends that postcolonialism designs a scheme that responds to experiences of colonisation and imperialism. Ziai (2013) states that the aim of improving human conditions under the pretext of development should be seen as a link to certain Eurocentric authoritarian implications for development. In this context, McEwan (2008) argues that postcolonialism exposes and problematises power relations which counts as knowledge, and that the production of knowledge is determined in the West with Western knowledge seen as universal.

Universal knowledge is assumed to act as a structural barrier to many, including women and the disenfranchised (Battiste, 2004). In such spaces, these groups are silenced in society structures and its knowledge making; where talking, and writing takes place, but women and other marginalised groups are not heard in the production of knowledge, because such knowledge is managed by others. The instruments of this hegemony and domination are cultivated in language, discourses, disciplinary knowledge and institutional policy and practice. Nevertheless, McEwan (2008, p. 35) argues that knowledge is established by actors who are in a specific location and are shaped by numerous cultural and other influences. According to Briggs (2005), the use of Indigenous knowledge has been seen by many as an alternative way of promoting development in poor rural communities in many parts of the world. Therefore, as Githui et al. (2015) claim, Indigenous knowledge is fundamental in discussing a more sustainable use of resources and a balanced development.

The emergence of postcolonial scholarship is traced to sometime after World War II (Escobar, 2011; Goss, 1996; Hodge, 2015). Various European powers spread after World War II throughout Europe's colonised nations (Goss, 1996; McEwan, 2008). Development became the dominant discourse of imperial Europe and was ethnocentric, rooted in European cultures, and reflective of a dominant Western worldview (McEwan, 2008, p. 137; Said, 1989). Thus, only those who were educated in Eurocentric ways of knowing, and upholding the European ways, progressed and were superior (Battiste, 2005). As Crush (1995) explains, the production of Western knowledge is inseparable from the exercise of Western power. This concept is expressed through the lifestyles, cultures, and knowledge of Indigenous peoples, which were disregarded and viewed as insignificant and lacking scientific rigour (Knopf, 2015). Moreover, Indigenous knowledge was even considered as primitive (Na'puti & Rohrer, 2017; Said, 1989; Stead, 2013), and submissive to Western influence and their top-down technocratic development paradigm (Knopf, 2015; Sillitoe & Marzano, 2009).

There was a demand for other worldviews, and alternatives to development were claimed to be the way forward in the new Millennium (Briggs & Sharp, 2004; Escobar, 2011; Simon, 2006). Therefore, Briggs (2005); Briggs and Sharp (2004); and Escobar (2011) claim that postcolonial ways of knowing, and views have relevance to critiquing mainstream development. Kothari and Klein (2023) explain that the mainstream concepts of development are focused on the economy. Development was then framed as an avenue to redeem the people of poor countries from poverty (Escobar, 2005; Kothari & Klein, 2023). However, Pieterse (2002) and Kothari and Klein (2023) contend that there was a systematic failure to lift the then so called 'Third World' out of poverty and disadvantage while aiding growth and accumulation in the Global North. Consequently, economic growth was futile and did not reach the Global South. However, it is perceived that the overarching goals to disintegrate structures of knowledge established by imperial modernity, deconstruct powers emanating from colonialism, and reestablish those structures with hybrid knowledge influenced by formerly colonised cultures (Bhabha, 2012; Moore-Gilbert, 2000).

Scholars assert that postcolonial thinking seeks to decipher and encourage alternative pathways to development based on a plurality of perspectives, truths and knowledge that contest the dominant colonial discourse (Battiste, 2005; Goss, 1996; Na'puti & Rohrer, 2017; Sillitoe, 1998a, 1998b, 2002b, 2010; Sillitoe & Marzano, 2009). Consequently, leeway is created through post-colonialism for Indigenous people to interrogate, destabilise and reconstruct Western knowledge as the foundation of dominant development discourse (Battiste, 2004; Blaikie, 2000; Blaikie et al., 1997; Pottier et al., 2003; Sillitoe, 1998b). The European colonisation of Indigenous peoples has had a devastating impact on the Indigenous societies, cultures, and mortality (Ornelas, 2024). While the study of subjugation concentrated on the social, political, and economic changes imposed on the Indigenous population, the

matter of food and nutrition and its impacts on people is rarely considered. Yet, food was a fundamental tool of colonisation, a shift in traditional dietary habits.

2.3.3 Post-development thinking: Critiquing the discourse of development for alternatives

A strong discontentment emanated to development that could lead to environmental destruction, when development equals cultural Westernisation and homogenisation (Pieterse, 2000). Therefore, in early post-development thought development was rejected not solely based on its outcomes, but also on its intentions, its world view and mindset (Kothari & Minogue, 2001; Pieterse, 2000; Sachs, 1992). In this context, Blaikie (2000, p. 133) and Escobar (2011) argue that while the "business of development" was flourishing, the process of development in developing societies was failing. Many people in developing countries found they were no better off, indeed many remained poor (Sharp & Briggs, 2006, p. 6). The proponents of anti-development and post-development, such as Pieterse (2000), state that an economic mindset suggests a reductionist view of existence.

Development was perceived as a powerful hegemonic discourse (Blaikie, 2000). It was embedded in Western philosophies of capitalism, material abundance and modernity (Escobar, 2011; Sillitoe, 1998b, 2002b, 2010; Ziai, 2017). The Western philosophies dispossessed people of their cultures and lands amid false promises of unattainable futures (McGregor, 2009, p. 1688). Furthermore, post-development scholars (Escobar, 1992; Ziai, 2012) contend that the development discourse is upheld by a Eurocentric system of institutional relations, which gives primacy to Western expert knowledge and technocratic reasoning. Escobar (2011) asserts that the mainstream lack of understanding of the local reality of the Global South was the alleged cause of the failure of development programs over the Global South. Nevertheless, Escobar (2011) and McGregor (2009) challenge the fact that the dominant discourse disregarded the voices of the marginalised, and minority groups including Indigenous people. Therefore, Sillitoe and Marzano (2009) contend that research based on Indigenous knowledge, which seeks to have local voices heard in the arena of international development has "become bogged down in a murky mire" (p. 14). From this perspective, Sillitoe and Marzano (2009) claim that Indigenous knowledge is uncertain in its potential as an effective bottom-up approach, since it has become distorted and masked through manipulation by outsiders. Indigenous knowledge, however, continues to be a source of critique for mainstream development, providing real alternatives that advance a prominent place for local perspectives.

Some scholars advocate renouncing the paradigm of development and discarding Western universalism as development (Briggs & Sharp, 2004; Escobar, 2005, 2011; Sachs, 1992). Recognising other worldviews were seen as required rather than a continuing search for development alternatives (Briggs

& Sharp, 2004; Escobar, 2005). In addition, McGregor (2009) asserts that the shift to shape alternative pathways to development was an emphasis on the power of human agency located within the social margins. Alternatives to development were purported to be the way forward (Briggs & Sharp, 2004; Escobar, 2011).

Indigenous knowledge is emphasised in the development sphere through community programs. For example, the African Department of the World Bank launched the Indigenous Knowledge for Development program in 1998 (The World Bank, 1998a, 1998b). The program has continued to play a major role in development activities (Karanda & Toledano, 2018; Olaopa & Ayodele, 2022). Wolfensohn, (1998a) the President of the World Bank, stated that "Indigenous knowledge is an integral part of the culture and history of a local community. We need to learn from local communities to enrich the development process" (The World Bank, 1998b, p. vii). Similarly, McGregor (2009) echoes that the protection and promotion of Indigenous knowledge systems "are critical and it is where alternative imaginaries and counter-hegemonic beliefs reside" (p. 1697). In addition, Narokobi (1983) advocates to include only the good aspects from the Western practices into our continuing local traditions and claiming it unique way of living and developing Papua New Guinea, our nation the Melanesian way. Therefore, learning and relearning our existing cultures and local food systems, and ways of doing things coupled with good western skills and knowledge can enhance women's skills as nutrition providers in rural villages.

In summary, alternatives to development have paved the way forward for Indigenous people to reconstruct Western dominated knowledge. The following section will now discuss Indigenous knowledge of food practices and food systems, how local knowledge development contributes to development, and its relationship to poor nutrition.

2.4 Conceptualising Indigenous knowledge of food practices and food systems

This section will explain the significance of traditional knowledge and its relationship to food and food systems in rural communities. Food plays an important role in the wellbeing of Indigenous communities and there is a need to focus on invigorating local food systems and local and traditional food, and Indigenous knowledge systems. Improving nutrition is positioned at the core of global development and is the catalyst to achieving the Sustainable Development Goals (SDGs) (United Nations, 2019, 2024). Food security is a fundamental part of rights to food and nutrition, and sustainable development. In exploring food security, it is equally important to acknowledge that food systems and cultural food

practices influence food security (Haynes et al., 2020; Iese, 2023a). This section will explain the importance of exploring food security in the context of the contributing food systems and the patterns and influences that have an impact on the nutrition of people in rural villages (Bhagtani et al., 2022; Iese et al., 2016; Iese et al., 2020).

Food systems are complex and play a significant role in ensuring a vibrant and healthy population through an adequate supply of nutritious food, while ensuring food safety for consumption (FAO, 2014). Therefore, Kuhnlein et al. (2001) attest that one must understand key terminologies such as general and traditional food systems. We also need to know the contemporary living conditions of Indigenous peoples to understand the impact of traditional food resources on the total diet and health of Indigenous people. The Food and Agriculture Organisation (FAO, 2014) refers to food systems as the…

> entire range of actors and their interlinked value-adding activities involved in the production, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries and parts of the broader economic, societal and natural environments in which they are embedded (p. 1).

From an Indigenous knowledge perception, Kuhnlein and Receveur (1996) propose the definition for a 'traditional food system' as "all food within a particular culture available from local natural resources and culturally accepted" (p. 418). Also, traditional food systems include the sociocultural meanings, acquisition and processing techniques, use, composition, and nutrition consequences for people using the food. Furthermore, Kennedy et al. (2021) differentiate between traditional food and Indigenous food, where…

> traditional food - refers to a generic term that can be applied to any family, community, culture, nation or region, and Indigenous food refers to either a species or variety that is naturally occurring (Indigenous) in a particular geographic place. (p. 2)

Similarly, the concept of dietary change refers to knowing how food is used, what food patterns evolve over a period, and the risks and benefits of the consequences of dietary change that have an impact on people's acquisitions. Terminologies matter when discussing Indigenous knowledge of food practices and food systems. In setting a foundation, the following will discuss the association between food security and traditional food systems influence on consumer dietary patterns and food consumption.

Food systems play a crucial role in determining what types of food to grow and understanding the pathways that food travels from farms to market. A food system is comprised of various systems including farming systems, waste systems and supply systems. Dominant frameworks conceptualise

food systems as interlinked components – including farming, supply, and waste systems – embedded within broader economic and infrastructural processes (Capone et al., 2014; Conn et al., 2020). The FAO (2014) situates these systems within interacting domains of energy, trade, health and policy, emphasisng their influence on food access and dietary outcomes. However, such models often marginalise Indigenous food knowledge, which historically governed food production and distribution through locally embedded, relational, and ecologically attuned practices. For Indigenous peoples, food systems function as socio-ecological systems in which cultural identity, land stewardship, and wellbeing are inseparable from food practices (Kuhnlein & Chotiboriboon, 2022). As a result, externally imposed changes to food systems reverberate across production, nutrition, consumption, and dietary preferences, frequently disrupting Indigenous knowledge transmission and culturally grounded food relationships. Conceptualising food systems and improved nutrition through an Indigenous knowledge lens is therefore essential for analysing how power, governance, and knowledge shape food practices and outcomes. Changes made to a food system affects other cross-cutting areas that are directly associated with consumption, production, nutrition and even dietary preferences.

Indigenous peoples' food systems (IPFSs) have traditionally provided healthy diets in diverse environments across diverse ecological contexts (IFAD, 2022). However, these systems have not evolved autonomously. As Kuhnlein et al. (2001) argue, Indigenous peoples are cognisant of involuntary dietary transformations imposed on them by environmental changes, political, and socio-economic disruptions. The International Fund for Agricultural Development IFAD (2022 Global Nutrition Report) asserts that historical and ongoing disruptions of IPFSs have caused profound changes in the dietary patterns of Indigenous people, as well as the continued loss of food biodiversity, and the increasing consumption of processed foods, among other factors (Kuhnlein et al, 2001). Such disruptions cannot be understood as isolated nutritional changes; rather, they are structurally linked to colonial processes that have systematically undermined Indigenous knowledge, land stewardship, and food sovereignty. Colonisation has influenced Indigenous peoples leading to a decline in dietary quality and nutritional health with burdens unevenly distributed within Indigenous communities. Indigenous women in particular experience a disproportionate share of malnutrition and diet-related health conditions, reflecting the intersection of gendered roles in food systems and entrenched colonial inequities (Lemke & Delormier, 2017).

Different cultures have shared systems of ideologies and regulations relating to food, meals, and eating patterns, which ultimately influences the timing, order and quality of the food intake (Tuomainen, 2009). Aime (2006) states that the older generations have cherished these valuable principles, wisdom and lessons of life that have governed and guided their daily lives. Nevertheless, Cochrane (1994) concedes that Indigenous peoples adapt their unique knowledge systems to changing situations, thereby creating new ways of understanding, but remaining connected to their original village settings and at

the same time responding to new surroundings. Indigenous peoples living in the rural villages of Central Province are mostly subsistence farmers whose daily lives are channeled by cultural activities and festivities (see also Chapter 6). Their shared responsibilities also determine the types of food they can plant and harvest from the nearby surroundings.

Rural populations face escalating challenges arising from dietary transitions, rising concerns about processed food, and the increasing vulnerability of local food sources to environmental and climate factors (Iese et al., 2018). In Papua New Guinea, these pressures intersect with Indigenous food systems that are fundamentally land-based and knowledge-driven. As Falanitule (2018) emphasises that *kai* is not just food for sustenance but matrix of relationships connecting to culture, community, land and the natural and supernatural worlds. This relational understanding of food focuses Indigenous epistemologies in which practices are inseparable from customary land tenure, ecological stewardship, and social obligation. Similarly, Lemke and Delormier (2017) demonstrates that Indigenous peoples' food systems are inextricably connected to the land, which in turn is interwoven with issues of self-determination, livelihoods, health, cultural and spiritual heritage, and gendered responsibilities. In the PNG context, disruptions to land access, environmental stability, and local food ecologies therefore extend beyond nutritional improved nutrition outcomes, undermining Indigenous knowledge transmission and socio-cultural foundations of food systems. These dynamics highlight that changing diets and food insecurity are not only matters of availability or affordability, but manifestations of deeper structural and environmental transformations affecting Indigenous relationships to land and food production.

As can be seen in Figure 2.3 below, a traditional food basket (*digu,*) is made by people in Central Province to put yams in, particularly for bride price ceremonies. This basket is done by the groom's family members to give to the bride's family. This food basket illustrates a significant relationship of how food is rooted in the land and is connected to the Indigenous people's culture in PNG. There are posts planted in the ground. The bush vines are then used to weave around the posts to form a basket which can carry the yams. The four posts represent values of the rural villages: culture, cultural practices, community and natural and spiritual world. Figure 2.3 also illustrates the relationship of Indigenous peoples' food systems that are inextricably connected by culture, cultural practices, natural and spiritual world, and community as represented by the four pillars planted or connected to the ground, and food is the root to the Indigenous systems.

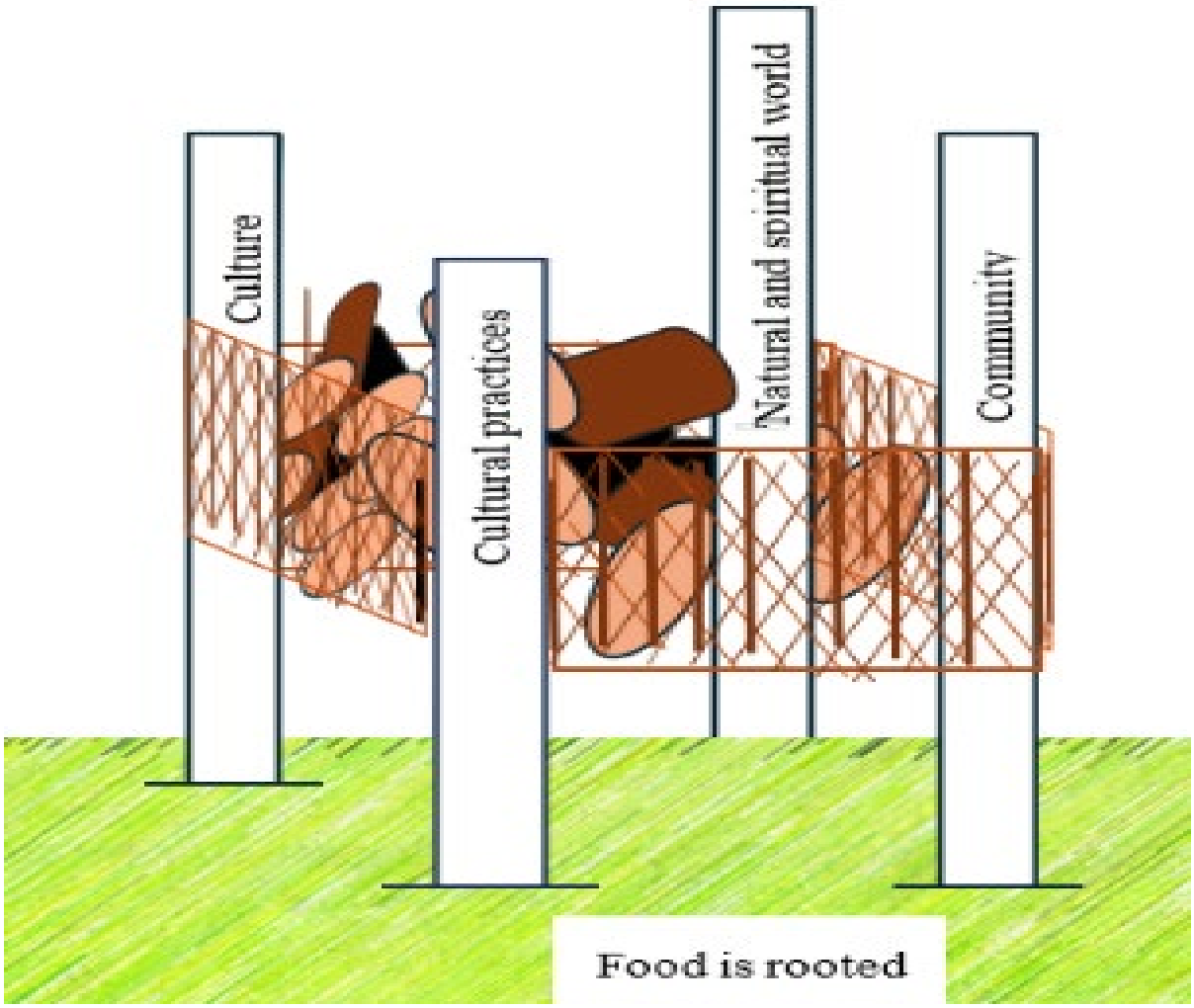


Figure 2.3: Food is rooted in land and culture
Source**:** Adapted from Lemke and Delormier (2017)

The ongoing loss of Indigenous land, alongside the dominance agrifood models fundamentally threaten Indigenous people's food systems and the capacity to sustain nutrition wellbeing. The Indigenous customs constitute complex systems of governance systems grounded in shared valuable principles, values and traditions that regulate access to land, organise food production, and define collective responsibilities within rural communities. When land is appropriated for other government purposes or for business expansion, these customary systems are disrupted, leading not only to ecological degradation but also to the erosion of Indigenous knowledge that underpins food diversity, dietary adequacy, and culturally appropriate nutrition. As Lemke and Delormier (2017) argue, loss of Indigenous knowledge has led to disproportionate rates of hunger and malnutrition, with particularly women and girls suffering the greatest burden. This pattern reflects how land dispossess weakens food sovereignty by dissolving the intergenerational transmission of food knowledge, diminishing local control over food systems, and increasing dependence on nutritionally, poor market-based foods.

Structural conditions that reproduce social injustice and inequality play a central role in destabilising Indigenous food systems and shaping unequal dietary outcomes. According to Lemke and Delormier (2017), structural inequalities – particularly those characterised by restricted access to land and other productive resources – constitute a fundamental threat to Indigenous food systems and nutrition. These inequalities undermine the resilience of individuals and communities, including environmental degradation, loss of biodiversity, competing demands for land for production of food or fuels, unsustainable and unhealthy consumption patterns and lifestyles, and centralisation of power in market structures. Moreover, the centralisation of power within dominant market structures further marginalises Indigenous food systems by displacing local knowledge, eroding food sovereignty, and deepening dependence on external food supplies that are often nutritionally inferior. Together, these structural forces entrench vulnerability and exacerbate nutrition-related inequalities within Indigenous rural communities.

Land rights are a fundamental basis for Indigenous food systems, food security, nutrition, and cultural continuity are constituted (IFAD, 2022). This relationship formally recognised in The United Nations Declaration on The Rights of Indigenous Peoples (UNDRIP) in 2007 acknowledges Indigenous peoples have the right to own land and to determine how to use their land and resources. In Papua New Guinea, where majority of land is held under customary title and is occupied by the Indigenous people who produce food for immediate consumption (Colman, 2018). Land in PNG is mostly owned communally by specific lineage, clan or tribal group. Land is the basis of production and consumption for most Papua New Guineans. Within this context, land operates as the material and institutional basis of Indigenous food systems, linking rights, food production, and cultural responsibility. Therefore, land rights in PNG are not only a prerequisite for food security and nutrition but critical mechanism through which Indigenous self-determination within food systems is realised.

Customs or beliefs relate to practices and the way of life of a group of people (Cochrane, 1994). This also means that traditional rituals for growing and gathering food and the times for traditional growing and harvesting food from the land and resources from the sea must be acknowledged. Many of these events were performed on the foundation of a traditional calendar (Jansen. A et al., 1990; Tokaimalo & Viti Levu, 1992). For example, in the Fijian calendar, *Vula I cukicuki*, in August, yam fields are tilled, cultivated, and sowed. Their calendar, the weather and peoples' skills determine the bounty for their households or cultural events. Yet, in another example, Māori, the Indigenous people of Aotearoa New Zealand, rely on signs and signals to indicate times for certain activities, such as *maramataka*, the lunar calendar from one new moon to the next. This calendar was used to inform the best time to plant and harvest certain crops, to collect shellfish and direct the course of ocean-bound vessels (Warbrick et al., 2023, p. 12). Therefore, the cultural beliefs customs, and signals emitted by the environment are significant to Indigenous people as it informs the people that food can be harvested or planted.

Traditional foods are interrelated to Indigenous people's cultural identity and the security of their community. Activities such as hunting, fishing, collecting and harvesting of foods are related to most oral traditions and rituals. In this regard, Egeland and Harrison (2013) argue that the prevailing definition of food security is inadequate in evaluating Indigenous relationships to food, since it suggests that food security depends on the assessment of monetary access to foods bought from the markets. In contrast, the worth of traditional foods for Indigenous peoples surpasses purely monetary assessments. As mentioned earlier, traditional food is an important element of food security for the Indigenous population. Campbell (2015) and Pollock (1992) state that in Pacific Island societies, food does not simply fulfil a biological function, it has a variety of social, cultural, and spiritual values and in most parts of Oceania, certain foods are given a social status. However, the kind of food that has high status varies from place to place depending on the ecological condition of the society. The following sections will discuss how colonisation brought about changes to food in the local communities, cultural food practices and the implications for food systems.

2.4.1 The impacts of colonialism on food and nutrition of Indigenous people

The consequences of colonialism left enduring and structural legacies on the food systems, diets, and nutritional wellbeing of Indigenous people. Central to these legacies is the impact of environmental dispossession which cannot be underestimated, through which Indigenous peoples were systematically alienated from their lands, disrupting long-established relationships between land, food production, and cultural practice. As a result, colonisation has contributed to a multifaceted disparities in food and nutrition that persists across Indigenous populations (Damman et al., 2013; Lemke & Delormier, 2017). For instance, Damman et al. (2013) identify limited access to land and other natural resources as main issues for these inequalities, undermining Indigenous livelihood and food security. Indigenous people are interrelated with their land, and land is not merely a productive asset but the foundation of subsistence, nutrition, health, and cultural and spiritual heritage. The erosion of land-based food practices through colonial processes has therefore compromised both dietary quality and social systems through which food knowledge, identity, and wellbeing are sustained.

The wellbeing of Indigenous people has been sustained by their food systems and their balanced relationship with the natural environment. However, across many contexts, colonial processes, Indigenous people were dispossessed of their land and the systems of knowledge that was transmitted through generations. In the case of many Indigenous people in PNG this dispossession has not necessarily occurred, yet there are still impacts on systems of knowledge. This suggests that direct land alienation is not the only driver of disruption; rather broader socio-ecological pressures also reshape Indigenous way of life.

Similarly, Kuhnlein and Chotiboriboon (2022) claim that Indigenous people are aware of the imposed dietary alterations brought by environmental and economic transformations. These include overexploitation of fish and wildlife stocks, pollution and degradation of lands and waters, urbanisation and loss of cultivated lands, invasive species and climate change. Such process collectively undermines the ecological foundations of traditional food systems, thereby restraining Indigenous agency in sustaining culturally appropriate diets.

These disruptions are not incidental but display ongoing structural inequalities. Damman et al. (2013, p. 267) argue that the state and corporate actors continue denying Indigenous peoples' self-determination by restricting access to land and resources, violating their access to adequate food and nutrition. This is evident in PNG, where extractive and commercial activities operate with limited regulation. For instance, Hamel et al. (2018) document how unregulated fishing expeditions by commercial enterprises, threaten marine ecosystems in Madang Province, undermining local subsistence practices and food security. In aggregate, these dynamics illustrate that even in contexts where formal land dispossessions are limited, Indigenous food systems remain vulnerable to external pressures, the cumulative effects of environmental degradation, market integration, and governance failures highlight the need to move beyond simplistic narratives of dispossession and instead examine the complex, interconnected structural forces reshaping Indigenous wellbeing, including nutrition.

Further, disparities for Indigenous people can also result from the effects of social determinants created by colonisation that induced a fall in dietary quality and nutritional health. Kuhnlein and Chotiboriboon (2022) describe social determinants as forced relocation similar to that of Indigenous people in the United States, who were forced to relocate from ancestral lands to reservations. In doing so, they were restricted from gaining access to their traditional diets and children were enforced to attend distant boarding schools, which deprived Indigenous communities of the continuation of their cultural practices and languages (Damman et al., 2008; Kuhnlein & Chotiboriboon, 2022). In the same way, when Indigenous people from Papua New Guinea, migrate to the cities in search for better opportunities, they leave behind their cultural land from which food can be easily gathered. Such transitions, disallows the people from accessing the land to produce nutritious foods.

Most colonisers have introduced their ways of knowledge and food into settlements. Colonisers that arrived in the USA in the late 1800s were bringing with them unhealthy food products, such as the canned food. Mar (2021) refers to this food as a "Western diet"- specifically high in sugar, loaded with fat, and made up of ultra-processed carbohydrates. In West Africa, Ikpe (1994) found that the imitation of European habits was not restricted to tinned milk, tea, sugar, canned food and bread. Members of elite families ate together at the same table signifying civilisation, love and harmony, instead of most traditional ways, where men ate separately from the rest of the people. As a result of such practices,

Tuomainen (2009) illustrates that the European way of thinking permeated African societies, moving people to aspire to emulate European habits, and in this case, Nigerian elites. Even unskilled workers observed several facets of the European food culture, which they could integrate into their diet, thereby apparently signifying progress. Colonial systems have marginalised Indigenous ways of knowings and do not reflect Indigenous realities (Wilton, 2024). For Indigenous people, the role of their physical environment was inseparable from issues of identity, balance, life control and food security (Kuhnlein & Chotiboriboon, 2022). The next section will discuss the implications of colonialism on Indigenous food practices and food systems and the relationship to the knowledge, and cultural values of local communities and how these can contribute to improving nutrition.

2.4.2 Perceptions of Indigenous knowledge and food: "backward knowledge" and "poverty food"

Perceptions of Indigenous knowledge and Indigenous food systems have long been shaped by colonial and development discourses that frame them as backward, inefficient, or representative of "poverty food," rather than legitimate systems of knowledge, nutrition, and ecological management (Dammam, et al., 2013; Lemke & Deformer, 2017). Such deficit-based framings marginalise Indigenous food practices by devaluing land-based knowledge, subsistence production, and culturally embedded diets, while privileging externally imposed agrifood models as models of progress and modernity. These narratives obscure the structural conditions, particularly land dispossession, political marginalisation, and unequal integration into market systems – that have constrained Indigenous food systems and reshaped dietary practices over time (Damman, et al., 2013) Consequently, Indigenous foods are frequently constructed as inferior or nutritionally inadequate, despite their historical role in sustaining dietary diversity, ecological balance, and community wellbeing. These perceptions not only undermine Indigenous knowledge systems but also inform policy and development interventions that erode food sovereignty and exacerbate nutrition inequalities, reinforcing the very structural disadvantages they are supposed to address (Lemke & Delormier, 2017).

Food is a critical aspect of the social world and is influenced by culture. It is woven into the fabric of individuals, communities, and national identity (Savage et al., 2020). Therefore, Indigenous knowledge associated with vegetables and their importance for food security in many rural villages warrants further discussion. In their research on Indigenous knowledge and vegetables, Hart et al. (2009, p. 209) highlight that many rural communities in Africa depend on foods gathered from plants growing in the wild or self-sowing themselves in household gardens and fields as seasonal volunteer crops, weeds or plants grown in unwanted places. These traditional vegetables and associated knowledge are often downgraded and labelled as "backward knowledge and poverty food" (Voster et al., 2007, p. 2). In addition, Hart et al. (2009) assert that households in Africa add some sources of protein in the form of

chicken heads, necks and feet, or tinned fish, which is dependent on food resources and income, and these foods are labelled as 'poverty food', and children and youth have negative perceptions of these types of food. Another example is avocado, used to be called 'poor man's butter' in Philippines but now is more valued (Ain et al., 2022, p. 65).

In Oceania, deficit-based perceptions of Indigenous foods are reinforced through terminologies such as 'famine' foods (Campbell, 2015) and 'weird' food (Iese et al., 2023) are utilised to refer to food plants and animals that were not usually consumed unless there was some kind of failure among the normally harvested crops, and are categorised as undesirable, or nutritionally inferior within dominant food narratives (Campbell, 2015; Iese et al., 2023). Foods labelled as "famine foods" are typically consumed during periods of crop failure or environmental stress, yet they encompass a diverse range of wild and semi-managed species that are deliberately maintained through Indiegnous land-based knowledge as contingency resources for times of scarcity (Campbell, 2015). In the same way, Iese et al. (2023), demonstrate that some foods, such as breadfruit shoots maybe culturally valued and regularly consumed in some Pacific Island contexts, while being dismissed as inedible or labelled as "weird" food in others. Such classifications obscure the strategic, adaptive, reframing practices of resilience as markers of deprivation. From an Indigenous health and wellbeing perspective, these perceptions have direct nutritional implications, as they devalue culturally significant foods, and legitimise interventions that prioritise external diets over land-based food practices. This reinforces a narrow understanding of nutrition detached from Indigenous wellbeing models. Emphasisng the need to re-centre Indigenous knowledge, and food systems within holistic frameworks of improved nutrition, and community empowerment.

2.4.3 Indigenous health and wellbeing models and relevance to nutrition

Indigenous Pacific health and wellbeing models – such as Fonofale, Te Vaka Atafaga – provide culturally grounded, holistic frameworks for understanding health as a multidimensional and relational construct (Durie, 1994; Kupa, 2009; Pulotu-Endemann, 2009; Tu'itahi, 2009). Even though Pacific peoples share some attributes, values, cultural orientations, and beliefs, significant contextual differences exist between communities, and this reinforces and validates the need for this study to be context specific. The Indigenous models are holistic and inextricably connected to social, cultural, political, economic, environmental and spiritual dimensions of wellbeing.

Within this background, nutrition occupies a central position as a core physical determinant of health, intimately connects to quality of life, emotional balance, and overall wellbeing. Nutrition does not function in isolation; it is interwoven with broader social and structural conditions, cultural food

practices, and collective relationships that shape health outcomes over the life course. Accordingly, this section reviews some selected Indigenous Pacific health and wellbeing models to showcase some relevant constructs to nutrition. beginning with an examination of the *Fonofale Model*.

The *Fonofale* model, by Fuimaono Karl Pulotu-Endemann (1984), promotes a holistic and culturally grounded view of health that symbolises the wholeness of a Pasifika wellbeing (Pulotu-Endemann, 2009; Teariki & Leau, 2024). Drawing on the metaphor of the *fale* (traditional Samoan house), the model symbolises the interconnected dimensions that constitute the wholeness of a person. The structural components of the *fale* (traditional house) - *falealuga* or roof, *pou* or posts, *fa'avae* or foundation and cocoon – represent key elements of the wellbeing that operate relationally rather than hierarchically.

Within this structure, the roof represents the cultures, recognising cultural values, beliefs, and practices as central determinants of health. The f*ale* has four pillars of well-being: spiritual, physical, psychological and other (comprising gender, employment, sexuality, age, etc.). The four posts not only connect the culture and the family but are also continuous and interactive with each other. While the foundation is the family (aiga) forming the basis of social organisations and collective well-being. The *fale* is encapsulated within dimensions of the environment, time socio political context, which exert both direct and indirect influences on health outcomes (Pulotu-Endemann, 2009).

The *Fonofale* Model provides a valuable concept through which understanding improved nutrition as a core component to health. Nutrition is situated within the physical post of the model but at the same time embedded within cultural knowledge systems, family structures, and community practices. Improved nutrition in rural communities enhances quality of life, emotional balance, and overall wellbeing, while communal food practices reinforces cultural identify and social cohesion. In this sense, the consumption of nutritious food is not solely related to individual health behavior but a collective practice grounded in Indigenous knowledge and relational responsibility.

Furthermore, local food systems are shaped by the same contextual dimensions that encapsulate the fale. Environmental disruptions – such as flooding or climate- related events – can undermine local food availability, strain community food systems, destabilise the interrelated pillars of wellbeing. As such, the Fonofale Model emphasises the vulnerability of Indigenous food systems to external disruptions while simultaneously highlighting the resilience rooted in cultural practices, community cooperation, and shared cultural knowledge. This holistic perspective reinforces the relevance of the Fonofale Model for analysing improved nutrition within rural Pasifika contexts. In addition, The *Fonofale* model is situated in its capacity to capture both vulnerability and the resilience rooted in community cooperation and shared knowledge. The model also emphasises empowering young single

rural women through community-centred, culturally ground interventions that enhance nutrition while reinforcing collective wellbeing and agency.

In comparison to the *Fonofale*, the *Te Whare Tapa Whā* model (Durie, 1994), a Māori practice framework, refers to health and wellbeing as a meeting house with four walls. The four walls are represented as an integrated system in which *taha wairua* or spiritual wellbeing, *taha hinengaro* or mental and emotional wellbeing, *taha tinana* or physical wellbeing and *taha whānau* or family and social wellbeing are mutually grounded, are all connected to the *whenua* or land which forms the foundation (Durie, 1994). This framework emphasises that wellbeing is not an individualised condition but emerges through balanced relationships among the rural people, land, and social structures. When all the aspects are in equilibrium, the people flourish and thrive. When one or more of the aspects is unbalanced the wellbeing of an individual is impacted (Durie, 2004b). In the same way, single mothers and individuals spiritual wellbeing, mental and emotional wellbeing, physical wellbeing or family and social wellbeing can be improved when they work collaboratively with family and community members on their land. When there is a disconnection or unstable relationship within the family of community, one or more of the aspects can be obstructed. From an empowerment view, *Te Whare Tapa Whā* model provides a view to understand how collaborative, land-practices can restore balance and enhance nutrition and wellbeing, which reinforces the significance of collective action and relational support systems in addressing social and nutrition inequalities in rural villages.

Another Pacific model, the Tokelauan *Te Vaka Atafaga* model, was created by Kupa (2009). *Te Vaka atafaga* is a model that uses the *vaka* (canoe) symbolises the process of journeying through the complexities of health and wellbeing. This model brings to fore the prominence of spiritual and environmental well-being. Hence, Kupa (2009) identifies the significant aspect of connecting to the environment, as in the Tokelauan connections to the weather, stars and the lagoon. In a similar way, the people of Gavuone and Ginigolo have closer relationship to the weather, stars and lagoon. The people read the weather patterns, the stars to gather their food sources. Furthermore, the *Te Vaka Atafaga* model combines four aspects physical, spiritual, mental and family that symbolises parts of the canoe. Kupa (2009) states that two aspects related to the Tokelauan culture were not included in the *Fonofale* model. The elements *fatu paepae* or welfare and *inati* or sharing were added to the *Te Vaka Atafaga* model to reflect the Tokelauan culture. According to Kupa (2009) *fatu paepae* is a "matriarchal title held by elder women responsible for overseeing the welfare of and care of the entire extended *aiga* or family. Elder women hold privileged leadership role and is very influential in key family decisions" (p.157). *Inati* is the system of sharing for the benefit of the family. Kupa (2009) also assimilates the model to the consequences of the rough weather, where the weather is rough, the wellbeing of the community will be affected.

The *Fonofale Model (*Fuimaono Karl Pulotu-Endemann, 1984), the *Te Whare Tapa Whā* model (Durie, 1994), and *Te Vaka Atafaga* model (Kupa (2009), articulate Indigenous understandings of health and wellbeing that are holistic, relational, and grounded in connections to land, environment, and collective responsibility. Across these frameworks, wellbeing arises through the interdependence of physical, spiritual, psychological, social, and environmental dimensions, challenging individualised and biomedical understandings of health.

Improved nutrition is positioned as a socially embedded and reciprocal process that both shapes and is shaped by wellbeing, mediated through family and extended kinship networks. Practices such as *inati* (Kupa, 2009), alongside equivalent concepts of *ve duru* (support) and *varevare* (sharing) (see chapter 6), illustrate Indigenous moral economies in which reciprocity and collective care govern food access and distribution. These aspects are active in rural villages where young mothers seek to gain support from extended relatives for cultural and social activities Accordingly, this research draws selectively on key constructs from these models to examine improved nutrition as inseparable from social relations, cultural practice, and environmental context in rural village life. Together, these Indigenous Pacific models provide a robust theoretical foundation for improved nutrition research and practice that is culturally anchored and for community empowerment interventions.

2.5 Conclusion

This chapter set out to explain the first two contextual framing parts of this thesis. I have used Indigenous knowledge as my main research framing because of the importance in Indigenous people knowing their ecological surroundings in informing food and nutrition. Indigenous people's connection to the land and environment enables them to improve their livelihoods. This chapter has analysed understandings of Indigenous knowledge and related these to nutrition. The core of the chapter looked at Indigenous people's food systems and how these relate to food and nutrition. Indigenous peoples, especially women and children, are affected disproportionately by malnutrition and diet-related problems. Therefore, this chapter has identified the need for an investigation of the structural conditions that underlie unequal access to resources and loss of traditional lifestyles. In addition, the chapter has highlighted the need for inclusive approaches that will shed light on issues affecting rural women's nutrition and enhance Indigenous knowledge and skills by providing strategies to leverage change.

This chapter has also shown the influences of colonialism and how the food systems of Indigenous people were altered and destroyed by colonial power-over structures. Colonialism has had a lasting

impression on Indigenous people's food systems. Indigenous knowledge determines cultural planning of events, health and nutrition and food preparation. Indigenous knowledge is embedded in local communities. Each is unique to a society or community. Indigenous knowledge shapes the livelihood choices and influences health. Indigenous knowledge also directs people to interpret concepts and ideas to understand the roles of men and women.

A deeper exploration of the respective historical, political, social, cultural, economic and environmental contexts is important when engaging with local communities and their use of food systems. Bridging Indigenous knowledge and Western research approaches, and collaboration between Indigenous and non-Indigenous ways of knowing can create new ways of knowing to address the challenges presented to our food systems and can guide Indigenous and Western researchers in food and nutrition. It is also important to understand how Indigenous people define their societies and the gender relations within them. This means that working with Indigenous people must be grounded in an approach where Indigenous people’s knowledge, and their associated ways of learning, creating, innovation and transmitting knowledge are given value and consideration, equal to or greater than other types of knowledge systems, including Western development concepts and science.

Chapter 3: Conceptualising community empowerment towards improving food and nutrition



Figure 3.1. Frond 2 (F 2) of the coconut leaf assimilates Community empowerment.
Source: Daniel Vagi (2023)

3.1 Introduction

This chapter explores community empowerment as one of the conceptualisations used for this research. There are three sections in this chapter. This chapter will first look at the principles and aspects of community empowerment. Then, empowerment in the context of improving food and nutrition will be explored. The last section will focus specifically on how women could be engaged in community empowerment with the aim to improve nutrition. This chapter stresses that when women are empowered politically, socially, and economically they will be more enabled to improve nutrition, nutrition related diseases and address the challenges of poverty. Therefore, women need to be given equal or fair access to resources in rural communities.

The chapter reiterates that the notion of community empowerment is significant in community development to improve nutrition. According to Ife (2009, p. 1) "community development is necessary if our human rights are to be fully realised. It is only in the community that we can achieve our full

humanity" (p. 1). Everyone has the right to access nutritious food, and equipping all community members with skills and knowledge to improve nutrition will provide a basis for the wellbeing of every individual. Kipuri (2009) states that Indigenous knowledge and rituals are embedded in community institutions and are inextricably linked to Indigenous people's identity (which was focused on in Chapter 2). The process of community development in rural settings is a bottom-up approach that seeks to validate traditional wisdom, knowledge and skills, and to identify and provide resources to eliminate malnutrition (Higgins, 2010; Ife, 2009). This chapter will explore the concepts of community empowerment, and the role of women in communities to improve food and nutrition, while weaving in the relevant Indigenous values and concepts throughout.

3.2 Understanding community empowerment

Community empowerment is an underlying principle in health promotion (Laverack & Labonte, 2000; Lemke & Delormier, 2017; Narayanan et al., 2022). To improve the livelihood of community members, it is important to define priorities, and support communities so that they can improve nutrition among their members. Community empowerment approaches can be used to create strategies and implementations to improve health and wellbeing, and minimise inequalities in communities (Laverack, 2006a; Narayanan et al., 2022). For women in rural communities, community empowerment is instrumental because women are usually incharge of nutrition (Heckert et al., 2019; Madzorera & Fawzi, 2020). The mechanisms through which women's empowerment can impact household nutrition are complex (Galiè et al., 2019). This section will first explain empowerment and will then deconstruct the term power.

By using my *Doi avatuani* 'weaving a basket' analogy, in this chapter I am comparing the analysis and aspects of empowerment and issues of power in community development, symbolised as Frond 2 (see Figure 3.1 above). This second frond, similar to the first one, is removed from the main coconut frond as the solid parts of the midrib are removed. In this analogy, the midrib stands for community empowerment and the process of re-negotiating power to gain more control. The midrib of the coconut frond is the thicker, and the stronger part that holds the leaves on both sides. In the same way that the midrib has to be dissected to create a basket, community empowerment requires sharing some parts of power between community members. Similar to the process of softening power by sharing it to create communities; for a baskt to be strong, the thicker parts of the rib are smoothed first. In communities, this process could be compared with people knowing their roles and working together to address challenges (the midrib). At the same time, the softer edge of the leaves is silted out leaving the stronger parts of leaves. This is so that the rim of the basket is flexible to weave at both ends forming an oval that represents community. Also, the softer edge of the leaves is removed so that the firm parts of the

leaves are stronger when weaved together. The process of refining the coconut fronds and leaves is associated with community empowerment, because the issues and challenges of empowered communities (as represented by the midrib and the softer parts of the leaves) can be solved when communities work collectively.

3.2.1 Explaining community and community development

Defining community is a complex proposition. As discussed by Tynan and Garbett (2007), a standardisation of the concept of community has been argued to be neither possible nor desirable, because of the complex variability of circumstances and socio-political environments in which communities are involved. Communities are described as incorporating complex affiliations of people, who do not always share a common identity. Differing and overlapping identities within community boundaries can vary over time (Tynan et al., 2013). Community members' identities may be based on age, gender, engagement in joint action, ethnicity, social ties, shared experiences, perspectives, expectations and interests and socio-economic status. Within the cultural context, communities are identified through relationships, social ties each member within the communities and neighbouring villages have and shared cultural practices which connects them.

Communities have aspects of collective and individual identity, which are the results of a web of relations based on sociocultural, historical, ideological, and economic characteristics and are not necessarily geographically defined, particularly where there are imbalances in resource availability, cultural heterogeneity, ethnic tensions, or itinerant populations (Tynan & Garbett, 2007). Ledwith (2011) states that community is a complex system of interrelationships interwoven across social differences, diverse histories and cultures, and the historical issues that have helped to shape the present. Phillips and Pittman (2009) define community with an emphasis on people living within geographically defined areas and who have social and psychological ties with each other and with the people where they live. Gorjestani (2001) and Ayala and Meier (2017) identify communities as groups of people sharing common interests and identities. My own understanding of community is captured in Ife's definition (2009, p. 11-12), where a community is referred to as social organisation, that has interconnecting features, as this definition fits well and is appropriate to the rural communities within which I have lived in PNG.

Community is related to the idea of collectiveness. In a community, people are implied to act together as a group. It is not just a collection of individuals; those individuals are part of a bigger picture. Membership is an important factor of communities as members agree to aims and goals of a community and are willing to contribute in some way or another (Ife, 2009). Community members know each other readily and this means that a community is not a large impersonalised and centralised structure. The

feeling of belonging is therefore important, and a community may provide a place where one is recognised and included. A community is built around commonality, a connection to a particular locality and it allows the expression of the culture. The varying views of these aspects all show that a community is relational and comprised of a group of people with similar identities, with common cultural understanding governed by their cultural customs, values and spirituality, who work collectively for a common goal and where members live in a geographical setting. Hence, these aspects resemble the cultural community members, where the members are connected through blood relationships and have cultural commonness in the community through which this study is situated.

There are varying definitions of community development, reflecting differing theoretical emphases and practical orientations. Ife (2010, p. 67) defines community development as an approach that validates knowledge, expertise and skills that already exists in the communities, emphasising local control over development process. This perspective highlights empowerment and self-determination as central principles. Similarly, Ani et al. (2018, p. 503) identify community development as a collaborative process which requires active engagement and participation from all parties including ministries, departments, government agencies, NGOs, the private sector and importantly, the active involvement and participation from community members who are going to plan, execute, and evaluate development initiatives.

While both definitions emphasise that development cannot be imposed and directed from above, and local ownership, Ani et al. (2018) advocates on inter-sectoral collaboration, suggesting a more structured and institutional approach compared to Ife's (2010) community-led and local orientation. Despite these differences, both authors concur that development cannot be imposed externally or directed from above but must be driven by community members through diverse ways of participation. The shared view emphasises a rejection of top down development models that have historically marginalised local voices.

The concept of community development is described as organic and multidimensional process that extends beyond economic growth including social, economic, political, cultural, environmental, and spiritual development (Ife, 2010, p. 67). However, Ife (2020) highlights that not all programs labelled as community development genuinely align with a holistic perspective, raising concerns about the superficial use of the term in policy and practice. This argument draws attention to the gap between theoretical ideals and practical implementation. In support of this holistic understanding, Kenny and Connors (2016) frame community development as a process grounded in the prinicples of empowerment, human rights, inclusion, social justice, self determination and collective action.

In combination, these perspectives suggest that community development is best understood not as a singular intervention but as an ongoing process in which communities collectively identiy and act upon issues that are significant to them. However, the literature also implies that achieving such an ideal requires meaningful participation rather than tokenistic involvment, highlighting the need for critical evaluation of how community development is practiced in different contexts, particulalry in Pacific Island countries.

Ideally, programs for community development would be directed by community members at each phase from determining issues, to choosing and executing actions, and assessments. Ife (2016) argues that such community directed processes foster empowerment by enabling individuals in the community to take part in community development initiatives, and members can increasingly recognise and challenge conditions and structures that have been leading to their disempowerment or have negatively impacted their well-being. This perspective aligns closely with an empowerment approach. A key strength of this approach is the explicit recognition of power relations and challenges to externally imposed initiatives.

Similarly, Laverack and Labonte (2000) advocate that community-focused development promotes its members to express and be empowered to participate in decision-making and to live to their full potential. The individual's contribution strengthens the argument that empowerment is not merely an outcome of development but a process through which communities gain control over decisions affecting their lives. This concurs with the concept of development according to the United Nations (UN) in their Development Programme (UNDP, 1990, p. 10) is described as a process of enlarging people's choices, which encompasses opportunities for being creative and productive. The inclusion of the UNDP perspective provides global credibility and reinforces the normative dimension of empowerment within development discourse.

Ackerman (2005) elaborates that people are active individuals in the political realm; therefore, they can query current issues and development interventions. They could also determine how power influences their lives, either positively or negatively. In considering the views alongside Ife (2010) and Kenny and Connors (2016), the literature consistently asserts that community members are experts in their own lives, and that local knowledge and values are vital to development. Furthermore, Kenny (2016) situates empowerment and collective action as the principal foundation of community development, emphasising power redistribution to deal with the sources of inequity and discrimination.

Despite these strengths, I believe the literature is mostly idealised. While authors assume that communities are able to work collectively and equitably, sometimes internal power dynamics related to gender, age or social status can be overlooked. This limitation becomes evident when considering groups such as young single mothers in rural villages, whose participation may be constrained by

entrenched cultural norms. While empowerment is emphasised conceptually, there is limited discussion on how empowerment processes can overcome socioeconomic, infrastructural, geographical, and cultural barriers in practice. The latter, cultural barriers, are a profound issue that hinders collective participation for young single mothers addressing their need for improved nutrition. The following section will focus on power and empowerment.

3.2.2 Deconstructing power

The notion of power redistribution in empowerment is contested (Ani et al., 2018; Ife, 2001; Pigg, 2002; Weidenstedt, 2016). Historically in most societies, cultural dynamics of power between men and women existed, where men held power over women, and which were understood as a magnitude of fear that if women gain power and agency, it will be at the loss of men's power (Kabeer, 1999; Kahn, 1984). Ife (2002, p. 53), however, argues that empowerment aims to increase the power of the disadvantaged without taking power away from others.

Power is usually defined behaviourally, as the ability of one actor individually or collectively, to affect the actions of another. Power is both dynamic and multidimensional, changing according to context, circumstance, and interest (VeneKlasen & Miller, 2002, p. 39). Its expressions and forms can range from domination and resistance to collaboration and transformation. There are two ways to conceptualise power (Ani et al., 2008, p.504). First, power can be denoted as the ability to take action. Second, power is referred to as something that can be owned by individuals or groups. Also, power can be considered as a set of affecting behaviours that are both social and individual (Pigg, 2002). Ife (2002) asserts that the process of empowerment is an effort to provide power to communities that lack power, due to being confined by social systems and structures. Power imbalance runs the risk of coercive relationships forming, where one partner or groups of individuals dominate decision-making or assert power in ways that prevent the disenfranchised achieving their desired development outcomes. In saying this, Rowlands (1995, p. 9) states that the ability of one person or group to influence another person or group to do something against their will is "zero sum" and that the more power one person has, the less another has. This form of power is exercised in many levels of a structure. Although, in some rural cultural settings, power can sometimes be restrictive within the social cultural systems, particularly when health and wellbeing of individuals, is a concern in the community. It is significant to understand these dynamics, as they highlight the need to move beyond hierarchical concepts of power and instead examine empowerment as a relational, contextual and transformative process. It is within this notion that the following section unpacks empowerment.

3.2.3 Unpacking empowerment

The literature offers a well-established conceptual foundation for understanding power through the lens of empowerment, drawing primarily on feminist and development oriented scholarship. Authors, such as Pigg (1999, 2002), Kabeer (1999, 2005), Rowlands (1995), Sen (1997) and Ani et al. (2017) collectively frame empowerment as a process, rather than a static outcome, which is one of the core of this body of work.

Empowerment involves the ability to make choices and entails a process of change from being without (sufficient) power to make choices towards having sufficient power to do so (Kabeer, 1999; Pigg, 2002). Pigg (1999) asserts that empowerment has two inter-related dimensions including resources and agency. Resources vary, some are individual characteristics such as skills and attitudes, while others are social and political such as networks of relationships (social capital). Some resources are material such as goods and finances to exchange for power resources. According to Kabeer (1999, pp. 437-438), resources are obtained through a multiplicity of social relationships regulated in different institutional frontiers. On the other hand, agency is the ability of people to define their goals and objectives and act upon them. It is more than observable actions that also encompasses the meaning, motivation and purpose that individuals bring to their activity, and their sense of agency. Kabeer (1999) associates agency with 'power within', which is represented in the manner of bargaining and negotiations, deception and manipulation, subversion and resistance, as well as more intangible, cognitive processes of reflection and analysis. This study accentuates that multiple mutual social relationships within the rural communities sometimes allow individuals to access resources for specific purposes. This acknowledges that marginalised individuals, such as rural young single mothers, may exercise agency in subtle, informal, and culturally constrained ways. This perspective is particularly valuable in rural and traditional contexts, where overt expressions of power may not be socially sanctioned.

While the role of social relationships in accessing resources is recognised, it tends to underestimate the exclusionary and disciplining nature of culture and tradition. This study observed that young single rural mothers may access resources through mutual social relationships, yet remain disempowered due to cultural status, exposes a tension. Social capital, often portrayed as empowering, can simultaneously function as a mechanism of surveillance, oral judgement, and exclusion.

Empowerment is seen not only as a philosophical perspective, but it is an "alive approach" that can be applied to increase well-being at the individual, organisation, and community levels (Ani et al., 2018, p. 503). Ani et al. (2018) utilise the empowerment approach to discuss issues in the community, such as poverty, health, or the situation of single mothers and disenfranchised people. Furthermore, Ani et al. (2018) contend that an empowerment approach can effectively resolve challenges by empowering

target individuals or groups to take effective actions through their capabilities and by developing their potential. According to Narayanan et al. (2022), an empowering approach to development locates people at the core of development, so that they are perceived as the most important resource rather than as the problem. Empowerment develops the skills and abilities of people to undertake future self-help programs through participation. Similarly, Kabeer (1999) explains empowerment as a "process of change, during which those who have been denied the ability to make strategic life choices acquire such an ability" (p. 437). Brandstetter et al. (2015) outline empowerment as a process by which people, organisations and communities gain mastery over their affairs. The authors project that individual or psychological empowerment has a positive impact on people's health and that empowered people engage in creating healthier environments. Consequently, empowerment can be seen as the expansion of assets and capabilities of people to participate in negotiating with influence and control, and that they can hold institutions that affect their lives accountable (Brandstetter et al., 2015; Kabeer, 1999).

If empowerment is at the heart of critical community practice, then power and its utilisation are at the core of empowerment (Ife, 2010). It is only through engaging with structures and processes of social, political, and economic power that communities can effectively work to confront the disadvantage, exclusion, and oppression that they experience (Holland & Rammohan, 2019; Ife, 2016; Laverack, 2006a; Luttrell et al., 2009). Rowlands (1995) asserts that the diverse perceptions of what constitutes power result in a variety of interpretations of empowerment. Like Ani et al. (2018), Rowlands also states that empowerment can be understood by investigating the root concept of power and absence of power, although even the root concept of power itself is understood and experienced in diverse ways by people. Nevertheless, an understanding of the construct of power is essential to deconstructing the concept of empowerment, as it provides the conceptual foundation on which community empowerment issues are constructed and enacted. The following section therefore turns to community empowerment, exploring how power is negotiated, organised and transformed within a rural community.

3.3 Community empowerment

The value of community empowerment has received considerable attention in many disciplines particularly as a result of the 1978 Alma Ata conference in Kazakhstan, where the Alma Ata declaration became a landmark in providing a direction for primary healthcare (Woodall et al., 2010). This was followed in 1973 by the oil price crisis, which brought into sharp relief the great economic disparities across the world. A succession of social reforms, including health, followed Alma Ata. The declaration advocates that...

> health is a fundamental human right and the attainment of the highest possible level of health is an important global social goal that requires the action of many social and economic sectors, not simply the health sector (Exworthy, 2008, p. 81)

The 1978 Alma Ata declaration emphasises the significance of involving the community in planning and implementing interventions that will improve the health of people.

To overcome malnutrition and improve nutrition in rural communities, a holistic approach and intervention is appropriate to enable communities to increase control over their lives (Ife, 2010; Woodall et al., 2010). Hence community nutrition is the procedure of assisting the individuals and communities improve their eating habits to prevent disease and promote health.

As elaborated above, community empowerment is mostly a process (Ife, 2010, Wood et al., 2010, Ife, 2010). Woodall et al. (2010) state that community empowerment is a series of actions which progressively contribute to more organised community led social action. The process begins with an individual's concerns about an issue, community empowerment begins with the development of small mutual groups, then community organisation, partnerships and subsequently groups of people taking political and social action to create social change through the redistribution of resources and power. In addition, Laverack (2006b) explains that community empowerment is a process that involves continual shifts in power relations between different individuals and social groups in society. The authors, Isfe (2010) and Laverack (2006) argue that people cannot be empowered by others; they can only empower themselves by acquiring more of power's different forms (Isfe, 2010, Laverack, 2006). It assumes that people are their own assets, and the role of the external agent is to be a catalyst and facilitator of the community in acquiring power. Furthermore, Babatunde et al. (2022) argue that individual empowerment cannot address inequalities and may not produce sufficient power or the resources required to influence political and social change. Communities become transformed when individuals who participate in changing them are empowered (Laverack & Labonte, 2000).

Then again, community empowerment is also an outcome (Laverack, 2006a), resources are redistributed to redress the causes of inequalities or a change of policy in favour of a group that work collectively to create change (Woodall et al., 2010). Therefore, the WHO (2024) states that community empowerment addresses the social, cultural, political and economic determinants that underpin health and people's immediate needs, such as improving access to recreational facilities (Laverick, 2006) and, seeks to build partnership with other sectors in finding solutions. Further, Laverack (2006a) explains that the forms of power can vary, for example, as a product of the redistribution of resources and decision-making authority ('power over') or as the achievement of an increased sense of self-determination and self-esteem ('power from within').

People gather resources while maintaining power over their processes within community-led development (Uvin, 2007). In development, people can take action to shift or impact existing power relationships in a community (International Human Rights Network, 2008; Jonsson & UNICEF, 2003; Kirkemann Boesen & Martin, 2007; World Bank & OECD, 2016; Worthen et al., 2010).

Community empowerment uses *participation* as a key tool because participating in decision-making allows individuals and communities to be involved in their own development. Moreover, people are entitled to the greatest extent of their ability to involve themselves actively and meaningfully in the community (Broberg & Sano, 2018; Ife, 2009; Kirkemann Boesen & Martin, 2007). Participation is meaningful when people contribute to decision-making processes on issues affecting their lives. D'Hollander et al. (2013) assert that participation promotes people's rights in the processes in sustaining community-driven development programs. Meaningful participation may guarantee the sustainability of projects by giving a sense of ownership in the process. Similarly, Ife (2009) articulates that participation is particularly meaningful when people have the skills to take care of the project after an intervention ends. Filmer-Wilson (2005) and Ife (2009) agree that participation in development processes becomes effective when local knowledge is utilised, accustomed to localised needs and preferences, when available resources are used, and when community members take ownership. In this way, the power structures shift, when people involved in planned projects empower the rights holders to control the planning process (Miller, 2010; World Bank & OECD, 2016). Participation across all parts of community life involves defining and formulating development policies and programmes. Ackerman (2005) clarifies that people participate in identifying their development goals by engaging in planning and implementing the projects to achieve those demands. Hence, there must be transparency in decision-making to achieve real participatory outcomes (Sano, 2000; United for Human Rights, 2008; Uvin, 2004).

Empowerment is an effective and most appropriate approach to alleviating poverty and health outcomes (Laverick, 2006, Reid, 2002). Reid (2002) argues that raising wages and income is insufficient to eliminate poverty but we must strive to change the paradigm and traditional beliefs of the community members as well as the local institutions. However, Mayo (2000) contests that empowerment in communities is achieved through a thorough understanding of how the community is made up culturally. There is a connection between Indigenous peoples and their environment from which local communities have been enabled to thrive over millennia (see Chapter 2). Furthermore, Brandstetter et al. (2015) contend that empowerment intervention needs to be adapted to local cultures and social contexts. Communities' understanding of the specific realities are prerequisite of their localities. The understanding of these realities will be important to achieve effective empowerment among members. Interventions should be organised in and around the local settings. Laverack (2006) states that empowerment interventions need to focus on building local capacity, resources, and structures towards

actions to ensure community ownership of the program. In addition, Reid (2002) proposes steps and processes when implementing the empowerment approach. (Reid, 2002). Reid (2002) suggests empowerment must be done in sequence: building hope, widespread participation, building a relationship with partners, creating vision, establishing a work plan, finding resources, creating success, and developing community capacity, adapting a strategic plan and development towards sustainability.

There may be empowerment programs provided by various institutions drawn to empower communities. According to Sulaiman et al. (2019) many program organisers fail to provide comprehensive and integrated or audit results of the training programs. Furthermore, monitoring and evaluation activities are often nonexistent. Nevertheless, Budi et al. (2013) argue that program implementation in communities is still poorly appreciated by the participants due to their lack of awareness that the realisation of program achievement has less than optimum results. In the following section, I will briefly highlight the concept of rural community empowerment and its significance to community empowerment approaches and models of wellbeing that are appropriate for the purposes of this thesis.

3.3.1 Rural community empowerment and wellbeing approaches

There is no universally preferred definition of what 'rural' means (Bennett et al., 2019; Coburn et al., 2007; Glendinning et al., 2003). For Coburn et al. (2007), rural areas are based on geographic characteristics and the population that may be characterised by low population density or socio-economic features. 'Rural' is also defined as a negative characteristic, in the sense of not being urban (where urban is more desirable in modernising and progressive development approaches). Rural areas are also identified by their geographical isolation and how the geography of a location separates people (Ford, 2023). In the case of PNG, the majority of people live in rural communities with limited infrastructure. Therefore, it is relevant to define what 'rural' means in relation to geographical and infrastructural features. Rural communities in PNG are mostly comprised of Indigenous people with common Indigenous knowledge (as discussed in Chapters 1 and 2). In PNG, rural areas are situated outside cities. Rural communities have limited access to infrastructure and services. Features of rural in the PNG context are described by Gibson and Rozelle (2003, p. 159)

> PNG's rural residents live many hours from the nearest basic social services, access to social service is still limited mainly because the road system is poorly maintained, highly fragmented in some areas, and frequently inaccessible during and after rain.

There is limited access to sufficient infrastructure and basic necessities as defining constraints shaping rural development contexts. In response, implementing rural community empowerment in a local context could increase the capacity when using local resources in creative ways (Brandstetter et al.,

2015; Gegeo, 1998). A range of approaches to empowerment have assumed an interest in rural community empowerment mostly focusing on empowering women (Laverack, 2006a; Narayanan et al., 2017) including a process of supporting rural communities to strengthen themselves and develop towards their full potential (Mikhailovich et al., 2016; Pamphilon & Mikhailovich, 2016; Pamphilon et al., 2014). For example, in some parts of rural Papua New Guinea, a community based nutrition program combined subsistence gardening with nutrition education for mothers, empowering women to improve household food security and sanitation while at the same time strengthening social support and confidence. Although, similar initiatives remain vulnerable to broader socioeconomic, cultural and infrastructural constraints that lie beyond the controls of rural communities themselves. Therefore, this study suggests empowerment as a locally driven practice and the influence of structural inequalities, emphasising the need for more, context-specific and long term analysis on empowerment outcomes.

3.4 Engaging women in community empowerment

This section will discuss women's empowerment as a key pathway to achieving the goal of alleviating poverty and improving food and nutrition. In the 1980s, women's empowerment became prominent in development discourse (Moser, 1989). Then in 2015, the UN Sustainable Development Goals (SDGs), specifically SDG 5 (Gender Equality) to empower all women and girls, promote women's empowerment. Since then, women's empowerment has gained global attention as critical for child nutrition (Santoso et al., 2019). However, in many countries gender inequality and discrimination curtail the economic contribution of half of the population (Narayanan et al., 2022). Singh and Jha (2024) argue that women's empowerment is considered a means to achieve important outcomes, including child nutritional status. The empowerment of women is a strategy to improve the household's food security and nutrition (Galiè et al., 2019; Van Den Bold et al., 2013). To achieve SDG 2, which looks at eliminating hunger, and SDG 3, which aims at good health and wellbeing, the UN recognises that women play a significant role in achieving these goals (UN Women, 2022).

Therefore, women's empowerment is an important aspect in development. Women are often the primary caretakers in a household. Intrahousehold dynamics, where interaction and actions between household members occur, determine allocations of resources and their impacts on individuals' wellbeing are increasingly a subject of analysis (Gupta et al., 2019). Research, in the context of empowerment and nutrition, has found that when women earn an income in their household, child and household nutrition are more likely to improve than when men earn an income (Gupta et al., 2019; UNICEF, 2017; Leight et al., 2025). For example, Santoso et al. (2019) and Meulen and Kassens (2018) argue that broadening the women's ability to make life choices is of important value. Also, Gupta et al. (2019) exemplify that

women's empowerment pathways can make an impact on household consumption as food producers and consumers. Furthermore, Meulen and Kassens (2018) advocate that women's ownership of assets and control over resources can influence the health of their children and the ability to purchase goods and services may improve children's health and wellbeing. Empowering women as part of nutrition-sensitive programs results in children with better nutritional outcomes (Heckert et al., 2019). Therefore, investing in women is beneficial for improving human capital formation, especially in terms of child nutrition, health, and education.

Indigenous women are knowledge holders of food biodiversity and are keystones of family nutrition (IFAD, 2022). However, in many cultures women often find themselves in a complex maze of power relations in which inequalities exist in work relations and in the communities. Hence, focusing on women, Van Den Bold et al. (2013) in their book *Women's Empowerment and Nutrition* argue that many development programs that aim to alleviate poverty and improve investments in human capital consider women's empowerment as a key pathway by which to achieve impact and often target women as their main beneficiaries. Indigenous women's informal affiliations in their villages represents a conventional avenue for insurance and mutual protection (Sarker, et., al. 2024; Imai & Eklund, 2008). Imai and Eklund (2008, p. 210) state that lack of support from government services, social protection and cultural membership in "friendly" societies may alleviate weaknesses among people in multifaceted risks. It is within local associations, such as sports teams and women's fellowship groups, that women are empowered and facilitate cooperative solutions towards improved livelihood systems. However, organising and training village mothers may attract educated men and women into leadership positions. Often these local powerful elites intervene and acquire the benefits that are earmarked for women (Imai & Eklund, 2008; Meulen & Kassens, 2018).

Women play a critical role in safeguarding their nutritional needs and those of their family members who come together (Madzorera & Fawzi, 2020). However, women also experience disempowerment and discrimination across a multitude of domains. Kuhnlein (2017) argues that a number of cultures today recognise women as the primary household head and community leader, with prominent relationships to food availability, food access and food utilisation. Consequently, women's empowerment needs to be addressed both individually and structurally. Van Den Bold et al. (2013) claim that there is an expansion in research on the relationship between women's empowerment and nutrition, particularly child nutrition. Hence, community empowerment is a core concept in health promotion theory and practice.

Women's empowerment is often related to women's abilities to make decisions and affect outcomes of importance to themselves and their families. Madzorera and Fawzi (2020) elaborate that women's empowerment addresses gender inequality in the context of lack of access and use of resources that

limit women's abilities to maximise their potential. Further, Santoso et al. (2019) state that it is important to understand the classifications of empowerment indicators relating to women. Therefore, Kabeer (2018) has proposed to classify the indicators of women's empowerment into three scopes, *resources*, *agency* and *achievements*. Firstly, Kabeer (2018) sees resources as materials, human and social resources and institutional environments that will allow one to make a decision. Examples within this domain include women's education, social capital, and asset ownership. Secondly, agency depicts critical thinking skills and the capacity to make independent decisions. Lastly, for Kabeer (2018), achievements are the outcomes of the practices of agency, and this is measured in terms of increased support for labour accessed in food production for consumption and to sell in the markets.

Women's empowerment is increasingly the focus of many development interventions as part of the quest to achieve gender equality (Van Den Bold et al., 2013). In this regard, Raji (2019) states that the crux of women's empowerment is the deployment of transformative agency by the beneficiaries so that it improves the ability of poor women to protect, challenge, and change patriarchal structures and unfair practices in a way that can be applied in everyday life either in community work or general development (Ani et al., 2018).

Women's lack of empowerment is a contributing factor in the persistent prevalence of undernutrition. Sethuraman (2008) posits that the underlying factors that most likely contribute to undernutrition through social-cultural pathways are gender inequality and women's lack of empowerment. For instance, in India, married adolescent girls are the least empowered members in their marital homes. Authors (Melesse, 2021; Sethuraman, 2008; Yang & Hanson, 2009), contend that increasing and enhancing women's education is one indicator of women's empowerment that can contribute to a reduction in the prevalence of being underweight.

Women's empowerment can improve when decision making powers over assets are enhanced. Madzorera and Fawzi (2020) contend that women need to be more involved in decision-making power over productive assets and the use of income from agriculture and off-farm employment to act on their nutrition knowledge. Because women, girls and children are susceptible to food insecurity, they can benefit from growing home gardens (Yang et al., 2009). If women's ownership of tools are enhanced (Melesse, 2021), women's ownership of agricultural and fishing tools contributes to improved nutritional status in children. Therefore, Madzorera & Fawzi, (2020, p. 1) argue that it is desirable for female farmers to be empowered because this can increase the control of production resources: land, improved seeds, technology for planting and harvesting, credit, training, and extension services. The authors also maintain that the proceeds from farming provide women an income to purchase food and other necessities. On the other hand, increasing women's productivity and income is inadequate to improve women's nutritional states.

Women are generally on an unequal playing field. Even though women's rights are human rights, women do often not have equal rights to participate in decision-making processes. For instance, in the rural villages in Central Java, Indonesia, women are unlikely to participate in decision making in the villages, harvest plans and empowerment programs (Sulaiman et al., 2019, p. 6). Consequently, Sulaiman et al. (2019) demonstrate that that discrimination or unequal gender status within development processes contribute to tangible material disadvantages, including loss of income, low productivity, poor nutrition and increased vulnerability to poverty. These outcomes emphasise how gender inequality is not merely a social concern but a structural determinant of development outcomes.

Women are also deprived of accessing community empowerment programs. Institutional roles and program implementation in most societies are still dominated by men depriving women of participation in the processes of decision-making (Sulaiman et al. 2019). Given this account, Madzorera and Fawzi (2020) and Sulaiman et al. (2019) agree that women's empowerment can address gender inequities in accessing and using resources that limit women's ability to maximise their potential. For example, Madzorera and Fawzi (2020) show that agricultural interventions can increase the work burden for women leading to energy deficits, with deleterious effects on women's nutrition. At the same time, agricultural interventions can affect women's time use, leaving insufficient time for childcare or rest is another lost opportunity for women unless family and community members support women.

Therefore, women's community empowerment intervention programs have often failed. Kabeer (2018) argues that even though there have been many intervention programs designed to improve women's economic abilities and results, these programs are failing to reach women. For instance, agricultural services that are executed by male workers circumvent women farmers or overlook the needs of the women (Sulaiman et al., 2019). Further, Kabeer (2010, 2018) states that even microcredit interventions are often insignificant since these can have little relevance to the lives of the people. Consequently, efforts to promote women's economic capabilities are only effective when programmes engage with women's needs, responsibilities and constraints, rather than assuming empowerment can be achieved through access to resources alone.

Valuable resources belonging to women are underutilised in rural communities as development programs are usually taken over by the male rural elite (Livingston, 2017; Kabeer, 2018). Madzorera and Fawzi (2020) state that men are part of the social fabric that dictate a woman's environment; involving them is critical to changing these norms. Roles that men can play include taking on childcare and household responsibilities. Village and community leaders, in many cases men, can change social norms restricting women's access to resources including land, inputs and technology that allow for higher yields. Therefore, engaging women in development processes and empowerment programs is a major way to improve nutrition (Pamphilon & Mikhailovich, 2016; Pamphilon et al., 2014; Pamphilon

et al., 2013). These notions emphasise the significance of community nutrition programs in rural communities that are gender-responsive, inclusive of men, and attentive to local power relations.

3.4.1 Community nutrition programs in rural communities

In the context of nutrition in rural communities, and as just explained above, the importance of equipping women to better nutrition is a crucial part of health and development (WHO, 2024). Better nutrition in the community relates to improved infant, child and maternal health, and stronger immune systems. People with adequate nutrition are more productive and can create opportunities to prevent poverty and hunger. However, the World Health Organisation (WHO, 2024) asserts that the developmental, economic, social, and medical impacts of the global burden of malnutrition are serious and lasting for individuals, their families and for communities (WHO, 2024). Therefore, community empowerment is a significant approach in efforts to improve nutrition (Laverack, 2008, Achmad, 2023). In this context, nutrition education is an effective intervention strategy in solving nutrition issues.

Nutrition education has had an impact on increasing participation in problem-solving (Amaliya and Mulyati, 2020). Several community empowerment plans can be implemented to address issues relating to nutrition including, nutrition counselling, skills training and enhancing women groups in rural communities. Nutrition education is a most effective form of reaching people (Amaliya & Mulyati, 2020). Another efficient strategy to improve nutrition that is based on local knowledge is community nutrition. Slanec (2023, n.p.) refers to community nutrition as one that provides fundamental knowledge to individuals and families regarding nutrition facts, eating habits, food security, and resources. Focusing on the community when addressing nutrition provides information and resources to the community to promote healthy lifestyles.

In this section, I will refer to community nutrition as promotion of good health by consuming good food and nutrients, to provide nourishment that improves health and wellbeing, and can be changed in practice by individuals, and collectively in rural communities and institutions. The goal of community nutrition is relevant to this research as it seems to improve and have positive health outcomes by educating individuals on healthy eating habits and proper nutrition (Slanec, 2023, Shantha & Shrimpton, 2017, Donini et al. 2017). Community-led programs are those coordinated by members, and leaders from within the communities (Hart et al., 2021, p. 3). For the purpose of this research, I extend this definition to include Indigenous knowledge by people from within communities to be involved in the development and implementation of community nutrition programs (referring to Chapter 2).

The relevance of community nutrition is interconnected to Indigenous people's food systems (IFAD, 2022). The International Fund for Agriculture Development (IFAD, 2022) states that food systems that

are based on Indigenous peoples' local knowledge have globally, in distinct environments, provided healthy diets. According to Indigenous perspectives, healthy diets comprise staple food locally harvested from the surroundings such as yams, taro, green leafy vegetables and fish (Eve, 2023; see also Chapter 6). Hence, understanding the features of Indigenous peoples' food systems can enable organisations and communities to develop local context nutrition intervention programs. Iese et al. (2023) contend that food sources and cultural and social practices are linked to food gathering and production. Therefore, the nutrition interventions in communities should be formulated with a more holistic understanding of Indigenous peoples' food systems (Iese et al., 2023; IFAD, 2022).

In Australia for instance, Hart et al. (2021) state that the efforts of previous government-led nutrition programs to improve nutrition had minimal impact on Indigenous communities. Despite the programs, there was a lack of government commitment to policy and program action such as inadequate funding, and a lack of consultation involving Indigenous peoples. In contrast, a successful nutrition intervention in Indigenous communities is exemplified by The Hunger Project in 2023, The Hunger Project, in their efforts to transform nutrition in Mexico, used Indigenous knowledge and worked with community partners to address the challenges. In working with communities, Indigenous farmers safeguard traditional practices and crops, preserving not only the biodiversity of their region but also their cultural and culinary significance. The connections of traditional food and food practices to culture and Indigenous communities and promoting traditional food and food practices through community nutrition-led programs, are significant solutions for Indigenous peoples that can be utilised by communities to improve and better nutrition, health, and well-being goals.

3.4.3. The implications to food and nutrition on women in Indigenous communities in PNG

Women are disproportionately affected by hunger worldwide and more than half of those who are undernourished are women (ECOSOC, 2007, para.14). The majority of those living in poverty are women (FAO and IFAD, 2009). The reasons for women being so badly affected are grounded in structural conditions where women have less access to resources such as land, agricultural inputs, credit, education extension, and other forms of institutional service. Such constraints not only undermine women's productive capacity but also exacerbate their vulnerability to food and nutrition insecurity. As the Food and Agricultural Organisation (FAO, 2016, p. xii) argues, women are more involved in labour and time-intensive chores, such as collecting water, firewood or other fuels, cooking, and taking care of children and sick people, and they increasingly carry the workload of agricultural tasks when men are migrating for work. These global structural patterns show a significant analytical lens for examining the specific implications of food and nutrition insecurity for women in Indigenous communities in

Papua New Guinea, where such gendered divisions of labour, limited access to resources, and socio-cultural norms intersect to mold women's food security and improved nutritional outcomes.

Land is often an unrecognised resource, and an issue that has a gendered dimension, underpinning food, environmental, and migration-related insecurities (FAO, 2016). Land is a resource dominated and accessed by men. Lemke and Delormier (2017a) argue that gender rights clash with traditional authority and customary laws that treat women as minor figures. Therefore, gender-based disparities in property rights transpire, for example women are less likely to have formal land titles. According to Escobar (1995), women are neglected, and women carry a large workload for which they get little reward, and they even often have no right, or frequently lose their rights, over their land. Such situations have led to local and global women's movements generated in order to locate women as visible actors in the development process. (Kabeer, 2008; Sen & Grown, 2013).

Despite these negative connotations, Indigenous women are the actual knowledge holders of food biodiversity and cornerstones for family nutrition. For example, women are key to knowing and preserving their traditional culinary that are transferred to the younger generation, possess extensive knowledge on edible plants and apply in agriculture, and understand soil conditions where they use to cultivate diverse native crop varieties. In addition, women are primary keepers of traditional seeds and related farming practices that contribute to biodiversity and food security. Therefore, Kuhnlein (2018) asserts that many Indigenous cultures recognise women as the primary household heads and community leaders who make decisions in relation to food availability, food access, and food utilisation. However, Ani et al. (2018), Lemke and Delormier (2017), and the International Fund for Agricultural Development (IFAD, 2022) in their Global Nutrition Report) agree that Indigenous women often find themselves working in a complicated power relations in which inequalities exist in work relationships and in their communities. Thus, continuing gender-based discrimination undermines their self-determination and women's rights, and negatively impacts their health, household nutritional status, and overall wellbeing. Discrimination also has consequences for the wellbeing of households and communities. However, there is a gap in grounded analyses that examine how indigenous women negotiate these constraints and strategically exercise agency within unequal power structures.

While the literature establishes Indigenous women as central to food biodiversity and wellbeing, there is limited engagement with the political economy of gender, power and coloniality. Therefore, addressing this gap requires analytical frameworks that can go beyond recognition of women's knowledge towards examining how power is redistributed with Indigenous food systems.

3.5 Conclusion

In this chapter understandings of different views on empowerment and concepts of nutrition and wellbeing were discussed. In the context of development, community empowerment occurs when people in a community demonstrate the ability to identify problems, obtain resources locally, improve skills and experiences, and implement, lead and mobilise all community members. The more community members, including the very marginalised, are involved in the community development process, the more likely they will actually be empowered.

Community empowerment can be achieved when community members master and control their living environment to improve nutrition, which is important to consider when focusing on rural communities in PNG. This chapter has layed a foundation for understanding that when young single rural mothers actively participate in enhancing their skills and developing their community, food and nutrition and livelihoods can also be improved in rural villages. As shown in this chapter, empowerment approaches are commonly used in line with other concepts, for example participation and including the disenfranchised in community. An empowerment approach, if it is used carefully and deliberately, can help to focus on inclusive thought, planning and action in development (Sulaiman et al., 2019). However, when it is used carelessly, deliberately vague, or sloganising, it risks becoming degraded and valueless (Madzorera & Fawzi, 2020; Narayanan et al., 2022).

Empowered women have a significant role in tackling nutrition issues faced in rural communities. Systematic and comprehensive efforts are required to enhance program effectiveness, to overcome challenges, and involve various related parties in achieving a desired outcome. It is equally important that governments and NGOs work collectively in building adequate infrastructures, adopting a suitable strategy and building effective coordination with a community. Indigenous communities often face strong challenges such as low levels of nutrition literacy and awareness, lack of access to resources, and gender imbalances. Therefore, continuous efforts are needed to increase public awareness about the importance of maintaining good nutrition.

This chapter also explored how empowerment is multi-dimensional, situational and context specific (Ife, 2010). The pursuit of greater empowerment of women is imperative for them to contribute to advancing universal health within their families and achieving sustainable development goals. In order to prevent negative effects for rural women, key actions for empowerment programs to document, mitigate against and refine interventions are suggested (Sulaiman et al., 2019). Community empowerment programs that aim to improve nutrition among community members must be inclusive of women. Cultural food practice and nutrition raises interest to explore more about the agency of

women in rural villages in PNG. The upcoming Chapter 4 will show how food and nutrition are addressed in PNG communities.

Chapter 4: Cultural food practices in Papua New Guinea



Figure 4.1 Frond 3 (F3) represents Cultural Food practices in Papua New Guinea
Source: Daniel Vagi (2023)

4.1 Introduction

This chapter analyses the contextual literature that considers how food is produced and what cultural practices are common in Central Province, PNG. The purpose of this chapter is to constitute a broader context for this study, and in this way, it continues and links with Chapter 1. This chapter will explain and outline the influence of colonisation that traversed the communities with introduced foreign food, *bagoga* (also see Chapter 6). Rural people have become reliant on introduced foods, especially when climate conditions destroy food from surrounding environments. This chapter will then explain the cultural systems that influence the activities of women in Central Province societies, and how those activities revolve around food and nutrition in rural villages. This chapter will also explain food and cultural food systems in Central Province and what women in communities do to improve nutrition. This chapter weaves the relevant local, Indigenous values of community empowerment, by focusing on programs for women in rural villages.

Referring again to my 'weaving the basket' analogy, this chapter is associated to the third frond (Figure 4.1), as this Chapter 4 explains the foundations of the aspects of cultural food systems in Central

Province, and how these were influenced by colonisation, which can be compared to the part of the basket where we lay out and refine the fronds to be suitable for weaving the food basket.

4.2 Overview of Central Province, Papua New Guinea

This section is leaning on some of the explanations that were presented in Chapter 1, which were mostly focused on a geographical overview. In this section, I will explain some more details about Central Province. Central Province is close to the capital Port Moresby and is connected by reasonable roads (see Figure 1.5). As was already mentioned earlier, Central Province has varying geographical challenges for social and economic development. Its proximity to the National Capital District has led to significant infrastructure development in the province, which has advantages and disadvantages. Generally, there is very weak service provision while the population depends on services for health, education, and communication. This lack of connection to services is particularly severe in the mountainous parts of the province as it puts pressure on families, especially women, and in the context of food security or financial security. Roads along the Magi highway are in poor condition making it difficult for farmers to travel into the city to access other services.

Agriculture is the most important activity carried out by people (Bourke, 2009). Engaging in farming fills rural people's lives in all aspects of their wellbeing. Indigenous people are living in rural villages. Their sustenance comes from local food crops and husbandry of domestic animals, and is supplemented by imported rice, wheat-based food, some meat and fish. The physical and economic environment is conducive for certain pockets of the population. Improved infrastructure such as roads for inland communities and bridges for coastal villages have linked the communities. Nevertheless, major road links for many communities in the province are lacking for most parts of Central Province. Given the challenges, which include the vast land areas, difficult terrains, and lack of infrastructure, difficulties are encountered.

Like in other parts of PNG, environmental factors, including heavy rainfall, severely constrain agriculture in villages (Bourke & Harwood, 2009). Central Province is primarily dry. It has a wet and dry season, wet from December to March and dry from April to October. The average rainfall for the province varies from 1000mm, on the coastal area near the capital Port Moresby, in the rain shadow of the Owen Staley mountains, to 5000mm each year at higher altitudes, the average temperature is between 26^{o} Celsius to 28^{o} Celsius (Allen & Bourke, 2000; Bourke, 2001). Cash crops are heavily dependent on seasonal effects (Allen et al., 2005; Imai & Eklund, 2008), but between May and November, no rainfall occurs. As a result, drought causes a persistent shortage of quality food (Rannells,

1995). Food supply is interrupted and reduces the quantity and quality of food, posing a threat to food security at the household level. According to Pham et al. (2021), Central Province has the highest food shortage, leading to wasting and stunting. Rural household wealth with effects on cash crops is linked with the consumption of good quality foods that can assist in alleviating nutrition deficiencies in the household.

The province is the location of the gas plant for the Exxon Mobil-led PNG Liquefied Natural Gas Project (LNG Project). Dairy farming is now partially replacing imports in Port Moresby and other parts of PNG. In August 2020, a mining lease was issued for the Central Cement and Lime Project, which involves quarry, plant site and a deep draft wharf. Recently, a Memorandum of Understanding (MoU) was formed to build a pathway for the rural Cocoa farmers in the Central province to be supported by the agricultural officers and build the infrastructure including fermenters and driers in the production locations (PNG Business News, 2023). Central Province offers diverse economic opportunities, including rice farming, cattle farming, dairy, rubber, cocoa, coffee, spice, fresh produce, fruits, coconuts, fisheries, forestry. Strategic location of Central Province provides access to economic opportunities from the nation's capital. The province supplies electricity and water to the capital city.

Central Province is a resource project area. A resource project area refers to a defined geographic area or land designation where resource extraction and associated development activities, such as oil and gas production, or logging, mining, are legally authorised and managed under relevant regulatory frameworks (Mancini et al, 2020). However, the development process is infringing upon the traditional lifestyle of rural communities. The province has some of the largest rubber plantations and rainforests. Rainforests are exploited for market production in that logs are harvested from the hinterlands and transported to overseas markets (Orere, 2020). Similar occurrences of economic development have disoriented the cultural and daily lives of rural villages. For example, in West Hiri, the PNG-Liquified Natural Gas (LNG) project (see Figure 1.3), an integrated development that commercialises PNG's gas resources, has caused environmental pollution, deforestation, water pollution and disturbances to social wellbeing (Bourke et al., 2019). Such activities exemplify modernisation, acculturation and continuous exploitation and infiltration of outside influences in the traditional rural settings. Hence, these factors emphasise the transitions that transform people's lives because of the economic development within the province.

Two villages were already explained in Chapter 1 as they were used as case study areas for this study. These Gavuone and Ginigolo villages are both located in the Central Province. Gavuone village is located in the Abau District, and Ginigolo village is located in the Rigo District (see Chapter 1, Figure 1.4). As this map that was presented in Chapter 1 has shown, Central Province is situated in the Southern Papua Region – one of the four regions of PNG. While growing up in the capital city, I saw development

and transformations taking effect in these villages that had an impact on the people. It is this perspective that I am taking when approaching this study that focuses on single women in rural villages of Gavuone and Ginigolo villages. The next section will discuss the changes that took place in the villages when Westernisation infiltrated the communities in Central province.

4.2.1 Colonisation and the implications of Westernisation in Central Province

People in the Central Province have had a significant amount of continuous contact with the outside world than those from other parts of PNG. European contact with the Central province dates back to 1606 and to early missionary activity (Fitzpatrick, 2011). In 1882, London Missionaries were deployed to Hula, Kerepunu and Aroma (where Gavuone village is located). In 1892, the Vatolata Training Centre in Tagana village (neighbouring village to Ginigolo village) for Papuan clergy was opened. Colonisation introduced new religions, spread capitalism and transformed societies and cultures (Campbell, 2015a; Englberger et al., 2007; Forsyth, 2011; Nalau et al., 2018). Before and after World War II, besides Tongan, Niuean and Fijian missionaries, Samoan missionaries lived intermittently in the Southern region (Milne Bay Province and Central Province), where they introduced a variety of taro still called 'Samoa'. For example, in the Gavuone and Ginigolo villages, a large yellow variety of banana is referred to as Samoa banana. One large yellow variety of banana, called 'Japan', was introduced by Japanese who occupied the Western tip of Misima Island, in Milne Bay Province (Lepowsky, 1985, p. 61).

The colonial period also unleashed a 'Westernisation package'. This was in relation to dietary habits, fragmentation of cultural foodways, systematic disempowerment that affects most people, and the dimensions of power (cultural, social, economic and political). Because of the proximity to National Capital District (See Chapter 1, Figure 1.3), Central Province people been at the epicentre of social change, dominating the social and economic life of Central Province. The rapid pace of modernisation and exposure of traditional communities to cash income has impacts on people's health. Consequently, Central Province has a high prevalence of nutrition-related diseases such as non-communicable disease (Patel et al., 1986), overweight and obesity (Pus et al., 2016). Also, climatic conditions contribute to food shortages in households (Nguyen. et al., 2021; Rarau et al., 2017; Vengiau, 2020). Hence, there is a high occurrence of nutrition-related diseases. Traditional forms of social organisation still play an important role in PNG's society and continue to be significant influences on the conduct of modern representative politics.

Globalisation also contributes to declining impacts in food systems in Central Province and elsewhere in PNG and other Pacific Island states. Food practices have either deteriorated or are extinct, a variety

of food crops are endangered, and sustainable food storage and preservation are not practiced (Campbell, 2015). In addition, resilient crops are exchanged, food eaten during famine have lost their significance in the face of disaster relief, traditional networks that were complex are now linear or are not in existence. Subsequently, imported food has taken precedence in urban areas as well as in rural communities (Haden, 2009; Johnson, 2017; Miller, 1947; The World Bank, 2014).

Dietary changes have involved the replacement of traditional food. The World Health Organisation (WHO, 2014), and Pollock (1986), have confirmed that changes in diet and local food environments are figured to be the cause factors for the rise in non-communicable diseases. As mentioned earlier, the nutrition transition from traditional food systems to dependence on imported foods has affected people's health. Most Papua New Guineans are now dependent on introduced food, especially processed items, for example, canned meats and fish, cooking oil, soft drink, sugar sweetened beverages and rice (Bottcher et al., 2019; Kittler et al., 2017). These are some of the main causes of non-communicable diseases in PNG and elsewhere. Hence, intervention programs must include traditional food systems to improve the situation.

4.2.2 Trading partnerships and nutrition transition in Central Province

The colonial influence on people and their long history with outsiders is a significant aspect contributing to this study's focus on local practices (see also Chapter 2). The history of the barter system illuminates the type of food used to trade with neighbouring villages. The barter system is a traditional method of exchange for services and goods (Kirch et al., 1991). Understanding gift exchange and ceremonial exchange practices is significant to recognise the cultural relationships of community members as a link to sharing food, an essential aspect to people's identities and their relationship with others. In reciprocation, relationships are created and sustained, and these are woven into social networks of obligations, and reciprocity (Sharp, 2016). Mediums of exchange among village people are mutually reinforcing and constituting. Close relatives are expected to share food, and equally, the act of sharing and eating together reinforces and creates stronger relational ties. Further, Sharp (2016, p. 78) states that the mode of exchange can set social boundaries, which may distinguish between those with whom one shares and those with whom one exchanges in ways other than sharing.

Exchange of items was practiced in the past that involved Motu people of Hiri district (see Chapter 1, Figure 1.3), who undertook trading expeditions in Motu trading canoes, called Lakatoi (see Figure 4.1), were carried by the southeast trade winds to villages bordering on the Gulf of Papua (Dutton, 1982). People have exchanged pots and arm-shells for sago and have obtained additional canoe hulls and food. The voyagers and traders returned home beginning of the year and March or later when the northwest

monsoon was blowing (Dutton, 1982; Oram, 1982). According to Lawrence (1998), the barter system and the trading partnership involved people across the Papuan hinterlands, coastline and fringing islands and the traders from the Torres Strait region who regularly travelled to the area.

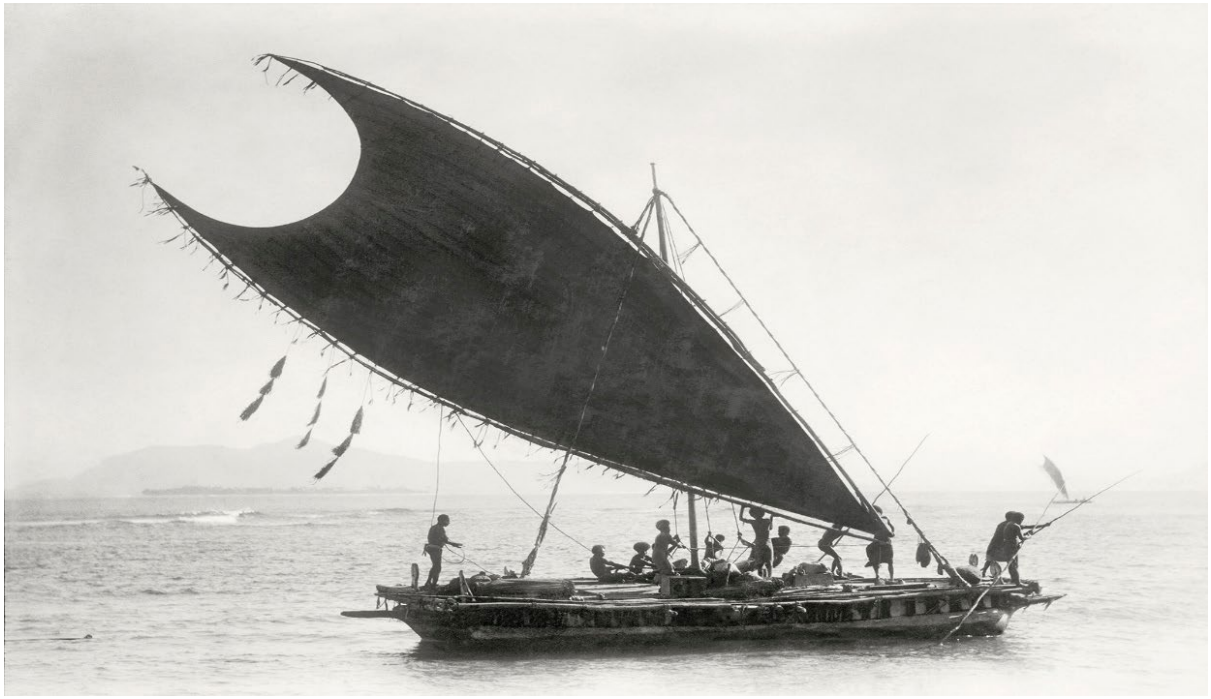


Figure 4.2 Image of lakatoi [hulled out] Orou under sail, Mailu, PNG, 1932
Source: McKay (2022) Photo by H. Bernatzik, courtesy of the Photoinstitut Bonartes, Austria.

The arrival of foreigners brought significant change, including goods and services, into Central Province. Food such as sago, taro, sweet potatoes, other vegetables and fish remain staple foods among the introduced rice and flour (Harding, 1994), and people have, over the years, traded goods and services in exchange for cash income. Also, children who were sent to boarding schools and colleges in PNG, were introduced to brown rice, wheat flour, tinned fish, corned meat and biscuits to supplement their diets while being away from home. Nowadays, people are moving from rural villages to better-off places, seeking access to markets for their produce and health and education services for their families (Bryant et al., 2005). As a result, the movement from rural villages to urban areas can sometimes contribute to nutrition transition in rural and urban communities.

This transition from rural to urban or vice versa has changed the population experiences in both quality and quantity of dietary behaviours and patterns (Rhazi and Garcia-Larsen (2020). Damman et al. (2008) elaborate on a nutrition transition as processes that involve changes in diet and changing patterns of work and leisure that have occurred with industrialisation, urbanisation, economic development, and the globalisation of markets (see also Chapter 2). Although, multiple government policies such as the *Nutrition Policy, National Health Plan 2021 – 2030*, and the education curriculum constructed by the

National Department of Education have contributed to improved nutrition (Agigio, 2010; National Department of Education, 2008a, 2008b, 2020; Norman & Mou Vagi, 2010). These plans that are implementing an organised framework by state obligations are, however, unregulated. For instance, the Department of Health does not have the system or the capacity to fully function as a Nutrition Department. Even though rural communities contribute to addressing the earlier nutrition transition towards transiting now to healthier practices, there is a need to address complexities by monitoring and evaluating the policies, such as nutrition programs, that run in the country and their effectiveness in delivering nutrition messages to rural villagers. People in rural villages have no control over policies or regulations that determine what a person should eat. Hearings on nutritional issues do not exist in the villages, for example, when discussing fortified food and the importation of lamb flaps from New Zealand. In saying this, there is an interconnection between globalisation, and Indigenous knowledge in maintaining a better understanding of the rural people's daily food consumption. The importation of food or introduced food such as tinned meat and frozen meat sold in the village stores contribute to the daily meals of rural people. Hence, understanding the interconnections between the introduced food and Indigenous knowledge of food and nutrition is a matter of concern and requires understandings on the implications of health and wellbeing of the rural people.

The rise in malnutrition is associated with a growing reliance on food imported to PNG (see details in Chapter 1), situating dietary change within broader processes of economic transition and globalisation. Ploeg (1985) argues that rural populations are predominantly subsistence-based, with rural livelihoods historically centred on Indigenous food systems. These farmers' labour productivity is low, which leads to low participation in the cash economy and restrains subsistence work. Therefore, local food production is inadequate to meet the food demands of the raising population in urban areas. Because local food production has become inadequate, food imports such as rice and flour have risen, making western food items more prominent and convenient. Food imports have increased significantly since 2000 (Schmidt & Fang, 2021)

PNG has become a large-scale food importer over the years (Ploeg, 1985) and whilst PNG has experienced positive GDP growth of 4.3% per year then more than 5% in the past five years (Schmidt & Fang, 2021, p. 2). The rising costs of food, transport, and basic services disproportionately affect rural household, particularly women, who are primarily responsible for food production, preparation and household nutrition. This inequality constraints wellbeing and limits the capacity of rural families to maintain nutritionally adequate diets on local foods.

The increase of food imports, particularly rice and flour, reflects not only consumer preference but also the marginalisation of Indigenous food systems through policy neglect, market incentives and infrastructural development. These food imports have become an important way to maintain food

security. As local food production becomes undervalued and under-supported, Indigenous crops and traditional dietary practices are displaced by imported foods that are often energy-dense but nutritionally inferior. Hence, the transition in diet has direct influence for malnutrition and emerging non-communicable diseases, undermining long-term community wellbeing.

Households in urban areas and rural villages both rely on rice for overall consumption. In 2022, the National Statistics Office (NSO) of PNG reported that rice was worth 160 million Kina the second most imported commodity for PNG. Schmidt and Fang (2021, p. 6) state that between 2012 -2016, agri-food imports including rice and flour comprised of 22% of total imports to maintain food security and support dietary diversity. Schmidt and Fang (2021, p. 11), indicate that high productivity and related household income contribute to consumption demand for higher value food, in PNG. When demand for protein sources increases with high income, demand also increases for pre-packaged meals containing higher saturated fat content. Also, PNG is the largest importer of ultra-processed food particularly sugar sweetened beverages in the Pacific (National Statistical Office, 2019; Schmidt et al., 2019; Schmidt et al., 2020). Even though food imports are necessary to meet demands of the growing populations, they are unregulated for consumption in PNG.

From a rural perspective, the shift towards imported foods represent more than a nutritional concern, it signifies a loss of autonomy, cultural identity, and resilience embedded within Indigenous food systems. The eradication of these systems diminishes social cohesion and weakens community capacity to respond to food insecurity. Therefore, malnutrition in PNG should be understood not as a failure of rural communities or women's practices, but as a structural outcome of development trajectories that privilege imported foods over Indigenous, knowledge, women's roles and locally grounded wellbeing. I believe that addressing malnutrition in PNG requires re-centering Indigenous food systems, recognising women's central roles in food and nutrition governance, and adopting approaches that challenge the political and economic forces driving dependence on imports. The next section will discuss food practices in Central Province, Papua New Guinea.

4.2.3 Nutrition transition and implications for Indigenous people

The impacts of colonisation and ensuing Westernisation have left an indelible mark in Global South countries in general, not least with respect to food (Damman et al., 2008; Iese et al., 2023; Iese et al., 2016). Damman et al. (2008) and Pollock (2009) state that transformations in diet, patterns of work and leisure have come with industrialisation, urbanisation, economic development, and globalisation. The authors regard these changes as nutrition transitions, and as contributing factors to non-communicable diseases (Damman et al., 2008; Pollock, 2009). Iese et al. (2023) discuss some implications that contribute to nutrition transition such as income disparities, persistent and rising poverty and changing

livelihoods. These are not limited to education and healthcare. Access to traditional foods is also limited by these nutrition transitions (Riches & Silvasti, 2014). Moreover, the impact of weather conditions and degradation of natural resources disproportionately affects the Indigenous population (Iese et al., 2017). Factors in weather conditions contributes to destruction of food sources and the rises in the cost of food. For instance, when a cyclone hits some parts of the country in Fiji, the other parts of the country that are not hit by the cyclone control the prices of local food if the same crops are grown uniformly. Similar cases are also sighted in rural villages in Gavuone and Ginigolo villages (See also Chapter 6) where the cost of food increases when the cost of transportation increases and roads are destroyed. Whereas in New Zealand and Australia cyclones have hit food producing areas and have raised the cost of food across the whole country. High food prices in rural and remote communities compromise food security even further (Silvati & Riches, 2014, p.195).

Modernisation and urbanisation coupled with changing perceptions of social norms in many societies influence food consumption. Damman et al. (2008) compare traditional foodways of Canadian Indigenous peoples and Western consumption patterns and identify that fast food, junk and snack food are regularly consumed as compared to traditional staple food, like yams, taro and breadfruit. In Central province, the traditional staple food is preserved for special occasions. Generally, the traditional village lifestyle of fishing and subsistence agriculture is now continuingly giving way to the promises of cash employment and an urban lifestyle (Iese et al, 2023; Damman et al, 2008). Stagnating job opportunities in rural areas and livelihood options in growing urban areas are key drivers for urban migration and cash employment. As a result, food habits have changed dramatically. With the introduction of imported food products, high-caloric rice and wheat products become more desirable than locally produced foods.

The food practices of many Pacific Islanders are adapting to an increasingly Western diet. Iese et al. (2023) state that food is driven by the status of cultural, economic, and developmental factors. For instance, educated people seem to buy unhealthier food and consume more processed food. There is a perception that eating fast food at McDonalds can only be afforded by people who have a job as a sign of achievement, a sign that one can afford to eat in a fast-food restaurant. Furthermore, Iese et al. (2023) explain that in Tuvalu, if one ate rice, they were regarded as having significant status as this was brought in by colonial masters. However, if one ate the local food, one was regarded as poor (Iese et al, 2023). In some Pacific cultures, if people eat taro, they are considered to be hardworking. Furthermore, the authors state that if one eats local food, they are regarded as possessing a lower status. In a presentation at the DevNet Symposium in 2023, Iese (2023) also mentioned that some foods, such as mutton flaps and turkey tails, have become a significant source of protein in some of the Pacific Islands. However, these would be seen as less desirable in the countries that produced them. Some foods, such as instant noodles, have become a cheap, convenient, and popular source of carbohydrates in many Pacific Island countries, but these are not necessarily very healthy, especially when compared to traditional foods.

A common statement in the Pacific, “I am not hungry, but I am food insecure” represents shifting realities of food systems and the triple burdens of malnutrition, weather conditions and food insecurity exacerbates many preexisting issues (Iese, 2023a). Albert et al. (2020) contend that external factors such as population growth, declining agriculture and fisheries productivity and global trade influence rural people to rely on imported foods. Iese (2023b) and Bhagtani et al. (2022) state that rural people are reliant on imported foods because the food systems have shifted in that they are no longer systems of food, but also new systems of cash or money flows, there is more emphasis on money rather than food. Even though rural people of the Pacific access food sources from the surrounding environment, Iese (2023) argues that it is imprecise to perceive that they are void of non-communicable diseases. The quality of food imported into Pacific countries has dropped dramatically for a long time and contributes to triple the burden.

Pacific Island countries are undergoing a significant dietary patterns characterised by a shift away from diverse Indigenous food systems toward increased consumption of imported, energy-dense, and ultra-processed foods. For example, in Samoa and Fiji, traditional diets centred on root crops, fresh fish, coconut, and leafy vegetables have slowly been displaced by rice, flour, sugar-sweetened beverages, and tinned fish, tinned meat, contributing to deteriorating diet quality and rising burdens of diet-related non-communicable disease (Snowdon et al., 2013; Thow et al., 2016; Bhagtani et al., 2023). Similar patterns are evident in Solomon Islands and Papua New Guinea, where subsistence gardening, foraging, and fishing systems remain central to rural livelihoods but are increasingly disrupted by climate variability, environmental degradation, and changing economic aspirations (Savage et al., 2020; Halliday et al., 2023).

Although food may be physically available in many rural Indigenous communities, access to nutritionally adequate, culturally appropriate, and stable diets is increasingly constrained. The Global Nutrition Report (2022) notes that there is an availability of food in rural villages, and adequate diet diversity and quality is possible. However, food supply is unstable and sensitive to disruptions caused by climate variability and change. Savage et al. (2020, p. 133) also found that a range of interrelated socio-economic and environmental factors influence food and nutrition insecurity, and the continuing processes of environmental change are a potential contributor to growing food security. The effects of environmental change, changes to ways of life, and dietary changes are not only affecting food and nutrition security, but also disrupting social relationships, culture, and spirituality, and threatening the social fabric of villages. Consequently, Kanua and Bourke (2022) and Stephenson and Lowagipo (2021) attest that improving food security can enhance the nutritional status of people living in rural villages. Rural people experience inadequate and unstable access to healthy, locally produced food leading to impaired diet quality and diversity (Kanua & Bourke, 2022). The disconnection highlights the distinction between food availability and food security, particularly in Indigenous contexts where

reliance on imported foods increases vulnerability to price instability and supply interruption (Global Nutrition Report, 2022; Kanua & Bourke, 2022).

For Indigenous people across Vanuatu, Solomon Islands, and Papua New Guinea, the nutrition transition has consequences that extend beyond outcomes. The erosion of customary food practices disrupts intergenerational knowledge transfer, weakens social and ceremonial food sharing networks, and alters spiritual relationships with land sea that underpins Indigenous wellbeing (Kanua & Bourke, 2022, Stephenson & Lowagipo, 2021). These impacts are gendered, as women bear primary responsibility for food production, preparation, and household nutrition, yet often have limited access to land, resources and agricultural extension services. Therefore, strengthening Indigenous food systems through climate-resilient strategies such as mixed cropping, crop diversification, and improved local food production represents not only a pathway to enhanced nutrition but also a mechanism for reinforcing cultural continuity, social cohesion, and women's livelihood within the ongoing nutrition transition (Kanua & Bourke, 2022; Kanua, Jinks, et al., 2016). The next section will explore what a nutrition transition means for women specifically.

4.3 Cultural food practices in Central Province, PNG

Women determine household food consumption in Papua New Guinea, shaping diets through what is harvested, culturally permitted, and prepared using locally embedded cooking practices. However, women's food decisions are constrained by cultural food taboos and gendered food-sharing norms including entrenched eating hierarchies such as men eating first and receive the largest or most valued portions of food (Raza, Amir, et al., 2020). Food in PNG is deeply embedded in social and cultural systems, with practices of planting and harvesting organised collectively and crops such as yams and bananas holding significant ceremonial values as symbols of strength, status, and social identity (Bourke & Allen, 2009; Pamphilon et al., 2014). Raza, et al. (2020) explain that different societies in PNG have significant cultural values and meanings for food that shape and reflect their values (see also Chapter 2). While women's labour sustains these culturally significant food systems, sometimes they derive limited social benefits from them, which reflects persistent gendered inequalities in access to food and resources. These practices illustrate how womanhood is socially constructed in relation to food, care, and sacrifice, positioning women as custodians of food security while simultaneously constraining their agency and nutritional wellbeing within Indigenous cultural contexts. Nevertheless, these cultural practices exemplify the gendered role of women in cultural societies where women are said to connect to food and appetite.

Food insecurity has increasingly become a threat in Central Province. Therefore, addressing food shortages and poor quality of food or lack of access in cultural contexts is important, as in other provinces in PNG (Global Nutrition, 2019). As explained earlier (see Chapter 1), healthy food contributes to prolonged life expectancies, improved quality of life and can be a vehicle for economic and social development. Poor food consumption exacerbates significant risk factors to poor health and disease. However, extreme environmental challenges have implications on food availability and are causing other challenges in PNG. Addressing the rising issue of unhealthy food consumption and improved meal may provide an opportunity to achieve other development goals of PNG. Therefore, it is important to identify the relationships between food, people and the ideologies of traditional food. Chen et al. (2024) and the PNG Government (2015, 2016) state that there is a need to recognise a system of integrated action toward improving nutrition. Undernourishment can decline in Central Province only when nutrition knowledge is disseminated. In this context, reductions in undernourishment in Central Province are unlikely without deliberate dissemination of nutrition knowledge that is culturally grounded, environmentally responsive, and embedded within broader development strategies.

Similar to other provinces in PNG, traditional foods play an important role and are significant elements in Central Province. Some authors (Goris et al., 2017; Gwatirisa et al., 2017; Jenkins & Heywood, 1984) discuss how people in Central Province are dependent on the staple foods that they produce through subsistence farming (Gwatirisa et al., 2017; Lepowsky, 1985), are culturally framed as essential for strength, health and productivity (Goris et al., 2017). Generally, some traditional foods come with restrictions, as they have historical meaning and are connected with ancestry rhetoric of where they came from. Customary dietary taboos may also govern different phases of the human life cycle and may relate to special occasions such as menstrual period, pregnancy, childbirth, lactation and in some traditional societies, preparation for the hunt, battle, wedding and funeral (Jenkins et al., 1984; Meyer-Rochow, 2009; Nihill, 2001). In Central Province, food production, preparation and consumption are thus deeply interwoven with cultural identity, social organisation, and ritual life, particularly evident during communal celebrations and cultural events. While these practices sustain cultural continuity, they also structure access to food in ways that may have implications for nutrition and equity, emphasising the need to critically engage with traditional food systems within contemporary discussions of food security and health.

Food production and consumption in Papua New Guinea are highly place-specific, with particular crops acquiring distinct cultural, economic and symbolic significance in different localities. In Central Province, yams and banana are important functioning not only as staple foods but also as commodities for trade, gift in social exchange, and resources for cultural festivities. In the Ginigolo village, one specific banana, called Rigo banana and commonly grown in the Rigo district, is used for cultural festivities (see more details presented in Chapter 6, and Figure 7.7). This exemplifies how specific food

varieties are embedded within local identity and ceremonial practice. Apart from the types of food that are grown, there are varied food taboos. As documented in the Trobriand Islands, for instance, Lepowsky (1985, p. 65) captured food taboos in Milne Bay province: [A] pregnant mother, eating too many fish is said to cause the woman to have a difficult delivery because the baby will grow too large. The mother of a first-born child may eat no fatty foods and no animal protein foods at all except for small clams, frequently boiled with wild greens, or freshwater crabs. For a subsequent child, most parental food taboos are lifted after three or four weeks, but no mother may eat European food (store-bought), or greasy foods such as crabs or pork until the baby is walking around. Violation of any of these taboos will cause illness in the child. These practices highlight the gendered nature of food systems in PNG, where women carry primary responsibility for safeguarding cultural continuity and child wellbeing, often through dietary self-restriction. Understanding these place-based food practices and taboos is therefore essential for critically engaging with nutrition, gender, and food security with Indigenous cultural contexts.

Some culturally embedded dietary taboos significantly restrict women's access to nutrient-dense foods during critical physiological stages, with implications for maternal and child nutrition. Fish, for example, is rich in protein, essential fatty acid, and micronutrients necessary for maternal health and the growing baby, yet its consumption is often limited by customary beliefs surrounding pregnancy and menstruation. Drawing on ethnographic evidence from Milne Bay Province, Meyer-Rochow (2009, p. 3) states how women are characterised as "sickly and runny" when menstruations are recurrent, and are not allowed from consuming fresh meat, ripe bananas and all fruits of the forest of red colour, based on the beliefs that such consumptions may disrupt ecological fertility or cause illness and death in others. These restrictions extend beyond diet to regulate women's social and spatial interactions with food, as menstruating women are discouraging from cooking or stepping over food to avoid harming those who consume it. While such taboos are culturally coherent within Indigenous cosmologies that link women's bodies to social, spiritual, and environmental balance (Meyer-Rochow, 2009; Leposky, 1985), the literature demonstrates a tension between cultural protection and nutritional risk. Women bear a disproportionate responsibility for maintaining moral and bodily order through self-restraint, often at the expense of their own nutritional wellbeing during periods of heightened biological needs (UNFPA, 2021; UNFPA, 2023). Therefore, engaging with these food taboos is essential to understanding how gendered belief systems shape nutrition outcomes in Indigenous contexts are undergoing environmental and dietary transition. Dietary beliefs and taboos in Central Province are similar to those documented in neighbouring regions such as Milne Bay, reflecting shared cultural and ecological boundaries that shape food practices.

Even though these abovementioned beliefs are culturally grounded, they often restrain women from consuming food that could provide good nutrition due to fears of adverse health and environmental

consequences (Meyer-Rochow, 2009). Such restrictions are in contrast to nutrition concepts and knowledge, which emphasise the importance of foods rich in protein, natural vitamins and minerals – particularly during pregnancy and child growth. These contradictions are especially acute in contexts where food options are limited. In parts of Central Province, fish constitutes the primary or only source of animal protein; prohibition of fish in the diet during pregnancy disadvantage women of a critical nutrient source (Wilson, 2015a). While people in rural villages may rely on staples such as taro, which is low in protein, which is enough for grown adults but is nutritionally inadequate for pregnant women and growing children. Concerns that consuming certain foods are forbidden may negatively affect future harvests and further reinforce dietary restraints (Meyer-Rochow, 2009), illustrating how women's bodies become sites through which ecological and moral order is regulated. These gendered taboos disproportionately disadvantage women's health, particularly in rural villages where alternatives are scarce. In addition to these constraints, food availability and meal preparations are highly sensitive to climatic variability, with frequent crop failures caused by prolonged rainfall, overcast conditions (in September – April, see Chapter 6), or drought (Goris et al., 2017). Furthermore, the literature highlights how culturally embedded food restrictions, when combined with environmental instability, strengthen women's nutritional vulnerability and emphasise the need for critically engaging traditional food knowledge within changing socio-ecological contexts.

Access to nutritious food in Papua New Guinea is generally adequate for many of the people in rural villages, except during periods of acute environmental stress, for example droughts (Gwatirisa et al., 2017; Wilson, 2015a). However, the ability to consistently consume nutritionally adequate meals remains problematic in many rural villages, where food choice is shaped by social, cultural, and structural constraints rather than availability alone. Whyte (2015); and Wiggins (2011) argue that education plays a critical role in enabling individuals to make informed food choices and prepare nutritionally balanced meals, suggesting that knowledge mediates dietary quality. Yet this emphasis on education risks overlooks the entrenched gender inequalities that shape intra-household food distribution. Wilson (2015a) asserts that gender inequality in cultures can influence food consumption. For instance, a father may consume most protein and receives the largest share during meals, while a mother and daughter receive the least or nothing after everyone else has been served. Further, Wilson (2015a) states that a male child may often receive little food as he may be involved in activities outside the home, whereas a female child may receive more as she is engaged in household chores and takes care of younger siblings. These patterns are culturally normalised yet produce uneven nutritional outcomes across gender and age groups. The literature suggests that food insecurity in rural PNG is not solely a function of individual knowledge deficits, but is embedded in gendered power relations within households. In this context, strengthening women's nutrition knowledge is necessary but not sufficient, while education can enable women to diversify and improve household diets (Waken & Paul, 2018),

its effectiveness depends on broader shifts in cultural norms and decision-making power that govern food allocation.

4.3.1 Occurrences of malnutrition in Papua New Guinea

Malnutrition and nutrition-related diseases remain persistent and contain unresolved challenges in Papua New Guinea, despite decades of policy attention and development intervention (Kanua, Bourke, et al., 2016; PNG Government, 2016; Schmidt et al., 2019). The burden of malnutrition is particularly widespread in rural communities, where livelihoods are highly dependent on subsistence agriculture and vulnerable to environmental variability (Siamiak & Emeto, 2017). While food scarcity contributes to undernutrition in some contexts, especially during climatic shocks, the literature suggests that malnutrition in rural PNG cannot be explained by availability alone. Limited dietary diversity, reliance on low protein staples, and gendered patterns of food distribution exacerbate nutritional deficit even in food-producing households (Kanua, Bourke, et al., 2016). Parental knowledge gaps regarding balanced diets further compound these challenges. Yet, framing malnutrition primarily as a problem of misunderstanding risks oversimplify its structural determinants. Persistent malnutrition reflects the interactions of ecological constraints, cultural food practices, and unequal access to nutrition within households, particularly affecting women and children. The continuing prevalence of undernutrition in PNG therefore signals not only food system fragility but also deeper socio-cultural and educational inequalities that shape what food is consumed, by whom, and with what nutritional consequences.

Empirical evidence from Papua New Guinea consistently demonstrates a strong association between parental education – particularly maternal education – and child nutrition outcomes. Research conducted in Madang and the Eastern Highlands, found that a high rate of children who suffered from malnutrition had caregivers who had no formal education (Wand et al. 2012, p. 1). The authors also identified that the occurrence of stunting was significantly higher among children who lived in the highlands (59%), compared to those who lived in coastal area (49%) (Wand et al., 2012, p. 228). In a similar context, Lagani et al. (2010) have argued that providing health services for adolescents is a key challenge because of poor school attendance. Their study showed an increase in neonatal mortality among teenage mothers, which underscores the need for action to improve knowledge of antenatal care, more coverage of female education, and improved nutrition. Similarly, Olita'a et al. (2014) further identify low maternal education, young maternal age, paternal unemployment, and low paternal education as compounded risks factors for child malnutrition. While these studies underscore education as a critical determinant of nutritional status, they also reveal the intergenerational and structural nature of malnutrition in PNG. Maternal education is associated not only with improved feeding practices – such as longer breastfeeding duration among mothers with at least primary education (Wand et al., 2012) – but also with enhanced health-seeking behavior and childcare practices (Lagani et al., 2010;

Samiak and Emeto, 2017). However, these benefits are constrained by PNG's lowest literacy rate in the Pacific (Asia Pacific Report, 2023). The PNG literacy rate between 2000 and 2024, shows data for current adult literacy figures as relatively low, with approximately 65% for male literacy and 58% for females (Countryeconomy, 2024, para. 1). In addition, many female children enrolled in education seldom complete their schooling at primary or secondary levels. This means that community education programs on maternal health and nutrition, even if incorporated in school curriculums in PNG, do not reach rural people (Schmidt & Fang, 2021). Even though nutrition is offered in the school curriculum, when students are unable to complete their education, nutrition concepts are often not learnt (Devete-Chee, 2021; National Department of Education, 2006; Vagi & Salley, 2017). Consequently, the literature suggests that persistent malnutrition in PNG reflects not simply individual knowledge deficits, but cumulative effects of educational exclusion, geographic inequality, and weak transmission of nutrition knowledge across generations.

Malnutrition in Papua New Guinea cannot be understood as a biomedical condition but must be situated within the environmental, social, and cultural contexts that shape people's lives and food practices (Aipit et al., 2014; Goris et al., 2017; Pham et al., 2021; Pus et al., 2016; Rarau et al., 2017; Schmidt & Fang, 2021). Anthropological studies have identified that nutritional related diseases are caused by culturally embedded food restrictions and broader socio-economic positioning that governs access to resources (Jenkins & Heywood, 1984; Jenkins et al., 1984). In rural PNG, high rates of malnutrition are consistently associated with the interaction of climatic stress, subsistence-based livelihoods, and food taboos that constrain dietary diversity, particularly for women and children. These intersecting factors highlight that malnutrition is produced through layered environmental and cultural processes rather than isolated individual behaviours.

This section has shown, how addressing malnutrition requires community-centred and holistic responses that recognise Indigenous food systems while engaging critically with the conditions that reproduce nutritional vulnerability (Waken & Paul, 2018). For PNG to make meaningful progress towards SDGs 2 (Zero Hunger) and 3 (Good Health and Well-being), coordinated and systematic approaches across agriculture, health and education are essential. Such collaboration must move beyond fragmented interventions toward integrated strategies that strengthen food systems, address social inequalities, and embedded nutrition within broader community-driven development efforts.

4.3.2 Risks of climate change on food production in Papua New Guinea

Climate change is a global phenomenon with profound implications for food security, yet its effects are unevenly experienced across Papua New Guinea due to diverse ecological zones, livelihood systems,

and levels of infrastructure. The impacts of climate variability differ markedly between provinces, shaping local capacities to produce, access, and afford nutritious food. In PNG, climate stressors such as prolonged droughts and recurrent flooding, have emerged as significant drivers of food insecurity by disrupting subsistence agriculture, destroying food gardens, and undermining local food supply chains (PCADMIN PNG, 2019; Wilson, 2015b).These environmental shocks are further compounded by challenges of physical access and rising food costs, which constrain the availability of healthy food, particularly in remote and rural areas (ABC News, 2024). As a result, climate change exacerbates existing nutritional vulnerabilities by interacting with geographical isolation, market dependence, and weak transport and distribution systems. Understanding climate change as a structural force shaping food environments is therefore critical for analysing contemporary patterns of food insecurity in PNG and for developing context-specific responses that strengthen resilience across provinces.

Central Province has a long history of climate-related shocks, particularly recurrent droughts and flooding, which have over time undermined subsistence food production, market functioning, and population health. These climatic events damage food gardens, reduce yields of staple crops, and disrupt transport routes, thereby constraining both household food availability and access to markets, and heightening food insecurity among already vulnerable communities (PCADMIN PNG, 2019, see also Chapters 6 and 7). Access to quality food and nutrition are inclusive human rights that capture individuals' nutritional aspects to living healthy active lives. As Azétsop and Joy (2013) argue, access to equitable and appropriate food is dependent on cultural norms and values and social, political and economic factors. Similarly, Burchi and De Muro (2016) emphasise that the nutritional status depends not only on the quantity and quality of food consumed, but also on the strength of local health and support systems, which are often weakened following climate induced disruptions. In Central Province, the risks posed by climate change thus extend beyond immediate crop loss to erode the broader systems that sustain food production, distribution, and nutritional wellbeing. Addressing food insecurity in this context requires recognising climate change as structural driver of nutritional risks and strengthening adaptive capacity within food, health, and governance systems to protect livelihoods and nutrition outcomes in rural villages.

Food security is widely recognised as foundational to achieving adequate nutrition and preventing hunger; however, the two concepts are distinct rather than interchangeable (FAO, 1999; Ghatas, 2014). Food security refers to stable access to sufficient food, whereas nutrition encompasses the quality, diversity, and utilisation of that food within social and biological contexts. Kent (2005) contends that addressing food insecurity requires strengthening household entitlements, particularly by enhancing the capacity to produce food or generate income for food purchase. While this entitlement-based approach usefully shifts attention from aggregate food supply to access and agency, it risks underestimating structural constraints that shape entitlements unevenly across regions and populations. In Papua New

Guinea, food security outcomes vary distinctly by geography, livelihood systems, and socio-economic conditions. Yet food insecurity remains a pervasive development challenge, mirroring trends across other Pacific Island countries (Davila et al., 2021). This persistence highlights that improving food availability or purchasing power alone is insufficient to address malnutrition in PNG, where environmental vulnerability, cultural food practices, limited service provision, and inequality intersects to constrain both access to food and its nutritional adequacy. A more nuanced approach is therefore required – one that situates food security within broader social, cultural, and political contexts and recognises that improved nutrition depends not only on entitlements, but also on food quality, stability, and utilisation within households.

In order to maintain optimal nutritional status, there must be an understanding of the meaning of food security as the essence of the definition that refers to requirement for nutritious food that must include not only sufficient quantities of food, but also sufficient quality (as mentioned earlier). The World Food Summit in 2009, organised by the Food and Agriculture Organisation (FAO) of the United Nations in Rome, Italy, has defined food security as occurring when…

> all people, at all times have physical, social and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Ghatas, 2014, p. 2).

Moreover, Chilton et al. (2009, p. 1204) imply that the absence of food security is a state of food *insecurity*, as it strikes at multiple levels: individuals, households, community and nationwide. Food insecurity has multiple impacts ranging from a protein or micronutrient deficiency that has severe health consequences to milder forms that affect attention and cognitive ability. According to Chilton and Rose (2009), food insecurity is considered an outcome of social and economic processes that lead to a lack of access to food. However, Chilton and Rose (2009, p. 2) argue that the absence of any aspects of the above, including cultural acceptability of food, and stability of food availability, access or utilisation results in food insecurity.

Climate risks in PNG have direct challenging effects on food security and health and these have hostile effects on livelihoods (Finkel, 2018; Gwatirisa et al., 2017). Most of the people living in rural villages in Central Province, as mentioned above, depend entirely on their subsistence food products and consume food that is produced, and caught from fishing and income (Davila et al., 2021). Some authors (Gibson & Rozelle, 2003; Gwatirisa et al., 2017), state that climate hazards in PNG include changes in rainfall and temperature patterns that affect access to local nutritious food. It is the vulnerability to climatic conditions that has an impact on food production in the villages (see Chapter 7). When food production is impacted, the dependence on imported processed food increases. The climate change

related droughts, and floods in Central Province contribute to poor harvest and consequently to poverty, hunger, and diseases (Bourke, 2001). For example, in 2015 and 2016, when an El Niño weather pattern hit the country (Bourke et al., 2016), many people lost their relatives to extreme hunger and increased incidents of disease (Finkel, 2018). Even though PNG as a whole may produce enough food for the population within the society, some people may not have enough access to food – especially during difficult climatic events.

Climate conditions contribute to a lack of access to food products and impose a challenge on the harvest yield which can determine consumption patterns (Siamiak & Emeto, 2017). For instance, Gwatirisa et al. (2017) and Dundon (2004) observed that climate changes such as draught or heavy rain seasons changes the meal patterns of rural people in PNG, where meals might be skipped during the day to stretch limited resources. Under normal circumstances, villagers are able to consume three meals a day – breakfast, lunch, and then evening meals. Drastic climatic conditions have an impact on food gardens in rural villages and therefore people in rural villages often would not have adequate meals.

4.3.3 The significance of nutrition education in PNG

As was briefly introduced above, illiteracy and lack of education is often associated with poor nutrition in Papua New Guinea. Wafia (2020) claims that many people in rural communities are illiterate and do not connect the relationship between nutrition and their children's growth development and the effects on the learning abilities of the children. Siamiak and Emeto (2017) state that the nutritional status of children is a major predictor of child survival. Hence, children require adequate food to grow and develop appropriately. At least three or four meals a day is recommended for growing children. However, if parents are illiterate, there is a tendency to misunderstand the foundation for having a balanced diet, which exacerbates the problem. Olita'a et al. (2014) have identified that children in Papua New Guinea fed less than three meals per day and were significantly malnourished, and there is a need to teach mothers about the need for children to eat regular meals.

The significance of nutrition education is echoed in research that calls for improved nutrition globally (Goris et al., 2018; Gwatirisa et al., 2017; Hinton, 2009; King & Nicholas Mascie-Taylor, 2002; Nguyen. et al., 2021; Pamphilon et al., 2014). However, the effectiveness of nutrition education is uneven, particularly among populations experiencing financial hardship. Rustad and Smith (2013), contend that people living in financial hardships are unable to access the knowledge and skills required to change their diets and other unhealthy behaviour. Low-income status is shown to be associated with lack of educational resources, and learning how to incorporate nutritious foods into a family budget may be challenging. Rustad and Smith (2013) suggested that nutrition intervention education among low-income women can change their connections to the ability of purchasing nutritious foods. These

authors' findings point to the significance of adult education as a tool to increase favourable nutrition and health behaviours in this population. Chen et al. (2024) have analysed health and nutrition programs in PNG. The authors identified four enablers of nutrition promotion programs: community involvement, cultural appropriateness, and strong leadership. Two main barriers were identified, which comprised of: limited resources and funding, and lack of central leadership to drive ongoing implementations. However, most of the health promotion programs in PNG have focused on delivering education to increase awareness of infectious disease and reduce the non-communicable diseases (Chen et al., 2024). Chen et al. (2024, p. 42) argue that health and nutrition promotion programs should aim at preventative lifestyle health behaviours and non-communicable diseases (NCDs) for individuals and communities. Although national policy frameworks, including the National Health Plan, and their *Healthy Islands 2021–2023* document, recognise health promotion that is inclusive of nutrition promotion as it prioritises strategies for preventing and reducing the morbidity and mortality of non-communicable diseases (Government of PNG, 2021), the translation of policy into practice remains constrained, particularly in rural areas. Therefore, while nutrition education is widely acknowledged as significant, meaningful improvements in nutrition outcomes in PNG require increase resourcing and a more holistic, culturally grounded approach that extends beyond awareness-raising to address structural, education, and access-related barriers to healthy eating.

Children require adequate food to grow and develop well. Paul and Waken's (2018) research, in Bougainville, peri-urban areas of Port Moresby, and rural areas in Central Province, titled *Behavioural research for better nutrition in Papua New Guinea*, found that people in Central Province were consuming more of their traditional staple food than those in other provinces. Many vegetables high in micro-nutrients were replaced by store bought foods. Waken and Paul (2018) have utilised a three food groups diagram (see Figure 4.3 below) to categorise food consumed in Pacific Island communities in their research. According to the South Pacific Commission Public Health Division (SPC, 2002), these guidelines provide an illustration to eat healthy and to promote and protect Pacific people's health. These guidelines are still used across PNG schools and hospitals. The food group broadly categorises food found in rural villages to enable the people to recognise the types of healthy food they can consume.

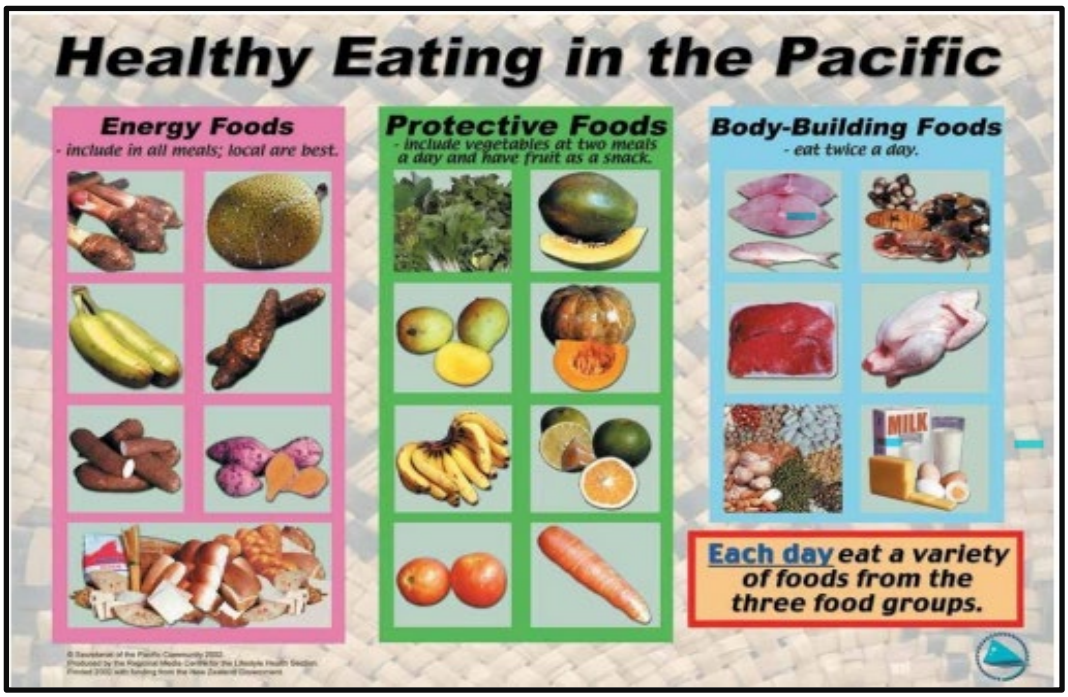


Figure 4.3: Three food groups for healthy eating in the Pacific
Source: SPC (2002)

Unfortunately, this kind of useful nutrition knowledge does not often reach the large proportion of people who live in rural areas of PNG. In the following section, I will discuss the role of women and their participation or non-participation in nutrition projects in rural villages.

4.4. Projects to improve nutrition in PNG

Efforts to address malnutrition in PNG have increasingly been pursued through nutrition-focused projects implemented by government, non-government organisations, and development partners. These initiatives show growing recognition that malnutrition is not only a problem of food availability, but is shaped by gendered roles, household dynamics, education, and broader socio-economic and environmental conditions (Goris et al., 2018; Gwatirisa et al., 2017). However, the effectiveness of nutrition projects remains uneven, particularly in rural villages where women play a central role in food production and caregiving yet have limited control over resources and decision-making (Pamphilon et al., 2014; Raza, et al., 2020). For example, Meulen and Kassens (2018) contend that enhancing women's income generating capacity and enabling them to own assets enhances their decision-making powers and control over household resources. Thus, enhancing women's control over financial resources can improve their wellbeing as they are able to purchase goods and services This section examines nutrition

projects in PNG, with attention to how organisations engage with rural women's roles, address family and community constraints, and contribute to improved nutrition outcomes.

Education targeted at mothers through formal or informal institutions is showing to play a significant role in improving community nutrition, in the contexts where women hold primary responsibility for child feeding and household food preparation (Waken & Paul, 2018). Meulen and Kassens (2018) argue that if women are taught skills to recognise signs of malnutrition, screen vital symptoms and diagnose malnutrition, and understanding its underlying causes, this knowledge can drive behaviour that seeks to find community level solutions to improve nutrition. However, external agents and donors tend to disregard the demand of assisting mothers to diagnose types of malnutrition, learn causes of malnutrition, and seek local solutions to remedy malnutrition (Meulen & Kassens, 2018). Enhancing women's knowledge is essential to, for example, improve the capabilities of women's associations, their resources and knowledge to improve nutrition. So far, PNG government-supported national women's organisations have not necessarily served rural women's grassroots associations and church-initiated groups well (which will be further explored in Chapter 8). This gap contains the effectiveness and sustainability of nutrition interventions, as women remain positioned as recipients of knowledge rather than active participants in addressing malnutrition. Therefore, strengthening nutrition projects to focus on enhancing women's skills and local agency is essential for translating education into meaningful and sustained nutrition improvements.

Dissemination of nutrition knowledge in rural villages of PNG is lacking, particularly among women who have had little or no access to formal education. Chen et al. (2024, p. 39) found that PNG has fewer health and nutrition promotion programs for non-communicable disease compared to other Pacific countries such as Fiji, where initiatives like the *Healthy Youth Healthy Communities* project have successfully targeted adolescents obesity through integrated nutrition and physical activity intervention (Waqa et al., 2013). In PNG, the gap in nutrition education is especially evident among rural women. Kuzma's (2013) study in rural villages in PNG, titled *Knowledge, attitude and practice related to infant feeding among women in rural Papua New Guinea,* found that nutrition promotion should be targeted to the large proportion of women who miss out on formal education. Even though rural mothers breastfeed their babies exclusively, women lack the knowledge between bottle feeding and the benefits of breast feeding. This reflects exclusion rather than individual failure, as many rural women are illiterate or have missed formal schooling altogether (see also Chapters 6 and 7). Hence, Kuzma (2013) explains that infant feeding should be captured early in the PNG Education curriculum as most rural mothers are illiterate or have missed out on formal education (see Chapter 1). In this context, Schmidt and Fang (2021) advocate that nutrition education programs should be delivered to a wider population and not be limited to primary and secondary aged children and across the country. In contrast, the National Department of Education (NDoE) devised a comprehensive nutrition curriculum that can be

delivered to students from elementary to tertiary students. As a result, women who are no longer within education systems – yet remain central to household nutrition – are largely excluded from formal nutrition learning. This emphasises the need for nutrition projects in PNG to prioritise community-based, women-focused education strategies that address structural barriers to knowledge access and strengthen rural women's capacity to improve nutrition for themselves and their families.

Multidimensional approaches, isolated to improving nutrition, have been reported in different provinces in PNG. For instance, one project was funded by Water for Women (WaterAid, 2023) and worked with women from seven villages in East Sepik Province by training and installing vital infrastructure, soap making initiatives and gender equality, and providing opportunities for women to earn an income. This program equipped women with skills to earn an income by producing soap products and maintain cleanliness within the village. Successful projects relevant to food security, agriculture and economy, such as described by Pamphilon et al. (2014), have seen tangible outcomes among families. Pamphilon and Mikhailovich (2019) also conducted a project aimed at training women smallholder vegetable producers to improve women's business knowledge and practices in Central Province, East New Britain and Western Highlands Provinces. Skills taught in their project to enhance women's ability as vegetable producers are essential to equip rural mothers, especially if coupled with Waken's and Paul's (2018) notion to teach rural women prepare nutritious meals using local food is important to improve the wellbeing of women and the community. These projects exemplify that improvements in nutrition in PNG depends on integrated approaches that simultaneously strengthen women's productive roles, economic empowerment, and integrate nutrition knowledge, rather than isolated organisational interventions, and incorporate local food systems, and that nutrition projects are locally embedded, nutrition projects designed to link women's cultural and women's productive roles.

4.4.1 The role of rural Indigenous women participating in nutrition projects in Central Province



Figure 4.4: Frond 4 (F4) is related to the role and need of empowerment of Indigenous women
Source: Daniel Vagi (2023)

The multiple role of women within the community and in households can be related to in Figure 4.4. that shows that the fourth frond, symbolising Indigenous women's participation and empowerment towards improving nutrition in rural villages, is essential to community empowerment in these villages. Each leaf in Frond 4 can be associated to different roles women do, and their roles and the decisions they make that have effects on the wellbeing of their family and the community.

Indigenous women play a pivotal yet structurally constrained position within households and community nutrition systems. Women are recognised as gatekeepers of culture (Ayala and Meier, 2017), and critical players in food security (Jonnson, 1996), usually exercising responsibility for household food production, preparation, and distribution. In addition, women have control over what to produce at the household level. Nevertheless, their contributions are often undervalued within broader social economics, and political structures. Drawing on Indigenous perspectives from Aotearoa New Zealand, Wilton (2024) argues that women's empowerment should be understood through culturally grounded and relational frameworks that acknowledge Indigenous knowledges, cultural identity, collective wellbeing, and community leadership. Children's nutritional status depends on how women fare within existing power relations and resource control of their villages. While Indigenous women's culturally prescribed roles as the caregivers of children situates them at the centre of nutrition practices, and existing forms of 'power over' that restrict women and their decision making autonomy, which directly impacts on what children consume. Mikhailovich et al. (2016) asserts that Indigenous women are the key to food production. Depending on how their roles are located in a community, women's involvement can enhance nutrition throughout their families, which is contingent upon women's labour, knowledge,

and authority are socially recognised and supported within the community. However, Indigenous women are often not empowered, and instead are culturally stereotyped within social stratification and gendered roles within their communities, even though they are the ones who toil the land using resources to provide for their families, clans, and tribes (see Chapter 2).

The perfect path to acquiring adequate nutrition for all is the full realisation of Indigenous women's empowerment, and supporting women's roles in food production and preparation and in healthy nutrition. Indigenous women are critical players in their cultures as they provide food and health care to their families. Only empowered women with access to education and decision making may be able to access and provide good nutrition (Kent, 2002; Kuhnlein, 2013). Moreover, Indigenous women are active agents in development; therefore, they need the support from government and other statutory bodies to work toward achieving effective standards for promoting food and nutrition security and ensuring better health outcomes for their families. Yet, women are often neglected socioculturally. The FAO (2015), Kuhnlein (2017), and Santoso et al. (2019) also indicate that women have special nutritional susceptibilities such as vitamin A and iron-deficiency anaemia, which are prevalent among women. Hence, Indigenous women need attention to what can be done, not only as farmers and caretakers but as policymakers, and agents of change to help end malnutrition (Kent, 2002, p. 44).

Better-educated women have greater decision-making abilities and could participate more in their communities. They would then also be better able to adopt appropriate feeding practices and care for their children. For example, Holland and Rammohan (2019) explore the relationships between agriculture and its impact on children's food and nutrition security in rural Bangladesh, by focusing on how women interpret the magnitude of empowerment in agriculture into strategic choices that influence their children's nutritional status. They identified that empowering women with accruing agricultural knowledge plays a significant role in reducing child stunting rates. Similarly, Pamphilon et al. (2014) piloted agriculture projects in East New Britain, Western Highlands, Bougainville and New Ireland provinces in PNG, and Waken and Paul (2018) conducted a project on behavioural change for better nutrition in Central Province. Collectively, these studies found that in assisting family's agricultural work as farm business has enabled families to improve their livelihoods including their nutritional status. However, these gains remain uneven and structurally constrained. Pamphilon et al. (2014, p. 729), contend that rural women smallholder farmers in PNG want to learn more, and need to have access to increase opportunities in decision making, yet such opportunities are overlooked. Sociocultural norms continue to deter women from attending training, where training is conducted outside village settings and caregiving responsibilities are not accommodated. As a result, men are prioritised to attend the programs instead, reinforcing gendered power relations – an issue that has directed implications for improved nutrition outcomes for young rural women in Indigenous communities in PNG.

Despite women holding significant responsibilities within household systems, women often face challenges in accessing resources, decision-making authority, and leadership opportunities. Consolidating women's agency therefore necessitates not only cultivating access to resources but recognising and supporting culturally embedded forms of leadership, participation, and collective empowerment that enable women to influence decision affecting household and nutrition in the community (Wilton, 2024).

4.4.2 The role of women in patrilineal communities in Central Province

In Central Province, clans form the major unit of social organisations within village communities. Like most provinces across PNG, Central Province is a patrilineal society where descent is traced through the male line. Central Province patriarchal societies mean that men have higher status than women. Although some provinces of PNG, such as the Milne Bay, Bougainville, and East New Britain, are formally matrilineal societies that trace descent through the female line, although they remain male-dominated, emphasising that lineage systems alone do not determine gender equity. Within Central Province's patriarchal forms of social structure, there are families and individuals within clans that hold rights over gardens and cultivated trees, while local kin groups hold corporate title to the land (Harwood & Bourke, 2009; Koian, 2010). Inheritance is passed down from the male lineage but decision making authority is concentrated among men. These arrangements define division of labour, whereby men are responsible for land clearing and governance, while women undertake the labour-intensive task of planting, harvesting and food preparation (Cahn & Liu, 2008). Despite the women's control over land, women play important roles in food-crop production and animal husbandry for contribution to cultural events, reciprocity and also sometimes for cash (Bourke & Harwood, 2009; Cahn & Liu, 2008). This structural contradiction – where women sustain food systems yet lack authority over land and resources – has significant implications for food security and nutrition in patrilineal rural communities, particularly as women's capacity to influence crop choice food allocation, and dietary remains constrained by male dominated decision making. Understanding women's roles within these patrilineal systems, particularly in rural villages, is therefore critical for analysing nutrition outcomes and designing interventions that address both gendered labour and power relations in Central Province.

Customary land in Central Province and elsewhere in PNG holds important subsistence and cash crop value, forming the foundation of household food production and income generation (Koian, 2010). In patrilineal societies such as those in Central Province, land ownership and inheritance are transferred through male lineage, rendering women's access to land contingent on their marital status and relationships with male kin. Where a woman's husband holds land rights, she may gain use rights that enable garden production and, in some cases, income generation for household needs. In the case of a

single mother, or a mother separated from male kin, the patrilineal land tenure system can significantly constrain access to productive land, limiting their capacity to cultivate sufficient food and increase vulnerability to food insecurity. These gendered land relations show how women's nutritional wellbeing and household food security are structurally shaped by customary tenure arrangements rather than individual effort alone. From this point of view, women's central role in food production stands in contrast to their limited control over land and resources, emphasising the ways patrilineal systems reproduce gendered inequalities that directly affect women's livelihoods, dietary adequacy, and resilience within rural communities.

Tackling malnutrition involves the general empowerment of women in all aspects of the community (see Chapter 3). Enhancing women's access to resources and knowledge in their communities is necessary because women have more responsibility for their family's nutrition than men (Kent, 2005; Raza et al., 2020; Van Esterik, 1999). However, as Broberg and Sano (2018) argue that the nature of political regimes as well as cultural institutional factors may significantly influence the implementation of agricultural program conducted in villages. Evidence suggests that when women from the same cultural contexts are organised to get together in collective learning exchange, can nurture the dynamic and potentially empower women to improve nutrition (Pamphilon et al., 2014). This shows that women's empowerment and improved nutrition are closely intertwined, but only when interventions are culturally grounded and address the structural constraints imposed by patrilineal social organisation.

Women are power machines to subsistence gardening, primary food producers, and homemakers in many rural villages, yet their labour often occurs within structures that limit access to resources and decision-making power. Indigenous women play significant roles as cultural custodians, leaders, advocates and community builders (Wilton, 2024). Thus, identifying types of resources available within a cultural setting, and those who control the types of resources used, is significant especially in the context of food production and when having to tackle malnutrition. As Kent (2005), Van Esterik (1999) and Raza et al. (2020) argue, improved access to resources, knowledge, and decision-making authority enhance nutrition and health outcomes. So should their participation in development and improved nutrition should be supported in various ways that respect local traditions and community priorities (Wilton, 2024). Without addressing the need for women's empowerment and stronger recognition of their contributions in rural settings adequate nutrition for their families remains constrained. Strengthening women's access to and control over resources is therefore not only a matter of equity, but a necessary condition for reducing malnutrition and improving food security in rural and patrilineal contexts.

4.5 Conclusion

This chapter has explained cultural practices in Central Province, and the influence of climate conditions on food systems in this area. This chapter has also explained women's roles associated with nutrition in rural villages, and has discussed the importance of nutrition awareness and education in Central Province.

This chapter has shown that rural women play key roles as Indigenous knowledge holders and food providers in Indigenous people's food systems. Therefore, harnessing and enhancing Indigenous knowledge about food and nutrition will highlight the role women play. Introduced food is not a favourite among rural people, food that is accessible in the villages has cultural significance. However, the option to buy food is essential to supplement local food when villages are affected by weather changes. Some of the cultural taboos may hinder women and children from consuming nutritious food. The literature has shown that nutrition can be improved when the roles of women toward improving nutrition is recognised. This chapter has identified that by enhancing women's knowledge and skills and improving their economic capabilities, they are more enabled to provide nutritious meals for their families.

The next chapter will explore the research methodology and methods utilised to collect the experiences of the rural villagers in Gavuone and Ginigolo in Central Province.

Chapter 5: Research Methodology: Weaving the baskets – doi avatuani



Weaving the left rim Weaving the right rim

Figure 5.1: The process of weaving and enhancing the rims.
Source: Daniel Vagi (2023)

5.1 Introduction

This chapter explains the methodology and methods used for this research. This study has enabled me as a researcher who is Indigenous to PNG to be selective and engage with two diversified Indigenous societies with different worldviews, knowledge and values. As an Indigenous scholar, fieldwork has also enabled me to uncover rich Indigenous knowledge that makes up the structures of the two rural villages that have been the focus of this study. I was guided by the values, rituals and customs that people have shared with me (see Chapter 1, where I have explained my positionality as a woman originating from Central Province and an Indigenous Papua New Guinean).

This chapter will introduce the overarching research methodology, as it captures the different stages and activities of data collection that has guided me as a researcher (Creswell & Creswell, 2018). Also, the research framework that refers to my research plan and has shaped and guided the research process will

be explained (Ravitch & Riggan, 2016; Stake, 2010). A plan is useful as it supports a researcher in articulating relevant research questions (Ravitch & Riggan, 2016). Furthermore, the methodological framework locates this study within multiple approaches: a qualitative methodological approach was used in combination with Indigenous methodology, mostly by attending *tamei guluagulua*, which is an Indigenous term that describes inviting a person to converse or talk over matters of concern. Applying *tamei guluagulua* as a method is appropriate. I am familiar with this style of conversations that can be used in both informal and formal meetings with people. O'Leary (2017) suggested that a suitable research methodology can provide an optimum chance to contribute new knowledge and add findings to the current knowledge base. New research findings can play a critical role in contributing to problem resolution.

The analogue of *doi avatuani*[11] – weaving the food basket – also can be used here to describe the process of this research. Women in rural villages meander through the bushes to get to their coconut plantations, where they climb a coconut tree (or sometimes their young children climb up) to collect the leaves that become the materials used for the food basket. Similarly, this study demonstrates the opportunities, limitations, and experiences, emotions, and celebrations that are collected together when listening to the women's narratives. The support from which relationships are strengthened, and cultural values are ignited is also part of the process. The above Figure 5.1 relates to the beginning of weaving the basket and enhancing the rims of the basket. Similarly, *Tamei guluagulua* as a method has guided my engagement with participants and has often made me reflect on my positionality in the community, where I have spent time either with my husband or without him. While in the villages, I was drawing on my husband John's established relationships in the rural villages, and the elders' relationships, when selecting participants. *Tamei guluagulua* were conducted in places beside the seaside when the weather was in good condition, and without time limit. Leaving these sessions open was suitable. Using *tamei guluagulua* is reflective of the society's culture.

There are five parts to this chapter. The first two sections explain the methodology and how these relate to methods and strategies implemented in this study and how *tamei guluagulua* is brought to the fore. This includes explanations on how *tamei guluagulua* was executed within a familiar cultural context, followed by transparency about the position I had in the field. Then, the ethical process involved for gaining clearance from different organisations in PNG and the Massey University's ethical processes are described. The last section looks at the fieldwork data collection and articulates the processes that

[11] *Doi avatuani* literally refers to I am weaving the food basket.

were utilised to access and collect data during fieldwork. This chapter will also describe the thematic analysis that was utilised to analyse the data.

5.2 Methodology: Weaving the basket with qualitative and Indigenous approaches

This study is situated within the socio-cultural context of Papua New Guinea, where knowledge is relational, collective, and embedded in kinship, customary authority, and connect to food and nutrition, and environment. Western research methodologies were not employed in this study because they are founded on epistemological and ontological assumptions that conflict with Indigenous ways of knowing and limit the cultural validity of research conducted in Indigenous Pacific contexts. Furthermore, Western methodologies would risk epistemic misrepresentation and power imbalances. Therefore, this study aligns its research practices with the cultural integrity and meaningful knowledge production and adopts an approach that is culturally valid, and ethically grounded. Western methodologies are not rejected but are used selectively and purposefully as complementary tools to support systematic analysis, reflexivity, and scholarly communication. By grounding the research in an Indigenous cultural framework and drawing on Western methods where appropriate, the study achieves epistemological coherence, cultural integrity, and academic credibility within the Papua New Guinea and Pacific context.

The methods in this study are intersected within a qualitative methodological and an Indigenous knowledge approach. In particular, the context specific *tamei guluagulua* method*,* a form of informal discussion, is utilised. For the issues affecting nutrition in young women in rural villages to be addressed effectively, it was important to listen to these young women and be open for new concepts that could be drawn from their ancient ways of knowing, as Aluli-Meyer (2013) suggested. Smith (2021) explained that “Indigenous methodologies tend to approach cultural protocols, values and behaviours as an integral part of methodology” (p. 5). A qualitative methodology that leans strongly on Indigenous knowledge encapsulates these values in research and allows the research to collect and identify rich data (Denzin & Lincoln, 2018; O'Leary, 2017; Scheyvens, 2014; Yin, 2015), which has a focus on the experiences of people as a means to understand the social world (Stewart-Withers et al., 2014). Also, qualitative research situates an observer in the location (Denzin & Lincoln, 2018, p. 3), and clarifies human experiences as they appear in people’s lives (Polkinghorne, 2005).

This study utilised these combined approaches to gather and weave data from Indigenous communities to study people and their surroundings. As mentioned in Chapter 3, communities are more than a

physical space where people engage with knowledge, it is a site where researchers may contextualise ways of knowing together with their participants (Aluli-Meyer, 2013). Indigenous knowledge is diverse and embraces local traditional knowledge that comes from a community. Weaving qualitative research with Indigenous knowledge was therefore useful in this study, and data was collected through several methods: *tamei guluagulua*, focus groups, participant observations, and fieldwork diaries. These methods of social inquiry emphasise drawing rich and meaningful data from participants' experiences, while they also recognised the broader social and political factors.

This approach also locates my positionality in this research and my awareness that my positionality affects participants, who construct their own realities and bring in their own knowledge to the research experience (Beins, 2018; Creswell & Creswell, 2018; Lincoln & Guba, 1985; Merriam & Grenier, 2019; Silverman, 2017; Stake, 2010). All knowledge is relative, historically and culturally specific, and embedded in power relationships (Burr, 2003; Stewart-Withers et al. 2014). Indigenous research methodologies describe a range of principles and values developed by Indigenous peoples themselves in response to their own unique ways of being, ways of thinking, and ways of doing (Gegeo, 1998; Sillitoe, 2006; Thaman, 2006). Indigenous people have their own distinct beliefs about what knowledge is and what knowing entails (Aluli-Meyer, 2013, p. 135). According to Waiko (1986), Indigenous modes of communication often conflict with Western forms of communication. Also, Smith (2021, p. 42) critiques dominant Western discourses of knowledge, which come with a set of values, conceptualisations of time, space, gender relations, forms of language and structures of power. In the same way, when entering a cultural space, even as an Indigenous researcher, I was consciously aware of taboos when discussing sensitive issues with women in the presence of men. Women felt comfortable discussing issues that mattered most to them when these were talked about confidentially. Or vice versa, it was inappropriate for me to talk to men or be seen alone as a new widow still in mourning. For this reason, my relatives followed me to places I entered, they guided and supported me. Therefore, it is important to acknowledge these Indigenous forms of communication, including verbal and non-formal, as they are inextricably interwoven, by drawing on in-depth knowledge from participants (Gegeo, 1998; N'Drower, 2020; Smith, 2021; Waiko, 1986). How one person experiences the world may differ from another. These interpretations matter.

5.2.1 The use of tamei guluagulua in comparison to yumi tok stori

When Indigenous ways of knowing are appropriated or misunderstood, more damage and harm can occur (Smith, 2021; Waldrip & Taylor, 1999). So, from this perspective, I determined that a quality communicative relationship was required to be established with the local people. Although I initially planned to use *tok stori* as a method for this research, there are conflicting views on the term because there are variations in Tok Pisin across Melanesia. Tok stori is a tok Pisin phrase, literally translated as

"talk story" or "tell a story", and means story. This can also be said for "tok bokis", literally translated as talk box and means parable or idioms. In the PNG Tok Pisin context, the term tok stori is a verb when used alone. Although some authors (de la Torre Parra, 2021; Sanga et al., 2018) claim that tok stori is a process of storying, unless a pronoun such as *mi* [I], *yu* [you], *yumi* [we or us, me and you] or *oli* [they] are inserted, it lacks the form of discursive, relational mode of communication and orality in PNG. Y*umi tok stori* extends an invitation to communicate and is inclusive in drawing people together and becomes useful formally or informally either one-on-one or in group communications. However, this study utilised *tamei guluagulua*, an Indigenous and local Central Province context specific method to extend an invitation to the participants to communicate their lived experiences.

This move to *tamei guluagulua* began when participants who were invited to the data collection location to *tok stori*, responded, "What do you mean by "*tok stori*?". At that instant, I was taken aback and realised that an incorrect terminology was used in Ginigolo and Gavuone villages, and I reverted to using the more appropriate local term – "*tamei guluagulua*". *Tamei guluagulua* means "let us talk" or "let us converse" in the *Ikolu* language in Central province where the fieldwork was implemented. *Tamei guluagulua* is an invitation to people to talk over matters of concern and can be used in informal or formal meetings with people. *Tamei guluagulua* can be used in different contexts such as when talking about historical stories, family genealogy, tribe and clan issues, cultural ceremonies or bereavement ceremony discussions. Therefore, *tamei guluagulua* was appropriate to utilise in the local context because of its inclusivity and fluidity as well.

Tamei guluagulua has captured the narrative quality and the mutuality essential in the forms of interaction that I pursued in these Indigenous communities. Practically, similar to the PNG context of *yumi tok stori*, *tamei guluagulua* has fostered a process of a two-way disclosure emphasising relationality and mutuality (de la Torre Parra, 2021; Sanga & Reynolds, 2019; Stead, 2013). As mentioned earlier, *tamei guluagulua* is an Indigenous local specific form of inviting a person to converse and using it as a method has permitted the process of research that revealed and supported culturally appropriate values and principles of communication and interactions when constructing a shared reality (Kennedy et al., 2022). *Tamei guluagulua* could capture the events, situations and knowledge that sprouted from the relational interactions with my personal networks and relationships, including colleagues from the National Department of Education (NDoE), and National Department of Health (NDoH). Similarly, conversing and storying were woven together, similar to multi-foiled coconut leaves, which in the context of this research represented the cultural values, situations, skills and knowledge forming the basket of Indigenous culture.

Aware that my initial approach was *yumi tok stori,* which was developed and shaped by my beliefs, values and perceptions of its appropriateness in a cultural context, I sought to sidestep and use a more

emancipatory approach relevant in the local context, influenced by my cultural experiences in Indigenous communities who possess their own ontologies. Smith (2021) in her teachings on decolonising methodologies encourages researchers to engage in culturally appropriate practices. Although Sanga et al. (2018) describe *tok stori* as a language of resistance, PNG is culturally and linguistically diverse with more than 850 languages, so using the local context of enquiry and conversing was appropriate. The aim of using *tamei guluagulua* was to focus attention on using the local vernacular, which would in turn remove the barriers imposed by seeing and describing values imposed by languages with multiple ways of being.

5.2.2 Inviting and exchanging with participants

During fieldwork in the villages, I approached and began my conversation with the individuals by inviting them to "*tamei guluagulua*" and drawing them to a place where it was safe to talk. *Tamei guluagulua,* which extends an invitation to people or relatives to communicate, is a form of communication and a process that is centred on the nexus of relationships. Negotiating relatedness was essential to this practice (Fasavalu & Reynolds, 2019). The relational network enhances the continuous importance of kin and the concepts of cultural reciprocity (McLeod, 2007). The literature emphasises that relationality is vital (for example by Fasavalu & Reynolds, 2019; Kovach, 2017; Wilson, 2008). Therefore, utilising local language was a key indication of the types of relatedness experienced and responsibility owing to the people (Roche et al., 2021). In my interactions in the villages of Ginigolo and Gavuone, speaking in the local languages offered a system of communication that enabled me to be involved in creating a "negotiated understanding of the world" with participants (Sanga et al., 2018, p. 7). Understanding the kind of relatedness and reciprocal obligation I was engaging in was crucial in my *guluagulua* (talk/conversation). This process of negotiating understanding which started before I entered the research field, when my late husband, John Vagi (Tioni Vagi Kalau), started preparations in the villages. Before a participant was identified, my kin and relatives informed me of their relationship to me, practically ensuring that the space was safe. At the core of *tamei guluagulua* is the sense of belongingness and a commitment to togetherness in a safe environment where the participants are able to share their stories.

The cultural reciprocity in the form of words creates a reciprocal obligation. The words exchanged through *tamei guluagulua* form necessary data in this study. Kovach (2021, p. 155) accentuates that the word "data" comes from a Latin word *datum* which literally means 'something given' and the altered past participle of dare "give". Data, datum, give – the etymology of the word data - thus the roots of data collection, imply gifting. In light of the Indigenous cultural values, words are a gift and fit well in the perspective of data collection as a gifting of another's story to the researcher (Wilson, 2008). It is a cultural practice that when a person visits a relative, a basket of food, or cooked food, is brought to the

house. The reciprocation of words and time from the participants, and in return offering store-bought food, cooked food, cups of tea and butternuts is appreciated by the people. These are part of the cultural episteme where storying and reciprocity nurtures relationships, compels responsibility, and thrives on respect (Wilson, 2008).

Reciprocation of food and words through conversation are distinct Indigenous cultural ways of togetherness and make sense of individuals and groups of peoples' worlds (see also Chapter 4). Further, reciprocity represents the interconnectedness with the environment, where people reflect on shared understanding about the space, life and issues that affect them. These relationships or interconnectedness are our reality and identity, and through these relationships there is the transmission of knowledge (Wilson, 2008). The act of sharing knowledge is woven with the strengthening of relationships.

This study coincided with the bereavement of my husband. So, my relationship with our people was essential in generating, sharing and observing values for an enduring relationship, be it in bereavement or in a normal conversation. These values include *ve gubakau* (respect) which infers not bypassing the boundaries of another person's conversation and observing the cultural protocols when communicating; *ve gulamagi* (love) and *vegabi dadamagi* (trust), and *vekamolagi geni* (obedience) were also important values, especially when listening and making meaning of what is conveyed in whispers, idioms and upholding cultural norms (*Temei guluagulua* with Davis Mou and my mum Varage Mou, 2023).

The values and purpose of conversing in Indigenous epistemologies encapsulate the responsibilities that come with collecting data and sensibilities when listening to participants (Kovach, 2017, 2021; Wilson, 2008). Therefore, this section has shown how in this research Indigenous Pacific research, methods were executed to capture an in-depth understanding illuminating experiences to improve nutrition in rural communities in Central Province, PNG.

5.2.3 Taking position while in the field

My positionality was already explained earlier, in Chapter 1. This section, however, will detail my position in the process of data collection and the implications involved doing fieldwork, while mourning my late husband. As mentioned earlier, my fieldwork coincided with my husband's funeral and cultural processes after his burial.

The different environments I inhabited and worked in have had an influence on my perception. Living in precincts with varying social dimensions have stretched beyond my knowledge of some cultural matters and the relationships in the case study communities that I have selected. Therefore, what used

to be my familiar environment had somewhat become unfamiliar. The significance of being in these different village locations must also be seen from an etic viewpoint of looking in from the outside to decipher the perceptions and behaviours of young single mothers when they talked about food and nutrition. In saying this, I migrated to New Zealand to live and study at different stages of my education, equating to almost a decade. Both insider and outsider lenses have allowed me to understand and comprehend the nuances drawing on (St. Hilaire, 2023), customary values and beliefs within the PNG cultural worldviews. This was already explained in Chapter 1.

The *doi avatuani*[12] framework, weaving the food basket framework uses insider and outsider perceptions represented by the two fronds that make up one part of the basket (see Chapter 2, Figure 2.1). When Indigenous knowledge systems and research processes come together it is similar to how the fronds of a basket are plated together - where the right side of the frond will support the left, making it a durable basket. The integration of Indigenous knowledge and methods allows both insider (emic) and outsider (etic) perspectives to be part of my positionality and also offers soundness in my data collection. It has enabled me as a researcher to gauge a collective understanding through a clear communication process. In this project, therefore, I unavoidably submerged in the communities as both insider and outsider which then necessitated certain obligations and responsibilities, giving me a deeper understanding in the course of the research.

Participants from the two villages, Ginigolo (my village) and Gavuone (my husband's village), had ingrained Indigenous cultures and traditions that guided the research (Aluli-Meyer, 2013; Waldrip & Taylor, 1999). According to Hornung (2016), research with Indigenous people must be established on the procedures of meaningful engagement and reciprocity with the researcher. Fortunately, because my late husband was a village elder and a clan leader in Gavuone village, he made arrangements with village elders and the church to establish a mutual understanding before I started conversations about my study. He had organised a meeting with appropriate village elders, and over a big meal had discussed the purposes of conducting my research in his village before my return from New Zealand. A verbal consensus and approval were granted by the village elders for me to begin my research. A reciprocal gift of store-bought food and betelnuts was presented to the village elders. In addition to my husband's efforts, my connections through work and positive associations with different organisations and my blood ties and those of my husband's enabled me access to the research sites (see Chapter 1).

[12] *Doi avatuani* refers to weaving the food basket. It is used as a framework to weave this chapter.

As a researcher, the transition into doing my research after mourning, depended on what I coined as "cultural settlement". By this, cultural protocols had to be fulfilled as a way of clearance for a widow to come out of her house of mourning, a cultural feast needed to be done for the community in order to increase access to and participate in the community. Culturally, in the past, a widow would be covered in mud, which now has changed to wearing black clothes, and she would be kept in her confinement for weeks and would come out of hibernation, depending on how fast the deceased relatives made a feast for the community.

As a researcher, my emic and etic perceptions of proceeding with research had to be decided. My decisions from my "cultural insiders' perspective in comparison to a vantage point that is external to the culture looking at constructs of "what may" were considered equally (Morris et al., 1999, p. 783). My connections to the villages and my husband's position in his community were valuable and paramount in my decisions, because the decisions would have either a negative or positive impact on me as an individual and researcher in the communities. Therefore, my cultural obligations were acknowledged in order for me to continue with the research as it also gave me the confidence to move about in the community. This cultural practice is beneficial to the awareness of what may be considered ethical practice in an Indigenous community.

The processes expressed in the analogy of 'weaving the food baskets' are associated to my positionality, research processes in relation to the cultural understandings and Indigenous knowledge aspects. Here, I weave Frond 1 and Frond 4 (See Chapter 2, Figure 2.1). When the right side is woven, it enhances the rim of the basket making it strong and durable.

As discussed above, in the Central Province of PNG, my relationship with the community members in organising the funeral and the cultural feasts is a testament to enhancing relationships and building trust. It is a reflection of working collaboratively. As stated in Chapter 1, I married a village, meaning that, I am a member of a collective village and cannot work alone. The cultural obligations are part of the cultural setting that I had to follow and be accountable to. Avoiding such cultural values and obligations would impact on me and, from an Indigenous worldview, would reflect poorly on my family. I could not work alone, as I would be perceived as an arrogant individual with no care for the culture and this would be an insult to my family. It also would mean that my children would not be assisted in the future. Therefore, a cultural feast had to be organised with the community and relatives to ensure that I am given the permission, as a widow still mourning my husband, to coordinate the research acceptable to cultural ethics.

5.3 Access to participants and sampling methods

A welcoming ceremony will typically be organised by the village council. Although Steven (2020) claims that cultural entry protocols were not essential in her studies, a ceremony was inevitable for me as an Indigenous woman from PNG with cultural connections to the Gavuone and Ginigolo villages. As explained above, given my bereavement, it would be amiss to ignore the cultural implications on me as the researcher and the influence of this circumstance on my fieldwork. Stewart-Withers et al. (2017) emphasise that cultural considerations must be identified at different stages of the project. Understanding and acknowledging the community's culture and being sensitive to my cultural integrity was paramount (Hornung, 2016). Therefore, a traditional ceremony was relevant in the community, the clans, and families. I was bound to the cultural and traditional obligations and so was required to do the clearance through cultural feasts before setting out to do the research in the village. Although prior arrangements were made with the community leaders in Gavuone village, showing respect to my family members and acknowledging their respect for my late husband, John Vagi, as an elder to the community, was significant in initiating the process.

Cultural practices and protocols were recognised as paramount and meaningful engagement that allowed both (Hornung, 2016). Protocols are ways of engagement and interaction with Indigenous people and communities (Janke, 2019, p. 2) to promote interaction based on good faith, mutual respect and cultural values (N'Drower, 2020; Smith, 2021; Waldrip & Taylor, 1999). It was important to note that as a researcher, my initial contact with the people had the potential to either establish or dismiss both the confirmability and empowerment of the research (Sillitoe, 1998a, 2006; Waldrip & Taylor, 1999). Because the local participants owned the knowledge, it was equally important to observe the cultural practices of the community. This acknowledgement allowed for openness and natural conversation; trust and confidentiality as suggested by Lovo et al. (2021). It also cultivated an interpersonal relationship, and exposure to contexts and ideas, following suggestions made by Fasavalu and Reynolds (2019).

Some participants received electronic copies of the information sheet (see Appendices 2 to 4), consent forms (Appendices 5 to 8) and approval letters (see Appendices 15 and 16) before we met. However, for rural participants, the information sheet and the consent forms were explained in their local language, and the consent forms were signed by them by writing their names. Officers from the government departments were interviewed individually. Before starting the meeting, I verbally read through the information sheet and the consent form and addressed any questions about the research and my purpose. Even though the information sheet and consent forms had been previously sent to them, I ensured on the day that they understood the reason for the interview. After receiving consent from

participants, I clarified that absolute confidentiality would not be guaranteed, but their identities would be protected in presenting research data, using pseudonyms rather than their actual names. Verbal consent to record was confirmed before starting the recording. I also asked participants' consent for my daughter's[13] attendance during most interviews. Prior to the interviews, I explained to er that all discussion and information shared by participants were to be kept confidential and any conservations should not be disclosed or discussed with anyone outside the research process.

Qualitative methods of purposive sampling and snowballing were utilised. Firstly, purposive sampling is a systematic way of selecting participants who are knowledgeable and relevant to the research aims (Flyvbjerg, 2006; Lederman, 1990; Rabiee, 2004; Scheyvens, 2014). Hence, the key informants included staff members from the National Department of Education and National Department of Health, and specifically those who were involved in nutrition, dissemination of nutrition curriculum and policies. To reach out to these people, emails were sent to my personal networks to identify relevant individuals for permission to be granted. Then I was directed to appropriate officers to organise and schedule times for meetings. When permission was granted, the letter paved the way for me to gain access to the staff and premises.

Secondly, the snowballing process involved finding a person who knew of a person with the attributes in the community (Merriam & Tisdell, 2015; Scheyvens, 2014). Communities in PNG thrive on strong kinship systems. Kinships are grounded on genealogy or consanguinity (Kawharu et. al., 2024; Meigs, 1987, 1989; Schram, 2015). Because I was not physically present in Gavuone and Ginigolo villages during the planning stages before reaching the village communities, I was informed through my blood ties of possible participants who would potentially be part of the research. Taking into consideration that Indigenous people's interests, knowledge and experiences were the centre of this research, my kin ties were relied upon to establish necessary relationships without causing any harm but to maintain trust and confidentiality. So, my relatives liaised with key people in the village in advance. They discussed with and informed the elders about the research.

A vast literature on the fundamentals of informed consent exists (Hershfield et al., 1993; Karanasios, 2008; Mason, 2018; Waiko, 1986). Scholars advocate for specific contexts and suitable cultural approaches when obtaining consent (Banks & Scheyvens, 2014; Czymoniewicz-Klippel et al., 2010; Denholm et al., 2017; Janke, 2019; Lovo et al., 2021; Stewart-Withers et al., 2017). For this study, because the participants were diverse, ranging from being illiterate to literate in the English language,

[13] My daughter signed the confidentiality agreement, which allowed her to be present during the interviews.

I ascertained that the participants knew that participation was voluntary by explaining in the local dialects that they could withdraw from participating if they felt uncomfortable.

In some cases, when interviewing older people in the villages, some village elders openly declared their illiteracy. So, in this case, it was irrelevant for an interviewee to write on the consent form (Banks & Scheyvens, 2014; Czymoniewicz-Klippel et al., 2010). However, the consent forms and the information sheet were translated by me into the local language relevant to the context, and the participants' responses were written. We were given verbal and written consent to continue with the research; their verbal consent was also recorded. Their prior consent enabled us to audio-record the interviews.

5.3.1 Non-mediated communication - languages in fieldwork

It was unhelpful to speak in English or Tok Pisin in Ginigolo or Gavuone villages to extract rich data, as words are data (Redman-MacLaren et al., 2019). In Gavuone village, I was aware that some village elders did not speak English fluently, to test that, I explained the information sheet to them in English, then two women in the group said,

> "Goi ragau no ini? Thau tauvau karo[14] ai ripaku, karo ai ono rori," she chuckles and says again, "ai a tikuli pe!"
>
> "What are you saying? I don't understand English, speak in the language", she chuckles and says again, "I never went to school".

To communicate with the people in the village it was necessary to speak the local languages (Roche et al., 2021; Smith, 2021). In hindsight, Fasavalu and Reynolds (2019, p. 13) state that our interrelations between people can inform multiple identities. Because some of my local participants were illiterate, being a multilingual speaker of some languages, I relied on the local vernaculars to communicate and understand the meaning conveyed by the participants. Speaking in different languages - namely in *Keakalo, Ikolu*, and English - to communicate and adapt to the different scenarios was advantageous. I spoke the *Ikolu* language with the Ginigolo participants and the *Keakalo* language with the Gavuone participants. I spoke English when I was among the English language speakers, especially the health workers and the teachers. Speaking in the local vernacular of different settings broke barriers to

[14] "tauvau karo", in Keakalo language, language spoken by Gavuone village literally refers to 'white man language' or English language.

accessing the participants. Furthermore, it enabled me to understand the cultural expressions, metaphors and stories of the phenomenon under study.

It was practical to use a language that is applicable to the local context. As the researcher, it was crucial at this stage for me to adapt to the languages spoken in the community and interact in a language that is meaningful and closer to their lived experiences (Redman-MacLaren et al., 2019). Temple et al. (2006) highlight that scholars who engage in research that involves languages they do not speak need to make choices. Because of my familiarity with the environment and the languages, it was inevitable to speak in the relevant languages to enable accessibility to the people and their experiences (Polkinghorne, 2005).

5.3.2 Gatekeepers and recruitment of participants

Established relationships and interrelations were integral to gaining entry to research sites (Kawulich, 2011; McFadyen & Rankin, 2016; Wanat, 2008). Drawing on my relatives' connections and acquaintances, they were able to act on my behalf and pursued the gatekeepers, seeking recommended potential participants (Corra & Willer, 2002; Karanasios, 2008; Lovo et al., 2021; Stewart-Withers et al., 2017; Wanat, 2008). My efforts to negotiate and collaborate with gatekeepers were essential (Amundsen et al., 2017; Stewart-Withers et al., 2017). Even though people in positions of power in bureaucracies gave official permission (Wanat, 2008), that is from the NDoE Secretary and the NDoH Secretary, access also had to be negotiated through multiple levels to reach the participants. Sometimes the participants were not available, which presented challenges. I made appointments with people, but they were not always available because of other commitments. I found this process a bit difficult given the limited time I had because of the cultural obligations and the prolonged rain that caused difficulties to travel (see Chapter 6, Figure 6.13). I had just become a new widow, and having to come out of my premises into an open environment turned eyes to watch me, suspicious of why I was frequently seen in the school premises. My children and extended family members were my protectors, guides, and support people who followed me everywhere I went.

NDoE granted access to the school premises in the Central Province and the Curriculum Division. However, I still had to pass through the principals of the secondary schools in Central Province and the Food Technology Curriculum Division Head (Wanat, 2008). This influenced the timespan, depth, and scope of the investigation (as was also observed by Amundsen et al, 2017). After several attempts, I was not successful in meeting one of the School Principals, as he had personal and official commitments. Fortunately, I met with my colleague who happened to be teaching in the school. I explained I was doing fieldwork for my PhD research and wanted to interview the Home Economics teacher and if he could direct me to the relevant person. Without realising that he was the Deputy

Academic principal, he mentioned that I was most welcome to go into the school. He was the acting principal at the time because the principal was away. He also mentioned that he was going to inform the teacher concerned about my visit and booked the appointment. At the time when I went to the school, the Home Economics teacher was away attending a meeting in the city. The next time I went, the school was on holiday, so it was not possible to find the teacher. I was able to locate her on my third attempt.

Similarly, visiting schools in Rigo district presented difficulties. The school was suspended for some time (between May and June) because a fight broke out among the students. My family members were concerned about my safety and advised me not to go to this school until the situation was cleared. By the time the situation was cleared, it was school holidays. Nevertheless, I took a chance by checking out the school to arrange a meeting with the Home Economics teacher. The teacher was administering a workshop at the school and was busy. Instead, I met with the school principal. The principal was informed that I had permission from the NDoE Secretary, and I discussed my purpose for visiting the school. Although he allowed me to carry out my research, I was not able to get in touch with the teacher at this time as she was on sabbatical leave during the second week of the school holidays.

The nutritionists from NDoH were also unavailable for meetings. An invitation to participate was sent through email with information sheets and consent forms in early June, then a follow-up email was sent in early July. Receiving responses was very slow. By late July an email was received from another nutritionist stating they were busy and suggesting a shorter time for 5-10 minutes because of their busy schedule. Moreover, she requested an alternative to provide the questionnaire and my requests for information so that they could provide answers. Even when the questionnaire was emailed to the nutritionists only one questionnaire was returned. I took the chance to get to their offices to have a five-minute interview, but the story was the same, they were not available. Three months after arriving back in New Zealand and when data analysis was completed, one responded to the questions through email.

Reflecting on these processes it becomes obvious how the process of contacting participants can be likened to the *doi avatuani framework* and how the processes were weaving the fronds of the coconut leaves together, integrating the cultural values, interlocking the nuances and factors relevant to the culture and other cultures. The framework also has woven together my position as the researcher and participants' experiences (from different data collection methods). The processes of this research have enabled me to see through the Indigenous lens and with an insider perspective.

5.3.3 Ethics processes, protocols and cultural obligations

This research was reviewed against the Massey University Human Ethics (MUHEC) code of ethical conduct and principles. An internal ethical review for this research was conducted at Massey University in July 2022. The process included a peer review ethics meeting with my supervisors and one Development Studies staff at Massey University, discussing several ethical aspects to be taken into consideration, including: ethically recruiting and accessing participants, securing privacy and confidentiality throughout the process, appropriate use and access to information, dealing with my insider-outsider positionality when conducting this study in the Indigenous villages, and how to inform participants appropriately (see attachment). Following this internal process, a formal submission was sent to MUHEC and was assessed as a low-risk project.

Although a citizen of PNG, I was required to obtain government-issued research permission for the study (Amundsen et al., 2017). The National Department of Health (NDoH) and the National Department of Education (NDoE) play important roles in policy making and oversee the functions of the schools and health services in the districts (Denholm et al., 2017). The NDoE (see Attachment 16) and the NDoH (see Attachment 17) required details of the research including research instruments before releasing permission to access the interviewees and the related data/documents from the institutions. According to the local ethics committees, this process has the purpose to ensure that the research primacy of local communities was supported (Denholm et al., 2017). Consequently, ethics approval was gained from the Institute of Medical Research Institutional Review Board in PNG as this research concerns nutrition and malnutrition, which are health related, and entry to institutional spaces was required. In addition, permission was granted by the Research and Evaluation Steering Committee and the National Education Department Secretary (16). In Central Province, PNG, I was also required to meet the CEO of the Abau District, and the principal of Kupiano Secondary School that served the Abau District and the principal of Kwikila Secondary school that served the Rigo District.

Denholm et al. (2017) assert that as outsiders, ethics committee members may lack insight into the local context especially the sensitivity to issues not commonly encountered by international ethics bodies such as local taboos. Pacific Island countries, including PNG, have distinct cultural protocols and practices (SPC, 2020). Moreover, Hornung (2016) emphasises that cultural protocols are significant, and it is important to recognise the values of cultural spaces. Nevertheless, Indigenous Pacific ethical systems are absent in institutions where the repositories are practiced (Sanga, 2015). Our ways of life are ingrained in the people's moral philosophies (Narokobi, 2016). The next section will explain data collection methods while on fieldwork.

5.4 Fieldwork data collection methods

This section will describe the methods that were ustilised to collect data in Ginigolo and Gavuone villages, partcipants with the Government and non Government organisation. I used *tamei guluagulua* in both informal and formal conversations with participants.

5.4.1 Engaging with young single rural mothers

Case studies aim to investigate and analyse a single or collective case to understand factors that influence communities through a thorough description (O'Leary, 2017a; Stake, 2010; Yin, 2009). This can comprise investigations of circumstances pursued over one or more cases within a confined area, either a setting or a context (Creswell, 2013). The two case studies were two villages in the Central Province, Gavuone and Ginigolo village, with young single mothers with whom I engaged in *tamei guluagulua* sessions and also elders as direct participants.

The participants in Gavuone and Ginigolo villages were selected through snowball sampling. A snowball sampling method selects participants with specific characteristics (Merriam & Tisdell, 2015; Scheyvens, 2014). In this case, selecting single young mothers was a daunting task. I was not familiar who the single mothers were or if they fit the criteria to be selected. I initially sought to interview young single rural mothers between the ages of 16 to 25 years. To achieve the criteria, I worked with community members, especially my nieces and nephews, to inform me of people whom they knew would fit the criteria. However, it was impossible to identify who was in that category since there were some older single mothers who could potentially be of value and were willing to be part of the research. Some of the older single mothers served in leaderships roles in the village and it was unavoidable to exclude them. The older single mothers were included after considering the values and experiences the women have encountered.

The process involved finding someone who may know of a person with the attributes that suit the criteria, then asking those who may know of others. Young mothers and key informants were selected through relational or kinship ties and blood ties to those related to my husband.

5.4.2 Focus groups

There were two focus groups. The two groups were comprised of women elders and leaders. These participants were selected using purposive selection (Lederman, 1990; Rabiee, 2004; Scheyvens, Movono, Auckram, et al., 2023), where features of the members comprised of women who have had experiences serving in Women's groups in church, leaders of the community church and where older

citizens of the community. Because of the cultural implications, the two groups were not merged in the discussions. At times, women had reservations about sharing issues that affect them. Hence, being together in a focus group of women only enabled a more fluid discussion rather than a strict question and answer process.

The focus group consisted of at least three to five community leaders who knew the villages and were interviewed as a group (Lederman, 1990). This method was important for the primary objective of knowing and clarifying the values, cultures and traditions that influence individuals' feelings, attitudes, and behaviours (Denscombe, 2014). Organising focus groups enabled me to delve into deep conversations with women leaders of the villages to gain access to in-depth views that may not have arisen from direct questioning. Also, the focus groups offered a valuable tool for including users and strategy development and evaluating health promotion and nutrition intervention programs (Knowles, 2015, p. 2). Women in the focus group held leadership positions within the village communities.

5.4.3 *Tamei guluagulua* as a method

Tamei guluagulua was utilised in this study. I began collecting data from the villages and headed into utilising the same processes of *tamei guluagulua* with NGO and government officials, *tamei guluagulua* can be used in formal and informal conversations. As explained earlier, the word *tamei guluagulua* was a suggestion by women in the villages, who quizzed what I was saying when the term "tok stori" was mentioned. The term *tamei guluagulua* was conceived as the most appropriate and has been used throughout this study.

Given the prominence of this brief context, *tamei guluagulua* can take place either in a formal or informal setting, in relation to this study it proceeded when cohering to cultural protocols when inviting a person or group into a space. In administering *tamei guluagulua*, irrespective of the conversation, either in a group or one-on-one, I had to be conscious of the context of *tamei guluagulua* including the cultural values that interplay and accompany the conversation between people. When saying *tamei guluagulua*, it comes with a tone and expression when inviting a participant/s to a meeting site, so a person can know whether it is a formal or informal conversation. The word *tamei* means let us and infers an invitation drawing a person to a space, in context to this study, *guluagulua* refers to talks or conversations either formal or informal between two persons to discuss issues of concern, with the aim to resolve. For me, the moment I took this sidestep, it was as though removing a leaf that was incorrectly woven in the basket.

My role as a facilitator to *tamei guluagulua* sessions, whether with one woman or a group of women, was to guide the conversations as would be the case in semi-structured interviews. Open-ended

questions (see Appendices 9-10) were used to guide *tamei guluagulua* to develop an in-depth understanding and access relevant knowledge and possibilities to address nutrition and health issues in the Central Province. In the informal setting with these women, *tamei guluagulua* was conveyed through explanations, jokes, stories, metaphors and idioms. Thus, engaging in *tamei guluagulua* has developed interpersonal relationships. Participants shared their sentiments in confidence and the sessions were filled with laughter, and sometimes tears were shared as the women shared some discontent. There was a sense of liberty as women shared their perceptions, a sense of *ve gabidadamagi* (trust) and *vegeni laukule (*reciprocity) between the participants as conversations and stories were exchanged without restrictions. Even though I had initially set a time limit of 30 to 50 minutes, culturally, *tamei guluagulua* has no rigid time limit. Because the aim of the conversation may be reached, but people will want to talk about the same issue in different ways, or the talk can be repetitive.

More formal *tamei guluagulua* sessions were conducted with key informants. Participants, who were key informants also had the opportunity to share personal opinions and matters of concern on sometimes sensitive issues. These more formal *tamei guluagulua* enabled me to follow up leads, encouraged further clarifications and enabled me "to establish a conversational style" (Patton, 2002, p. 343). This process has not only allowed me to collect data but also to explore participants' thoughts, feelings, and beliefs with a focus on a predetermined subject such as how women could be engaged in community empowerment activities to improve nutrition.

Tamei guluagulua were also used with key informants from NGOs and Government organisations. This phase involved eight participants in semi-structured, individual interviews. The participants were interviewed away from their workspaces as they felt that it was appropriate to do an interview away from the vicinity to avoid people wanting to know what is being discussed. The sessions took between 30 minutes to one hour and were audio recorded. One of the sessions was done online via zoom. I had initially booked a one-hour session with this participant. However, due to technical issues, we were only able to do a 30-minute discussion that day. An additional one hour the next day was offered, which she favourably accepted. The following day, the Zoom booking for one hour was completed. The data from these interviews were rich and significant providing guidance and a standard for the interviews that came after.

Another local expert asked to talk to me in a hotel. She felt it was not appropriate for her to meet in her office space as her colleagues would be suspicious. She also had concerns that her role would be in question if our discussions were done in her office. She was a junior staff and even though she was responsible for writing the curriculum, she felt that her other colleagues could have been included. The participant also felt that her colleagues could be distracting the conversation for work related issues.

Also, confidentiality would be a matter of concern as her colleagues will be interested to know the discussions.

These sessions gave me the avenue to gather responses to the questions, issues, subject matter, or themes (O'Leary, 2017a). In addition, I could gauge their perceptions in regard to how they construct food and nutrition and how communities could assist to improve nutrition. When fieldwork was completed, the discussions were transcribed and then translated into English. Throughout, when using verbatim quotes, both the local language and English translation are presented.

5.5 Analysing the Fieldwork Data

A thematic analysis process was used to analyse the data gathered from different sources (see Table 5). Braun and Clarke (2014, p. 57) describe a thematic analysis (TA) as a "method for systematically identifying, organising and offering insight into patterns of meaning (themes) across a data set" Data analysis brings understanding by exploring and interpreting complex data. Flick (2014) describes the data analysis process as "the classification and interpretation of linguistic (or visual) material to make statements about implicit and explicit dimensions and structures of meaning-making in the material and what is represented in it" (p.5). Hence, data collected for this research was analysed by way of preparing and organising first (text data as in transcripts, image data such as in photographs) and then identifying themes through the process of colour coding. Data was then presented in form of figures, tables, and narratives (see the following Chapters 6 and 7). There is innate power in words and images (O'Leary, 2017a); therefore, applying a thematic analysis supports conserving the richness, and crystallises meaning. An overview that shows participants and summarises some of these processes can be found in Table 5.1 further below.

5.5.1 Analysing data from *tamei guluagulua*

The participants were invited to use Keakalo language while in Gavuone village, and Ikolu language while in Ginigolo village and English language when talking to government organisations. These were grounded on the understanding that using various and appropriate languages deepens and enhances the possibilities for accurate understanding and analysis. Transcribing data from local languages to English has posed challenges. When translating *Keakalo* language, that is the Gavuone language, certain terminologies had to be confirmed for appropriate use or in situations where there was another meaning to the words. The same was done with the *Ikolu* language in Ginigolo: multiple phone calls were made to confirm the validity of the terminology. My Samsung Galaxy S10 phone served as a reliable device

to record *tamei guluagulua*. Therefore, when transcribing conversations in *tamei guluagulua*, the recorded *tamei guluagulua* had to be replayed a couple of times. *Tamei guluagulua* were transcribed with help of a translators who signed the confidentiality agreement form. In areas where I was unsure of certain terms and contexts, my children who are native speakers of the language, were consulted to check and amend words and meaning wherever required. It was time consuming and a long process when transcribing the interviews, connecting with the data and trying to sort the data into themes, and understanding two local languages when transcribing into English. However, data from these languages, *Keakalo* and *Ikolu*, were rich and had to be clearly articulated.

Because of being pressed for time, I was not able to send the transcripts to the participants. Sending the transcripts would have caused further delay and costs. Transcribed interviews were read over a couple of times, using my coloured highlighters, colour coding the general themes that surfaced from the interviews. I came across cultural words relative to community empowerment (*vanua vekokolena)* and cultural values (v*e vava*[15] *or veduru*[16]*,* and *basket to basket*[17]*)*, this was not straight forward as I had to understand the nuances. These themes were talked about in two different languages, so I had to choose a language that would be representative (Ravulo, 2017; Waqa et al., 2023). However, this was not practical as different languages portray a nuance reflecting different cultures. Waqa et al. (2023, p. 37) states that unpacking concepts in the vernacular language brings about a deeper understanding of what is being discussed.

Ideas for the thesis title were loose as I struggled to identify a title that would be more encompassing and reflective of the core of the thesis, rural communities and women. I conceived that the framework had to be real and resonate with the uniqueness of rural women, community, cultural values and the process of this study. These concepts were revealed and confirmed when women discussed the value of *basket to basket,* and how the community members displayed their cultural values during my husband's funeral, showing their respect (*ve gubakau*). Members of the community worked together, *vanua vekokolena*, to build a shelter, women brought lots of food, water and firewood to support and help (*ve duru*) with the catering. And it was then that I firmly settled on *doi avatuani*, which means I am weaving the food basket and has become the title of this chapter, where *doi* refers to the food basket that is woven by women.

[15] *Ve vava* refers to giving support or assistance in Keakalo language, Gavuone village.
[16] *Ve duru* refers to giving support in Ikolu language in Ginigolo language.
[17] Basket to basket is a metaphor used by women to mean reciprocity.

5.5.2 Analysing Documents

A thematic document analysis was applied on documents from government organisations and NGOs. Document analysis refers to a review on documents, examining and interpreting to gain meaning. This analysis is presented in Chapter 8. Creswell (2013) states a document analysis is a good source for text data to understand the central idea. The documents I used included the PNG nutrition policy (Government of Papua New Guinea, 2016), Department of Education curriculum (National Department of Education, 2006, 2008a, 2008b, 2016). In the process nutrition education curriculum (National Department of Education, 2008a, 2008b) and the Government policies were analysed to identify the correlation between the two and the influences of decentralisation in the content of the curricula.

5.5.3 Analysing Observations

Observation in qualitative research collects data using one's senses, including seeing and hearing, in an organised and meaningful way (O'Leary, 2017b; Scheyvens, 2014). I used participant observation and non-participant observation: participant observation is engaging in community events and living closely with the people in the community. I lived in the community from mid-February to end of July 2023, during which I observed women's daily activities and have joined in cultural events. Observing women's activities have included to see what they do when they wake up, watch their cooking processes and the types of food cooked, how food is fed to the children, and how food is distributed in the family. Adding to the list of their roles were women casting their nets to catch fish, looking for crabs and shells, planting yams and cassava, selling food at the market, working as a group helping (*ve duru*) other women to weed, plant food, plough the land and cut fire food. Some of these roles were monetised to earn an income for their cultural activities or church activities. Some women did not reach their levies for the Women's Fellowship *boubou*[18] or the church *boubou,* so they asked if I had some work, they could do to earn an income. So, we planned some tasks they were able to do, but requests were also coming through my children. Even men groups were interested to help me and my children. These became community activities where the members of the clans worked together.

I also took part in some of the activities women organised. These events included contributing to the Women's Fellowship *boubou* (thanksgiving), Church thanksgiving (*boubou*), cultural feast, and the

[18] *Boubou* is a local word for thanksgiving; this is where one tenth of individual's earnings are collectively gathered and given to the Circuit (Church head office) for the running of the churches in the villages.

kavela[19] market. Women took part in clans practicing dances to present at the *boubou.* My children and I participated in these activities and gave our donations to the church.

The physical characteristics of the community were also captured in my observations. These included features that showed the effects caused by climate change, socio-economic activities and the living conditions of the women, which I recorded in my fieldwork journal. Heavy rain flooded the village and damaged the bridge in the village during my time in Gavuone village. The bridge connects the village to other neighbouring villages, the city and the food gardens belonging to families. The food gardens were destroyed, and some families had to remove their food from the ground prematurely. They were also unable to go fishing because of the rough seas.

Below, Table 5.2 summarises the participants for the study and the research methods utilised. Names indicated for the participants in the table are pseudonyms and do not in any way identify the person who was interviewed. Six young single mothers were interviewed, three from Gavuone and the other three were from Ginigolo village. These single mothers live with family members in the village. Three young single mothers from Ginigolo were engaged in *tamei guluagulua* individually whilst the young mothers from Gavuone felt they wanted to talk to me in a group. However, their views were analysed individually. I was unable to *tamei guluagulua* or interview with two nutrition officers and instead have sent a list of questions to both. One (James) returned my email with comments after three months, but the other officer had not responded to my emailed request.

Table 5.2: Summary research methods and participants involved in the research

	Data collection method	**Research participants**	**Sample size**	**Age**	**Number of children**	**General Comments**
1	Gavuone and Ginigolo villages					
	Tamei guluagulua	Young mothers from Gavuone	Lewa Veaina Ianama	30 25 30	2 1 1	Four of the women lived with family members while one of them lived in a makeshift home.
		Young mothers from Ginigolo	Eve Mune Mogogele	30 30 21	2 5 1	

[19] Kavela market is where members of the Kelerakwa village congregate to sell food produce and fish products. One tenth of the money earned from selling the garden produce is given to the church as contribution for boubou (thanksgiving).

2	Focus groups –Key informants from Gavuone and Ginigolo villages					
	Tamei guluagulua	Group 1 – Gavuone Community leaders 1 group (4 women elders)	Wai Lua Kele Lako	64 68 56 50	5 6 4 4	Amongst the community leaders focus group members, women held various formal leadership roles such as chairperson, secretary and treasurer of the Women's Fellowship group.
		Group 2 – Ginigolo women elders 1 group (3 women elders)	Vabu Vala Eve	85 56 30	6 5 2	
3	Key informants					
	Formal Tamei guluagulua	NDOE[20] NDOE, curriculum writer Home Economics teacher	 Veauneg a Kupi		 1 4	 Worked with the Department for more than a decade. Worked for more than 2 decades
		NDOH Nutrition officer Health worker	James Kirineti			Worked in the role for more than a decade Worked for more than 1 decade
		NGO 1 x SPC – South Pacific Nutrition FAO	Lizzie Ganima			Pacific Island regional nutrition coordinator Worked in various NGO[21]and NDoH[22]
5	Locations of observation	Community meetings/events				Dates observed
	Gavuone village Ginigolo village	Boubou (thanksgiving) Women's Fellowship boubou Friday markets at Kupiano New Shop opening in Kupiano. Alternative days, Markets at Kwikila				10th July 2023 17th July 2023 Every Fridays

[20] NDoE refers to National Department of Education.
[21] NGO refers to Non-Government Organisation. He worked with UNICEF, UN, World Bank, then FAO
[22] NDoH refers to National Department of Health

5.6 Conclusion

This chapter has discussed methods used for collecting data. Doing this research and operating in the field was emotionally difficult as I was grieving over the passing of my husband. The fieldwork coincided with the period of mourning my late husband, John Vagi. We started this journey together and he worked with me albeit remotely. As he was an elder and a clan leader, and located in the village preparing the scene for the research and negotiating with the other village elders, his demise caused me to travel alone on the remainder of this research journey. Therefore, the processes of gathering data were difficult in his absence. However, I recognised that I had to find the strength within me in transitioning to be a single mother, emotionally traumatised as with his passing as part of me is gone. I learnt to appreciate the cultural processes for the funeral, and at the same time tried to complete the fieldwork.

My role as an insider and outsider had to be intricately woven in my positioning throughout the data collection process. Maintaining my focus and establishing those cultural understandings and respecting the values of the two village communities have played a significant role in constructing my research methodology, which have combined qualitative and Indigenous knowledge-based approaches.

As an Indigenous researcher on the ground, using research methods that were most appropriate in the Central Province Indigenous context came into place. Nevertheless, as a widow, upholding the cultural values attached to this position was tangible and unavoidable. Thus, an elder of the family was consulted to give me the assurance and clearance without bypassing any cultural protocols. This also meant that there had to be a mutual understanding between me and the participants, the cultural values of the participants and their perceptions of me as a new widow administering the research had to be cleared. *Tamei guluagulua* provided that cultural pathway for investigations, and one that recognises the connectedness of cultural understandings. *Tamei guluagulua* authenticates the ontological practices which would usually discuss and weave through a mutual conversation in the local context and is appropriate for this research. The next two chapters will present the themed highlights of the research findings.

Chapter 6: Cultural perspectives of nutrition in village communities



Figure 6.1: Joining the ends of the separate rims.
Then tying the two rims together to enhance the rims.
Source**:** Daniel Vagi (2023)

6. 1 Introduction

This chapter presents the analysis of findings drawn from experiences, information gathered and fieldnotes, to highlight the participants' understanding of nutrition and their interpretations of how nutrition can be improved in the communities. The aim of this chapter is to analyse aspects of nutrition from the perspectives of rural communities and to locate the perspectives of single mothers in rural villages. This chapter is related to Research Question 1: *How are notions of 'community empowerment' and 'nutrition' conceptualised from an Indigenous perspective in Central Province, PNG?*

This chapter is organised in three main sections guided by the findings identified from the research. The chapter will first look at how nutrition is defined by rural villagers and presents a number of ways food is perceived as healthy in the villages. This will be followed by exemplifying how food has cultural

meaning, some specific cultural events, role food plays in these, and how community members are involved in providing food for these events.

As in earlier chapters, this chapter will also relate to the *doi avatuani* (weaving the basket) frame. In this chapter, the emphasis is on the whole basket, which is shown in how it will be filled with food, and then how it is ready to be exchanged for the sake of *ve genilaukule*, (reciprocation), also practiced as basket-to-basket exchange. Relating to the data presented in this chapter, the parts of the framework that include dimensions of *vanua vekokolena* (community empowerment) will be highlighted and how this is related to activities that lead to improved nutrition. In relation to weaving the basket and in reference to Figure 6.1, there are two rims that are woven separately out from the four fronds displayed in Table 1.1. After the rims are enhanced, they are strategically put inside the other rim. Then, these rims are tied to have a stronger rim and at the same time have more leaves that can be woven to make the sides of the basket firm and stronger to hold food and other items. This tightening practice relates to this chapter, as the findings symbolises the importance of a well-connected community.

6.2 Perceptions of nutrition and food in rural villages

The term nutrition was difficult to define among rural women. There is no word in the local languages that could easily translate to 'nutrition'. However, there was some mutual understanding how the term nutrition could be translated from English into the local languages – or at least be described. The local term for food is *ganigani* and means anything that is edible. Each food that is consumed is locally identified and categorised according to its unique features. For instance, *vabuli* is a broad category for yams, each species of yam has a name and is recognised by its unique features. Women perceived nutrition as when a person consumes mixed food which gives strength to the body.

A meal is prepared according to the availability of food: what a family harvests from their family garden, and what is gathered in the environment nearby to their community. Because of a number of different circumstances impacting on harvesting healthy food items, a nutritious meal in rural villages is often difficult to prepare. Women in both villages perceive a nutritious meal as one that consists of a variety of food on the plate, which may contain a mixture of food harvested from the garden, bought from the store and some protein. Some people may not always have a variety of food. When asked what her understanding of a nutritious meal is, Eve explained that she perceives a nutritious meal as:

> Ganigani giraugirau ia keta araga ganigani ia, keta situa ganigani ia, e plain ba niu ai bo dalini. Araga ganigani ia be galivata, vabuli, kale and gailau e bulega keta.
>
> A mixture of garden food, and store-bought food, cooked plain or with coconut milk. Garden food includes banana, yams, taro, and green leafy vegetables and some protein, like fish.

Similar to Eve, participants perceived their staple foods or garden food as nutritious giving them strength on daily a basis. When comparing store bought food with food harvested from her garden, Mune said that nutritious meals were those that were harvested from the garden with the absence of processed food. She explained:

> Araga ganigani ia be fresh, be mix bo ganini ta kila kale, gailau, magani, loku. Vanuai be na ganigani ga ganini. Araga ganigania bo ganini genai goi bogonuni.
>
> Food harvested from the garden is fresh, so you can eat a mixture of these foods, mixed food like taro, green leafy vegetables, fish, pawpaw. You eat most of these food in the village. You get filled when you eat these foods.

Other participants responded by identifying the food they consume daily. For example, Veaina explained that,

> Ganigani ga ve ganigani vanuai garo paraparanai gauri wa karawa, mokela, keu e magani. Wa gai gemai ganigani ga wala gauria
>
> The food we eat in our daily meals are banana, sweet potatoes, taro, and fish. They are our food. We grew up eating these foods.

According to these women, food prepared for their families is often produced or gathered from their gardens and the environment they live in. For instance, Veaina lives by the sea and has access to fish and other seafood that can be included in their daily meals. Unlike Eve, who lives further away from the sea, and so has to purchase fish and meat products to include in her meals. The image below shows a cooked meal where food is harvested from the garden and the chicken seen on the plate is raised by the family. Not every family in the village raises chickens or has a chicken farm. Women consider this plate of food as a balanced meal. Food presented in the picture was gathered from the village. The chicken is raised in the village.



Figure 6:2: Women's view of a balanced meal
Source: Jonnelle Vagi (2023)

Young female participants who finished education at primary school level or who finished high school early were unable to respond to what nutrition was, instead they asked for further clarification on the terminology. So, I clarified using the local dialects, by first describing the content of food, functions of the nutrient in the food, how nutrients help the body and the results if they consume less or more of the nutrients (see also Whitney et al., 2022). For example, why do the nurses tell you to eat a lot of green leafy vegetables? This was new knowledge to them or maybe they could not relate the nutrients to the food.

The English concept of nutrition was further clarified and related to their understanding. I was unaware that some women in the village lacked understanding of the term nutrition. I assumed that women would have some understanding of nutrition because basic knowledge of nutrition is taught in schools. However, nutrition is an unfamiliar word among many young mothers who live in rural villages in PNG. Defragmenting the concept of nutrition in relation to food was necessary to draw out the women's cultural understanding of nutrition. For most, nutrition is food that is consumed daily to fill their stomachs to give them strength and energy to be able to work. For Mogogele, nutrition is about good food that will make you strong. She said that 'nutrition' is…

> Ganigani namoia bo ganiani bege kala kokolemuni gauia.
>
> The good food you eat that will make you strong.

The women categorise good food as that harvested from the gardens compared to food bought from the shops. According to Lewa, nutrition is food that they consume daily. These foods are part of the subsistence base of their culture. The local foods are high in energy and are commonly eaten in the rural villages. She explained that:

> Garo mapararia, gaigemai ganigani ga ganiani gauna wa karawa, mokela, gani, keu e magani. Garo vairi kavela ga kokoni. Ga wala ganigani ria.
>
> Our everyday food that we eat every day is banana, sweet potatoes, yams, taro and fish. Sometimes, we collect mangrove seeds. These are food we grew up eating.

Women in Gavuone village collect mangrove seeds during the drought season. Apart from the main staple foods, mangrove seeds or *kavela* has become a main food source for those who live by the sea. *Kavela* are tucker consumed by people of Gavuone and Kelerakwa and villages along the coastlines of Abau district (see Figure 6.3).



Figure 6.3: Mangrove seeds
Source: Retrieved from Wet Tropics Management Authority, Mangroves (n.d.)

The process of preparing *vanua rice* from mangrove seeds is tedious but women are skilled in preparing it. The seeds are collected, boiled, left to cool, then grated into fine shreds. The fine shreds of *kavela are* soaked for a couple of days in the sea so that the toxins are removed. Once the *kavela* is removed from the water, it is rinsed in clean water and cooked with coconut milk until the liquid evaporates. When the liquid evaporates, it resembles the texture of rice and this is why it is called *vanua rice*, village rice. Figure 6.4 below shows an image of cooked *kavela* with fish on the top. This is a traditional diet still eaten today.



Figure 6.4: Traditional velerupu dish, kavela and fish
Source: Jonnelle Vagi (2023)

The notion of nutrition as strongly related to food that gives people the strength to work was stated by some participants. According to Vabu, food is consumed to work in the body so that…

> Au tauganigu ai bei ragani, lalagu ai bei ragani, valovaloi bei ragani o virigogu ai bei ragani o tuligagu ai bei ragani nogo nei au kokole ba davalini, nogosena maguliai e kokole ba davalini vaguna tauganigu bei ragaragani.
>
> It will run in the body, run in the blood, it will run in the veins, or run in the muscles, it will run in my bones, it is through that way that I can get my strength where my body will function.

The notion of food giving strength to work and its function in the body confirms that there is an understanding of nutrition and a connection to the function of food. Vabu stated:

> Ganigani ta ganiani gauna be kokole bei genimuni e keve visivisi asi bo davalini. Garo ketaiai baraki ge kilani, bono ganigani bono kokole be asi bono kevekeve gesiani.
>
> We eat food to give us strength so that we do not get sick or have pain in the body. Sometimes the old people say, you must eat so you will not be sick.

Others conceived nutrition in relation to the need for pregnant and lactating mothers to eat well. The participants stated that it was important for pregnant and lactating women to eat well so that their babies will be healthy. Other phrases were used in the village that infer a definition of nutrition in the context of a lactating mother feeding the baby. For instance, Eve said:

> Kwalela bono niu, latamu bene gone be natumu bene kokole.
>
> Drink a lot of soup for your breast to be full so you can feed your baby, and your child will be strong.

Below, Figure 6.5 shows a typical meal for a lactating mother to have. It is a meal that contains a lot of soup, which is believed to assist the lactating mother produce more milk for the baby.



Figure 6.5: Typical meal drenched in soup
Source: Jonnelle Vagi (2023)

The participants were aware that they have to maintain good health for their babies to grow strong and be in good health, they are required to drink a lot of soup to feed their babies. Generally, women are encouraged to eat good food so that they can be strong to work.

Participants from both research sites indicated that a person's physical attributes can indicate if they are healthy or sick. Mune is a single mother and has struggled to provide for her children and herself. At

the time *of tamei guluagulua* she looked pale, and she confided that she had not eaten for a while as they did not have any food in their home. She also stated that her relatives have been reaching out to her because of her weak physical appearance. For example, Mune reflected:

> Goi tauganimu bei rakava asi o gani kokoleni, bono ganigani be tauganimu be kokole.
>
> Your body does not look good; you must eat well so that your body can be strong.

A weak physical appearance of an individual indicates that a person is either unhealthy or is going through a difficult time. Sometimes when a person is going through difficult times, the community members will know. But often members of the community refuse to assist because they believe that it is the responsibility of the immediate family to look after this person, and this can be difficult if they lack the resources.

To other participants, nutrition meant consuming a mixture of garden food and store-bought that must be plain and without additives. Foods harvested from the garden are bananas, yam, kaukau (sweet potatoes) and greens. A nutritious meal would be a mixture of fresh food on the plate, containing a variety of food harvested from the garden.

Knowledge of nutrition is to have a balanced diet. Knowing what a balanced diet is can have an impact on how someone may consume their meal. The respondents in the rural villages had difficulty in explaining the term 'balanced meal'. There is no word in the language that pinpoints what a balanced meal is. However, *gani giraugirau* in (Ikolu language) may give reference to the term balanced meal as g*ani giraugirau,* which means eating differently or eating different types of food, but it may not necessarily mean eating a balanced meal. However, the participants have used a description depicting fullness or satisfaction after eating a meal. In some cases, meals eaten are not always balanced as some foods are missing, especially fish or meat. Ganima is a nutrition specialist and has worked in various organisations in Papua New Guinea for many years. According to Ganima[23], the perception of nutrition is…

[23] Ganima, spoke to me in English during the interview.

> about food and cooking balanced meals. Nutrition is bigger and involves both specific and sensitive nutrition. It is something we are trying to teach our community.

Nutrition encompasses the knowledge of nutrients and how they work in the body. People in the village know that consuming food is more than satisfying one's hunger but not what the nutrients in the food do to prevent sickness. Therefore, Ganima has emphasised the need to raise more nutrition awareness to educate rural people.



Figure 6.6: A balanced meal as described by women
Source: Jonnelle Vagi (2023)

Figure 6.6 (above) shows a plate of food that was prepared during fieldwork. The participants were asked of their perceptions of the plate of food. They described the physical description of the content of the plate of food and agreed that it was a mixture of food and is a balanced meal. But they lacked the ability to identify nutrient components of the food. A typical meal that may be consumed in the rural villages by the sea contains *kaukau* (sweet potato), banana, fish and coconut. The meal depicted in Figure 6.6 is comprising of banana, greens and chicken. Not everyone in the rural villages can eat chicken. Chicken sold in the shops is expensive and often rural people are unable to purchase chicken.

However, some families farm chicken to earn an income or to supplement their diet as a source of protein. Some people who live near the sea are fortunate to catch fish for their meals. People who have canoes travel out to sea to catch good fish and they know where to go and what types of fish to catch.

The next photo, Figure 6.7, illustrates a typical main meal that is consumed in the rural villages, normally for dinner.



Figure 6.7: A typical rural meal
Source: Jonnelle Vagi, (2023)

The meal shown in Figure 6.7 consists of coconut, *kaukau,* banana and fish which are high carbohydrate foods and lack some vital nutrients such as vitamins and minerals. Food that provides vitamins and minerals such as fruits and nuts are consumed in season and as snacks. However, rural people are content with the food they consume as it gives them strength.

As shown above, there is some understanding of nutrition among the women. However, James whose role is a nutrition technical advisor with the National Department of Health, who has worked in this space for many years stated:

> The community perception of nutrition is about food and cooking balanced meals. Nutrition is bigger and involves both specific and sensitive nutrition. It is something we are trying to teach our community.

The type of food chosen when cooking a balanced meal is interrelated with thinking about nutrition. Without a meal that contains healthy food, a person cannot consume the nutrients that give strength to the body. James differentiated between nutrition and food and explained:

> Food is different from nutrition. Food is what we eat daily, and nutrition is what happens to food after it is eaten.

There are similarities in perception by James, the Nutrition Technical Advisor in Papua New Guinea, and participants from rural villages. Even though the rural women have not completed their education, they have some understanding of what they regard as healthy and good food. Therefore, there is a general understanding of nutrition, women are aware that they need to eat nutritious food to keep strong and healthy. They are happy when they consume their staple food from the garden as it is the source of keeping them fit.

6.2.1 Changing eating trends in the villages

The 2005 National Nutrition Survey shows that PNG has a poor nutritional outcome with high levels of stunting and undernutrition (FAO, 2024) (see Chapter 3). Magdalene worked as a midwife, nurse and a midwifery lecturer for many years, before working in the Department of Health for many years and agrees with these statistics provided by FAO. Magdelene[24] said:

> Yeah, you know we have stunting, which is on the rise, we have malnutrition which is on the rise. We shouldn't be having that because we have a variety of food. It's the way people prepare their food. They don't make use of those nutritious foods.

The rise in malnutrition in rural villages poses a challenge for communities and a concern for the government. Even though rural villages have a variety of food that can be accessed from the surrounding environment to sustain themselves, the problems of rural people lacking the knowledge to prepare nutritious meals is becoming clearer.

[24] The conversation with Magdelene was conducted in English. Magdelene is from a province other than Central Province, and it was appropriate to speak with her in English rather than Ikolu language or Keakalo language.

Kupi[25] has been a teacher in rural schools in Central Province for more than two decades. In her capacity as a teacher, she has seen transitions and changes in the Home Economics curriculum, the advantages of the subject to students and the difficulties of teaching the subject. She also advocates that malnutrition should never be an issue in the rural villages. Kupi has observed that the nearby villages are endowed with lots of nutritious fruits and vegetables that are sold in the markets. In relations to this, Kupi said that many of her students from the nearby villages and mothers needed to learn how to incorporate these foods into their cooking.

Kupi, being a Home Economics teacher, has participated in preparing food for events organised by the district officers. The district officers prefer having her oversee preparations of food rather than engaging women from the villages. She has also attended feasts and celebrations in the village communities. Women know how to prepare their staple foods; these skills and knowledge were taught by their mothers. Furthermore, she emphasises that…

> Women in villages need to be equipped with knowledge and skills in how to cook and incorporate nutritious food. They know how to cook their staple food, but they are cooked in coconut and sometimes in plain water. Women also need to plant other vegetables in their gardens apart from yams and sweet potatoes.

Rural villages may have a variety of food growing in their gardens, like their staple foods, yams and bananas. In some gardens, people plant more food that have high cultural prominence, especially those that can be used for cultural festivities. Most of the people do not plant food that contain high vitamins and minerals such as carrots, beans or capsicums. Some may plant these vegetables, but these vegetables do not thrive, because they lack the knowledge in caring for these vegetables.

Kirineti[26] has lived in Kupiano and has worked as a nurse in the district hospital for many years. She plays multiple roles in her capacity as a nurse. One of her roles is to organise immunisation awareness in the neighbouring villages. She highlighted that there were many young mothers who bring their sick babies to the hospital or for immunisation. Among the sick babies are children who suffer from malnutrition, with severe diarrhoea and wasting. She clarified that some nurses teach mothers how to feed their babies when they bring their babies to the hospital for immunisation. Kirineti mentioned that…

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[25] Conversations with Kupi were conducted in English
[26] Conversations with Kirineti were in English Language

> We have a lot of young mothers who come to the hospital on Wednesday for immunisation and other clinical issues. The villages around here have a lot of malnutrition cases, and I have attended to malnutrition cases while working here. We do not have the computers to enter our data but write them in our books.

According to this health worker, an increasing number of young mothers from the nearby villages including Wanigela, Waiori, Kelerakwa and Gavuone, frequent the hospitals with their children. The purpose of mothers taking their children to the hospital is for immunisation or nutrition related diseases. However, teaching mothers to identify different food to prevent children from getting sick and suffering from other health issues is a matter of concern. Therefore, Magdalene and Kupi advocate that there is a need for young mothers to be equipped with knowledge and skills in caring for their children.

Another significant finding exposes the need for awareness to reach young mothers in rural villages. Magdalene is a midwife and has been a nurse and a midwifery lecturer for many years, before working in the Department of Health. Magdalene states that…

> Young mothers don't really give the right food to the children to enjoy in life, and their children are supposed to have three meals a day. But because parents are so caught up with their daily routine and business like their gardening and things. Parents don't feed their children on time. Mothers don't feed the children what they are supposed to. The parents don't feed them well anymore.
>
> Easy tasol kam kukim ol noodles tasol na givim lo pikinini.
>
> No hard work, cook noodles for their children. What nutritional value does those things have? Nothing, and this is the information that is lacking for our parents, and people in our community.

Magdalene's perceptions of parents not consistently providing nutritious meals reflects on the dynamics of living in the rural villages. These dynamics include prioritising the women's commitment to community and cultural activities, social activities such as sports, and economic activities. As part of the rural village life, parents commit their entire time working in the gardens to provide food for their children. But sometimes, mothers are too tired to prepare decent meals. In an informal conversation with a group of some mothers in school, I asked what their children take to school for lunch, one of the mothers clarified in the English language that many mothers in the villages are too busy with their gardens that they forget to prepare lunch for their children. She said,

> Our gardens are where we get free food, we must maintain our gardens. We make our gardens to feed ourselves, make money and share with people. Because we are too busy, if we have money, we give money to our children to buy noodles, biscuits or doughnuts from the nearby market. Sometimes, we leave food in the kitchen so that they can eat after school while waiting, but you know, there are other children in the house too.

When children go to school, mothers give money to their children to buy biscuits for lunch. This is because mothers walk distances to their gardens. So, to reach their gardens in time, they have to wake up early to get enough time to work in their gardens.

Veaunega's role encompasses writing the national school curriculum for Home Economics and Food Technology in PNG. This curriculum is taught by specialised home economics teachers in the secondary schools across the nation. Veaunega's[27] views of nutrition is:

> We need to raise a lot of awareness, [be]cause the eating trend and habits, food choices are changing. People are consuming more store-bought food. I see awareness to be a big thing for the community, to educate our community on the importance of eating the right kind of food, and diet. A lot of lifestyle decisions are affecting Papua New Guineans. We have a lot of nutritious food, a lot of organic food, so we have the right food, it's just awareness and education. It must start at the school and so, we want Home Economics to be taught at a higher level.

Veaunega emphasised the need to raise awareness in the communities. Despite that fact that Papua New Guinea grows organic food, lifestyle diseases are increasing because of people's food choices. She contends that educating the community and teaching Home Economics subjects in schools can better health in communities. The perceptions of evolving eating trends, eating habits and a reliance on introduced food is visible in urban and rural settings (Iese, 2023). Most of the participants agreed that diets of rural people have changed over the years as more introduced and imported foods are brought into the country. The complexities evolving around raising malnutrition rates in PNG, and how nutrition awareness could be addressed, are difficult because of the diverse cultures, geographical locations of the villages, and the funding implications for awareness in the rural villages.

[27] Conversations with Veaunega were in English language.

Even though diets are changing in rural villages, most of the participants agree that they love their garden food. The older respondents claim that consuming their garden food is more satisfying than introduced food. For example, according to Eve:

> Oi bege senisi, gonenai be galeka, komu, magani. toma be raisi, parau, noodles, fresh meat, takila too much of tinned fish. Gonenai be vagi, bae, e magani ge vagi gwani, o toma be tini ganiganina ta ganiani be kevekevena wena girau tadavaliani
>
> Yes, people's diets have changed. In the past, we used to eat *galeka*, sugar cane, fish, today we eat rice, flour, noodles, fresh meat. Let's say too much tinned fish, before we ate wallaby, pig and they used to catch fish, but today we have too much tinned food so we a suffering from all kinds of sickness

Diets have changed in rural villages. What used to be eaten in the past have been replaced with introduced foods (Iese, 2023; Saweri, 2001). Similar sentiments were raised in the discussion about consuming fresh foods as opposed to preserved foods in rural villages. Their perceptions of consuming preserved foods (tinned fish etc.) came to light as the women talked about cooked food being eaten as the women talked about *bagoga* (left over food). According to Eve:

> Bagoga taganini. bagoga ema tanuvaitanuvaini gauna taganiani ena fridge ai tanuni gauna taganiani. Gonenai gila be fresh.
>
> We are eating preserved food or left over food, we are eating the food that stays in the fridge for a long time.

Bagoga is a term used in the *Ikolu* language in the Rigo District that refers to cooked food that is eaten the next day. Therefore, in this context introduced food items, those that are preserved in the tin, or stored in the refrigerators can be referred to as *bagoga* food. It is often said that people who eat *bagoga* are sick and not always strong. In the village, people are frowned upon when *bagoga* is eaten. Children and teenagers were restricted from eating *bagoga* for health reasons and longevity (Lagani, 2023). The following section will discuss experiences of participants and the importance of nutrition education in rural communities.

6.2.2 Nutrition awareness in rural communities

Most of the women said that relevant organisations hardly reach the villages to raise nutrition awareness. However, women are told to eat a variety of green vegetables when they visit the clinics for pregnancy checks or when they bring their children in for immunisation. Not everyone gains access to the awareness that is provided by the NGO's. Mogogele is a single mother who lives with her parents

in the village. Mogogele left school because she was frequently getting sick in school and her parents were unable to pay her school fees. While living in the village, her relatives engaged her to look after their children. The church she belongs to also assists her to do some studies. When I asked the women if any of the NGOs visited the village to do nutrition awareness, Mogogele said:

> Nogo be magau mogo gemei lakatogani mogo, women in violence mogo.
>
> It's only those people who advocate against domestic violence who come into the village.

There is a presence of NGOs such as Care International, World Vision and the UN, in the country. These NGOs aim to work in the communities to improve nutrition, but these organisations have not reached some of the villages. However, there are some individuals who visit the villages to raise awareness about domestic violence. Like Mogogele, Mune disagrees that NGOs and specialists from the government visit the villages to raise awareness on nutrition.

> Asigina, nogo be immunisation tauia mogo ge gomaini, melovala ge gwanu giani gauia e nogo sena, senagi nutrition kavanai be asigina, nogo be asi vegabini neinei.
>
> No, only people who give immunisation come to the village, those that give injection to the children like those ones only come, but the ones on nutrition side don't come, no it doesn't happen here.

Health workers visit the villages when there is a major break out of disease. The health workers educate the community on how to prevent diseases from spreading, such as COVID-19 or scabies, and ensure that children get immunised, yet nutrition is not addressed. Asked if they thought it was necessary for NGOs, and government technical and specialists, and health workers to visit the village, Mogogele said (with emphasis and in an angry tone):

> Yes! Begere mei lakatoga. Kwalana, vavine valiguia asi ribaia, ataveisana natuia bege gitagaugiani…ataveisana ganigania bege genigiani, begere mei lakatoga gai begene veribamai, begeru veduru. Sinagi nogo sena asi gekalani, mostly gemai mothers mogo.
>
> Yes! They should come into the village. Because some mothers, don't know how to care for their children, how to feed their children the right food. They should come and teach us and support us.

The expressions and tone in Mogogele's statement emphasise the need for nutrition programs for women in rural villages. She stated that the women should be taught, *veriba mai* (teach us), and supported (*veduru).* The nutrition programs and resources will enable women to be equipped with knowledge and skills to care for their children. Some young mothers lack knowledge in feeding their children. Mune found that:

> Family planning, melovala ge gwanu giani gauia e nogo sena. Senagi nutrition kavanai be asigina. Ena ganigani namo ia bono gani. Nogo be asi vegabini neinei. NGO keta asi ge gomaini, not all the time but keta gego maini segani geta gera vanua selfish be nogo rai tau goneni gauna, committee makina asi honest committee ia be atagau o moni geve lakasiani maki committee na geve poketaiani. Ena molagani makina bese kamolagi veisena.
>
> Only family planning and nurses come to immunise the children. No one comes to the village to teach us nutrition and anything relevant to that. We would like people to come and teach us about eating good food, none of those people come to our village. When the NGO comes at times, our village is selfish. So, whoever comes first, the committee also is not honest, whatever they give, ends up in the committee's pockets. Like yesterday (referring to the Governors visit to women in Rigo district), we heard that the Governor was coming to our villages. Life is like that, that's how it is going.

Government and NGO specialists and technical advisors have not reached the women in rural villages. This quote exemplifies the fact that there is an absence of relevant organisations attending to the needs of the women. Most of the women living in rural villages have not completed their education (Goro, 2021). So, the fundamental knowledge about the significance of nutrition was not learnt. For these reasons, women in rural villages look for opportunities, not only in a nutrition context, but other areas like in agriculture, where they can learn to improve their livelihoods.

There is an indication that women lack adequate information. Sometimes, women leaders keep information to themselves or divert it to specific groups. The reasons outlined above suggest that women lack some resources, knowledge and skills. They are only taught by their mothers who also lack the knowledge. Therefore, equipping women with skills and knowledge can enhance or improve their cultural understandings in nutrition. However, another respondent stated that young people in the communities are trained as volunteer village health workers to assist in health promotion. These village health worker volunteers promote health and report diseases that are identified to the District Health Centres. The midwife who has been training volunteers for rural villages, Magdelene, explained:

> You know people in the community, young people in the community are the bridge between the community and the health centre. They can be part of the health care system, and most of their job will be like village health care workers. We used to train them on this. Most of the time we give health promotion, and if we identify any diseases, they will refer to the health centres and the link between the Community health centres feeding the government with the information.

In some parts of PNG, young people from the rural villages are being used as health care volunteers (O'Keefe et al., 2011). Magdalene indicates that, as part of the health care system, the role of a Village Health Volunteer (VHV) is to support a healthy lifestyle in rural communities. According to her, unemployed youth who live in the villages are selected to work as volunteers and are trained by the Department of Health. These VHV are trained to identify common sicknesses and symptoms if they occur in the villages. The information is gathered and reported to the district health. The VHV is a bridge between the village and district health. However, the participants from the two villages sites lacked knowledge about the existence of the VHV in their communities.

The next section will bring to fore discussions and experiences of rural women, the significance of food and cultural understandings of food. It will be highlighted what food means in the rural villages and its connection to women and the cultural festivities.

6. 3 Food and community activities and the significance of *ve tarikaka* and *ve galagala*

Food means much more than biological survival. It stands for cultural and religious life. It facilitates relationships with other people in the community. From an Indigenous food systems perspective and looking at local cultural practices, it is important to recognise that food draws people together and food plays an important role in activities organised in the villages. The activities of the people are focused and planned around a seasonal calendar. Knowing the seasons of food facilitates the traditional activities and values, which are the pinnacle to the identification of plans of action to provide nourishment for families. In Ginigolo village, of Rigo district's social context, these cultures activate a sense of *ve tarikaka* (maintaining relationship with siblings and first cousins), *ve galagala* (maintaining relationship with extended relatives) and *ve vagakava* (providing assistance), verbs from the *Ikolu* dialect in the Rigo district. These words are relational terminologies that are activated during family and community gatherings. In this context, relatives are drawn together, and food sharing rekindles the bonds and connectedness in communities. The value of maintaining *ve galagala* **(**with extended

relatives) and *ve tarikaka* (with close cousins), enhances the people to work cohesively, assist and support in activities organised in the family or for the community. The participants explained the significance of the values in maintaining relationships. For Vabu:

> Vegalagala e vetarikaka magulinai vau ia bei vagoni bei lakakaini. Au tarikakagu be nagoa be ia gaukalani be nago na vekavaia nogosena magulia gekalagoni.
>
> Maintaining the relationship with extended families and close kin is the way of life, that is the only way for them to come closer to you. My cousin is there, they are working so I will go [there] to assist them, that is the way of life.

Relatives are drawn towards someone who reciprocates with kindness and recognises their needs. When one assists them in their time of need, relatives in return will also support and attend to their activities. This is the way of life in Ginigolo village.

Going further with the concept of maintaining relationships, Eve claimed that *ve galagala* and *ve tarikaka* are significant concepts and core to the system of support.

> Gau barana be vetarikaka e vegalagala, nogonana vau goi galagalamuna bei vekavamuni, bege veduruni, galagalamuna beia gitamuni. Gemu kevei gemu rakavai gamu bei tugutugu rageni. E nogo magau velekwa e veginitago, takila veginitago varo cornai naia. Genai vanuai ga tanuni, vegubakau asigadara.
>
> The big thing is to maintain a good relationship with your cousins and other relatives. It is only through maintaining relationships that your relatives will assist you, your relatives will see you. When you are sick, in your bad times, your relatives will send things up to you. Also, for whatever feasts, bride price, let's say bride price. And that is the reason why we have so much respect for our relatives.

Vabu also agreed that maintaining relationships with kin and relatives is the way of life. It was explained that maintaining *ve tarikaka* and *ve galagala* also extends and activates *ve vagakava. Ve vagakava* is a verb in the *Ikolu* language that means assistance and support. These values establish and activate an act of reciprocity of giving in cultural festivities or activities and in our daily lives. Enhancing *ve tarikaka* and *ve galagala* activates *ve vagakava***.** This was clarified by Vabu:

> Goi iagena veginitago bwagoni genai ia maki goigemu veginitago beiagoni. Veilamu bogatoasia genai ia maki veilana bei gatosiani. Goi bo veilani genai ia maki beia veilani. Goi velekwa bo kalani genai, ia maki goi gemu velekwai beia veilani.

> Gena galivata bo gabini genai iamaki goi gemu galivata bei gabini. Vanua magulina be nogo veitani vegubakau be gau barana.
>
> If you go to that person's bride price ceremony or cultural feasts, that person will also come to your bride price ceremony and feast. If you show your face, they too will show their faces. If they do their feast, you too will have to show up in their feast, they will appear at your feast. If you get galivata [a banana variety] for them they too will get galivata for your feast. This is what life is in the village and respect is a big thing.

Similar to Vabu's contemplations on the value of respect and reciprocity, Eve illustrated how systems of relationship work during cultural festivities. She said:

> Goi gena galigwata (banana variety) sebona bo gabini genai goi gemu gaukalai ia lua beiagabini.
>
> If you get one galivata [banana variety] for him, he will get two for you in the future.

Food stands for cultural and religious life; it facilitates our relationships with other people, and food is pivotal to community ceremonial celebrations. It is during the community cultural festivities that values of reciprocity, relationship and respect are visible. Also, during these occasions, many young women are engaged in every aspect of the feast such as preparing meals and learning the values of the culture, the ways of doing things are taught by older people.

Preparation of village activities involves a lot of planning and hard work is put into the activities. This means that harvesting food from the gardens must fall in line with community festivities and cultural activities. The family programs for the feast and community activities must also be in line with the seasons of food and the harvest calendar. To achieve these goals, families, clans and communities prepare their gardens. Gardens are where the people gather their staple foods including taro, corn, yams, bananas, and *mokela* (sweet potatoes). They also target the seasons when they will be able to gather protein rich food such as crabs, prawns, and fish or to hunt for game like wallabies and wild boars.

Food is used to generate an income, maintain relationships and medium to draw people together. One of the common church gatherings, is *boubou*, which is an annual Thanksgiving event for United Church. Women in rural village play a major role in contributing to the thanksgiving event. Women are part of their local women's fellowship groups and are divided into four groups (Service, Education, Recreation and Devotion). Each of the women in these groups are each given a target amount to raise. Each woman

in the group now has to work hard to contribute toward the fund. In order for them to meet their funding goal, individual women make gardens to sell products, cook items to sell, or involve their spouses to catch fish to generate an income for it. These are added tasks to providing meals for the family.

Another way for a group to reach the target is by raising awareness within or outside the clan to see whether they will need women to weed the garden, plough the garden, plant the garden or gather firewood. All these jobs are done with the expectation of reciprocal assistance towards assisting women meet their *boubou* targets. I refer to this process of assistance as *ve vagakava* (*Ikolu* language) or *ve va'ava* (Keakalo language). This process was captured in my notes while doing my fieldwork in Gavuone as follows:

> The women's fellowship from Kelerakwa, youth groups and clans are preparing for their boubou[28]. Boubou is drawing closer and the women's fellowship leaders from a clan have visited my children and me for support. They have asked if I have work that needed to be done. Work such as weeding the garden or ploughing the land for a watermelon garden. Another family came to ask if they could plant mokela (sweet potatoes) in our garden for their boubou. They are selling yams and crabs to raise funds for boubou. I gathered my children together to see if there were work to be done. My children and I schedule time for each group to help out on our land. We made time for the women to help me clean my yard, bring me ten bundles of firewood. One bundle of firewood is K10.00[29]. Also, we arranged for the family to plant my daughter's mokela[30] garden. Meanwhile, my son arranged for a group of youth, to pull the fence around the land (Journal entry, June 2023).

In the process of assisting the women's and youth groups with their *boubou* contribution, they congregated and brought yams and other food to my house. But when the women heard that I was preparing for a bride price event in the next fieldwork site, as part of the tradition and the act of *ve va' ava*, the women reciprocated by contributing toward the feast. In this way, providing for this bride price event that the practice of *vegeni laukule,* reciprocating, *basket-to-basket* was demonstrated.

This basket-to-basket system was revealed by single mothers in the rural villages as one way to reciprocate, *vegeni laukule*, by offering baskets of traditional uncooked food or a dish of cooked food

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[28] Boubou literally means annual thanksgiving organised by the United churches in all rural villages in Central province
[29] Kina (K) is PNG's currency. K10.00 is equivalent to New Zealand $4. 37
[30] *Mokela* refers to sweet potato

with other goods, it can also be referred to as a barter system. In reference to the journal entry, the act of *vegeni laukule*, basket-to-basket is the exchange of work by women for a monetary value towards their activities. This represents the cultural value of reciprocity. Figure 6.8 shows bags of yams gifted to my children and me towards the contribution of the then upcoming bride price feast.



Figure 6.8: Bilums of yams and taro, gifts from Kelerakwa Women's Fellowship group
Source: Jonnelle Vagi (2023)

The participants from Ginigolo rural village pointed out that cultural activities such as velekwa (feasts) and veginitago (bride price) are major activities people in rural villages work towards. As just was elaborated on, these activities are significant in maintaining relationships. The families make decisions to meet the objectives of their velekwa and veginitago and, therefore, decide on the size of their vegetable gardens, the number of gardens and the types of vegetables they will plant for upcoming events. They also plan ahead on the types of vegetables to sell to generate an income so that the income can be either contributed towards the feasts in cash or used to purchase other food or items to accompany their digu (food basket or food dish). The participants mentioned that they would plan ahead when the church calls or asks for contributions for programs of different activities. Vala illustrates how she plans ahead with her family and that she reserves some of her harvests to reach a planned date. Sometimes, food reserved for these occasions are the best products, while the family eats low grade food. Vala explained:

> Takila ena rubu kearigoni, rubu kearigoni bena goi varau bo planini, be au naia wiki aunai au nagosena naveitana navetaina ba kalani. Be bwalaukuleni natumu garavamu boveikilariani…Enogo kiki bagatoria be asi bono gabikalauria. Au magegu group gaukalai genai.

> Let's say when the church announces the program and dates for activities, you will already be planning, so when you return you will tell your spouse and children. I will be doing this for this week. I put that aside (referring to food) so don't touch it, I have some group works so don't touch it.

Church and community activities are planned according to women's gardening and harvesting seasons. Women in the village prepare their gardens with a perceived goal and take into consideration the festivities and ceremonies that will eventuate. They save their harvest so that the food products will last for the next harvesting season. In some cases, their harvests are divided and preserved for those purposes. Vabu states:

> Yes, ta kila na galivata au gegu veginitago gauria bagabiriana gauria be asi gabi kalau. Na galivata a lobe giani asi bogono gabi kalauria. Be na beia mageni genai naba selo giani monia bogo gabigiani, ganigani maia bogo gabini maia sitoai. Oi, nogo galagala geia disi maia mobo kalani mase gabuna gana mobovagoni, o veginitago gabuia gana mabovagoni. Maguli be nogo sena.
>
> Yes, festivities like bride price and other feasts influence how we do our gardening. I will take these for the bride price so don't touch them. I am wrapping the bananas (galivata) so don't touch them. Sometimes we sell them in the market, get the money and buy store goods. You will do dishes for the relatives (you prepare dishes to assist relatives). You go to the bride price feast area. Life is like that.

This is the way of life practiced in Rigo and Abau Districts. Their commitment to family, community and church activities and planning of their gardens revolves around their commitments The next section captures discussions on experiences of accessing food and resources in villages.

6. 4 Conclusion

This chapter highlighted findings on women's cultural perceptions of food and nutrition. Participants have identified that consuming more store-bought food contribute to sicknesses. However, in rural villages, mothers are sometimes unable to prepare good food for their children because they are concerned about their gardens.

The data presented here has shown that social and economic empowerment or disempowerment is coupled with the social standing of women. The environmental challenges in rural villages that affect single mothers in providing for their families are also significant, as they can lead to food insecurity, which affects single mothers more than others.

This chapter presented the *ve genilaukula*, *basket-to-basket* use strategy, an exchange based on cultural values that maintain relationships in the community. The basket-to-basket practice epitomises the values of reciprocity, respect, relationships, giving support and assistance and obedience (*ve tarikaka*, *ve galagala,* v*e vagakava*, *veduru* and *vegubakau*) and are integral to the process of *vanua vekokolena,* community empowerment. The next chapter will explain availability and access to food and will elaborate on the gender roles that determine food production and distribution in the village.

Chapter 7: Food availability and food production practices



Figure 7.1: Completed woven sides of the basket
Source**:** Graton (n.d.),

7.1 Introduction

This chapter builds on Chapter 6 and continues to represent the analysis of findings drawing on the fieldwork data. The first section will show how women access food and will look at the hindrances to producing and accessing food. These obstacles have a strong impact on food security and the villagers' health. The second section will then focus on gender roles and specifically the women's roles in food production and the struggles that especially single mothers encounter.

As before, the *doi avatuani* analogy can be applied in this chapter: similar to Chapter 6, the whole basket that is supposed to be filled with food is presented here. Sometimes, there are obstacles that keep a basket empty. Yet, with the support of family and community through *ve genilaukule*, reciprocity as in basket-to-basket, something can be done to fill the basket with food.

7.2 Access and availability of nutritious food in the villages

Resources in the villages are sometimes difficult to access. Resources in the village context refers to food or materials that people can draw from to live and work effectively. The ability of individuals, households and communities to access sufficient, safe and nutritious food to maintain their health is also challenging at sometimes. This section will explain women's experiences and their understandings of food accessibility and availability in rural communities.

When there is no food, this means that all stock is in the ground, still growing and yet to be harvested in a certain calendar month. So, the village people gather other types of food while waiting for those that were planted to be harvested. People in the village make more than one garden so that they are able to harvest more, they store up the surplus, and some food is reserved to be gathered for later purposes. Vabu said,

> Golou araga gonena rogo galani, kwakwa taimi na rogo ma ganiganina, be rogo bove aloni genai, ganigani araga gonenai ga gabini. Araga gonenai bo kwani bo aleva alevani. Asi ganigani taiminai e garo Lalani genai be gai galakatogani velogai galeka gavetauni e kiroma gave tauni, kurumoni ga geloni.
>
> The new garden is still going, so the harvest is yet to be ready. So, while you are waiting, you feed from the old garden, you will harvest and still work in the old garden. When there is no food or when the sun is too hot, we go inside the forest, looking for *galeka* and *kiroma*, we pull *kurumoni.*

Figure 7.2 below shows the *kurumoni* plant grown in the villages. The tubers of the plant are edible. Women harvest the tubers during drought seasons and can create a good meal for the family.



Figure 7.2: Kurumoni plant is also known as the camma tropiccana
Source: Limu Mou-Vagi (2023)

Rural women are very resilient and able to make more than one garden. Making more than one garden is dependent on land ownership. While the new garden is still growing, women still harvest food from their old garden, as the old garden will still have food in it. There is a system or cycle in the villages that people utilise. When a new garden is prepared and planted, people will still be cleaning the old garden because food is still available.

Participants also raised issues about what they need to consume daily and how they sometimes go without food or struggle to meet the needs of their children. One woman, who had six children expressed distress at the amount of burden she encountered since the passing of her husband. Similar sentiments were expressed by other single mothers, as Mune explained:

> Magemai genai kiki be, parau keta misia keta ga ganini. Asiginagenai, rice ga ganini, or rice e flour asigina genai biku rakavarakavai nagwa genai nogo gaua ga ganini. Na atanu kiki be lunch be momogoni ga skip iani. Garo siau kiki, e gemai davali gelegeleai kiki. Asi gini bena asigina nogo bena gena mogo. Atagau kiki a seloani gauna kiki bena dinner gauna maia a goiani bena. Bena asigina kiki bena bese geiai a noginogi kiki bena biku rakavaia ta ge genimaini nagwa
>
> When we have food, we eat small fried flour dumplings. Otherwise, we eat rice or if there is no rice and flour, we eat young, unwrapped bananas from the garden if they are in the garden. We honestly skip lunch. The sun is hot; we live according to

> what we find. If there is nothing, then there is nothing to eat, we go to sleep. Whatever we get from our marketing sales, we spend it to buy our dinner. If there is nothing from the sales, I seek assistance from my family members, they give me bananas if they have it.

Women sometimes have healthy diets when they have sufficient food harvested from the gardens or bought from the store. However, when there are no food women enter their old gardens to gather unwrapped, young bananas if there are any in the garden. When there is no food at all, they go to sleep without eating.

Most single mothers highlighted benefits of their practice of *ve tarikaka* and *ve galagala* (see details about these practices in Chapter 6). One participant expressed that when there is no food to feed her children, she seeks assistance from her relatives. For example, Mune describes this as follows:

> Ba ganigani asigina taiminai bena ave tuamagini. Moni ata bara davali sia bena gegu maketi bara vebaraia. be keta bena a give up goni gabuiai benamo market bena a tualekwaiani be nogo agitaiani genai au be asi monigu ave toleni. Be nogo rai galagala namoia kiki nagoa asigina sinagi arigoni, vetuagu wani genai parao seboia geni guni. Amai bake iani kiki asigina kiki a build-up iani. Be a gauni gabuiai mana kalawilagini. O family keta ge gitaribaguni genai nogosena, keta ma garavaia, o nogo cousin akilagiani ge gitaguni genai ge kilani ta ganigani vau bono laka gesiani. Be gila maki ma geia bese kiki be misia kiki ga ganini bena gavanagini.
>
> When there is no food, I think a lot. Where and how could I get the money to increase my market or have a continuous market. At times I give up and when I give up my market, I don't have any money. So, wherever there are good relatives, I go to relatives who feel sorry for me. When relatives give me flour, I bake it and sell to earn an income. I continue to sell when the income increases. When some relatives notice that I am down and looking sick, they call me to have dinner with them before I go home. They too have families, so they share little food for us to eat.

Women are financially burdened when they do not have the means to support themselves or continue with their market activities. Women seek assistance to regenerate their market by starting little again. It was pointed out by one of the participants that maintaining relationships in the village community is very important because it is the way of life in the village. Mune explained that in times of drought relatives assist each other:

> Garo keta bema galagala namo genai, geia aragai ganigani gogo genai gai ge genimaini ge duru maini. Bema asigina genai bena aisgina kwalana garo siau lelevagi. Be gai ena maketi e stoa ganigania gave gabikauni o velogai ga lakatogani.
>
> And if there are relatives who have surplus food harvested from the gardens, they supply, if there is none, there is none because of drought and dry season. We rely on market food or store-bought food. If there is no money, we rely on bush food

There is a general feeling of hopelessness when there is no food available, or there is no garden to sustain the family. The cultural practice of maintaining *ve galagala* and *ve tarikaka* is the way of life in the villages. By maintaining this culture, people are supported in different ways such as clearing and planting new gardens and cultural festivities and ceremonies. Food is also shared among each other.

Women in Ginigolo have a calendar and a system of planting and gathering food in different seasons (see Table 7.1 further below). In the villages, when there is drought, and while waiting for their food still underground, people go into the bushes to harvest wild yams. They walk long distances to familiar locations where wild yams were previously dug. People survive by eating food gathered from the bush. The weather determines when women should be planting food or when they should be harvesting. Yams is particularly important, and Figure 7.3 shows a variety of it.



Figure 7.3: Yam varieties
Source**:** Jonnelle Vagi (2023)

Figure 7.3 shows different species of yams that are harvested between August and October. These yams are rare and special to women in the rural villages and are often handled with care and kept for cultural purposes. When these yams are still in the ground and are still growing, women go into the bush to look for wild yams. The next section will discuss experiences of women and the impacts of environmental changes on their food sources.

7.2.1 Food availability depending on available resources

Food is readily available in the rural villages. Food availability refers to the physical existence of a sufficient quality of food (see Chapters 2 and 3). However, land degradation from changing climate patterns and human interferences sometimes alters the availability of food. Findings that were explained earlier, in Chapter 6, show that there has been a change in the diets of people in the villages. *Vito ganigania*[31], so called 'hunger foods', such as rice and flour, have become dominant in people's diets. Instead of eating food from the gardens, people are purchasing food from the stores. Only those who work very hard in the gardens, who can sell products and can earn an income, can supplement their family's diets with food bought from the stores. Eve stated:

> Melo vala valiguia and taulimalima keta vanuai ge lepesigiani. Keta sinai tamai ge gwaukalani be aragai asi ge gwaukalani. Ge lepesiagiani aragai asi gegulani gwaukala.
>
> Young boys and girls and some people who live in the village are lazy. For some, their parents earn an income, so they do not like working. They are lazy and do not like working in the garden. They rely on their parents.

According to the participants, young people perceive working in the garden as laborious and burdensome. Some young people have little technology and tools available for gardening. And some lack the knowledge working in the gardens or do not fancy working in the heat of the sun. These are some factors that disadvantage young people from working in the gardens.

Many women in the village use their excellent skills and preserve their food, especially yams. Vabu explained:

[31] *Vito ganigani ia* refers to hunger foods in Ikolu language spoken by Ginigolo village in Rigo District.

> Gai gaimai ganigani gekolini genai, raisi parau na gave koukougauani, vito ganigani ia. Gai gamai vabuli be gatogiani be misia misia ga ganigiani. Ganigani baraia be gabei vau ga gabiasiani. Nogo be gaigemai future gauna. Nogo ganigani keia begene koli, nogonai vao gauiai maia bagana vegabi kau nogonana vito bagana dukua, vito dukuduku na ga siagoni. nogo ganina be, nogo ganigani barana asi gave gabikau goni kwalana, vanua gaukalana bege gwarasini nogo bagana vegabikau bagana dali ia gana genai.
>
> When our food finishes, we rely on rice and flour to close that gap, they are referred to as hunger food. Our yams are used for the future or later. We start with the small sized food first until those small foods would finish. Then we would go on to using the big-sized food to combat and face the drought season. We called it the hunger supporting food. We would not touch the big food. We cooked the big food when there are community activities.

It is in Vabu's quote above that *vito bilina*[32] is introduced. *Vito bilina* refers to preserving and reserving food to 'close the hunger gap' between when the food will be harvested and when the food is planted. The small sized yams are consumed and when the small yams are finished, they use the big sized yams. The big yams are reserved for special occasions or to be consumed later. The big yams were used when food is still in the ground or during drought seasons. When the big yams are gone the people in the village rely on consuming rice and flour. The introduced food then become the *hunger food* or *vito bilina* which means 'closing hunger' or closing the gaps' during the drought seasons or raining seasons especially when the food garden supply is scarce.

Women in the village are strategic in their plan for planting and preserving their food. They preserve their yams and food so that they can still eat during drought seasons. The small sized yams are eaten first while the big sized yams are preserved for later or used for bigger events in the village. Vabu reasoned:

> Gai be nogo ganigani keia gave gopagopa gau goni o nogo ganigani keia ia koli goni, ganigani baraia gave nabakau goni. Nogonei vaube atagani gaukalaia ge siagoni vaube ga dalidali goni, vanua gaukalaia daidalia, ekalesia gaukalaia, felosipi gaukalaia ga kala goni nogo nei gave nabakaugoni. Gai gemai venabakauia be nogo

[32] *Vito bilina* refers to locking hunger or closing hunger in Ikolu language, spoken in Ginigolo village, Rigo district.

> ganigani baraia geiai, gaina asi ga kala rakavarakavaia goni, gai gemai vito bilina ga siani. Gai asi begene vito mai be nogo ganigani barana na bene kougaua, vito bilina ga siani.
>
> We would use those small sized foods to cover us until those small sized were all eaten. Then we would go onto the big food. We cook the big food only when there is a big event in the village. We would take our big food out to cook for village work, church, ekalesia and women's fellowship work. It was only then we would touch our big food. We have held onto those big food, we did not use them unnecessarily, we have called them our *vito bilina*[33]. So that we do not get hungry, that big food will close it, we call that hunger blocker or close hunger.

Food is readily available in surrounding environments, and one has to work on their land to till the land and plant seedlings that can be harvested in the future. However, most young people hesitate to make gardens. Eve elaborated:

> Ge lepesi e keta asi araga ribaria. Keta varo varo asi ribaria, o keta laulau asi ribaria. Asi gegulani vekwalai. E keta lobelobe asi rebaria. Nowadays aunai na taulimalima keta asi ge ulani venaga tali.
>
> They [some young people] are lazy, and some don't know how to make gardens, how to plant or how to weed the garden. They do not want to work hard. Some don't know how to wrap the banana. Nowadays, most of the young people do not want to bend themselves down to work.

A variety of food can be harvested from the garden if young people work hard on their land, but sadly this is not always the case. One issue is the knowledge gap, which could be addressed by the men in the villages. Men in the villages of Central Province own land. Land can be cultivated with a variety of food species. The skills and knowledge are normally passed down from the parents to the young people to till the land. Some roles taught by the parents are gender specific while others may be not. For instance, preparing the land is usually done by men as it involves digging the ground. Men are not allowed to plant, as planting yams is specifically a women's role however the men are responsible to

[33] *Vito bilina* refers to closing the hunger gap in Ikolu language, Ginigolo village.

plant and care for the bananas. This seems to be a knowledge young people need to hold onto. There is, however, a knowledge gap between the old people and young people when making gardens.



Figure 7.4: Women from Ginigolo village showing their harvest from the garden
Source: Gima Godu Mou (2023)

The above Figure 7.4 shows young women holding food that are harvested from their garden. Food can grow in the environment, but people must learn the skills and knowledge to cultivate the food. However, in most cases the weather patterns affect the food supply. The next part of this section will highlight discussions on the implications weather patterns have on the food systems.

7.2.2 Implication of weather patterns on food supply

There are times when food gardens are destroyed by environmental conditions, such as drought and flood. In these events, the new and old gardens can be destroyed, and food systems are then destabilised (Iese, 2023, PCADMIN PNG, 2019). In villages along the coastlines, like Gavuone and Kelerakwa, the wet seasons can cause a lot of damage to the food gardens, and this can mean that people in the villages can go without food for months (some consequences for families were explained in Chapter 6). I was compelled to capture the events and experiences of these weather events in my field notes, as below:

> It is raining non-stop, raining into the second week and hesitates to stop. The seas are rough, the bridges are overflowing with water, the roads are in their worst states making it difficult for the vehicles to travel. Worst still, the water has reached my waist, and I am wading through the water around my house. Families are running to their gardens to save their food. The older women of the village are advising me to remove my tapioca[34] out from the ground because they will be spoilt. Sure enough, after a couple of days, my tapiocas are rotten (June 2023).

> Flood and the raising levels of water are extremely difficult for people living in the villages as people rely on their food gardens. However, when food gardens are flooded, food that was planned and planted for a purpose or even for daily consumption is destroyed. And if the food is still in the ground, the women will have to harvest the food before it becomes rotten. Even still, there is no guarantee that the food can be preserved for later use. Nevertheless, if women have food gardens in higher land areas, they are likely to have food that they can turn to. For this reason, people who have land are likely to make more than two gardens so that they can harvest food in abundance. Flood destroys people's food gardens as captured in my fieldwork notes. Food such as yams and tapioca or cassava that are grown in the ground are often under water. In most cases when these crops are flooded, the women harvest most of their food early because the food will rot if they are left in the ground.

At the time of my fieldwork, the prolonged raining causing flood affected the villages, the food gardens and the roads. One of the participants explained that food should not be bought from the food markets because the contaminated water had affected the food quality. Consuming the food has led to people contracting diarrhoea, the contaminated water also caused an outbreak of skin disease. People can become sick from eating food harvested under the flood. Therefore, during fieldwork my children were warned by the older women not to purchase food sold in the market. Maopa explained:

> Ganigani maketi ai ge voirana gauri pigono voiria, ganigani nalu ai ge miani gauria maketi ai ge voiriani. Wa vi pige rawali.
>
> We should not buy food from the market. You know food dug out from the water are sold at the market and these floods can make us sick.

[34] Tapioca also known as cassava and scientifically knows as manihot esculenta. It is an edible root tuber.

Climate risk can have a direct effect on food systems in the rural villages. Climate hazards include prolonged rainfall, which can last for more than two weeks (Bourke & Allen., 2009, Bourke, 1990). The unstable supply of food from the garden reduced access to local nutritious food. Subsequently, there was a high dependence on imported processed food. When flood destroys the roads leading to the villages, cargoes for the stores are delayed, and so food prices rise (Savage, et. al., 2020, 2021). Meanwhile, some people rely on their relatives to give them food if they have an abundant harvest. Also, a decrease in traditional livelihood practices, such as gardening and other food production has impacted the ability of people to sustain their economic livelihoods and customary practices. This is a struggle for most families living along the coast.



Figure 7.5: Flood causing a broken bridge
Source: Daryl Vagi, (2023)

Figure 7.5 shows the bridge that normally connects Port Moresby to the villages in the Marshall Lagoon, Abau district. The flood has broken this connection. The implications of flooding, and broken bridges, can cause more burden on the rural people as participants indicated (see also Wiegand, et. al., 2023). The blocked bridges are a result of the extractive industries who dispose wood chips or unwanted fallen trees into the river. When the water level rises, the current from the river washes the rubbish to the bridges. These rubbish then blocks the bridges passages causing an overflow of water onto the road. This was also captured in my fieldnotes,

> We are stuck in the village for two weeks now. Food sold in the markets can be very costly, only those who earn an income can buy the food. There are lots of logs and residues that are causing the blockage in the water passage. The bridge is washed away. The road is flooded, and the road conditions are not conducive to travel, for people to bring their produce to sell, store owners do not travel to reload their store

> goods until flood subsides. The store shelves are empty, and stocks are down. As a result, the prices of food and other goods in the store tend to increase in the villages (Fieldwork notes, 2023).

When the logs, which have come down the river from the mass logging activities that multinational corporations (mostly from China in the case of these villages) have undertaken since 2010, block the water ways in the bridges, the flood rises and overflows the bridge. A prolonged flood cuts off the services and road links between the village and Port Moresby. The store orders are delayed leaving the store shelves empty and the cost of food prices also rise. The flood that swept through the villages in Ginigolo and Gavuone had destroyed food gardens. People have lost most of their bananas, yams, green leafy vegetables and other main crops, including piggery farm and poultry during this recent flood. Eve said:

> Na toma aunai gabatana beiraga genai. Na bena store ganiganiria mogo. Gutuma benamo store ganigani ria mogo.
>
> Just recently the river was flooded. It's just store food now. Most of them are relying on store bought food.

Food security of the people is challenged almost every year when prolonged rain occurs as observed in the rural villages. People find alternative ways to provide food and finances to feed their families. They are resilient when climate affects crops and, in most cases, overcome the changes that occur in their environment. This is how Lewa has described her resilience:

> Gai ma gamai ganigani, ganigani ia vogo, gai e ma gemai iulakapu, ga varovaroni, gai e matini veiairia, gai e wedana mogo iulakapu everavani.
>
> We have food, we have lots and lots of food, we have gardens, we plant our food, we work like machines, but the weather spoils our gardens.

As Lewa said, there is an abundance of food in the village. Women expressed that they had good land that produces food in abundance. But the yield of food is often destroyed by weather changes. The changing weather patterns influences garden food harvests and food sold in the stores. Cost of food sold in the stores increase when roads and bridges are destroyed by the flood. Rising cost of store-bought food increases the burdens of the people.

Women work very hard in their gardens with simple tools. They refer to working like machines because they start in the early hours of the morning and finish late in the afternoons. Women produce food in abundance using their own food knowledge, seedlings and agricultural systems. Home gardens are very common in rural villages from which women grow their own food using simple tools and sustainable methods. However, the varying weather patterns, combined with commercial logging practices, can destroy their food gardens, the seeds to plant for the next season, and consequently their food security.



Figure 7.6: Images of fresh food harvest from the garden
Source**:** Gima Godu Mou, (2023)

The above Figure 7.6 shows fresh food harvested from the food gardens. These food items can either be prepared for their meals or sold to earn an income. Income that is earned from selling food is used to purchase rice, and flour.

7.2.3 Consequences of extractive industries on the food systems in rural villages

Agreements signed by Central Province Governors, individual landowners and the extractive industries are not known by village communities. Yet, extractive industries contribute to the soil erosion and have an impact on the food systems in rural villages. For example, logging companies located near Gavuone

village harvest the trees from the village forests and are directly exported overseas. As could be seen above, logging has a negative impact on local villagers' access to food – especially when combined with some weather patterns. The financial returns from the selling the full logs overseas do not benefit the villages in relation to building proper infrastructures for the communities or better roads.

The extractive industries have an impact on the environment where people access their food. The residues that are disposed in the nearby river affects the rural people's food systems. The river from which the prawns and fish are gathered turns brown and murky caused by the residues from the timber mill. The following journal entry describes my observations and conversations with local people:

> There is an area where the mill by the river harvests mangrove trees. There is soil erosion in the area and the water is murky. The residues from these timber mills are deposited in the river. Prawns and fish that used to be collected from that area have depleted. In some places, the water smells, because the residues have settled in one spot of the river.

When the logs are milled, the chemicals and residues from the timber are diverted to the river. The residues block the river systems which eventually washes and destroys the bridges. Figure 7.5 is an indication of a washed-out bridge that was caused by the flood. The water ways at the bridge were blocked by the residues causing the outburst of the bridge. At the time of the flood, logs and trees clogged the river system.

The mangrove seeds that are eaten in Gavuone and nearby villages are also depleting because the mangrove trees are extracted for timber. The residues from the timber pollute the water, which eventually destroys the fish and prawns. When there is flood, prawns from the river are washed onto the beaches. My experience of sighting an orange beach is described below:

> It is high tide; the sea is looking muddy and not pleasant to have a swim. I look to the left end of the beach then look again to the right and I wonder why the beach front is looking orange? I walk down to the beach to investigate my inquisitiveness and find baby prawns lying on the beach scorched by the heat of the sun. I look across to the ocean and there docked some kilometers away from me is the cargo ship and I can see the barge sailing across in front of me to unload the full logs on the ship. It has been there two weeks now.

When there is high tide, the rubbish from the mill is washed onto the beach. During low tide, the beach front is covered with rubbish including shrimps. In Gavuone and Kelerakwa villages, prawns are a source of protein when in season. Yet, rural people have observed that there is a depletion in the number of prawns caught in the river. As described here, extractive industry activity impacts the availability of nutritious food in the case study sites in Central Province

7.2.4 Accessibility to food

Food accessibility can be challenging at times in PNG. Maintaining the supply chain is a difficult process. Central Province has tough terrains, and the supply of food is difficult. It can be expensive to transport food from the city to the rural villages or vice versa (Saweri, 2010, Sammut et al. 2014). Accessing food in the rural villages can sometimes be difficult. Accessing food refers to the ability of having sufficient resources to obtain appropriate food to prepare a nutritious diet. Food availability refers to the amount of food or sufficient quantities of food that is available on a regular basis.

People living in rural villages are reliant on their Indigenous food systems including harvesting, hunting, fishing, and gathering traditional food and purchasing market food. Shown in Figure 7.6 (above) and Figure 7.7 (below) are staple food harvested from the garden and sold at the market to earn an income. While these images may demonstrate that there is an abundance of food, not everyone in the village may harvest abundantly.



Figure 7.7: Fresh local vegetables sold in the market
Source**:** Jonnelle Vagi (2023).

A significant finding is that some single mothers struggle to provide for their families. Within the village system, accessing food comes from produce in their own gardens, and (2) income generated by selling food products, which in turn are used to purchase food from the store or other sources, foraging the bush (4) hunting and fishing and (5) from relatives. In rural villages, generating an income can also be difficult, a single mother is required to plant food items in her garden or help plant the food items in her family garden. Even though single mothers are usually able to sell their food products, unfriendly weather can sometimes destroy their food crops. For instance, Mune stated that:

> Garo siau kiki, e gemai davali gelegeleai kiki. Asigina bena asigina nogo bena gena mogo.
>
> The sun is hot; we live according to what we find. If there is nothing, there is nothing and we go to sleep [on an empty stomach].

Mune was given a small plot of land by her parents. She has been planting her garden, but the drought season spoilt her produce. The seeds that could be used to replant for the next season are destroyed. It then became difficult to sustain her food garden. When one has no income, it is unlikely to purchase some seeds for different vegetables. Apart from the regular staple food seeds, people also like to plant other vegetable seedlings. Planting these vegetables can contribute to generating an income. However, accessing different seedlings can be costly and sometimes cause delay in providing nutritious food.

Some participants do not have the knowledge or skills to plant seeds. People access food according to the environment that they live in. If they live near the river or the sea, they are likely to have high protein diets compared to those who live in the highlands of Central Province. However, Mune managed to source some funds from her relatives to enable her to sell some baked food. The income she earned was used to buy food from the market. Mune explained:

> Atagau kiki a seloani gauna kiki bena dinner gauna maia a goiani bena. Bena asigina kiki bena bese geiai a noginogi kiki bena biku rakavaia ta ge genimaini nagwa.
>
> Whatever we get from our marketing sales, we spend it to buy our dinner. If there is nothing from the sales, I seek assistance from my family members, they give me bananas if they have them.

In another finding, single mothers are farmers who are independent and usually keep their households in a self-sufficient state. In relations to this, most mothers have a tendency to sell their garden products as major income; this in return is utilised to purchase other food products either from the market or the stores.

In other cases, single mothers struggle to provide for their families. As a sole parent, a woman is expected to provide for her children and the family. Even though a young mother may return to her parents' home, she struggles with providing a nutritious meal. A single woman and her children in times of food insecurity will experience poverty and poor living standards. She will go through mental and physical health issues. Mune expressed some of her experiences:

> Au keta bena asi a ganigani goni. Natugu mogo ave kilagiwani, au be roriguai a sia goni. Be gai nogo lagania be gai ga suffer lelevagi gon (Clears her throat) Vito mamina ga gabiato.
>
> I sometimes do not eat. I would tell my children to eat my share of the food. I would say I am OK, so you children eat. So, during those years, we really suffered (clears her throat). We tasted hunger.

These scenarios capture economic and social disempowerment among women. Usually, it is during the plentiful months - that is, in July, August and September - that clans call for feasts. Vabu explained the significance of 'reading' the weather and planting food in the correct seasons accordingly. She states that, when women know these calendar months, they will know when to prepare their gardens, when to plant and harvest food. This should also indicate the types of food they will prepare. A description of the calendar is tabulated in Table 7.1 (below).

From the months of February to July, I was in Gavuone villages for the funeral and continued with my fieldwork. As Vabu explained, the months of November, December and January are usually the months of drought. This is the season when the food is in the ground, and there is no food. If their food reserves are depleted, an alternative food is sought in the bush while their new harvest is still in the ground and when their food reserves are depleted.

Even though most people in the village have land, only the hardworking ones can till the land and can produce enough food from it. Life has become difficult for many young people. Participants stated that people who are unable to produce food are actually stealing from other working individuals in the village. For example, Vabu stated:

> Ma geia tano gauia maki nogosena gelemani. Na asi ge araga kokoleni gauia, ganigani davalidavali gei ai gwagigi. Na toma keta magulina gwagigi genai asi gadara.
>
> Even those that have land are also stealing. They don't have the strength to make their food gardens. It is difficult to find food. Today's life is very difficult.

The knowledge and skills of when food should be planted and harvested are important for young people to be equipped with. Even though the village people can plant a lot of food to take them through the seasons, as mentioned earlier for some young people, who lack knowledge, working in the field can be difficult. They then often resort to harvesting food illegally from other people's garden, which makes other community members uncomfortable.

Table 7.1: Ginigolo women's calendar

January and February	Vito garona, ganigani asigina, kwakwa maki ge kolini Hunger time. It is at this time that there is no food. It is also when digging of yams ceases.
March	Gwakoli, daga vebubu lausi goni *Daga* is the white flower/seeds from the kunai grass that falls which signifies that food is ready to be harvested.
April	Gwaganigani, ganigani mamurani, mamura vetoleni. Gavatabu legina launa girigirina vebubuni. *Gwaganigani* is the month of April. This is when the new shoots of the yams are formed and are shooting out of the ground. Which is known when the young leaves of the kunai grass fall to the ground.
May	Biliakei – ganigani kwalana vetoleni Biliakei is the month of May. Stem of the yams is formed
June	Biliabara – ganigani kwalana karevani be kwakwa gena garo. This is when the yams mount is clear because the leaves have fallen off and ready to be dug out off the ground.
July	Biliabarana – ganigani kwalana lekeni. Biliabara is the month of July. The period when the stem of the yams is dry and is an indication that the yams are ready to be harvested. This is the harvesting seasons where mothers dig out yams.
August	Ganigani lekeni. When the stems and leaves of the yams are drying out and indicates that the yams are to be removed from the ground.

September and October	Tubutubu, varovaro garona. The season when women start planting yams and other crops.
November	November is referred to as *aga.* The month of November is often the planting season for the mothers. During this month women prepare *mokokele* (preserved big yams) and *toboka* (preserved small yams*).*
December	Isiumanu – taulimalima ge sikogatogoni isiu ge gitagwani. Mamura gena garo nagoa, Ganigani valiguna vamei rageni, pouni. Watching the stars raising into the sky. When the stars have reached higher this indicates that the new shoots of the plants will come out of the ground.
November and December	Rainy seasons. There is no food because the yams are underground and are still growing. So, women go into the bush to collect wild yams. Or women prepare *mokole* or *toboka* for the families to consume.
December to January	This is when during full moon it is the season to collect crab.
January to March	Gavakubo e tilapia gena garo. This is the milk fish and tilapia season. Usually, they come out when there is rain and flood.

Source: Vabu (2023)

Women in the villages are guided by this knowledge in preparing themselves for the seasons and associated festivities. Knowing the months of the calendar in the local contexts equips women with knowledge. According to one of the women, Vabu, who explained the abovementioned seasonal calendar to me, some women lack this knowledge, and it is important for women to know and be guided.

The following section will discuss gender roles in food production in the rural villages. Men and women in the villages work cooperatively in their roles in providing food for their families and also to achieve different goals for the village cultural activities.

7. 3 Gender roles in food production and distribution in rural communities

Gender roles are demarcated in Ginigolo and Gavuone villages. Men and women play an equal part in achieving their roles to achieve their goals. The different roles they play, are intertwined with cultural norms and traditions. These goals include meeting the church thanksgiving targets for individual levies, or clan levies and cultural feast contributions. Women's roles could require attending to yam gardens, while men, would be producing the best bananas for feasts. Apart from attending to household chores, generating income, and improving their livelihood, the participants from Ginigolo were asked in a *tamei guluagulua* sessions if there were other roles they played that were relevant to food, gardening, and contributing to feasts that are still important today. Vabu said:

> Oba! Doi gavatuni! Goroga ga tulini, gemai geda ga tulini, bala gesiani genai gemai bala felafelaia ga kalani. Gai gemai gwakala asigadara, sinagi doi be gai gemai gaukala ivagaia. Vavine valiguia gogo doi vatu asi ribaria.
>
> Yes! We weave our food baskets! We knit our string bags, we weave our baskets, we prepare our headdresses for cultural dancing, we have lots of work, but weaving food baskets is still important today. Young women today still don't know how to weave food baskets.

Women multitask, apart from preparing meals for their families they engage in numerous other activities in their communities. Hence, *doi avatuani* was consolidated to demonstrate the framework. *Doi avatuani* epitomises the multiple roles women play in weaving together their goals of improving the livelihood of their families, and achieving set aims of clans for the betterment of the community. Some tasks women do contribute to assisting the community activities. A *doi* (food basket) has a functional purpose, when woven with good materials, it becomes a durable and strong tool for mothers. It is also used to put food in to reciprocate with families, individuals and communities. Contributing one *doi* of yams to a feast is a significant act of maintaining *ve galagala* and *ve tarikaka.*

7.3.1 Gender roles in rural communities

Women and men play clearly defined but equally important, complimentary roles in providing food for their children in rural communities. Women's roles in providing nutritious meals are interlinked with community activities. The participants expressed that in most cases, they are preoccupied with so much work daily. Some of the daily activities' family members engage in are tied in with community and church activities. These activities are often tied in with the clan's programs such as organising for feasts,

or preparation for village events including church plans and women's fellowships. Participants explained to me that their daily gardening and household chores are interconnected with their community's social activities. Vabu clarifies that her role living in the village is not limited to just cooking food for the family and washing clothes but is multitasked because women engage in different village functions.

Some work is done collectively with community members. For example, and as already mentioned, when family members need to plough the land, or if there are events in the community, men go out fishing together. Men's roles in relation to providing food for the family include clearing a new garden, cutting the grass, digging or hoeing, building the fence around the garden, planting bananas, fishing, hunting, and weeding (Fieldwork observations, 2023). The women's activities include cooking, fetching water, weeding their garden, planting and harvesting food, collecting firewood.

Families work collectively when a feast is planned. Then, the women plan and organise their yam gardens while the men prepare the land and organise to plant their bananas. The couple decides where they will clear their land for their garden and what they will plant for feasts. They organise their calendar for the activities that will eventuate in being prepared for a feast or event, which are structured to the calendar and seasons of the harvest.

Young women feel that their mothers and immediate relatives are their primary educators. They are taught the skills to run the household, take care of chores and provide for their families. The women normally attend church-based women's fellowships in villages and are involved in community activities. When there are church events, these tend to be the avenue where the young women are trained in the cultural ways of doing things. Sometimes, there is discrimination in the community where young single mothers are not involved in community activities. For instance, Mune explained:

> Gai vavine na asi ge keamaini, ena fellowship gaukalaia o, garo ketaiai taulimalima gemei lakatogani geni, o gaukala barai ai maki, gai ge duai pitoga maini.
>
> We single mothers are never included in the community activities, fellowship work, or when some people come to the community, or in big ceremonies, they do not count us in.

Sometimes, young single mothers are drawn by the elderly women of the clans, to help them work in their gardens or prepare food. However, they still feel that they are discriminated by community members. So, they believe that if they are equipped with necessary skills, then they can be independent.

In contrast, some women said that they are included in the family activities. But sometimes, community is not fair on the decisions that they make. For instance, Veaina said:

> Garo mapararіai, e vanua gena kepi wa, gai veaimai ai ge gogomainia. Geviamini, thau elekuai, ne ini, goi pono veami neini, a ririwani. Thau na a vailariania, thau pa'ana veami, wa raugauna, e vanua gai ve amai iavogo namu ai go gogorani? Gai ai ge vavanmaini!
>
> On most occasions, the problem with this village is that they don't call us, they don't help us, they come to me for help and tell me to join the church, but I tell them: What about those people, who are like me, and the disabled? You people are not helping.

The above quote by Veaina, who in our *tamei guluagulua,* pointed out that the community does not help single mothers. She added that single mothers were not included in the community's decision-making process. Support systems within the community are not evident, but women rely on their immediate family members. Veaina also made a point that single mothers are not supported by the community or the women's fellowship groups. Lewa and Veaina are best friends in the village; they come from the same clan and are neighbours. Listening to Veaina, Lewa interjected and said:

> Gai aumai two e pereni, thau ai gaku ganigani o pene nauku ge agini, ina gai raiti ga ririwani, ganigani paga taiati, o ai gemai topu, thau ia elenai a thaoni. O ivakuna e ala parukuni, a thauoni ia elenai. Gai aumai two gave va'avani, iulakapuai, narunaru ai, thau ai geku ia elenai a thaoni, ia ai gena, thau elekuai eveamani.
>
> Two of us are best of friends. When I don't have food or when my children cry for food or if they say, mum we want to eat rice we are tired of eating food from the garden, or if we have no soap to wash our clothes, I go to her for help. If my sister in-law makes me angry, I go to her. We support each other in making gardens, cooking food for the feasts. If I don't have anything I go to her and when she doesn't have anything, she comes to me.

Not everyone in the village can have a continuous food supply. Generally, when women lack resources (tools, seeds, soap powder, food and menstrual pads), they seek assistance from their relatives. Young mothers expressed that they often felt embarrassed to ask their relatives for resources.

Churches play an important role in the villages. A majority of the people in the village attend church. The pastors are the link to the people in the villages and are usually responsible for organising activities

for the village. Therefore, teaching the concepts of improving nutrition for pastors and their wives can be a strategy to convey healthy nutrition messages to the community. Lizzie is a nutritionist and works as the Regional Nutrition Coordinator in the South Pacific Commission. Her role involves being an advisor and supports Pacific Island countries to control and prevent non communicable disease. She focuses on public health and nutrition in the Pacific. In *tamei guluagula* with Lizzie[35], she explained:

> We listen more to what the pastors say and what the doctors tell us at the hospital, so we try to encourage the countries to work with the church, with the churches I know it is an entry point to encourage healthy living and healthy eating.

Pastors in the villages play a significant role in preaching the bible for spiritual growth and maintain peace in the community. It is the perception of the village people that pastors can play the role of educating the people on various aspects of life. This section has deciphered that women engage in multiple roles in rural villages. Women are not limited to cooking food and washing clothes, but they are major contributors to food production and ensure their children are well fed.

7.3.2 The struggles of single mothers in rural communities

This research has focused on single mothers in the rural villages. It is important to unpack who single mothers are in this context. Often single mothers are referred to as *gabani* - women whose husbands leave them, or women leave their spouses vice versa. Also, those who have children out of a wedlock. *Vabu* are widows, those whose husbands have passed away. The two words *vabugabani* refers to a group of single mothers.

A single mother takes on extra responsibilities in caring for the needs of her child or children. When doing this research in the village, I was asked why I was doing my research on single mothers. I responded by saying, many young single mothers go through a lot of problems that can affect their social standing and mental health as well as their children's. In most cases, single mothers in the villages do not have access to resources other than what they receive from their family members. Further, single mothers must work hard to win the hearts of their family members in order to receive their support. In the case of a widow, she can either return to her husband's place where they built their home, or her parent's home. In either case, she has to work hard to support her children. This is something that this study also sought to consider. Veaina clarified why her son was adopted by her brother:

[35] Conversations with Lizzie were conducted in English language

> Thau ave garawa, nauku apuna. Garawakuna e kaliwaniku gaurai arikuna ge gogoku, gila goi ga aluni.
>
> I was married, and I had one son when my husband left me. So, my brothers told me to return home with my child. My brothers are good, so I am staying with them.

Veaina was married and had children. But when her husband left her, her brothers asked her to return to look after their parents. Ianama explained how she returned to her family after her husband left her:

> Garawakuna e kaliwaniku, ne ririwa veniku. Gaurai, nauku goi garoa. Nauku apua arikuna e gapia, apua thau goi ga aluni.
>
> I was rejected by my husband, so I am staying with my family. One of my children was adopted and the other one is living with me.

Another woman, Ianama, was unable to care for her two children. So, her brothers each took on one of her children to give them a better life. This also released Ianama from a high workload in the village as she was looking after her parents and the gardens. In another scenario, Waipara said that she has been single for many years:

> Thau nauku iarau pege kamu. Mauli emir ava vagi, garawakuna emi kaliwani mai emi warega mauli eme rave.
>
> My children have grown now. But it has been difficult to raise my children without my husband.

Single mothers struggle to care for the children and care for themselves. One of the young single mothers, Mune, mentioned that she went through hardships when she returned to live with her brothers. Mune expressed:

> Au keta bena asi a ganigani goni. Natugu mogo ave kilagiwani, tubugai gesi kiki au be roriguai asia goni. Be gai nogo lagania be gai ga suffer lelevagi goni. Vito mamina ga gabiato.
>
> Sometimes I was not eating. I would tell my children, we are with your grandparents, I am OK, so you children eat. So, during those years, we really suffered (clears her throat). We really felt what hunger meant. When there is no food, I think a lot and wonder where and how could I get the money to help me

> increase my market or have a continuous market. At times I give up, and when I give up my market, I don't have any money.

Mune has had a difficult life after her husband passed away leaving her with five children to care for. At the time when her husband was alive, he took care of them, and they lived a good life as he was working in the extractive industry in PNG. He made sure his children were well fed and clothed. Mune's ability to provide for her children was constrained due to lack of financial support and low educational qualifications, which means she was unable to find employment. Even though she returned to live with her family, she encountered verbal and physical abuse from her immediate family members while dealing with her emotions. These difficult situations within her family contributed to her eating less or nothing at all and experiencing hunger.

Situations such as Mune's demonstrate disempowerment of women. However, Ganima explained that a woman is important in society as she can contribute meaningfully to the family.

> A woman is very important in society. My children's nutrition is also important. Women in PNG are last to eat. They are the least one to get food. So, if I am a mother, my priority will be my kids who have to be well fed.

In some societies, women are the last to eat, as women prioritise their children to have a meal while they eat the scraps. This was the case with Mune, even though her relatives shared their meals with her, she reserved the meal for her children. In most case, she ate less but worried about her children's wellbeing.

7.4 Conclusion

This chapter has explained how women see their multiple roles in the villages. The findings show that when single mothers maintain their cultural relational links within their rural settings, they might be able to access support from individuals, families or clans in the villages; but this is not always the case, as Mune's situation has shown. Women depend on immediate family relationships, but in most cases, they feel that the community should work collaboratively to address issues that can improve the welfare and health of women and their children.

The chapter also showed that weather and extractive industries in the rural villages contribute to the destructions of food systems and the road links between the village. Changing weather patterns and constant flooding influences the food consumptions patterns of the people.

The next chapter discusses the experiences of women when accessing support systems. Existing community empowerment strategies that can assist women to improve nutrition in rural villages will be analysed in this following Chapter 8.

Chapter 8: Nested cultural values in rural communities to improve nutrition for women



Figure 8.1: Inside view of the basket, leaves from the side of the basket are pulled together and plaited to enhance the base of the basket
Source: Graton (n.d.)

8. 1 Introduction

This chapter will analyse the cultural values that are embedded in rural villages which influence the activities and experiences rural women in Ginigolo and Gavuone villages. This chapter will therefore follow earlier chapters. In Chapter 6 the participants' understandings of nutrition and their perceptions of providing meals for their families were explained. It also described women's multiple roles in the local food production and their engagement in community activities. In Chapter 7, the barriers women encounter in accessing and producing food were addressed. Findings presented now, in this chapter, confirm again that there are cultural values nested in the support systems within the village societies that can assist women to improve their health and wellbeing.

By drawing out the villagers' experiences and by using the *tamei guluagulua* framework, this chapter aims to understand the support systems in the villages. In the two rural village settings, again it can be observed that women have an important role to play in their village communities. They contribute to the cultural activities organised in the village. As identified in the earlier chapters, the family support

system can be maintained through established relationships, *ve tarikaka* referring to maintaining relationships with siblings, *ve galagala,* maintaining relations with extended families, and *ve vagakava* in extending support and assistance to the families and community. These relationships are identified as nested cultural values, and are interrelated to support individuals, families or clans in the villages, and in turn contribute to healthy communities. As can be seen above, Figure 8.1 represents these relationships and integrates the cultural values and the support systems within the cultural society. When the support systems extend their resources, skills and knowledge, the basket is woven together enabling improved nutrition outcomes to be achieved.

This chapter begins with an analysis surrounding the communities' cultural support systems for women, followed by an analysis of the women's experiences with the church and the local government agencies. Lastly, I will analyse how women see some strategies for community support in the rural villages.

8. 2 Community cultural support systems for women

This Chapter specifically identifies cultural support systems that can enhance the work of women in the community to improve nutrition, which is linked with the quote by Eve at the very start of this thesis that showed the strong relevance of reciprocative relationship. The village support systems are often informal and culturally oriented. Informal support is accessed within the community where women in their daily lives participate alongside their family members and community members. Informal support embraces knowledge about where resources can be accessed and skills taught. These systems are interrelated networks, from which individuals, families and clans can gain access for support and assistance. The cultural values in village communities are the heart and soul of relationships and family, collectiveness, respect and spirituality. These values are all-encompassing and are interrelated with ve tarikaka, ve galagala and ve vagakava; it is from this system that young mothers can draw their support. This section will unfold systems of help offered to single mothers toward providing for their families.

8.2.1 Support systems for the household

Single mothers often return to their place of birth when they encounter problems. However, there are times when their living situation with family members is not always the way it is culturally expected to be. Conflicts among family members and the lack of acceptance and support felt by single mothers when staying with family members is sometimes worrisome (GoPNG, 2025). For some single mothers, living with their family is good while for some it becomes burdensome and often leads to mental and social discomfort affecting their health (GoPNG, 2025, GoPNG 2013). Women can gain access to land when they live with their parents. Women are gifted with land from their parents. In most cases they

work side by side with their brothers. Female members of the family can plant their gardens on their parents' land if the parents are alive or if they are gifted by their parents. Mune is a single mother who returned to her parents after her late husband demised. Mune's parents gifted her a piece of land when they were still alive so that she could look after her children. Mune said:

> Au sinagai magulinai, tano misinata, araga gonena ge geniguto. Be gevekilaguto, nogo araga bana gitagaua be natugu bana gitagaugia.
>
> When my mum was alive, she gave me a small piece of land, the old garden. She told me to look after the garden so that I could look after my children with it.

Similar cases were identified with other single mothers. The single mothers were given a portion of the land by parents to make their gardens. When Mogogele was asked if she had difficulties making gardens, she said:

> Asigina. Tubugaia, mummy genai geve gubakauani be she always makes garden there. Garden be enaia numa rekenai mogo.
>
> No, my grandparents were good to my mother, so she always made a garden there. So, our garden is just near the house.

These two scenarios show that some single mothers are supported by their parents through the provision of land. Having a piece of land gives them the freedom to plant and harvest food for their children. However, certain circumstances also deter single mothers from moving ahead in making gardens on their parents' land. In the Central Province of PNG, the sons inherit the land from their fathers. So, the son and, once married, he and his wife, control the ownership of the land. Ianama stated that it is sometimes difficult for a single mother to work on land owned by older brothers and especially when having to deal with sisters-in-law. She explained:

> Vairi, vairi wa gelegele pana ilagia vairi ariria melo maluaniri, garawari, e vavine vairi ia ianama vairi ia rarava wa, vavine vairi ia ga alananamara vavine vairi pai gene alu nanamara mai, wa, wa veaina, evana wa mauli wa veaina, oi po olema ravari oi wa paigene alu nanamamu namu, oi wa pono olemana veniria oiwa pige va alu irau iru mu.
>
> There are a few who have older brothers, whose wives, well, some have good wives who will help but others are not good. Sometimes, if you treat the lady well, she will help you. If you treat her badly then she will not help you. That is what life is

like. If you do not treat them well, they will not treat you well, if you treat them well, they will take care of you.

The notion of *ve vagakava*, to support, does not work when there is a gap in the relationship. Similarly, the notion of *ve tarikaka* will not work if there is friction among the members of the family. As for Lewa, who was a single mother for a long time and has four children, maintaining family relations was important to support her children. Lewa said:

> Pe thau wa pana ilagi, nauku wa iavogo pe thau wa eiaikuni ave walavini, nauku wa poa iavogo pe, na ariku maparari wa maa vavarana, a ve `walavini, nauku iavogo peh, nauku a vewalavini, gaigani gena side ai aione rai ini, thau nauku wa veaina ga walavini, thau wa geregaku na a vewala, thau wa fit thau nauku na geregaku na iamarana, rigolo tuelo thau na a iamana, nauku geregaku na a iaman, penedau pene sikulu, mai ene va gavuri.
>
> As for me, I have a lot of children, so they see me working really hard because I really worry about my kids. I have four kids, and four is a lot. I also help my siblings because I think about my children. I worry about how I will feed them, and what they are going to eat. I am strong. I took care of my children on my own for 12 years, and now they are all in school and I will take care of them until they complete their school.

Similar to Lewa, single mothers can go through an array of difficulties in the villages. They struggle to meet the needs of their children and in most cases worry about how they will feed their children. When there is no one to support them in making gardens or to care for their children the mother is urged to work extra hard to attend to the welfare of her children. For instance, Lewa had to work extra hard assisting her siblings, recognising the need to provide for her children. Yet in another example, Ianama struggles to maintain the relationships with her sisters-in-law. Consequently, the poor relationship has an impact on her children. That is, the children will be mistreated and sometimes will not be fed.

Another finding in the research showed that families need financial assistance. Some single mothers said that they need financial assistance to plough their gardens and for almost everything else in their households. At times family members remit money to support making new gardens. For example, Lewa said:

> Taimu vogo na thai e namu e vaina e taimu moni ai mo pe, ava ga alani, thai e ga marketi taimu ai moni ga rawalini, thai wa moni ai ge veni maini, moni ai ge veni maini, evana moni ai ge veveniagini, thau airipaku, ia valu wa ariku tauni ai ge aluni pe, moni ge uni. Pira garawariana gevailarana pa.
>
> Most times, these days it is all about money, so we make gardens, we sell the produce at the markets, and we get money from that. We do not receive money from them, they do not give us money, these days they do not just give money. Maye his wife tells him not to send money.

Women in villages save money to pay for services in village such as to plough the land either using a tractor or groups, or to assist with weeding or planting the garden. Mothers request funds from their siblings to plough the land. While others do not receive funds, some receive financial support. For instance, Veaina said:

> Ge uini fortinighti ge uni, wa ganigani ana uri, wa ava valivu ana ve ala.
>
> They send money, fortnightly. I send them food and they send me money to make their new gardens.

Even though the women have some financial support, they also must work hard to earn the income to support and provide for the household and pay people to make new gardens or contribute to other activities. Some families reciprocate and exchange food for money. But when a woman does not contribute to working in the garden, there will likely be no food in the house. Control of assets is associated with dietary diversity by increasing her ability to produce or purchase more and prepare more nutritious meals. In contrast, Lewa explains that family members do not always support her financially to make new gardens or pay for services:

> Pa lilagia wa, ariku wa ma gena business, pe ila taim vogo na ila wa ai ge veni maini, e, thau maina taim apua thau na mai a vava rana, pe thau nini, thau geku ava taim vogona thau mai ige vavaku ge pirini thau nai geku ava mai ge laua, namu ila wa ai geria vevava thau eleku ai, namu thau ma nauku ila ga vevava rana, wa veaina, vevava gena side wa wa veaina thau na alani namu ila valu wa, thau geregaku ma nauku na a me upurana.
>
> Like I said, my brother also has a business. But most times they do not send me anything. One time I helped them, and I thought they would help me out in my garden when they were free, they did not help me, even though my children even

> helped them. And yet, they do not return the favour. I feed and care for my children by myself.

These findings show that the support systems within the households are often not in favour of single mothers. Single mothers work as hard as they can to sell the produce from their gardens, they generate an income, then purchase foodstuff from the market or stores or contribute to the village activities. Furthermore, single mothers have reiterated that accessing an income drives them to purchase other resources and fulfil the needs of the household. For instance, Lewa said:

> Pene ma gemu moni, ganigani ma ono voia, ono ganigani, Moni na ono voi, magani ono rawali, magani irau ira pe, oi magemu petrol. Petrol pono ve voi, tinigi, wagau veairi.
>
> When you have money you will buy food, and you will eat. You use money to get the things you want to buy. You can buy fish, different varieties of fish. So, you have petrol for the dingy and equipment like that.

Petrol for the dinghy is a much-needed resource for rural people living by the sea. It enables people to go out to the sea to catch fish. They catch fish to generate an income, to feed themselves and share with relatives. Lewa highlighted that life in the villages has changed a lot. In the past, people used to practice a barter system where they traded among themselves to get the resources they needed. Life has become difficult for those living in the village. Lewa explained:

> Wa gau maparari, oi wa, e nai pono alu, gau mapararia, pene rakamu pene rakamu, pe, evanamo, gau mapara parari geme change, wa one ie, valu mauli wa, ia nama, ama, ina, eh rori auna auna, wa one ie mauli ri wa ianama, gaumaparaparari, ipo gemiani, bata system nag au ma paraparari geme change ie, eva namo, gau maparaparari wa, oi po iligavi, oi po ulavun, gau wa, ige me kwara, oi wa ma gemu moni.
>
> Everything is here in the village, and you will want to stay here. You will not starve. But right now, everything has changed for people living by the sea. But life is ok. My mother and father spoke the truth. Living by the sea has made life easy. Everything you need is right there. Trading (barter system) has now changed. What you said is true, if you have a job or if you work hard everything you want will come through and you will have money.

These quotes show that single mothers strive to support their children. Because they live by the sea, they can fish or collect sea food as a source of protein or earn an income to purchase other foods. Lewa collects crabs and mud shells to sell at the market. Even though the village may have all the resources, a person has to work hard to gain the resources. The next section will highlight the support mechanisms in the village for young mothers.

8.2.2 Support systems for young mothers

Drawing on the interviews with single mothers, findings show that single mothers may lack support from different sources. They face various constraints and challenges while taking care of their children and deal with matters of health and well-being. One of the support systems single mothers have access to are their parents or kin who provide financial or in-kind assistance. The other support system they access is their extended female relatives whom they trust. For example, Lua is a single mother and has two children. After her husband passed away, she remained in her house caring for her children. Lua raised her children on her own and stressed that she has no support other than her family and closest friends. Lua stated:

> Thau garo vairi, ai ganigani pa au nauku ge taiatini, e raisi ge ririwani, thau e vavine (pointing to her friend) genai a thaoni. Geku ririwa gauri maparari, thau ia elenai a thaoni, ai topu, iulakapu gauria.
>
> Some days, when there is no food or when my children are tired of eating garden food and they want to eat rice, I go to this lady (pointing to her friend). In all my shortcomings, when there is no soap, or garden needs I go to my friend, she is my cousin, but we are best friends.

Accessing support from immediate families is another source for single mothers. There are times when friends can assist in a small way. For instance, Mogogele was living in the village with her parents but her relative needed her assistance to care for her child and do the house chores while she was at work. These single mothers sometimes provide childcare assistance for their relatives for an income. Mogogele expressed that

> Au kakaguna veikilaguto, to look after her baby. Peigu goni, dia ia natuna mogo a gitagauani. While looking after her baby I was also cleaning the house.
>
> My older sister told me to look after her baby (kakagu refers here to an older sibling or older cousin). She used to pay me, not only to look after her child, but while looking after her baby I was also cleaning the house.

Mogogele lives with her parents in the village. For Mogogele, it is important to care for her parents and in particular her child. Her child is a toddler and providing for her is a priority. Therefore, the offer to provide childcare assistance from her relative was significant, as her earnings in return will help support her child and family.

Caring for the children is burdensome, and Mune works very hard to put food on the table or even to purchase clothes for her children. Her husband used to be the breadwinner who supported her in her small market business. When her husband passed away, it became difficult to provide a good meal and purchase decent clothing for the children. Mune said:

> Na natugu ge sikulini be a maketimaketi gave gopagauni. Geia a goini, geia piripou vedale o uniform asigina genai. be namo rakava kiki bana maketi kiki bana save up. Be nogo moni seboia kiki adavalini senagi a bogebogeni numa maia vakolini genai, nogo uniform atagau monia asiani gauia mana gabi giani ganigani maia a goini. Lema maia barato bena nogo gemai niu e rava kika ga selo gasiani makina lema tauiana ge gabiani.
>
> My children are in school. I sell food and scones at the market to cover the gaps. I buy their food, their clothes or if they don't have any uniforms. So, whether good or bad, I must still sell something at the market and save up. From the little money I earn and gather, I look around and when I see that the house has nothing at all, so what money for the uniform I save, I use it again to buy food. Stealing is increasing, so our coconuts and what we used to use to sell are [often] stolen by the thieves.

Mune's quote shows that she can be independent in providing for her family, but she needs more support. Even though she has the skills to earn an income, she lacks the resources. Mune is skilled in baking scones, but she lacks the ingredients for baking products. She also has entrepreneurial skills to sell food products but lacks the financial support to restock the ingredients. Earning an income is equally important to sustain her family. However, the products that she could sell (such as coconuts, custard apples, pawpaws, mustards, mangoes and pineapples) are often stolen by other people who also lack the resources to support their family. These findings show that life has become difficult for the young people in the village. Such trajectories in life impinge upon the provision of good nutrition. The next section will show the experiences young mothers have with the churches, NGOs and government organisations.

8. 3 Experiences of community empowerment

The community is strengthened by working collectively and participating in community and family activities. While in the two village communities, I observed how single mothers engaged in community activities. Some activities included working collectively in clans or groups to raise funds for church thanksgiving events, to weed the garden, gather firewood, and plant vegetables in other women's gardens. Supporting women in making food gardens is a source of their livelihood. Therefore, they are encouraged to make big gardens to improve their livelihood because the products from the gardens can be used to feed themselves or sell to earn an income. Working collectively enables families and clans to meet their goals and contribute to having good meals.

Ve tarikaka and *ve galagala* are fostered when mothers work collaboratively. As was explained in earlier chapters, when church and community activities are organised, women seek support from relatives to prepare their gardens, plant vegetables and weed the gardens. These are major parts of the empowering processes for women, families and communities. However, the women have also expressed that young mothers do not always get the assistance they require from the communities.

The scenarios mentioned by Vala have reflected that women in rural villages lack support from outside sources, NGOs and government organisations. Vala is a leader in the Women's fellowship. She explained that all women in the rural villages could gain access to resources if the Women's Fellowship has proper plans to guide the women. During tamei guluagulua, women shared their sentiments by stating that women need to organise themselves within their clans to support each other. However, Mune verified that:

> Community aunai be beia gwagigini, kwalana asi beia vetoleni, momogoni ena family aunai be bei vekalani gelegele, beiavegabini ta sia.
>
> It will be difficult within the community because it will not come to fruition, truly within the family it will work for sure, it will come to fruition.

The women in both villages felt that the community-run programs were difficult to coordinate This suggests that the middle persons who organise these programs might not be effective in organising the program events. For instance, Lewa said:

> SME iarau moni ga veniria wa vanuai pige mi roarai geria inagulu vavine veriparia gauria. Namu paga veralo raurau, aigau. Pira moni ria ge ganiriao pa?

> We gave our money to the leaders to for Small Medium Enterprise (SME) officials to come to the village to teach us. But we have been waiting for a long time now. Maybe, did they eat the money?

The participants also mentioned that not all women are informed when events are organised. Whilst in other cases funds can be distributed for the events, sometimes finances do not reach the intended purpose. Mune also explained:

> Garo ketaiai member moni vanua genigiani senagi, gaina asi ga gitaiani. Moni ata gekalasaiani maki gai asi ribamai. Gatanuni luana keta mauni vau gakamolagini vanua be member moni geni giato senagi lekwalekwato. Mani leaders na gegani giani. Siboia mogo geve pikini bena moni geve varegenini. Garoketaiai, geia dogolou geve pikini bena gei gaukala geve waragani. Geia poketai ge gatogiani.
>
> Sometimes members give funds to the village, but we do not see them. We do not see how the money is used in the village. After some time, we hear that the member gave some funds to the village, but it went missing. Maybe the leaders ate the money. They choose themselves and share the money among themselves. Sometimes, they choose among their clan members, and they run their own programs among themselves. Women leaders pocket the money to benefit themselves only.

Most of the participants claimed that information about programs do not reach all members of the communities. Sometimes information remains within a selected number of women. The women leaders are selective of who should attend; therefore, the benefit of participating in community programs does not reach all the women in the villages. Women struggle to support their families with little assistance from family members or their community. The young mothers felt that they ought to be independent to look after themselves but often rely on their relatives for support. The following sections will discuss the experiences of women who attend women's fellowship programs.

8.3.1 Experiences of women with Women's Fellowship Programs in rural villages

Women's groups such as the Women's Fellowships are run by the United Church (the main denomination in the area). In the villages, these fellowships offer programs to assist women spiritually but do little to enhance woman's health and livelihood. The Women's Fellowship group in Ginigolo and Gavuone villages meet once weekly but narratives of Vala capture the essence of the lack of support

from Women's Fellowship groups, from the community and those from the outside organisations for women:

> Ta rogosi berevagomai nasena program ta asi vewaragani. Organise kavanai be vavinena bege organise. Vesikuli kavanai be asigina. veduru kalaia be asi gekalani. Kwalana geia familina kika mogo ge gitagaugiani. Geia familina mogo ge gitagaugiani, community na veduru be asi kalana, galagalana mogo veduru kalanai. Galagalaiana mogo veduru kalani e sinai tamaiana mogo. Rubuna asi gitagaugiani.
>
> No one has come to run any program in this village. No one comes to teach us. There is no form of support or assistance because women are taken care of by immediate family members. Families look after them. Their families care for them, community does not assist in the situation, only their families assist them. Their relatives assist them and their parents only. The church does not care for them.

Although the Women's Fellowship groups exist in both villages, women lack vital resources that will assist in alleviating their living standards. Much of the labour of fellowship members remains invisible and is unpaid, especially when their workloads become increasingly heavy. Even though mothers are knowledgeable in making their gardens they feel they lack access to essential resources and the knowledge to provide nutritious meals. Lewa attested:

> Narunaru giraugirau pegere varipamai. Ri na ene varipa mai. Vanua inaguluna iakamu, pe ga narunaruni, wa ina maina eve ripa mai Veaina ga narunaruni. Pe pono gia, boubou e avinai, vavine geria riti pono giari. Ri na ene varipamai.
>
> They should teach us how to prepare different types of food. Who will teach us? We have lots of church activities in the village that require us to cook. How we prepare our food is taught by our mothers. So, you wait and see, *boubou* (church thanksgiving) is coming closer so you must observe how women bring their dish. Who will teach us?

During *tamei guluagulua* sessions, women showed that Women's Fellowship group programs are centred around spiritual growth and leadership skills which exclude young mothers. The mothers from both villages, echoed similar sentiments. Ianama said:

> E vevava pe ilagia, namu verauleai pana ilagia, thauna pelotipi wa thau mai garoani iarau namu, auali kamu vagi e kamu vagi… Pe thau ge veamaini thau elekuai goi pono veamai pono me joini negeini. . . wa rau mogo go valavuniakuni namu, uma

> vairi e communitina ai go iarana, a vailarana, gaina numa auri, ge vavamaini, iauiau ai garavari ipo ge alumo.
>
> Let's talk about this assistance, maybe I should just say it, I used to go to this Women's Fellowship but there was too much praying. Too much. So, they came to me and told me to go and join them. But I tell them, it is good you are telling me, but do you see other people in this community too? The people in my house help us, but how about those who do not have their spouses, we help you, but you do not assist people like us, we sit among them like we do not exist.

The programs in Women's Fellowship capture support spiritual growth for women. Ianama indicated that there was more praying done than enabling the mothers to upgrade their skills and knowledge. Furthermore, Lewa also said:

> Vinakau iavogo eme aluo, puka rorirori na mogo e ilagiani, namu ilana vevava ai e alarana. E rorirori mogo e alagiani na gai waragauna gai e vavamaini.
>
> Lots of Pastors have stayed in this village, they only come and talk about the bible but do not assist. They only come and talk about the bible, why is it that they do not assist us?

The above quote is a reminder how missionaries, now followed by pastors, have been in the village communities for decades. The prime purpose of their presence is to preach the gospel to the people in the community. Conversations with single mothers, who attend church and fellowship regularly, bring to the fore the lack of rural advancement and enrichment in skills and knowledge that do not materialise in the village.

Similarly, single mothers from Ginigolo village also reiterated their dissatisfaction and identified areas that need improving in the Women's Fellowship group programs. A single mother expressed:

> Women's Fellowship be agitaiani be keve taulimalimai ena dori maseni vaube nuaia ya barani. Women's fellowship maki noga mogo asi bo trust ia ni. be vira taimes nagau ge kilagi ani senagi asi geve kalani. Be ata bese senisi ani maki asi ribara. Nogo be bise kilagi naia o bise laka laukule be nogo action na asi bei vekalani. O nogo geia sisiba sisibai be varau guluna bara o action na be varau bei kalani o bo laka laukuleni genai gia levai bara gila veilai ai genai ba kilagia bo siani. Maguli be nogo sena ragani.

> I see the Women's Fellowship going to the sick people only when they are about to die, then they get a shock. You cannot trust the Women's Fellowship here. They have talked about this many times, but it does not happen. So, we do not know how to make the changes too. It is like we will talk about it now, but when we turn our backs, there will be no action. During their conversations the idea is big, but their action and plans are in place when you turn your back. They will say, never mind about them. Life is like that around here.

As the above quotes show, single mothers expressed distrust and discontentment in the functions of the Women's Fellowship programs in both villages. Growing the trust and relationship among the women can better serve the women. Women expressed that Women's Fellowships have over time not supported single mothers and have not delivered programs to the expectations of single mothers in the village. The mothers also highlighted that they do not receive much attention and assistance. The rural women signal the need to have extensive assistance from multi-governmental sectors. Becoming members of Women's Fellowships could be one avenue and a medium to reach all mothers in the village. However, as mentioned above, it is costly to be involved in Women's Fellowships. Mothers in both villages felt that Women's Fellowship programs could include affordable activities for women to learn basic skills to improve their livelihoods. The participants also said it was essential to plan and organise with the church pastors and leaders of the Women's Fellowships to incorporate lessons, skills and knowledge. In the following subsection, I will draw attention to discussions relating to single mothers' experiences of church support in the village.

8.3.2 Experiences of Church support systems for the village communities

Churches are central to the community and for women in both villages. Women in both villages said that the churches have been in the communities for many decades, and they can bring transformation. They believe that women should be better supported by churches, as in the words of Lewa

> Vinakau iavogo eme aluo, puka rorirori na mogo e ilagiani, namu ilana vevava ai e alarana, waragauna gai e vavamaini?
>
> Many pastors come and go but they don't talk about supporting the village, why is it that they don't support us?

In this context, Lizzie who has worked as the Regional Nutrition Coordinator in the South Pacific Commission for many years, said that the burden of unhealthy eating in the Pacific communities is troublesome and there are high rates of malnutrition. Churches play a vital role in some communities.

In this regard, she suggested that since the communities listened to what the Pastors say, people should be encouraged to work with the churches to improve nutrition. Lizzie[36] stated:

> In some communities, the church plays a big role. In the Pacific, we listen more to pastors and doctors. So, we try and encourage the countries to work with the church. I know with a lot of work we have done in the Pacific and supported a lot of the countries to work with faith-based organisations. Faith Based organisations is an entry point to encouraging healthy living and healthy eating. Changes will come through faith-based organisations and churches in the village community. Because health institutions are not coming to the villages. So, I think the root remains in strengthening the faith-based NGOs and empower the churches in a way that they take the lead by incorporating the principles of healthy living into their existing set of norms, and in the hope that people would be more accommodating to these changes. But this is part of our way of living. This is part of our church. This is part of our culture that we learn to do these kinds of things.

Whilst Lizzie states that churches can be a medium to teaching healthy eating in the communities, Lewa disagrees as she has not observed churches assisting communities to transform or improve their livelihood. Lizzie states that health institutions do not go into the villages, but churches are in all villages; therefore, training pastors to incorporate principles of healthy living in their programs can help improve nutrition in communities.

Disseminating knowledge to the pastors of the churches is sometimes difficult. Because sometimes the pastors in the villages are untrained and lack expertise. Often, denominations send pastors are from outside the region who do not speak the local language. The pastors' training leads them to care about church matters and not the community's needs. The traditions of the villages bind people to always doing the same things, such as organise festivals, and churches that support these traditions do not address the current real needs of people. Therefore, the world view of the churches lacks to encompass many practical needs of the people. The support towards the community needs and church programs do not come to fruition. Churches also lack the support from government.

[36] Conversations with Lizzie where conducted in English language.

Mune's parents were church elders in the Seventh-day Adventist (SDA) Church and provided pastoral care and visitations to the needy in the village. However, after her parents passed on, the support from their church was not evident. Mune said:

> SDA church be gonenai be Yes, a tuamagiani. Toma gaua be noga mogo ena poor asi ge durugiani. Ena sena ogogami ge lakagenigia goni ge duru gia goni. Na toma church members a gitagiani be asi geve committing ena veduru rava kavai ai.
>
> Yes, the SDA church used to do that (support single mothers) in the past. Today, the SDA church is poor, they don't help. When mum and dad were alive, it was ok. They would visit the poor people in the village and help them. When I see today's church members, they are not committed to help and other things.

According to Mune, the church should be the catalyst for assisting single mothers in providing where they lack the resources. However, the churches seem to lack the capacity on the vision to be able to assist single mothers in this case. Further, Mune stated:

> Ba ena vanua na nogosena bege kalani, be veduru bege vekalani, senagi ta asi debana ragaraga ena vanua, na sena kiki vavine besere duruia tuamagia asi gegabini. Gilabe ena siboia mogo o geia family mogo. Siboia mogo. Ena poor taulimalimai nogo sena asigina. Asi ge kala rogo giani. Asigina!
>
> If the village leaders seek for assistance from outside source, then we would get support and there will be obvious physical evidence of assistance given to the village, but no one in the village has the ability to organise and assist our women. The leaders and their families benefit from the handouts. There is nothing for the poor family. They don't help them. Nothing!

Mune draws attention to the fact that churches in her observation do not assist the people very practically. Mune expressed that assistance from churches would be more obvious if projects or programs were organised for women's involvement. Some of the programs organised by the church or community activities benefit particular groups or clans and single mothers, who are in need, are not included in training and for other support.

However, other women participants stated that some churches assist their members in gaining access to food in times of crisis and assist to improve their education qualifications. For example, Mogogele attends the Mormon church in her community, which provides her the capacity to further her education. Mogogele states:

> School kavanai maki gaina rubuai maki they provide nogosena gauia TVET and FODE pathway. Rubuna peiani, oi.
>
> [On the] school side of things, our church provides TVET[37] and FODE[38] pathways, Church pays, yes.

These findings indicate that some churches assist single mothers by providing a pathway to complete their education apart from helping them grow spiritually. Whilst they are helping single mothers to improve their education, this does not show that the mothers are taught well enough to improve nutrition in the community.

Single mothers experience more complex challenges because of the lack of income opportunities and other insecurity. However, they often create friendships that nurture peer-to-peer support systems, which comprise helping each other to make their gardens and to create an income when they sell their food products. At the time of talking with Lewa, a group of single mothers organised to make a new garden for a friend who would pay them. The group were working hard to attend a church conference in the village. The income that was going to be generated by helping their peers was to raise funds for the conference. Lewa explained:

> Gai wa e rupu ga thaoni, iai evanamo thau a awalini, pe wa sister na wa rori peve ialagia thau wa thai maina September gemai, apaipai maparamai gemai conference apua wa saidiai ene vegapi pe gai ri K150. 00 ia ole, pe gai vavine maparaparamai K150. 00 moni iakamu, pe gaiwa moni ariai ga gapi…ma a complain, gomi vairi ma garawamui gai geregamai e K150 ia kamu one month apuna mogo e moni ariveaina iga gapia wa commenti wa eme rageagiao, vairi wa ai moni ai ge marketini kupana ganigani ge vagirao pe, ari ai moni ge gapiao gau ri geme rageo gemai.
>
> We go to this church, it is a good church, and one sister mentioned all the women will have a conference in September, which will be held on the other side [of the village Gavuone] and we are told to pay K150.00[39]. This money is too big, so where

[37]TVET – Technical Vocational Education Training; a pathway for learning in the national education system that consists of skills development relevant for improving livelihoods or occupational fields.

[38]FODE – Flexible, Open and Distance Education; learning pathways offered through an open and distance where the students study the same concepts in the secondary education curriculum at their homes and their own pace.

[39] K150. 00 at the time of conversion, the equivalent to New Zealand dollar is NZ$65. 93

> will we get the money from? I complained, because some of them have their husbands [but] we are by ourselves. K150 is too big, we cannot raise that money in one month. How do we get the money? These comments were raised, some don't have any money because they are not selling their harvests in the market, the rain destroyed their food garden. We are questioning where we will get the money from to pay for this event.

My conversations with the women showed that the demands of the churches on the communities are difficult for women, especially single women, to meet. As Lewa narrated, even though the church organised a conference for the women to attend, paying the cost to attend such a conference is difficult. The women expressed that their sources of income for such church activities were destroyed by a flood, and this was making them feel vulnerable. The following section will discuss the experiences of single mothers how to access government support systems.

8.4 Experiences of Government support systems for young single mothers

This section will highlight the experiences of women living in rural villages and their engagement in the communities. Women want to be given the opportunities to transform their lives and make a difference in the villages. This section will focus on the role of government when promoting nutrition. It highlights the presence and absence of government support systems for mothers in rural villages.

Generally, as the earlier sections have shown, most of the single mothers in the study lacked support in rural villages. Some government support is received, such as free education from Grade 1 to Grade 10. However, female students drop out of school because they marry early or parents are unable to pay the project fees imposed by the school, even though education is free. In the education systems of PNG, there is primary school education is from Grade 1 to Grade 8, secondary school is from Grade 9 to Grade 10. Then we have the upper secondary school from Grade 11 to Grade 12. The exams are usually done in Grade 8, Grade 10 and Grade 12. So, if the students pass the recommended grades in Grade 8, they continue to Grade 10; the same is applied in Grade 10. Their formative years in school are the main avenue to learn skills and gain knowledge about nutrition.

In both research sites, the communities engaged Small Medium Enterprises (SMEs) to run workshops in the villages. SMEs were established in PNG in 2008 and play an important role in local social and economic development. One of their roles is to implement programs and projects that will support the

growth and development of women in entrepreneurship. Through these media women can access loans from different banks, and they can access financial literacy in their communities and plan projects for their businesses. So, the women leaders saw the opportunity to engage technical officers to assist women establish their projects. However, the women were dissatisfied when SME were not able to run the planned workshop. The single mothers from Gavuone village paid some money to the person initiating the SME registration. Paying the registration fee would enable the workshops to be run in the village. However, Veaina emphasised that the community should organise workshops to help the single mothers in the villages. Veaina stated:

> Pe au wa e veaina a ve valavuni, rai moni mitia pige venimai, po valavua community na. Gaugau na ne walani. Pira gai ai ripamai, ai ge rori agiani. Moni ia ga ole namu o, gau apua ne wala. Moni ge gani lewalewa, Ipo e lewalewa o, Uliuli ne ma varipa, keke kapu ma ne varipa. Doughnut gena saidi ai, Neini, keke kapu, uliuli, doughnut ene varipa, ai geveripa. Au apua e veami, SME gauna eme varavua pe apaiapai geve raloni apaipai, gau apua ne vewalani. Apai pai two gauriana e miani pira wa raveaina. Moni iarau ga koko ri, ga veniri.
>
> I am thinking like this; the community should give us some little money. We contributed money but nothing has happened. They may have eaten up the money. It just got lost. They did not teach us how to sew, or bake cake, doughnut side of things. She said she was going to teach us how to sew, bake cakes and do doughnuts, but she did not teach us. One person came to our village and did the SME registration, but the women are still waiting, nothing is happening. We collected the money a long time ago and gave the money to them.

What can be seen is that women have distrust in government organisations when services do not reach rural villages. Women are interested to improve their skills in various areas including sewing and baking. These skills are taught in schools, but rural women lack these skills for reasons already stated above. Learning these skills in return will enable the women to generate an income for their families.

Government services, such as schools, are an avenue where women gain knowledge to equip themselves. Women in rural villages have everything for good nutrition. Yet, according to Vinakau, a teacher in the local school, women lack the knowledge of how to prepare simple nutritious food or meals. Vinakau said (in English):

> We have everything, for good nutrition in PNG, the thing that is lacking is probably knowledge; the knowledge of how to prepare simple but nutritious meals. Like in

> the Home Economics subject, we teach our students how to prepare meals for different age groups including lactating and pregnant mothers, elderly and school age children. But only a few people in PNG have the knowledge on how to feed their children nutritious meals.

Home Economics is a subject that is taught to students from Grades 7 to 10. Through this subject, students (both boys and girls) are equipped with skills and knowledge about nutrition. The students are taught how to prepare different dishes using the staple foods grown in local villages (PNG Food Technology outcome-based curriculum). However, facilities to teach Home Economics in schools are deteriorating, to the extent that the Home Economics subject is not taught any longer in some villages. In addition, teachers not trained in the field of home economics are forced by the school principles to teach the subject (Vagi & Salley, 2017). Veaunega[40] said:

> We have written the curriculum in such a way that teachers who are not qualified in rural schools, can pick the curriculum and teach the subject. But not all the schools have the equipment or funding support.

Veaunega has pointed out the lack of human resources and facilities in schools. Teaching Home Economics in schools is one avenue where nutrition concepts can reach many people. Vinakau gives her experience as a child growing up in the rural villages and sees Home Economics as a subject that can be used to reduce malnutrition. She recounts her childhood upbringing noting that she was not fed nutritious meals:

> Yeah, so that's maybe, I didn't see it that time, but I see it now as an adult, and the home economics teacher, was not just a home economics teacher but also just a person, a mother, a woman. When looking back, I wasn't fed nutritious meals when I was growing up. Now I make it my business that my children have the best meals. What I do as a teacher, I tell these young boys and girls because they are all taking home economics, it is your duty to learn in this field because when you return to the village and when you marry a girl who doesn't have this knowledge, you are the one who will tell your wife… At the same time… all men in PNG are not providers, they are breadwinners, so they would have that money, give enough money to their spouses to purchase food, the kind of food that they would want their family to eat.

[40] Conversation with Veaunega were conducted in English language.

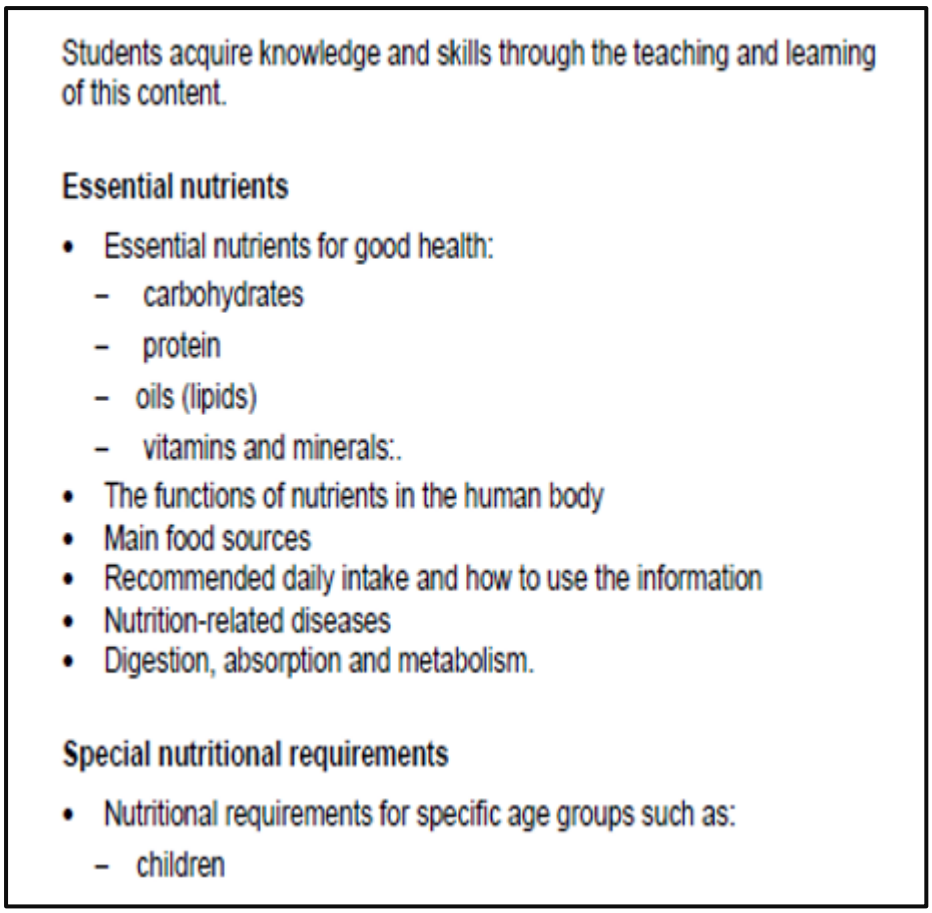
Home Economics or food technology is a subject where students are taught knowledge and skills to improve their livelihood and are equipped to prepare nutritious meals. Most of the students are encouraged to take this subject, but often male students feel that it is just for the female students.

The PNG national curriculum puts Home Economics subject in the Design and Technology subject field. This subject field incorporates Design and Technology, Practical skills, Computing and Home Economics. The focus in this context is the Home Economics subject where basic nutrition knowledge is taught across PNG. The syllabus builds on concepts and skills from primary education (Year 7 and year 8) and links to secondary education (Year 9 and Year 10). According to the National Department of Education (2016, p. iv)…

> The Lower Secondary Design and Technology subjects contribute to integral human development as they are based on the students' physical environment, societies and cultures. They link the National Education Plan's vision which the secondary education enables students to achieve their individual potential to lead productive lives as members of the local, national and internation community, and relate to activities that can be used in everyday life. The subject equips students with practical knowledge and skills that will enable them to contribute meaningfully to their local communities and societies. They empower students to manage their limited resources to achieve set goals and successfully make a living in their community.

These subjects are developed with the primary aim to equip students with lifelong skills and opportunities for students who return to live a productive life in the community. The curriculum captures "our way of life' (ibid, p. 4) in reference to culture.

The Home Economics subject is mostly taken by female students. The change in curriculum has now enrolled male students. Figure 8.2 below shows an extract of the Design and Technology curriculum offered in the schools in Papua New Guinea. The Home Economics subject is contained in the Design and Curriculum, and captures topics, 'food and nutrition' taught in Grade 9 and Grade 10. The curriculum captures the fundamentals of nutrition, properties of food and preparation of nutritious meals using traditional methods to prepare local food. Figure 8.2 below shows part of the content knowledge for Grade 10.


Students acquire knowledge and skills through the teaching and learning of this content.

Essential nutrients

- Essential nutrients for good health:
  - carbohydrates
  - protein
  - oils (lipids)
  - vitamins and minerals:.
- The functions of nutrients in the human body
- Main food sources
- Recommended daily intake and how to use the information
- Nutrition-related diseases
- Digestion, absorption and metabolism.

Special nutritional requirements

- Nutritional requirements for specific age groups such as:
  - children

Figure 8.2: PNG Home Economics Curriculum Grade 10 Food and Nutrition content
Source: NDoE (2016) Design and Technology Syllabus.

However, not all the female students go through to Grade 9 or 10 and might already complete their education in Grade 8 or earlier. Mothers who have dropped out of school earlier miss out on this knowledge.

Another finding also showed that there are gaps in the government services that are supposed to be provided in the rural villages. According to Vinakau who teaches in the rural school said:

> So, the students who come to school they have their mothers who don't have that knowledge yet. Maybe, people like health officers would be the best people to reach those small areas and maybe come back to talk about nutrition once again. When they talk about nutrition they would have charts, and posters of different kinds of malnutrition diseases that affect children.

Vinakau's quote shows that mothers in rural villages lack nutritional knowledge. Vinakau recommended that the Ministry of Health officers would be the appropriate means to reach the rural villages to teach nutrition. However, during my observation in district hospitals in the Central Province, the health

officers pointed out that there were no nutrition officers that could promote nutrition in villages. Coupled with the lack of nutrition officers was the lack of office facilities and amenities for nutrition officers. Similar sentiments were echoed by different arms of the government highlighting the absence of nutrition officers. Magdelene works for Department of Health, she said

> There's nothing. No nutrition officers. And that is the missing link that I identified. Yeah, you know we have stunting, which is on the rise, we have malnutrition, which is on the rise. We shouldn't be having that. We shouldn't be having that because we have a variety of food.

There is a lack of nutrition officers in Rigo and Abau districts. Despite the increase in nutrition-related diseases in the rural villages, the village communities are unable to access the information they need to improve. The PNG Government (2016, p. 10) Nutrition Policy handbook, indicates that…

> At all the provincial and district levels, nutrition specific and nutrition sensitive interventions are not included as part of Medium-Term District Plans and only 8 out of 22 provinces have designated nutrition officers. Few provinces have taken the steps to establish multi-sectoral nutrition committee to identify and respond to nutritional issues. Even in provinces where these teams have been established, budgeted work plans have not been developed and there is little coordination between national, provincial and district teams.

Whilst some health services exist in rural districts, health officers lack the resources to carry out their roles in the villages. In most cases, there are no nutrition officers to carry out their duties in promoting and making awareness to improve nutrition in villages. As was observed during fieldwork, there was no nutrition officer to speak to, no facilities, and computers to operate from. Even though the former Prime Minister of PNG, Peter O'Neal had said:

> The implementation of key nutrition strategies will make an important contribution to our PNG Visions 20250 to improve the lives of all PNGeans. The National Nutrition Policy is implemented in all levels of Government and throughout the various agencies and development partners truly committed to health and development of PNG (PNG Government, 2016, p. iv).

The Papua New Guinean nutrition policy has strategies to contribute to achieving PNG's visions to have a healthy population by 2025. The nutritional policy has a multisectoral approaches to improve nutrition and implement nutrition interventions are yet to be coordinated into a central facility. The technical

capacity is also limited in delivering specific nutrition interventions. Similarly, the Department of Education also has strategies to address nutrition issues in PNG.

Despite the fact that the Education Department has a comprehensive curriculum and has the ability to teach Home Economics across PNG, there are many difficulties. For instance, most schools in PNG lack funds, resources, facilities, or trained teachers to teach the Home Economics subject. The education system in PNG deters students from learning these skills. The Health Department in its policy aims to direct health promotion programs and resources to reduce health status within the population. According to the Ministry of Health (Health, n.d para 1), health promotion in PNG is…

> To empower individuals and communities thereby enabling them to control the status of their own health.

Health promotion is the foundation of the National Health Plan vision (PNG, 2021). The emphasis has been on communicable diseases by delivering education to enhance awareness of diseases and reduce the burden of diseases. The National Health Plan 2021 - 2030 focuses on health promotion, including nutrition promotion. The plan prioritises as part of its strategies to increase population awareness for individuals and make informed decisions about their health and engaging in partnerships with stakeholders to implement nutrition programs in doing so, will reduce and prevent morbidity and mortality of NCDs.

This section has drawn on the knowledge of teachers and health experts and has used a document analysis. Results show that Government departments, both Education and Health, have a primary role in nutrition promotion and have devised policies to improve nutrition in PNG. Their goals are yet to be achieved. Whilst there is no specific nutrition system in place in the Department of Health, the department of health also struggles to address nutrition across schools across PNG. The links between the health department and the rural villages towards promoting nutrition awareness are not yet established. In the next section, I will highlight strategies that were suggested in *tamei guluagulua* by the participants.

8.4.1 Women's views on support systems for better nutrition

A majority of the women in both rural villages expressed that they do not receive assistance from all the systems of the government. Most of the mothers wanted to see a change in their livelihoods by being equipped with skills, equipment and tools. In saying this, one single mother suggested that the more experienced mothers could pull together all the single mothers and teach them how to prepare nutritious meals. Mogogele said:

> Nogo geia experience begere veribamai. Experienced mothers how they feed their baby ena new mothers noge sena gegitani single mothers begeria help ia. Begere help ia, ata veisana baby right food begere genia. Sinagi nogo sena asi gekali. Mostly gemai mothers or hospital iai vau. Or school iai genai.
>
> The experienced mothers should teach us their experiences; how they feed their baby. New mothers and single mothers should be assisted. They should help us, how to cook and teach us, what to give, the right kinds of food. But they don't do that. It's only our mothers, or the immunisation team that does that when they come to the village.

Most young mothers are taught by their own mothers. Sometimes mothers were not able to complete their own education, which limits what they can pass on. Hence, Mogogele stated that it is important for mothers to be trained and equipped with further knowledge.

Also, mothers from both research sites expressed that they have not had anyone teach nutrition in the village. In our *tamei guluagula*, the women explained that they understood the importance of eating a variety of food not only to give them the strength but to keep them healthy and to avoid sicknesses (see Chapter 6). They reiterated that technical people from government should collaborate with the villages as this would benefit the communities. The participants also expressed that they eat the same food every day because they have those food growing in their gardens, and they needed to learn new ways to prepare meals. The participants mentioned that the Agricultural Department has useful programs to teach women. The programs include planting new vegetables or care for their vegetables. Mogogele said:

> Asigina, Agriculture department asi vamei lakatogani. Nogo benamo sibomai mogo. We start from sibora betara ve organise. Fellowship na begere start off benamo. Council na maki nogo beregitaia benamo tuamagina keta begere gabia. Vavine begere keavegogo gia. Vanua leaders na begere keavegogo mai. Vavine baraiana. Na vanua vivinea baraia gauia. Gilana nogosena gauia begere kia vegogo ia. Ge goneto be gilana ribaia nogosena begere organise ia.
>
> No, the Agricultural Department does not come into our village. We run ourselves, we should start with ourselves and organise ourselves. It should start from the fellowship where all the women be called to gather. The Council should also see that area properly and they should have some good understanding. They should call the women together. The village elders should call the women together. The big women [of high status] from the village should call all the women together. They

> went ahead of us so they know some skills and knowledge so they should organise us.

In both villages, women clearly identified that engaging educated women from the village would be another valuable avenue. Within the villages, there are women who are knowledgeable and equipped with skills that others could draw from. However, the women reiterated that the process for receiving support could be organised in the community through the church pastor and his wife as they are leaders of the village. Relevant programs and specialised skills from local people could then be integrated with the church programs. As was shown earlier, women felt estranged from church support, but if pastors and their wives were more closely involved in nutrition training, this would improve not only the women's nutrition knowledge, but would also reconnect women to church activities in a positive way.

8.4.2 Government action and support for rural women

In the following, I will explore the support systems in place for rural women and bring to the fore their conversations on the government support mechanisms. Women in both research sites have distrust toward the government systems and the lack of support from government services. Nutrition awareness and workshops for women in rural villages are lacking.

The findings show, as already explored above, that there is a lack of nutrition organisational structure and infrastructure in running a collaborative nutrition program in Central Province and across PNG. Nutrition has often been perceived to be a health matter. Within the National Department of Health (NDoE), the nutrition section is small. PNG Government (2016, p. 11) states that…

> Nutrition human resources capacity is very limited in PNG at all levels to provide technical manpower and support to implement nutrition intervention. The impact of the lack of capacity in nutrition is not only in terms of developing a multi-sectoral strategic plan but it also inhibits the ability to identify, advocate, budget and implement a coordinated response to nutritional problems in the communities.

As was identified in the Rigo and Abau district hospitals, there were no nutrition officers that could account for nutrition promotion (see also Chapter 6). Ganima is a nutrition specialist and has worked in the nutrition space in different organisations, including the National Department of Health, and UNICEF and she currently works at the FAO. Ganima indicated that unless there is good leadership at the strategic thinking level to change nutrition in PNG the indicators will not change. When funds were allocated to establish the nutrition sector in National Planning to cater for the nutrition affairs in the country, the funds were diverted for other purposes. Ganima said:

> Each agency will look at the nutrition policy to draw up the plan and guide the resourcing and activity plans, and strategic plan according to the National strategic plans. The challenge right now, it's not being coordinated. There has to be a central agency that does the coordination. It's not the National Department of Health because initially when the policy was developed, the proposed project management unit under [DNPM][41] to establish the Nutrition Project Management Unit, said to coordinate the sectors, but then the challenge with them is, you know, the DNPM's inconsistent support and lack of prioritisation and recruitment of nutrition coordinator. They allocated one million PNG Kina every year for nutrition financing. That's to fund the coordination. The establishment of that nutrition sector and one million is a lot of money.

Ganina pointed out that a large sum of money, one million PNG Kina, was allocated to the National Planning to coordinate and establish the nutrition sector to organise the resources and support nutrition implementation for the country. However, the Department of National Planning and Monitoring (DNPM) diverted the funds. Rather than putting the funds into a useable course and reaching the rural villages, these funds were utilised for other purposes. Ganima clarified with emphasis that the:

> Government Departments are not investing in Nutrition. The Department of Agriculture Livestock does not have a nutrition person. So that's the challenge and financing is one of the challenges even. Right now, we have the multi-million Kina with the World Bank Project. For me, I don't see us changing our well-being, it's just a waste of money. I was asking why one million Kina? A cash voucher to support pregnant and lactating women there should be a better way of using that money. We cannot just give it a free handout. So, there are better ways of doing this so for me, I don't agree with the project.

There is a need for a National Nutrition Sector in PNG. The funds were made available to coordinate and facilitate nutrition. But there is a lack of monitoring and evaluation to coordinate and facilitate nutrition. The cash vouchers, as Ganima explained, were not devoted to tangible outcomes for the development of women or towards empowering women.

[41] DNPM – denotes Department of National Planning and Monitoring. This is a government body that acts as the key central agency advising Government on matters relating to strategic development; development policy; development planning and programming; foreign aid coordination and management; and monitoring and evaluation of national development projects and programmes.

8. 5 Conclusion

This chapter presented the support systems available for young single mothers in rural villages and has also explained what support is still needed. The support systems women receive in their villages are strongly linked with their family environment and the community. In most cases, single mothers work on their parents' land to care for their children, their parents and their siblings. While in the community, families work collectively to reach their household goals, to pay school fees, contribute to church thanksgiving events, including women's fellowship thanksgiving events. Support systems are not always available for single mothers when compared to the women who have their husbands. The community members work collectively to achieve their desired goals. However, when it comes to supporting single mothers, there is a gap. Single mothers usually organise their family members to help with clearing new gardens, planting, weeding and harvesting. They do not receive further assistance apart from their families. The data presented in this chapter has shown that women want to be equipped with skills and knowledge that will improve their livelihood. Furthermore, government does not provide enough nutrition and support from health officers to the villages. Government should be able to deliver nutrition promotion, and nutrition knowledge and skills to equip the mothers in Central Province.

Single women in the two villages want to be independent and self-reliant and be engaged in the avenues that can help improve their livelihood and nutrition, and in avenues that can enhance their skills and knowledge. Women in rural villages are resilient and withstand the laborious work they do in the gardens and contribute towards cultural activities. However, this chapter has shown that the Women's Fellowships in the villages could be made more supportive by being equipped with resources to train women. Women in Central Province suggest that even though they are equipped with the cultural knowledge and skills, they believe that their livelihoods could be improved if they can be engaged in workshops that can help them generate an income.

This chapter has also shown that the National Department of Education has a curriculum to equip students with skills and knowledge in nutrition. However, the rural schools lack the facilities to adequately disseminate the required skills that could equip the students. Young mothers who drop out of school go without learning the skills to equip the students.

This chapter has indicated that nutrition has been categorised as a health issue. There is a small nutrition section within the Health Department, but it lacks nutrition officers who are able to work with rural women. There is a gap in the government's organisation regarding nutrition issues, and there is a need to work collaboratively to address nutrition issues facing women in rural villages. In the next chapter, I weave together findings, conceptualisation and context, to discuss these findings and underlying issues.

Chapter 9: Discussion and Conclusion




Figure 9.1a (on the left): A woven basket handle
Figure 9.1b (on the right): A young girl carrying a basket on her head
Source: Gima Godu Mou (2023)

9.1 Introduction

In terms of the *doi avatuani* framing, the discussion and conclusion Chapter 9 serves as a basket handle as depicted in Figure 9.1a. The basket handle is woven, attached to the main structure of the basket and serves a functional purpose, as can be seen in Figure 9.1b. The basket handle unifies and supports the basket structure. Likewise, this chapter holds together and integrates key elements of the thesis. This chapter brings together Indigenous knowledge, practices, systems and the people who sustain this system, women's roles in sustaining nutrition. All the findings from the earlier chapters are brought together into a cohesive framework, highlighting their significance for community empowerment and improved nutrition in rural villages.

This final chapter discusses the findings of Chapters 6-8, showing what these findings contribute to existing literature and how they address the core aim of this thesis: to employ Indigenous knowledge when working towards improving the nutrition among rural women. In development practice to date, one strong focus on achieving better nutrition has been to strengthen the overall empowerment of communities, of which women are a part. This chapter will discuss how the research findings have addressed the research questions that were proposed at the start:

1. How are notions of community empowerment and nutrition understood and practiced in Central Province, PNG?

2. What cultural knowledge can be applied to empower communities to address healthy nutrition?

3. How can women be empowered to improve nutrition in their communities?

The intention of this research was to capture and narrate the stories of rural single mothers in Central Province in PNG. By centering the experiences of these women, this thesis has demonstrated how Indigenous knowledge can improve nutrition while providing a framework for communities to maintain and revitalise traditional food production and distribution systems. This research also looked at what additional knowledge is needed to improve healthy food consumption in rural settings. As a consequence of understanding cultural values and food practices, this research asked how nutrition could possibly be improved. Many of the single mothers that engaged in *tamei guluagulua,* explained that they struggle to provide nutritious meals for their children. This research, however, has also shown how single mothers are equipped with cultural knowledge, customary values and skills passed on from their mothers and ancestors.

The cultural values and practices of *ve tarikaka, ve galagala, ve vagakava*, *ve genilaukule* [42]*basket to-basket* and *ve gubakau* were identified throughout this study as valuable when understanding how nutrition could be improved. The analogy of weaving a food basket, *doi avatuani,* was used in the framing of this study to apply a holistic approach, which could address the issues for the women in the two villages that needed to be overcome. The food basket framing also symbolises the strengths that are innate in Central Province society, when working towards better health and wellbeing through improved nutrition in rural communities. Throughout the earlier chapters, in association with weaving the food basket, I have symbolically 'laid the coconut fronds' by framing this thesis conceptually (Chapters 2 and 3) and contextually (Chapter 4) and by explaining the methodology and methods used (Chapter 5). I have explained how the food basket is used for exchange in Chapter 6. In addition, in Chapter 7, the sides of the basket are woven to represent weaving individual fronds that contribute to the strength of the basket. The participants's views highlight how food access and good nutrition is deterred by weather challenges. Furthermore, Chapter 8, explains the pulling together of the strands at the bottom of the basket depiciting cultural values within the communities, and how these values realtionships, knowledge sharing, food security and community empowerment. In this discussion and

[42] *Ve genilaukule* refers to reciprocity in the Ikolu language. Women have used reciprocity as basket-to-basket when exchanging a basket of food for other goods and services.

conclusion chapter, I will show how the (research) basket is woven together, how chapters relate to each other, and how my study with the women in Central Province will expand Indigenous research-based knowledge. Here in Chapter 9, I am 'pulling and plaiting the fronds' to complete the research basket.

In the three findings chapters (6-8), this study has analysed cultural values, *ve tarikaka* and *ve galagala,* two concepts that refer to maintaining relationships, and *ve vagakava,* which refers to supporting each other. *Ve genilaukule*[43]*,* actually refers to reciprocity but it is not equivalent to what women in Gavuone and Ginigolo refer to as basket-to-basket practice. The practice of reciprocity, and the basket-to-basket practice that women have used in Gavuone and Ginigolo villages, is an exchange of food baskets in exchange for either food or support. *Vegubakau*[44] can be accorded when *vetarikaka* and *ve galagala* are maintained. These cultural values lead to empowerment, *vekokole*[45] referring to strengthening women and the community as explained in the previous chapters.

Women are the main providers of food in this context. Even though men have a role in food production, it is the women who make decisions on what vegetables are planted and at what time, and how food products will contribute when cooking meals. Knowledge and focus is brought in the process of creating nutritious meals, and the more women are respected and supported, the more they will be able to provide well for their family. This study also shows that local Indigenous knowledge has strong value. This includes the understanding of what support mechanisms within the community and from outside sources are available.

The methodological approach to this study interwove Indigenous knowledge based methods (*tamei guluagulua*) with qualitative methods (observation and journaling) (see Chapter 5). I have engaged, and concentrated on the experiences of, single mothers in Ginigolo and Gavuone villages. *Tamei guluagulua* is the local practice of informal and formal discussions and is well recognised by the local women. Drawing on this specific local practice aligns with the practice of other scholars using culturally grounded methods in Melanseia (Sanga et al, 2018; de la Torre Parra, 2021). In the following sections I will discuss my key findings in response to the research questions. This chapter will discuss the findings (of Chapters 6, 7 and 8) in conjunction with the literature (presented in Chapters 2 to 4).

As follows, Section 9.2 addresses Research Question one (RQ1) through the discussion of the cultural perceptions community empowerment and practices of healthy nutrition in rural communities. In

[43] *Ve genilaukule* refers to reciprocity and women have used the metaphoric term as basket-to-basket
[44] *Ve gubakau* refers to respect
[45] *V-e kokole* refers to empower or strengthening

Section 9.3, I address Research Question two (RQ2) when discussing women's direct roles in providing food and nutrition in rural communities. Then in Section 9.4, Research Question three (RQ3) will be addressed through a discussion of cultural understandings to strengthen women's efforts as food providers.

9.2 Cultural perceptions of community empowerment and practices of healthy nutrition in rural communities

This section will address Research Question 1 (RQ 1) to understand the cultural perceptions of community empowerment and how 'nutrition' is locally understood and practiced in Central Province. In the first sub-section, I will discuss the understandings of community empowerment in rural communities. This will be followed by a discussion on the local perceptions of healthy nutrition in rural villages. The last sub-section will then look at the cultural perceptions of food availability.

9.2.1 Local cultural perceptions of community empowerment

When focusing on healthy nutrition, results in this study have shown that it is significant for women to be respected and engaged in community activities. Women then have a chance to feel empowered in their community. Eve mentioned that when a woman contributes to the activities in her village, she is highly regarded when she participates in cultural activities. These observations link with Gwatirisa et al. (2017) and Bre (2006) who state that an exchange of food is symbolic of respect and acceptance. When relationships are maintained, transactions are established and there is reciprocation of food, knowledge and skills and a consolidation of support.

Women's ability to produce food that leads to healthier nutrition in rural villages are dependent on relationships maintained in the community. In this context I look not far but within the community's cultural contexts, where women can be equipped with skills and knowledge. Findings in this study have shown that there are existing culturally rooted practices that families in rural communities utilise to support each other and enhance their relationships. These significant local practices and values that women have mentioned in our sessions include *ve galagala* and *ve tarikaka* as significant aspects of community empowerment (see Chapters 6 and 7). These relationship values (between closer and extended family) are often maintained in rural communities and are utilised to support one another when participating in community activities. As was explained by Vabu in Chapter 6, *ve tarikaka* refers to maintaining immediate relationships within the family, kin members of the family and first cousins. In

rural villages, women maintain *ve tarikaka* to share or access resources, agency and achievement (see Kabeer, 2018 see also Chapter 3). Resources include physical resources, such as seeds and food, and social resources, such as *ve duru,* support in the form of financial support or clearing a new garden. Women also seek assistance from their immediate relatives to access or approve resources, for example when planning a new garden. Their achievements are celebrated when women have contributed in a positive way, and this is when reciprocity is displayed. Even if the outcome does not turn out the way they have expected it to be, mothers continue to maintain their relationships. One of the main aspects of *ve tarikaka* is sharing and reciprocating resources. Sharing and reciprocating can be done at all levels in rural communities.

These exchange practices and relationships are likened to Ife's (2009) conception of communities and how these relationships are governed by cultural customs, values and spirituality. Here I will also associate *ve galagala* to accessing and gaining support from outside sources and institutions, referred to as agency (Kabeer, 1999 see also Chapter 3). The outside sources and institutions are schools, hospitals, the National Department of Education (NDoE), National Department of Health (NDoH), Non-Governmental Organisations (NGOs) and Churches. In rural villages, these relationships within the community and with organisations enable people to work collaboratively to achieve a desired outcome from working in their gardens, to provide better nutrition for their community and families (Kipuri, 2009), or access additional skills, knowledge and resources. However, sometimes there are disconnections in *ve galagala* because of cultural power dynamics and imbalances (see Ife & Fiske, 2006; Kabeer, 2010; Pigg, 2002). Women face formal and informal barriers to access productive resources and services in rural areas. There are also barriers in relation to control over productive assets, their land, the use of technology and equipment, and access to knowledge and finances (see Chapters 7 and 8). Projects conducted in other provinces in PNG have shown that equipping rural women with technology, skills and knowledge will enable women to provide better and nutritious food in communities (Davies et al., 2024; see also DFAT, 2024; Meulen & Kassens, 2018). Therefore, the contribution of my study with women in rural Central Province is that a focus must be on the women when maintaining relationship ties between rural village communities and institutions. If these relationships are maintained for the purpose of supporting women in Central Province, and considering that women are the key food providers for families, this could affect villages to be able to provide healthy diets in their communities.

Findings have also shown that women work collaboratively with family members, clan members, and social networks in rural communities as these enable them to share the load of garden work. As Eve has stated (see also the starting quote):

> Ve tarikaka, ve galagala gau barana vanua aunai.

Maintaining relationships means so much, it is a big thing in the village.

Ve tarikaka and *ve galagala* are social networks and the glue that hold the people in rural villages and communities together in all situations. This glue, or cohesive elements, are the social networks. In the *doi avatuani* framing these are symbolised as the ties of the four fronds at the two ends of the basket. When tied together the fonds are creating a stronger rim and can be likened to a community where relationships are well balanced (see Figure 9.1, also see Ife, 2009). Within a rural community, aspects of Indigenous knowledge are importantly embedded in food practices, and this knowledge determines how women are guided in their cultural practices.

As was explained by Eve in Chapters 6 and 7, cultural activities in rural communities are never conducted alone or by one person. It takes a village and the involvement of clan members to clear and plant a garden. These activities are communal and align well with the cultural concept of *rai asi galagalana* [46] (as Vabu had explained in Chapter 6), which means a person is not without relatives. Being embedded in community support networks during gardening is also related to *thau nori roropau*[47] (taken from a note by my husband, John Vagi), which means "I am not an orphan", and which reveals that one does not exist alone but is connected and surrounded by a matrix of relationship (which is also recognised by Ife, 2009). For single mothers to maintain *ve tarikaka* and *ve galagala,* culturally determined relationships and working collaboratively embodies social empowerment within rural communities. Single mothers draw from their immediate family members (*ve tarikaka*) and social groups (*ve galagala*) to work in the gardens, which also enhances their self-esteem. When women harvest food from their gardens and sell their produce at the markets to earn an income, women are then able to make some decisions on what can be purchased.

However, as was highlighted by Mune (in Chapters 6 and 7), sometimes single mothers live in disharmony with family members, and there can be disagreements on how land should be utilised. Working collaboratively, an aspect in community empowerment, is where cumulative cultural knowledge is drawn upon (Sillitoe, 2006; see Chapter 2). Established relationships are useful for women to access support and assistance (Kabeer, 1999, 2010). These cultural activities, values, and identities are prominent aspects of the rural communities (according to Vabu and Eve). In a similar

[46] *Rai asi galagalana* - is a phrase from the Ikolu language (language spoken in Ginigolo village) and means that no one is without a family, indicating that a person has roots to a family and belongs to a clan where support can be accessed. A person cannot feel the pain on their own but needs the support from the relatives.

[47] *Thau nori roropau* – is a Keakalo language phrase that literally means I am not an orphan. This phrase was often used to state that a person is not alone, he comes from a clan, a community and a tribe.

context, Scheyvens, et al. (2023) state that social and cultural interrelationships are cemented for the wellbeing of rural communities (see also Kipuri, 2009). This would mean that as long as single mothers are supported and recognised by their families, they are included in their communities, and have access to resources, their wellbeing is secured. Problems start when single mothers are not included.

The notion of *ve vagakava* emerged in *tamei guluagulua* with women, who narrated how they work together with their families, clan members or groups such as sports groups or church groups. People in groups organise themselves to support and work collaboratively to ease the load when clearing the bush for a new garden, sharing the harvest or when fish is caught in abundance and brought to the village to be shared within the families (as Vala and Vabu explained). Working collaboratively to prepare for a feast generates an atmosphere for change, and this collaboration redistributes resources among the people, as was explained in Chapter 6. Cultural relationships and reciprocity are also noted in Kupa's (2009) Tokelauan example, the *Te Vaka Ataga* model, where sharing was emphasised as an important aspect among Tokelauan rural communities. Sharing resources, food and knowledge within rural communities enhances social networks, which is essential in the context of addressing nutrition and food security (Ferguson et al., 2022; McPherson, 2003).

Culturally, as mentioned earlier, the aspect of sharing carries the notion of reciprocation, where people exchange food and goods against other food, goods and services that can be offered (Ferguson et al., 2022). Cultural knowledge and understandings of sharing epitomises cultural empowerment. For instance, Lewa described in our conversations the notion of 'basket-to-basket' exchange (see Chapter 6), as similar to a barter system (Kirch et al., 1991), which is essential in the rural villages. In order for better health and livelihood in rural communities in Central Province, it is important to locate these significant cultural values to enhance the capabilities of women. Women in the villages are self-sufficient, and practice intricate exchange arrangements. Participants in Gavuone and Ginigolo villages describe that the basket-to-basket or reciprocity practice in villages is a customary representation of maintaining relationships accompanied by cultural values. Sharing with relatives is one way of ensuring that resources are efficiently used, and that people look out for each other in times of need. On the other hand, when resources are not distributed evenly, or when women do not share their meals with their neighbours, or even when a basket is not reciprocated, women withdraw from participating or regroup with different members.

This study has therefore added to the understanding that healthier and abundant food can be collectively gathered and produced when resources are adequately distributed among women. Working collectively in the community connects women and people to their land, and through relational ties; *ve tarikaka* and *ve galagala,* and cultural systems. When these relationships are not maintained, resources are unevenly distributed. Referring these results to *doi avatuani*, weaving the basket, when a frond is not woven

together and has missed its connection, a gap is created, and food falls out, or the basket begins to slacken off.

Pigg's (1999) interrelated dimensions of resources and agency approach can be associated with the interconnected relationships within the village communities, neighbouring villages, that is, *ve tarikaka* and *ve galagala*. These relationships are resources from which skills, knowledge and abilities can be drawn from. The networks of relationships, either within the immediate village settings or outside of the villages, are part of the social capital of rural village communities. The interrelated dimensions can be likened to the connections rural people have with their surrounding environment. Therefore, maintaining *ve tarikaka* and *ve galagala* are in this thesis identified as resources from which rural people form multiple social relationships. Drawing on these interconnections, women are able to access resources available for distribution and exchange. From receiving resources, rural people are then able to work towards their goals to live healthy lives in the villages. In saying this, Rowland's (1997) genres of power may open the possibilities of understanding collective action to better healthy wellbeing and living standards in rural villages. This study has contributed to more understanding of community empowerment, as embedded cultural relationships were identified as aspects of community empowerment in rural communities. One of the arguments identified in this study was that for women to augment healthier lives, communities need to work collaboratively towards maintaining relationships and networks that may exist within the communities and informal systems.

9.2.2 Local cultural perceptions of nutrition

Nutrition is interconnected to rural people's food systems (see IFAD, 2022 also in Chapter 3). Good nutrition strongly relies on the women's ability to plant and harvest local food for consumption. Scheyvens et al. (2023) have stated that cultural values and practices are the foundation on which a person is anchored when providing for their wellbeing (see Chapter 6). This is similar to what Durie (1994) has said, that family and community are connected to the land. Pulotu-Endemann (2009) also positied that the foundation of health is grounded in the family that forms the essence of social organisation. The health of women and family members are linked with good nutrition within rural communities. A balance between the different aspects of society, which would include social, economic, political, spiritual, cultural, physical, and environmental dimensions is important when addressing health and wellbeing (Durie, 2004a; Kupa, 2009; Lennie, 2002; Scheyvens et al., 2023) – and nutrition combines all of these aspects, as my study has shown.

This study has identified that women have the ability to produce good food for their families and communities. Findings have shown that eating a variety or a mixture of food is healthy, and when nutritious food is consumed it will work well in people's blood and body and gives them strength. The

women explained about nutritious food that it gives them good health. Nutrition is about eating edible food to nourish the body and to avoid any sicknesses or weaknesses. In addition, women indicated that nourishing the body enables individuals to actively participate in family and community pursuits. Therefore, this study contributes to the implications of eating unhealthy foods in rural villages, especially for young mothers. In the next subsection, the cultural perceptions of food availability will be discussed.

9.2.3 Local cultural perceptions of food availability

Findings have shown that making multiple gardens and maintaining old gardens is an expression of cultural resilience. Old garden sites are referred to as *golou* (see Chapter 6, also Veitayaki, 2002). The old gardens, *golou*, are maintained as they serve as a reserve from which families are able to harvest food. Families can use the seeds from *golou* to make a new garden. The cultural practice of making multiple gardens in various locations depends on land ownership. Using land carefully aligned with knowledge of seasons contributes to improving local food systems (see Chapter 6). These observations can be compared to Kupa's (2009) acclaimed notion of the importance for local communities to connect to their environment, which was represented by a canoe. When families prepare for various cultural festivities, they must also prepare for challenging and changing seasonal patterns, to harvest food in abundance. I have used the basket analogy to explain cultural food practices in rural villages, which captures the environmental challenges that are imposed by extractive industries on rural people's food systems. Local nutrition is impacted by global activities as I observed and explained in Chapter 7. In addition, environmental challenges such as changing weather patterns significantly affect food production and food availability (Schmidt & Fang, 2021). The destruction is caused by global activities impacting on food systems. The declining health of the ecosystem and environment in Central Province are likened to the weakening of the food basket. When the basket is weakened and has created a gap, it will cause food to fall out, and the basket is unable to contain all its valuable contents in the basket. Figure 9.2 shows a food basket woven by women from the village. The whole basket woven together symbolises the aspects of cultural food practices. The aspects of cultural practices are also portrayed in the role of women and their contribution to better nutrition and their ability to provide for and share healthier meals with their children, families and communities.



Figure 9.2: Food basket woven by rural women
Source: Gima Godu (2023)

This image of Figure 9.2, also relates to the framework of this study. As was explained throughout, the four pieces of the coconut fronds were represented as Indigenous knowledge (Chapter 2), community empowerment (Chapter 3), cultural food practices (Chapter 4) and the research methodology (Chapter 5). Each of the leaves of the fronds have represented different aspects of the research. The cohesive elements or glue represent the Indigenous social networks or cultural relationships, *vetarikaka* and *ve galagala* and cultural values: *ve gubakau* (respect), *ve duru* (support) and *ve genilaukula* (reciprocity or basket-to- basket). The cultural values and the relationships or social networks are aspects of community empowerment that strengthens the community by working collaboratively. When all the elements, or leaves of the fronds, are woven or plated together at the base, the base becomes stronger, and it creates a durable food basket, one that represents an Indigenous community empowerment model towards healthy food production, where women are enabled to provide nutritious meals for their children and consequently enhance livelihood in rural villages. When the base of the food basket is strong, food is contained. In the same way, when all the aspects of community empowerment are woven together with good relationships, good access and availability to food, where women are respected and engaged in community activities, where cultural knowledge is wisely applied, and where values and skills are used and appreciated, a sturdy community is enabled.

Cultural knowledge in making food gardens in various locations of land positively influences local food availability and includes decisions on multi cropping. Maintaining cultural systems is a value in both village communities; for a woman in this system to have multiple gardens in the village, displays her strength, her pride and dignity showing her capability of providing for her family (according to Vabu, see Chapters 6 and 7). Women ensure that food is available for consumption throughout the seasons,

when food from *golou* (the old gardens) is depleted, by utilising their knowledge that was passed onto them by their ancestors to access food from nearby environments.

These local practices and the women's strengths in Central Province could be seen in contrast to Chilton and Rose (2009), who have argued that food insecurity as an outcome of social and economic processes that lead to a lack of access to food. Sadly, as this study has shown, a lack of access to food is often faced by rural single mothers, who face barriers and insecurity in accessing or having any control over land needed for gardening, for example for Mune and Veaina (Chapter 6), which is a contributing factor of their disempowerment. This study has observed that external support would be needed to support single mothers to be more involved and integrated in their ability to produce more and healthier food. The changing climate and weather patterns indicate that new knowledge is required by women. Mogogele, a participant in my study, and Iese's (2023a), confirm that even though the cultural knowledge is passed down communities and members of the communities need new and different knowledge to accommodate the challenges of not being able to access food; some of these barriers are related to climate change. Other barriers are related to control over land by external corporations. This study has added to the understanding that cultural perceptions of food, food preservation and the implications of barriers to resource access on women's livelihoods must be understood and adapted.

9.3 Women's direct cultural roles in providing food and nutrition in rural communities

This section addresses Research Question 2 and looks at *what cultural knowledge can be applied to empower communities to address healthy nutrition.* I will also continue to use the analogy of weaving the food basket (*doi a vatuani)* and will explain the results related to the significance of women's role in providing food and nutrition in rural communities. In Chapter 6, Vabu explains that women in villages have a significant role in their communities especially in food production. Supportive village involvement is the determinant to better livelihood and therefore contributes to health and wellbeing of families, as could be seen throughout Chapters 6 to 8 (see also Lemke & Delormier, 2017; Narayanan et al., 2022). Narayanan et al. (2022) had observed that nutrition outcomes are strengthened when women have the knowledge, resources, and social support to make decisions regarding food production, food consumption, and family livelihood. While Narayanan et al (2020 conceptualise nutritional empowerment primarily through women's agency within food, health and institutional domains, this research has shown that empowerment is also relational and culturally grounded. Participants describe how Indigenous knowledge, food sharing, reciprocity, and community cooperations contribute to access and availability of nutritious food. Therefore, nutrition is understoond not only as an outcome of

individual decision-making but as a product of interconnected social and cultural relationships. Furthermore, Lemke and Delormier (2017) conceptualise food security as multidimensional concept shaped by interconnected social, cultural, economic, and environmental factors. The findings of this study align with these perspectives but extend them through the *doi avatuani framework.* This food basket aligned concept demonstrates that access to nutritious food is not only influenced by individual and institutional empowerment but is also woven through Indigenous knowledge, reciprocal relationshoips, collective responsibility, and cultural values. Within this framework, improved nutrition is understood as a relational process that emerges from the interconnectedness of people, families, communities and their environment. *Doi avatuani* weaves these strands together with Indigenous knowledge, reciprocity, cultural values, and community relationships, creating a stronger, and more holistice understanding of nutrition and community livelihood.

Women's role to provide food is also partially contributing towards achieving the UN sustainable development goals (SDGs). As was mentioned in Chapter 3 (see also UNICEF, 2017; United Nations, 2019) several SDGs are addressed when women are empowered. In the context of nutrition, women's empowerment will lead towards improvements in SDG 1, No Poverty; also SDG 2, Zero Hunger, and SDG 3, Good Health and Well-Being (United Nations, 2024). In order to eradicate poverty (SDG 1), women must be empowered to engage in economic exchange, and to access resources and education. Working towards SDG 2, women's engagement in increasing food production, providing nutritious meals, and generating an income must be acknowledged. Healthy nutrition (related to SDG 3) would require strengthening the links between organisations and institutions and rural villages, and to improve provisions of health and education services for women and girls. It would also be important to widely disseminate knowledge about healthy diets and the use of locally sourced vegetables and protein, which is currently not the case in the villages as could be seen in Chapter 6.

The role of women is closely linked with their households and the use of food. Women are positioned in their households where they provide food and prepare meals. Addressing women's role in food production and lack of knowledge in providing better nutrition and livelihood in rural village therefore has the potential to be a catalyst for improving knowledge on healthy nutrition in the rural communities (Damman et al., 2008).

9.3.1 Women's role in food production, distribution and consumption

Findings have shown that people in Central Province like elsewhere in PNG sustain a subsistence life (see Chapter 4). Most of the families rely on food harvested from nearby environmental surroundings. Studies in PNG such as by Harwood and Bourke (2009), Gibson (2001), Gibson and Rozelle (2003)

and Greenhill (2006) state that dietary change is evident in rural villages due to changes in the food systems. Also, Horsey et al. (2019) and Haynes et al. (2020) have found that people have become reliant on introduced food as they are sold in the village stores. This may be true among urban populations as they may be driven by limited land. In contrast, my research has shown that most people in rural villages prefer their local staple over introduced food. Despite the fact that participants were located in two isolated geographical settings, their understanding of good nutrition and better livelihood highlighted the importance of being involved in production of healthy local food and to gain new knowledge about safe food preparation. As mentioned above, participants also highlighted the importance of maintaining good relationships in the community. This study found that people's consumption of food depends on the availability of food crops grown on their land. Even if climate conditions may often destroy food gardens - see Horsey et al. (2019) and Iese et al. (2018) on the effects of weather conditions and climate change on resources - the women can harvest food from previous reserved gardens and may rely upon introduced food when food is scarce as a result of flood or drought (see Chapters 4 and 6). Cultural practices of food production can be enhanced when they are introduced to new crops that can withstand the changing climates while at the same time enhance sustainable ways of living.

Indigenous people's food systems consist of immense knowledge that can be utilised to improve nutrition. Women in rural villages play a major role in food production, distribution and consumption. In harmony with Kuhnlein (2009) and Kuhnlein and Receveur (1996), single mothers as household heads make decisions on how food is accessed and how food is used or prepared. Similarly, the participants' roles in rural villages revolves around food production, such as cultivating food crops and raising animals (as shown in earlier chapters, e.g. Chapter 1). In their involvement in food production, women are able to make decisions about how to prepare meals or whether to use food items to generate an income. However, women in rural villages are also experiencing massive health challenges in tandem with rapid changes in their environment (see Chapter 7). This is also the case in other parts of PNG and globally. Observations and narratives of mothers that I have talked to have shown that harsh climatic conditions have a direct negative influence on traditional food systems, food production, consumption patterns and at the same time experienced exacerbated food shortage. My study found that many families experience seasonal shortages, specifically during seasons of poor harvests, droughts and floods. Similar studies such as Schmidt et al., (2019) have shown that although families may consume staple crops regularly, there is inadequate consumption of nutrient-rich foods such as fruits, vegetables, animal-source foods, and legumes. Their study strongly aligns with the findings in Chapter 7. The participants in my research similarly described seasonal variations in food availability, and the importance of locally grown food.

An aggravation of environmental damage is also caused by logging and other extractive activities nearby villages (Chapter 7). All these disruptive aspects are in line with factors identified by Iese (2023),

who found that disturbances to the food systems and environmental changes have an impact on diets. Other studies (Damman et al., 2013; Lemke & Delormier, 2017) have noted that the women's wellbeing and their communities' livelihoods are sustained by existing food systems. These have a relationship with the natural environment and are interrelated with the land that is used to provide for their livelihood. Depending on the environmental circumstances, food and nutrition security is affected, and with these the villagers' cultural heritage is too (Lemke & Delormier, 2017). In other words, the destruction of food systems exacerbates poor nutrition and food insecurity among women and their children, and their communities. Therefore, when a woman's ability to earn an income from her food products is limited, she is unable to exercise her independence in making decisions, which can also lead to vulnerability. In this sense, women are environmentally, socially and economically disempowered when weather conditions, or the effects of extractive industries, impact crop yields and decrease income generating options. These factors make it important to understand how support from formal structures are needed for women in rural villages.

In Chapter 6, it was shown how food has cultural meaning and plays a strong role in cultural festivities. The surrounding environments within which families and communities exist contribute to these cultural or church festivities and other community activities. Women's informal affiliation in villages can contribute to arranging festivities (see Imai & Eklund, 2008). Their ability to utilise available resources within their environments to draw financial outcomes, including using available labour within the community to initiate and implement agricultural activities on their land, are essential aspects within the community, which was also identified by Gwatirisa et al.,(2017), Pamphilon et al., (2019), and Sen, (1999). Therefore, to eliminate poverty in line with SDG 1, and improve the standards of women living in rural villages, it is important to keep using local resources sustainable and to teach women to engage in economic activities, where they can access resources education. As my findings have shown, these empowering activities may contribute to better nutrition. For example, accessing food from the women's environment relies on their and the communities' ability to purchase sufficient food quantities and quality.

Single young mothers' abilities to access adequate resources enables them to acquire appropriate foods for a nutritious diet. The key to this is the purchasing power of women and their own labour. Unfortunately, this is not always possible for all single mothers, as my study has shown. The women's and the communities' food production is pertinent to how much women can produce from their vegetable gardens (Gwatirisa et al., 2017). Most of the women participants have utilised their available resources in terms of labour, from within the community and the basket-to-basket practice. The ability to utilise labour within the community was dependent on the women's relational ties, and by maintaining *ve tarikaka* and *ve galagala,* having a cultural awareness of those relationship and cultural values (See Chapters 7 and 8). These cultural values are significant and practiced consistently within

the socio-cultural environment. When these ties are weak, as was in Mune's and Ianama's case, women experience significant problems. Similar models to my observations were represented such as, when there is no family support or when the family foundation is weak, there is reduced social support (Pulotu-Endermann, 2009), and in Durie's observation that when all aspects are in equilibrium the people flourish (Durie, 1994).

Studies in PNG related to addressing malnutrition have highlighted that nutrition must be improved holistically, starting with agricultural interventions. Young rural women may learn farming skills effectively through family members, clan, and community relationships (Hill & Pamphilon, 2024), empower young rural women with placed based and culturally appropriate learning, thereby ensuring that local knowledge is emphasised with external agricultural knowledge (Pamphilon & Mikhailovich, 2019). In gaining these experiences women's economic opportunities would be strengthened (Mikhailovich et al., 2016). Other authors have hinted on some successful aspects that can reverse malnutrition and I agree with Kent (2002) and Raza, et al. (2020), that enhancing women's resources and knowledge in the community is necessary. The findings in my study indicate that issues with malnutrition stem not just from a lack of education or awareness on the part of young single mothers. Food shortages are also related to climate change caused by people as well as by the extractive industry in Central Province.

9.3.2 Local Indigenous understandings of food and connections to cultural values and food systems

The findings show that there are existing culturally embedded understandings within the village communities that influence the actions and behaviours of single mothers and how they engage in the food systems and participate in cultural activities of the communities. The cultural engagements and activities are comprised of socio-cultural, economic and spiritual structures from which single mothers benefit. These women also contribute to and participate in working towards healthier nutrition within their household and communities. Working collaboratively (*vanua vekokolena*) applying *ve duru* (support) for a purpose, with *ve gubakau* (respect) and *ve gulageni* (love), and maintaining relationships (*ve tarikaka* and *ve galagala*) are aspects of cultural community empowerment. For example, clearing and weeding the gardens, planting vegetables, preparing cultural feasts and organising thanksgiving, as described in Chapter 7, are prominent examples of existing cultural values that directly support women to improve nutrition. These structures share parallel notions to the *Te Atafaga* (Kupa, 2009) and *Fonofale* models (Pulotu-Enderman, 2009),the *Te Whare Tapa Whā* model (Durie, 1994). Each of these emphasise collaboration, and for family members and kin working together to improve everyone's wellbeing. Similarly, these structures locate *ve tarikaka* and *ve galagala*, *ve gubakau* to be culturally embedded within efforts towards healthy nutrition in rural communities.

Findings have also shown that women in rural villages still prefer their staple food over introduced foods. These introduced foods, such as tinned meat, tinned fish, packed chicken and lamb flaps are referred to as *bagoga* (leftovers or preserved food) (as explained by Eve, in Chapter 6). However, it is inevitable for people in the rural villages, especially when weather conditions destroy their food gardens to use *bagoga*. Climate conditions can contribute to a low nutrition status, and in turn this then contributes to malnutrition. Given these circumstances, it is highly likely that people living in rural villages rely on *bagoga*, processed and imported foodstuffs. Leftovers are used when store-bought food becomes *vito bilina* (closing the hunger gap), and food is not accessible, or vegetables are still underground, or when destroyed by weather conditions (Vabu in Chapter 7).

As this thesis has emphasised throughout, women influence the nourishment of children and family members. Holland and Rammohan (2019) explained that women can improve and influence the nutrition and health status within their communities. The Central Province rural women's roles in food production are similar to those in Pakistan (Ishfaq et al., 2022), where the engagement of women in gardening may influence control over decision-making with regard to food and nutrition and preparations of meals and contribution towards community activities and the household level use of food. As such, Rezaei (2010), and others (Heckert et al., 2019; Lemke & Delormier, 2017; Sinclair et al., 2022), also state that women have the ability to take on multiple roles in rural communities either individually or collectively, which enables them to access and control resources to influence food security and improve nutrition. At the same time, introduced food and imported food is perceived to be the major contributing factors to declining health trends (see Chapter 2). Therefore, disruptions in food supply distort provisions of nutritious meals that impacts the nutritional status of people, and the livelihoods of mothers and village communities. In fact, women are able to sustain themselves despite hostile weather conditions that destroy their food systems. They can maintain positive relationships to make new gardens, and are contributing to cultural festivities. These attributes and contributions epitomise that women have a significant role in providing for the family through *ve vagakava* (support) and *vanua vekokolena* (community empowerment). Women are therefore considered as important contributors to strengthen their communities, while providing meals for their families. This acknowledgement of women's roles points to the need for a wider recognition of women's endurance and resilience, and that support is due for these incredibly strong rural women. This argument encapsulates the essence of this study: the embedded cultural knowledge in food production and relationships are assets that contribute to Indigenous knowledge to gain better nutrition; and therefore, these values and knowledge can be incorporated into services and programs in Papua New Guinea to allow for meaningful engagement with formal sectors.

9.4 Cultural understandings to strengthen women's efforts as nutrition providers

This section relates to Research Question 3 that asks: *How can women be empowered to improve nutrition in their communities?* This section discusses some of the structural issues that must be addressed to facilitate real *vanua vekokolena* (community empowerment) to strengthen communities. To improve women's health and wellbeing it is important to be surrounded by healthy communities. Such an environment is needed to reduce malnutrition, which must be realised in Central Province by equipping young single mothers with new skills and knowledge. This thesis argues that it is not enough to draw on local knowledge and acknowledge how skillfully women use their cultural understandings when dealing with food. There also must be more balance when it comes to accessing and distributing resources in communities, and it is important that communities make sure that single mothers are included in these efforts. Only when this balance is achieved can communities be truly empowered and *vanua vekokolena* be achieved.

Rural communities have culturally embedded support systems and understandings of food and nutrition. These are comprised of socio-cultural, economic and spiritual structures that influence how people behave in their community, how villages (*vanua vekokolena*) can be strengthened. In line with the need to enhance nutrition in rural communities, the participants have argued that working with organisations and institutions at rural villages level was not sufficient at this time. It would be important to strengthen this link to improve provisions of health services and education services for women and girls and have more dissemination of knowledge about good cultural healthy diets provided in the villages (such efforts would address SDG 3). Despite the fact that women contribute to subtle roles and activities, and have prominent needs and priorities, many of them feel disempowered. This shows that the foundations to empower women, and strengthen communities, is with collaborative actions, and with initiatives that lead to power redistribution (Cookson et al., 2025) and strategic ways that could enhance women's equal participation in the villages (Wilton, 2024; Nash et al., 2025) and it is most effective when grounded in local cultural contexts (Lopez et al., 2023). Such efforts are at the core of what this thesis aims to highlight.

The young single mothers have shown that they need support in knowledge and skills, and equipment to improve nutrition. For example, Mune lamented that she lacked the finances to provide for her children or purchase food to supplement their diet. Similarly, women that participated in this study hinted that if they would gain knowledge and resources, and would have access to agricultural tools, which would facilitate them to generate an income, then women's economic situation would significantly improve and they would be more able to contribute to church and cultural activities (see

Chapters 6 and 7). Meulen and Kassens (2018) support the findings by signifying that women can be empowered through asset ownership which enhances their decision-making power, improve family nutrition and contribute to stronger and resilient communities. Similarly, Gupta et al. (2019) contend that women's empowerment impacts child and family livelihood by enhancing women's ability to make decisions in relation to household resources, nutrition and health. The results from my study have pointed out the importance of selling food products as inducing an economic aspect towards the possibility to be able to buy nutritious food, and to purchase equipment that could lead to planting a variety of food products, which would then lead to healthier nutrition in the rural villages. In enhancing women's pathways in gardening and agriculture as both producers and consumers could influence food consumption (Gupta et al. 2019). Together, my findings suggest that when young rural women gain access to available resources and decision-making authority, their families experience improved nutrition and livelihood. In addition, these studies also reinforce the arguments presented in Chapters 6 and 7 that empowerment is multidimensional and includes, social, economic, decision-making aspects that can influence improved nutrition, and women's empowerment is fundamental to community development.

The findings of my research show that economic-driven actitivities of globalisation are trickling into the local villages and are creating both opportunities and new patterns of inequality. One example is the influence of a logging corporation in the direct neighbourhood of the villages and the negative impacts on food production, all of which is unlikely to improve nutrition in the rural villages. This finding is consistent with Ife's (2016) argument that community development can strengthen local capabilities, improve nutrition and livelihoods; although, the unequal distribution of economic opportunities proposes, that development benefits are not always shared equitably across communities. Ife (2001) explained that the negative characterisation of globalisation and introduction of market systems in villages mostly served the interest of the rich and powerful. Similarly, Banks (2014) highlights that empowerment efforts must address issues of structural inequality and social justice. My findings show that while some individuals gained more access to resources and income, others continue to remain marginalised, consolidating existing disparities. decision-making power, and participation in social and economic life. Furthermore, Farrell et al. (2021) demonstrates the relationship between economic systems, food environment, and well-being, that economic empowerment includes access to resources, decision-making power, and participation in social and economic life. While my study supports these outcomes, it also shows that uneven access to economic activities can establish dvisions between those who benefit from development initives and thos who do not. Therefore, economic driven activities may simutaeneously promote empowerment and contribute to new forms of inequality within rural villages.

The young single mothers' situation is intensified because of their social, spiritual, cultural, political, psychological, and economic vulnerability as these aspects have a bearing on providing for their

children. Participants felt that constraints and a myriad of complications were inhibiting them from fully contributing to providing for their children as they were confined by the social systems and structures. In this context, Ife (2010) explained that there was a need to engage with structures and processes of social, psychological, political and economic power, and only by addressing these could communities address issues young single mothers are facing. My research findings acknowledge that young single mothers are enabled in their communities when they experience aspects of 'power to' and 'power within' (Chapter 3). Empowerment occurs, as this study has identified, when resources are acquired through *ve galagala*, multiple social relationships, and through which power relationships have potential to shift (see also Laverack & Labonte, 2000), and when access to resources are enhancing young single mothers' knowledge and skills. Laverack and Labonte (2000) explained that these shifts and political and social change can be a catalyst to bring more equity to rural villages. Studies in PNG have argued that nutrition education and awareness in rural communities are important strategies to alleviate malnutrition (Goris et al., 2017; Waken & Paul, 2018). However, my findings have shown throughout how women contribute to the nutrition of their families and villages, by working collaboratively within their communities.

The Government of Papua New Guinea has allocated funding to address malnutrition through national nutrition policies, and strategic action plans, and development partners such as World Vision who have implemented integrated nutrition programs. As was mentioned in Chapter 1, authors have recorded a high rate of malnutrition among children in PNG (Chen et al., 2024; Goris et al., 2018; Health, n.d; Pamphilon & Nema, 2021; Schmidt & Fang, 2020; Schmidt & Fang, 2021; Schmidt et al., 2022; Siamiak & Emeto, 2017). When looking closer into this issue, the document analysis, presented in Chapter 8, showed that the Government of PNG shares finances in their budget every year for the treatment of malnutrition and for the delivery of nutrition knowledge in education institutions, health and agriculture. Education institutions and NGOs have strategic plans and approaches to eliminate malnutrition. For instance, World Vision (2021) has implemented, in parts of PNG (in Port Moresby and in urban areas of Bougainville), an integrated approach to focus on combating malnutrition among pregnant and lactating mothers, and children below two years old. The evidence of this study suggests that the benefits of these initiatives are not consistently reaching all communities. Geographic remoteness, poor infrastructure, limited health service coverage, and resources constraints continue to hinder the delivery of nutrition interventionsl to most rural populations. Thus, high rates of malnutrition continue despite fundings in nutrition education, helath promotion, treatment programs.

Correspondingly, NGOs such as *World Visions Caring for Nutrition* project sought to reduce malnutrition using the integrated approach which put together nutrition education, agriculture, economic inclusion, and community–based health initiatives. Yet, consistent prevalence of malnutrition highlighted in community narratives proposes that gaps remain between policy intensions and local

implementation. Despite the fact that, these interventions contribute to improve nutrition knowledge and health seeking behaviours in some areas, their reach may be deterred by logistical challenges, funding limitations, and broader socio-economic inequalities affecting vulnerable families (see also chapter 8).

Participants, as shown in Chapter 8, have some knowledge of how to prepare simple nutritious meals, but there is still some lack in this regard in rural villages. Within the education institutions, the Home Economics subject is taught in schools widely with a comprehensive curriculum. However, there are complexities of delivering Home Economics lessons that are compounded by a lack of trained Home Economics teachers, appropriate facilities to teach and a lack of funding (Vagi & Salley, 2017). Funds are unequally distributed for Home Economics classes, forcing teachers to teach theory classes rather than incorporating practical lessons (as Vinakau had explained, in Chapter 8). My research findings show that the children attending rural schools miss out on attaining the appropriate and relevant nutrition knowledge that could equip them for the future. These findings suggest a variety of potential factors that can be utilised to enhance the food and nutrition curriculums in schools. However, Home Economics training can also be utilised in Women's Fellowship groups in the rural villages. Women's Fellowship groups are one link that a majority of the women living in the villages can access. Results in Chapter 8 have shown that joining one of the Women's Fellowship groups could be an avenue that can incorporate nutrition knowledge together with spiritual growth. This is unfortunately not possible for all women, as was explained.

This leads me to the observation that women in rural villages play a key role at the household and community levels, by equipping other women with knowledge and skills. When women teach and support each other, they are passing on resources, such as knowledge and seeds. By learning about Indigenous practices, women's lives and their understanding about what healthy nutrition is, and what food combinations would lead to healthy meals, would significantly improve in the community. The downside at this time is that single mothers have felt that they do not have sufficient access to knowledgeable older women, nor to nutrition classes taught be Home Economics. If communities would facilitate, and discuss, how knowledge could be passed on to the younger generations, and if older women would be more available for younger ones, then this issue could be addressed.

These results strongly suggest that rural young mothers are resilient and equipped with cultural knowledge but would need more adequate resources and technology and want to acquire skills and knowledge to improve nutrition and their livelihoods. Yet, women lack relevant avenues to seek financial support, for example, to initiate small income earning projects. Women want to be financially able to explore and improve ways to cultivate mixed agricultural crops other than their staple food. These dynamics contribute to enhancing and supporting young mothers in rural villages to improve

nutrition. The women's role in rural communities can influence and improve nutrition, but their access to resources limits their capabilities from improving their livelihood and health.

In Chapter 7 it was shown that the PNG Government (2016, p. 11) acknowledged its struggles with their attempts to reduce malnutrition. Government at this point does not have a comprehensive nutrition administration nor data on implementation nor any strategic program towards nutrition improvement. Drawing on the fact that the Government of Papua New Guinea lacks implementation and monitoring of multisectoral nutrition response to nutrition problems in the communities, it is noteworthy to empower rural women as they are the guardians of Indigenous knowledge and contribute significantly to nutrition in rural communities, health and wellbeing, and welfare of the family. Therefore, this study contributes the knowledge of the importance of *vanua vekokolena* (community empowerment) in rural communities to ascertain better health and wellbeing in Central Province, Papua New Guinea. *Vanua vekokolena* captures local community empowerment, where the cohesive elements, *ve tarikaka* and *ve galagala* are included to tie the community. When rural communities maintain their relationships, the resources and agency are gathered and plaited to enhance the community.

These findings indicate that addressing malnutrition requires not only increased investment but reliable systems to guarantee that nutrition services, information and support, reach rural villages. Systems that work would parallel community development perspectives which underpins equal acces, local participation, and community ownership as essential for improved nutrition in rural communities. The findings also show that, despite the presence of national nutrition initiatives and external support, women continue to experience food insecurity and malnutrition because development interventions are not adequately addressing local realities, power realtions, and challenges to accessing nutrition services. Therefore, community empowerment and context-specific approaches are essential for achieving improved nutrition.

The tool that emerged from this research is the *doi avatuani framework* (weaving the food basket) as an analogy to explain the weaving of the chapters in this thesis and the process of gauging the views of the participants as seen in Figure 9.1. The provision of good nutrition in the community with the aim to reduce malnutrition is a holistic approach that requires interconnected relationships, and is linked with a bottom up approach. In this way the *doi avatuani* framework has created a platform that weaves together the aspects of community empowerment and Indigenous knowledge, the inclusion of local voices, and the processes of this thesis. The cultural understandings of nutrition and cultural values are aspects of community empowerment that has shown that the women's task to grow and provide nutritious meals can be enhanced when community members maintain their relations.

9.4.1 *Doi Avatuani* – Food Basket – A model for improved nutrition

The findings from the study and the incorporation of the framework developed in this thesis leads to the construction of an Indigenous model for improved nutrition which is unique to the Pacific. The model acknowledges the role of young single mothers in rural villages, the Indigenous knowledge and community empowerment conceptual framing, the cultural relationships in empowering young single mothers and cultural food practices. The application of the *doi avatuani* model therefore links between the conceptual frameworks, the context in Central Province, the Indigenous informed methodology, and the findings of this research. In this way the *doi avatuani* framework was used throughout the thesis. Weaving a food basket is a functional tool particularly woven by women as part of their role and used by women to carry their tools and food. The following diagram illustrates how this framework has operated in this thesis.

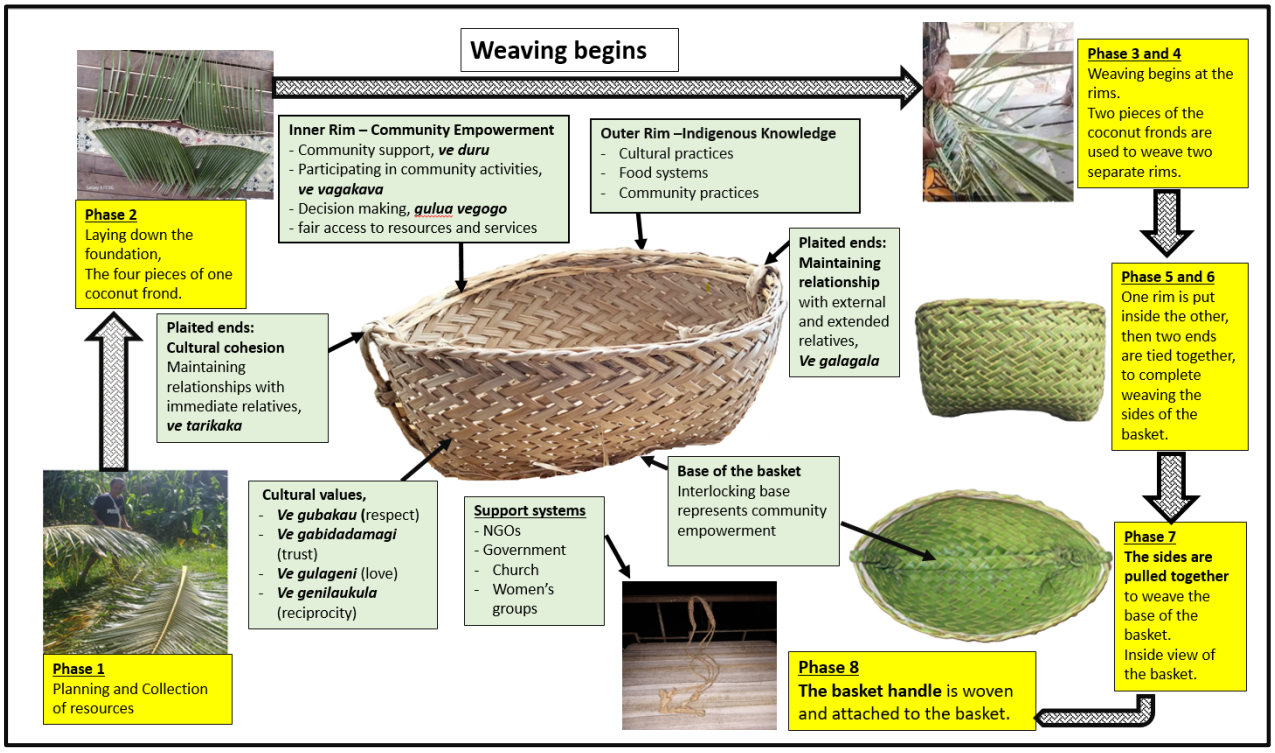


Figure 9.3. The *doi avatuani* framework and model for improved nutrition and livelihood in rural communities.
Source: Limu Mou-Vagi (2025 - 2026)

The above diagram in Figure 9.3 demonstrates the process of weaving the food basket and how it was integrated in the different Chapters of the thesis (also see Chapter 1, Table 1.1, where the framework was first introduced). The inner part of the process is the completed food basket as illustrated in the diagram, and in Figure 9.4 the completed basket is shown.



Figure 9.4 Completed doi, food basket
Source: Limu Mou-Vagi (2026)

The food basket is called the *doi* (in Ikolu language), and *a vatuani* (also in Ikolu language) is an action verb - *I am weaving.* So, when the two terms are put together, *doi avatuani,* it means I am weaving the food basket, which has been the title of Chapter 5, the research methodology. The *doi avatuani* analogy signifies the process of the entire research from the beginning to the end. As was outlined in Chapter 1, each phase of weaving the basket was highlighted and related to each chapter of the thesis. Figure 9.4 shows the completed version of the *doi,* the food basket. The *doi avatuani* represents the entire journey of the thesis as well as the aim of the research, and each part of the *doi* is an enabler to empower women to improve nutrition and wellbeing in rural villages as well as the overall goal of improved nutrition. The *doi* also symbolises a healthy, diverse, and resilient diet for families in rural communities. A strong basket can hold layers of food, which can be carried on the head to many and destinations. The *doi* can carry staples, protein sources, fruits and vegetables. A well woven basket displays, diet diversity, seasonal resilience, and cultural continuity. It is also important to note that in Central Province, food baskets are shaped by the ecosystems, that create unique dietary patterns.

The *doi* holds two conceptual frameworks: Indigenous knowledge and community empowerment. The doi symbolises how Indigenous knowledge, community empowerment, and women's roles interact dynamically to shape their food baskets, which ultimately influences, food security, nutrition and livelihood. According to Gegeo (1998), Indigenous knowledge and community empowerment contribute to rural development, and are interrelated. They each play a substantial part in improving community resilience and sustainable development, as in the case with improved nutrition. Therefore, improved nutrition, a rural development initiative, is effective when grounded in Indigenous epistemologies rather than adopting an external Western model (Gegeo, 1998 and Hart, 2010; Day et al, 2026). As my study demonstrates community empowerment serves as an important path for improving nutrition by boosting local capacity, strengthening social and relational support networks,

and enabling individuals to make informed decisions about food production, preparation, and consumption. These results have confirmed that Indigenous rural people possess a strong understanding of their social, cultural, and environmental realities (Gego, 1998, see also Chapters 2 and 6).

The rim of the *doi* symbolises the community as the incorporating structure that provides coherence, stability, and collective support. However, the strength and integrity of the rim are not derived from the outer boundary alone but from the interconnected, and the interwoven relationships that sustain it. Within the rural Indigneous villages context, Papua New Guinea, communities are constituted through complex networks of kinship, reciprocity, and collective responsibility that shape social organisation and wellbeing (Veukiso-Ulugia et, al., 2025). As a result, a discussion of the community rim necessitates a deeper exploration of the relational ties embedded within it. The following section therefore examines kinship as a fundamental organising principle within the doi avatuani framework, which demonstrates its role in strengthening social connectedness, facilitating the exhchnge of resources and knowledge, and sustaining collective wellbeing, livelihood, and improved nutrition across generations.

1. The Rim of the basket represents community

Weaving the food basket is an integration of and an interconnection of the two rims that make up an enhanced single rim. The basket rim denotes the community. A community is built on their cultural practices, knowledge of their environment and food systems, as well as their community practices. For people to work in their communities effectively, they seek the support of other members of the community, they participate in community activities and make decisions based on their cultural knowledge. Similarly, the South Pacific Community (SPC, 2021) states that the Pacific food systems are constructed on community cooperation and collective management of resources, contributing to resilience and food security. My research has also shown that a rural Indigenous community, as identified in the research field sites, are held by their local knowledge, which is utilised and drawn on to achieve the villagers' daily cultural activities.

When Indigenous knowledge and community empowerment are mutually reinforced then, symbolically speaking, 'the rim of the food basket' is strong. Strengthening factors are when Indigenous knowledge systems are identified and appreciated, communities work together and gain control over the development processes and women can strengthen their capacity for self-reliance or empowerment to improve their wellbeing. Hence, the basket rim is enhanced by weaving the two rims (Indigenous knowledge and community empowerment) together.

i) The inner rim of the basket represents community empowerment

The inner rim of the basket represents the aspects of community empowerment including, community support, participating, decision making and fair access to resources and services. In many Indigenous rural communities, young rural women seek the support from their family networks to provide guidance, childcare assistance and food security (See also Chapter 7). Findings show that Indigenous communities exercise collective support systems where people, usually relatives, support each other for most activities such as planting, harvesting, and community and cultural activities (see Chapter 6). Therefore, in order for the food baskets to be filled with food and for the harvests to be in abundance, an individual does not have to work alone – it is a community effort to fill a basket together. This is in contrast to Western practices, where knowledge is accessed through formal education, training, and workshops, formal education for young women, professional services, and individual empowerment.

ii) The outer rim of the basket represents Indigenous Knowledge

The outer rim of the basket represents the Indigenous knowledge that includes cultural practices, food systems, and community practice. Furthermore, each strand in the frond represents knowledge that has been passed through generations. These elements include seasonal knowledge, farming systems, food preservation techniques, and use of cultural systems. Indigenous knowledge ensures that women understand nutritional diversity, cultural understanding of land use, and adapting to climate variability (see Chapter 6).

Within a local community, knowledge is passed down through the elders (see also Chapter 4). In this study, it was the older women in the villages, usually the immediate women teach the young women skills and cultural practices. These knowledge and skills equip young women to be economically, socially, emotionally, and spiritually independent while at the same time preserving culture. Resources women access will usually be shared communally. This differs from Western Practices, where resources that may be required by women will be accessed through grants or programs organised by NGOs, or Government organisations.

2. The plaited and tied ends of the basket represent ve tarikaka *and* ve galagala

The basket ends are plaited together, tied and woven to hold the rims together. The plaited ends denote social cohesion, maintaining relationships with immediate relatives (*ve tarikaka*) and, the other end represents maintaining relationships with extended family (*ve galagala*). Similarly, Laverack and Laverack (2001) state that the social cohesion as an aspect of the process of community empowerment engages individuals and groups towards social and political change. Maintaining relationships and social cohesion within a rural community (as described in Chapter 6) can be compared to the plaits that

run either horizontal or vertical, or overlap each other, and represent a multidimensional form of social cohesion that connects young single mothers with individuals, close relatives (*ve tarikaka*), distant relatives (*ve galagala*), government services and NGOs (see also Chapter 6). Australian Institute of Health and Welfare (2025, p.1) emphasises that:

> Cohesiveness is created from connections based on a shared sense of belonging and attachment, similar values, trust and a sense of social solidarity. It encompasses the connections and relationships between individuals, groups and associations.

The findings suggest that the cultural relationships (*ve tarikaka* and *ve galagala*) identified in this study are integral components and represent multidimensional social and cultural interactions that contribute to rural community empowerment, which can support enhanced nutrition and wellbeing results.

3. The sides of the basket represent cultural values and cultural food practices

The sides of the basket are built using a tight, interlocking weave pattern. The pattern forms a diagonal crisscross (herringbone like) design, where strips overlap in alternating directions. These are used to symbolise the cultural values including ***ve gubakau*** (respect)**,** ***ve gabidadamagi*** (trust), ***ve gulamagi*** (love), and ***ve genilaukula*** (reciprocity). These values run through the community. In addition, the patterns on the sides of the food basket also represent cultural food practices. There are unique patterns that reflect cultural identity and food traditions. As described in Chapter 6, rural communities have various local traditions that drive women to engage in cultural activities. Some of these include, communal feasting and food sharing (social cohesion), taboo systems (who eats and when), cooking methods, rituals and ceremonial foods. Furthermore, sharing food is a key cultural practice across Pacific societies and strengthens social cohesion (SPC, 2021). The local sharing networks deliver significant social protection mechanisms during economic and environmental stress (see Chapter 6). These networks influence the diets consumed in every family; and sharing practices reinforce social bonds. Community practices can both support or limit nutrition among families, young mothers and children. When any of the cultural values are violated in the community, a gap is created in the cohesion of the community, creating 'a hole in the basket'. Therefore, a basket that contains a hole will not be able to hold food securely, neither will a community that is not well woven together receive wholesome nutrition.

The *doi avatuani* conceptual framework, which has been created in the process of this thesis, is a Pacific-centered model depicting cultural meaning that demonstrate sustenance, sharing, reciprocity, basket-to-basket exchange, protection, identity and collective wellbeing. Rather than viewing nutrition as an individual behaviour, the *doi* conceptualises nutrition as being support by interconnected cultural

values that collectively determine food sharing, food production, and gaining improved nutrition outcomes.

4. The base of the basket represents Indigenous peoples' nutrition and food systems

Improved nutrition or improved livelihood for the women and their families is symbolised by the base of the basket. When a basket is encased completely, it is strong and can contain many resources. The outcome for a woman to provide for her family is achieved when her livelihood is secured by family bonds. The knowledge of the Indigenous food systems is the basis for improved nutrition, because the young rural mothers have the capacities to access, produce, and prepare culturally appropriate foods for their families. Rural people's diets rely on natural resources of the food systems (FAO, 2021). These include access to land, sea, and the surrounding environment from which food is produced and accessed, cultural practices, sustainable livelihoods and improved nutrition. The base of the basket can also be viewed as the resource systems that support food security, and cultural stability. However, when there is an impact caused by climate change, environmental decline, or loss of access to traditional food sources access to resources is destabilised, and similarly, the structural strength of the food basket and its ability to support healthy meals and improved nutrition is weakened (as Chapter 6 has shown; see also O'Meara et al., 2023; and Thow et al., 2025).

5. The basket handle represents leadership

The basket handle represents leadership and multisectoral Governance support systems from which women and communities gain assistance or can access additional resources (Kuhnlein et al., 2013). These leadership support systems are symbolised by the basket handle, without which a basket is not functional. Without a handle a basket is unable to move or be carried to a desired destination. Within the conceptual framing, the handle signifies the capacity to move 'the basket' (community) from knowledge (concepts) to practice. Within cultural practice, the handle enables the movement and action of the basket being carried. Improved nutrition can be gained when there is a coordinated leadership within and across communities, such as with Church leaders, women leaders, Women's Fellowship leaders, government agencies, and development partners. Leadership implements the knowledge and empowerment combined in the rim of the basket, when it mobilises a collective action across different sectors to improve nutrition and sustain wellbeing. This concept demonstrates a contemporary Pacific food system, which identifies governance and coordinated action as significant to achieve empowerment and food systems grounded in Indigenous knowledge.

Indigenous knowledge, community empowerment, and women's roles interact dynamically to shape rural food systems, which influences improved nutrition, food security and sustainable living. Improved nutrition in Central Province, is about *avatuani,* the "weave", that already exists, making sure that traditional knowledge, women's role and cultural practices and values are held tightly, supported and adapted to the challenges faced by women in rural villages. In this context, the *doi* is a culturally meaningful figure and symbol that signifies identity, basket-to-basket, reciprocity, sharing and collective wellbeing. Rather than improving nutrition by young single rural mothers on their own, the basket conceptualises nutrition as one that can be supported by interconnected cultural values that collectively determine food production, food sharing and improved wellbeing. The *doi* suggests that effective nutrition should move beyond individual behaviour and consider addressing the cultural, social, environmental and spiritual determinants of food choice. By enhancing the cultural foundations – traditional knowledge, community, and family – policies could construct and develop enabling environments that improve nutrition for Central Province, Papua New Guinea and broader Pacific Islands.

The *doi avatuani* framework provides a culturally grounded approach to improving nutrition as an outcome of interconnected relationships in the community, knowledge, culture, surrounding environment and governance. By positioning Indigenous knowledge at the centre, this new framework extends current nutrition literature and provides a basis for PNG and Pacific-led policy, practice, and research.

9. 5 Conclusion and Outlook

This section summarises the concepts gathered from the overarching aim of the research to explore how community empowerment can improve nutrition in Central Province, Papua New Guinea. This section will also highlight the strengths and barriers of the research. This study was limited to a relatively small scale study on young single mothers in two villages in Central Province, PNG. Therefore, in the future it would be essential to extend more research to include other villages and districts in Central Province and compare my findings with other parts in PNG. A number of studies would be needed to gauge perceptions of how Indigenous knowledge on good nutrition could be used to support communities, and how especially the younger women could be included in decision making on training and facilitation of healthy cooking. Indigenous knowledge is a resource that can be used to enhance already existing skills and to help grow more and healthier varieties of food. Improved nutrition leads to more strength among villagers. Working collaboratively in rural villages can immensely aid women and reduce their malnutrition.

This thesis has illuminated the significance of utilising Indigenous knowledge in all aspects of nutrition: food production, consumption and distribution. Better health by addressing women as significant contributors to these foods related activities must be addressed through community empowerment. Even though the women can gain *ve duru* (support) by maintaining relationships with immediate (*ve tarikaka)* and extended (*ve galagala)* family members, these relationships can also cause disharmony. For women to access *ve duru* from their community members and the ability to have an abundant food production, there must be a continuous reciprocation of support or an exchange of basket-to-basket in resources within the community. These cultural concepts can be utilised, and this study has shown how healthy nutrition starts at the community level, when resources are made available to all, and when the needs of rural young single mothers can be addressed, and their voices be heard, on all levels in the community.

Women are the gatekeepers to taking care of their family members and providing nutritious meals. One aspect among rural single mothers, as was identified in this research, is to look at community empowerment holistically. All aspects, such as social, political, psychological, spiritual, cultural and economic systems, must be addressed to achieve change. Structural issues must be addressed. For example, the rising cost of food is a major economic barrier that hinders single mothers from contributing to some community activities or activities that could empower them. Another structural issue that could be addressed is the absence of sufficient government support in the villages. More support would lead to more knowledge among villagers, including young mothers. Globalisation and the import of store-based food has also impacted on healthy food production. This thesis outlined the difficulties related to changing weather patterns, which could be a result of climate changes, and that logging activities undertaken by international companies are impacting negatively on food availability.

The distribution of funds for women's programs in rural villages often does not exist, which means that women are not receiving the support they need. Women's Fellowships are usually attached to the churches and not all women have access to these fellowships. In most cases, women's group programs are aiming at spiritual growth more so than for skills to improve livelihoods. If rural women were key agents in achieving transformational social change, strategic plans and policies would be needed to accelerate the aim to equip all rural women with secure livelihoods. Nutrition related policies should be activated in the local communities, and on district, provincial and national levels to be able to reach out to everyone, including single mothers. These policies should also be incorporated in the Women's Fellowship programs to improve local food use and health in the villages. My study in Central Province has identified that there is an absence of a nutrition governing agency. To address the issues of nutrition in PNG, government must be made accountable for their responsibility of establishing a central nutrition office that could serve communities.

The research findings also suggest several policy implications towards enhancing community empowerment initiatives: through collaboration with village churches, Local Women's fellowship groups, NGOs, government agencies, and other stakeholders. These recommendations emphasise coordinated planning and resource sharing. Facilitating resource mobilisation through financial incentives and networking opportunities can enhance food sustainability. Sound nutritional programs and awareness need to be spread around the country and reach rural women directly, rather than focusing on small community units in rural villages. In addition, nutritional programs should include support activities in the areas of promoting cultural food practices; and they best would introduce annual yielding crops, and promote ways for women to be independent income earners. Creating awareness for women to be independent income earners will enhance women's roles as economic providers. The provision of support structures in rural villages to facilitate women's active economic involvement should also be incorporated at the district and provincial levels.

In conclusion, I draw on the opening quote in Chapter 1, by Eve:

> Vanua vekokolena kavanai be vanua tauia ge gaukala vegogoni geve duruni.
>
> The village people must work together and support one another to strengthen the community.

This quote has guided me in applying the aspects of community empowerment by weaving together the features of each chapter to create the *doi* of this thesis. When people work together and share resources within their communities, the members of the communities can provide good nutrition and have better livelihood. A classic community activity, where members of the community work together towards local cultural events s shown below. This image links with earlier illustrated baskets or *bilums* of yams (see Figure 6.8) brought together to fill the *digu,* the main yam basket (as below, Figure 9.5). Basket-to-basket actions, or reciprocation in the form of food, or in the form of social support, enables members of the community to work together for activities in the village to come to fruition. This shows that *vanua vekokolena* is realised when all the members of the community work together and share resources for the better livelihood and harmony.



Figure 9.5: Vanua vekokolena, working together in the community
Source: Limu Mou-Vagi (2023)

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Appendices

Appendix 1: Ethics Approval (MUHEC)

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

8/07/2022

Dear: Limu Mou-Vagi

Re: Low Risk Notification - 4000025928 - Improved nutrition through community empowerment in rural villages in Central Province, Papua New Guinea.

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our database for inclusion in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

If situations subsequently occur which cause you to reconsider your ethical analysis, please contact a Research Ethics Administrator.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:

"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director - Ethics, telephone 06 3569099 ext 85271, email humanethics@massey.ac.nz."

Please note, if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to complete the application form again, answering "yes" to the publication question to provide more information for one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely



Professor Craig Johnson
Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand T 06 951 6841; 06 95106840
E humanethics@massey.ac.nz; animalethics@massey.ac.nz; gtc@massey.ac.nz

Appendix 2: Information sheet – Young Single Mothers

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

INFORMATION SHEET (Young Mothers)

Hello, my name is Limu Mou Vagi. I am a PhD student in Development Studies at Massey University, New Zealand. My research is titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea", and I am particularly interested in how nutrition could be improved for young women in rural communities.

Nutrition deficiency is common in rural villages in PNG. My research explores indigenous nutrition knowledge and cultural food practices in rural villages that could help alleviate nutrition for community members, especially young women. This study aims at exploring the cultural understanding of nutrition and community empowerment. This local knowledge may be drawn toward improving women's lives and 'families' nutrition in rural communities. It might also be used to implement and deliver the Papua New Guinean nutrition curriculum and nutrition policy. This research will utilize qualitative research methods, including interviews, observation and tok stori sessions, to allow insights into improving nutrition by engaging women through community empowerment.

I invite you to participate in this study as I would like to draw on your experience and insight to help build my understanding of local nutrition knowledge. If you agree to participate, I would like to meet for an interview for approximately one hour.

The information you provide will be kept confidential and stored safely. I will use pseudonyms instead of names, and all physical data, including interview transcripts and notes, will be stored in a lockable container or filing cabinet, and electronic copies of this data will be saved on the research project's password-protected computer and external hard drive.

I would be delighted if you would agree to participate, and please be assured that you are under no obligation to do so. If you decide to participate, you have the right to:

- decline to answer any particular question.
- withdraw from the study.
- ask any questions about the study at any time during participation.
- provide information on the understanding that your name will not be used unless you give permission.
- be given access to a summary of the project findings when it is concluded.
- ask for the recorder to be turned off at any time during the interview.

Thank you very much for considering participation in this study. Please contact my supervisors or me if you have any questions or issues about this research.

Te Kunenga ki Pūrehuroa

School of People, Environment & Planning
Private Bag 11222, Palmerston North 4442, New Zealand. T +64 6 350 4343 F +64 6 350 5737. http://pep.massey.ac.nz

Appendix 3: Information Sheet – In Keakalo language

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

INFORMATION SHEET (Young Mothers) vavine/iauiau vanamo pege va wala.

Garo namana thau raraku Limu Mou Vagi, thau e PHD stiuden e cosi rarana Development Studies thaunai thau e New Zealand i ai a tikulunia. Thau a sikuluni avanai wa Massey University. Thau geku ulavunu pepana rarana wa ganigani pene nama ma pene para iana vanua thaunai repana vanua guguluna ga ulavunu koukounia Central Province thaunai thau geku ririwa kamuna wa vavine gena avanai geria ganigani ariveaina pene nama iauiau maina vanuai ge alunia gauria geria ganigani ariveana pene nama

(Hello, my name is Limu Mou Vagi. I am a PhD student in Development Studies at Massey University, New Zealand. My research is titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea", and I am particularly interested in how nutrition could be improved for young women in rural communities).

Ganigani gena nama e gena ulavunu auna aunana ai gava gugulunia vanua mapararia thauna eh PNG thaunai maina.. thauna ulavunu pepana ganina wa ari veaina valu iana e vanamo vanua auri maparia geria rauneka eh kunenai ge mauliwai vanua auria maina geria vevaripa eh geria rauneka gara ole koukouria mulinai wa rauneka ariveaina gara ulavunuagia ia gera vanua auria, vavine ma inageria eh iauiau elerai pene thau ariveaina geria mauli pigava namara. E pepa gena giu wa iana rauneka ganigani gena avanai wa raveaina eh iana vanua ma pene va iligara. E vanua raunekana ma piga va ulavunua ganigani gena avanai ma pene vanagi iana vavine geria mauli ma pene nama eh pamili mapara ria mapige ripa ganigani gena ulavunu auna auna iana aunipara thaunai wa ragau. mulinai eh pepa gena runeka ma ige va ulavunua PNG gena nutrition curriculum and nutrition policy. E ulavunu wa qualitative research method , rorirori, alukou e ve rori raraparana en ve gapi pene thao gemai pepa gena verenagi maparana pene va gugulua.

(Nutrition deficiency is common in rural villages in PNG. My research explores indigenous nutrition knowledge and cultural food practices in rural villages that could help alleviate nutrition for community members, especially young women. This study aims at exploring the cultural understanding of nutrition and community empowerment. This local knowledge may be drawn toward improving women's lives and 'families' nutrition in rural communities. It might also be used to implement and deliver the Papua New Guinean nutrition curriculum and nutrition policy. This research will utilize qualitative research methods, including interviews, observation and tok stori sessions, to allow insights into improving nutrition by engaging women through community empowerment).

Thau mui a karo venimuinia pigo veamai pe'eme alukou repana thau geku ririwa wa mui gemui mauli eh vevaripa pana ripa mulinai thau geku ririwa pana va gugulua repana thau geku pepa ganina wa thau pana ripa vanua gena avanai wa ariveaina pe va namara. Ari veaina pe ulavunu koukou pa ari veaina pe ulavunu mulinai iana vanua gena mauli pe va namara. Thau maina wa

thau geku raoneka pene para iana vanua gena ganigani raveaina evanamo eme miani. Pene goi o ririwani thau pono iaku wani aua mulinai.
(I invite you to participate in this study as I would like to draw on your experience and insight to help build my understanding of local nutrition knowledge. If you agree to participate, I would like to meet for an interview for approximately one hour.)

Gemu rori rori mapararia ia auri lua lua mo elerai ene mia eh ma uma vairi ma pai gene ripa. Thau goi ma uma elerai pa'ana va riparia eh goi maina ma pa'ana eilagi raimu. Goi gemu rorirori mapararia ana ole veni ria, pene goi form, pa recording po ririwa goi gemu information wa container pa filing cabinet thaunai ana olewaria electronic copies mapararia wa ulavunu computer thaunai ana olewa ria. Computer magena paswed ema hard-drive maina magena paswed.

(The information you provide will be kept confidential and stored safely. I will use pseudonyms instead of names, and all physical data, including interview transcripts and notes, will be stored in a lockable container or filing cabinet, and electronic copies of this data will be saved on the research project's password-protected computer and external hard drive).

Pene goi ono veamai thau geku verele ene kam repana goi thau geku ulavunu pe ala koukou. Goi mai pono ripa, thau paana va iligamu goi wa gemu ririwai ono veamai goi mai ma pono ripa,goi wa gemu ririwai pono veamai
(I would be delighted if you would agree to participate, and please be assured that you are under no obligation to do so. If you decide to participate, you have the right to:)

- Thau na ririwani e question pana answara (decline to answer any particular question).
- Thau e study ana kaliwania/kapu/kapurai (withdraw from the study).
- Gemu ririwai pono renagiku (ask any questions about the study at any time during participation).
- Gemu ririwai pono rori namu mapono ripa goi raramu pa'ana vaowa namu, pene goi ono ririwa raramu ma'ana vaowa. (provide information on the understanding that your name will not be used unless you give permission).
- E ulavunu gena summary/ ve va ripa pepana ma'ana venimu e ulavunu muliaina (be given access to a summary of the project findings when it is concluded).
- Pene goi no ririwani goi pana recordimu pono eilagiraia (ask for the recorder to be turned off at any time during the interview).

Tanikiu raga kamu goi thau po gapi rageku thau geku ulavunu pame va gauvagia. Pene goi magemu verenagi ganina eh ulavunu gena avanai thau geku supervisor pono roriveniria.
(Thank you very much for considering participation in this study. Please contact my supervisors or me if you have any questions or issues about this research).

Contact Details:

Researcher
Limu Mou-Vagi
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School of People Environment and Planning
Massey University
Private Bag 11222
Palmerston North 4442
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This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

Appendix 4:Information Sheet – In Ikolu language

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

INFORMATION SHEET
Gulua vekareva pepana

Hello, my name is Limu Mou- Vagi, I am a PhD student in Development Studies at Massey University, New Zealand. My research is titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea", and I am particularly interested in how nutrition could be improved for young women in rural communties.

Helo, au aragagu Limu Mou – Vagi, au be PhD sikuli vavinegu, Development Studies Masesey University, New Zealand vanuana aonai. Au gegu aunega vetau arana be "Impro ved nutrition through community empowerment in Central Province, Papua New Guinea", e au a ulani be ata veitana nutrition vavine valiguia geiai bere namo vanua aonai.

Nutrition deficiency is common in rural villages in PNG. My research explored nutrition knowledge and cultural food practice in rural villages that could help alleviate nutrition for community members, expecially young women.

Ganigani rakavaia boganini keveia be baralelevagi vanua tata aonai gitani Papua New Guinea ai. Au gegu aonega vetau kavani be nutrition veribaveriba e tubugata ganigani ata ge gaukala sia e ata ge dalisia goni vanua aona, nogonana ganigani namoia keve bei vekeiani daubarai vanua aonai, vavine duruduruia.

This study aims at exploring the cultural understanding of nutrition and community empowerment. This local knowledge may be drawn upon towards improving women's lives and families' nutrition in rural communities. It might also be used to implement and deliver the Papua New Guinea nutrition curriculum and nutrition policy.

Na aunega vetau gaukalana ganina korikori be, tubugatarana geia riba nutrition ganina atagau e vanua vekokolena be atagau. Na tubugata geia veriba e aonegana, vavine ma geia famili gosi geia ganigani magulina e kevekeve vekeina magulina vanua aonai begene namo gana. Na aonegana makina, Papua New Guinea gena nutrition sikulina e nutrition rovana begene vakokoleia.

This research will utilise qualitative methods, including interviews, observation and tok stori sessions, to allow insighrts into improving nutrition by engaging women through community empowerment.

Na aonega vetau gaukalana be, taulimalima vedenagi gaukalana (qualitative methods), taulimalima gesi guluagulua, matai bogeboge, e tamei guluagulua, kwalana au a ulani bana riba, ganigani namoia a keve begene kei kavanai, vavine begene gaukala sebona vanua vekokolena kavanai, be kevekeve vanua aonai begene kei.

I invite you to partcipate in this study as I would like to draw on your experience and insight to help build my understaning of local nutrition knowledge. If you agree to participate, I would like to meet for an interview for approximately one hour. I would also appriciate the opportunity to invite you and others for more informal discussions with groups in your community for up to two hours.

Au a ulani, goi augosi ta gaukala sebona na aonega vetau gaukalanai be goi gemu riba au a ulani bana riba kareva, be au gegu riba bene kareva tubugata kavani vanua gena nutrition o ganigani e keve riba kavanai. Bema goi bo ulani na gaukalai gaukala genai, au a ulani au gosi bitana guluagulua. Au maki a ulani, goi e taulimalima geta gosi bitana guluagulua sebona vanua aonai.

The information you provide will be kept confidential and stored safely. All physical data, including copies of this data will be saved on the research project's password-protected computer and external hard drive.

Goi gemu riba au bogeniguni gaua be, gabutai ba gatotogagiani be tautana asi bei gabiani. Na guluagulua ba gabi ia gauia e geia copi be computer magena password ba external harddrive aunai ba gatoani.

I would be delighted if you agreed to particpate, and please be assured that you are under no obligation to do so. If you decide to participate, you have the right to:

Au ba vereverni bema goi ulani na gaukalai bo kalaiani genai, goi asi ba ve kilanaginagi muni. Bema goi o ulani genai, goi ma gemu maoro

- decline to answer any praticular question;
  asi bo ulani vedenagi bege kilagiani gau a bana kilagia.

- withdaw from the study before I leave the field
  ba vegaivagini na aunega vetau kavanai

- ask any questions about the study at any time during participation;
  ba vedenagini na aunega vetau gaukalana iai gegu ulai na gaukala aonai.

- provide information on the understanding that your name will not be used unless you give permission;
  Gegulani guluagulua ge vetaugiani gauia bagenigiani senagi au aragu asi begeni gaukalaia bema auna gulua maoro asi ba genigiani genai.

- be given access to a summary of the project findings when it is concluded
  au a ulani bema geia gaukala bei kolini genai, atagau ge davalito gaua begene veribagu.

- ask for the recorder to be turned off at any time during the interview.
  Ba denagi iani, recoda be gene vabusea geia vedenagi aonai

Thank you very much for considering participation in this study. If you have any questions or issues about this research, please contact me or my supervisors:

Tanikiu asi keikeina goi gemu veduru na aonega vetau gaukalana kavanai. Bema goi ma gemu vedenagi na gaukala kavanai, au bono rinigenigu o au gegu supavaisa bono rinigenigia.

Appendix 5: Information Sheet – Key Informant



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

INFORMATION SHEET (Key Informants)

Hello, my name is Limu Mou Vagi. I am a PhD student in Development Studies at Massey University, New Zealand. My research is titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea", and I am particularly interested in how nutrition could be improved for young women in rural communities.

Nutrition deficiency is common in rural villages in PNG. My research explores indigenous nutrition knowledge and cultural food practices in rural villages that could help alleviate nutrition for community members, especially young women. This study aims at exploring the cultural understanding of nutrition and community empowerment. This local knowledge may be drawn upon towards improving women's lives and families' nutrition in rural communities. It might also be used to implement and deliver the Papua New Guinean nutrition curriculum and nutrition policy. This research will utilize qualitative research methods, including interviews, observation and tok stori sessions, to allow insights into improving nutrition by engaging women through community empowerment.

I invite you to participate in this study as I would like to draw on your experience and insight to help build my understanding of the situation and local knowledge of nutrition and the dissemination of nutrition in PNG. If you agree to participate, I would like to meet for an interview for approximately one hour. I would also appreciate the opportunity to invite you and others for a more informal tok stori (discussions with other key informants) for up to two hours.

The information you provide will be kept confidential and stored safely. All physical data, including interview transcripts and notes, will be stored in a lockable container, or filing cabinet, and electronic copies of this data will be saved on the research project's password-protected computer and external hard drive.

I would be delighted if you would agree to participate, and please be assured that you are under no obligation to do so. If you decide to participate, you have the right to:

- decline to answer any particular question.
- withdraw from the study before I leave the field.
- ask any questions about the study at any time during participation.
- provide information on the understanding that your name will not be used unless you give permission.
- be given access to a summary of the project findings when it is concluded.
- ask for the recorder to be turned off at any time during the interview.

Thank you very much for considering participation in this study. If you have any questions or issues about this research, please contact my supervisors or me:

Te Kunenga ki Pūrehuroa

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Appendix 6: Information Sheet – Focus Group

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

INFORMATION SHEET (Village elders/leaders)

Hello, my name is Limu Mou Vagi. I am a PhD student in Development Studies at Massey University, New Zealand. My research is titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea", and I am particularly interested in how nutrition could be improved for young women in rural communities.

Nutrition deficiency is common in rural villages in PNG. My research explores indigenous nutrition knowledge and cultural food practices in rural villages that could help alleviate nutrition for community members, especially young women. This study aims at exploring the cultural understanding of nutrition and community empowerment. This local knowledge may be drawn upon towards improving women's lives and families' nutrition in rural communities. It might also be used to implement and deliver the Papua New Guinean nutrition curriculum and nutrition policy. This research will utilize qualitative research methods, including interviews, observation and tok stori sessions, to allow insights into improving nutrition by engaging women through community empowerment.

I invite you to participate in this study as I would like to draw on your experience and insight to help build my understanding of local nutrition knowledge. If you agree to participate, I would like to meet for an interview for approximately one hour. I would also appreciate the opportunity to invite you and others for more informal discussions with groups in your community for up to two hours.

The information you provide will be kept confidential and stored safely. All physical data, including interview transcripts and notes, will be stored in a lockable container or filing cabinet, and electronic copies of this data will be saved on the research project's password-protected computer and external hard drive.

I would be delighted if you agreed to participate, and please be assured that you are under no obligation to do so. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study before I leave the field;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission;
- be given access to a summary of the project findings when it is concluded.
- ask for the recorder to be turned off at any time during the interview.

Thank you very much for considering participation in this study. If you have any questions or issues about this research, please contact me or my supervisors:

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Appendix 7: Consent Forms - Single Mothers



MASSEY UNIVERSITY
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TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

PARTICIPANT CONSENT FORM - YSM

The Information Sheet has been read out and all details were explained clearly to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

- I agree not to disclose anything discussed in this focus group discussion.
- I agree/do not agree with the interview discussions being tape-recorded.

I would like to be referred to in this study in the following way (fill in your preference):

- My name and title i.e. .....
  - (e.g. Bushy Rakara, Gavuone Village Councilor, PNG)
- My title or a descriptor i.e. .....
  - (e.g. Councilor, PNG)

I acknowledge that

- Taking part in this research is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and withdraw any unprocessed data I have provided,
- Any information I give will be kept confidential, and no names will be used to identify me with this study without my approval.

I agree to participate in this study under the conditions set out in the Information Sheet.

I would/would not like a summary report of the findings sent to me on completion of this research.

Signature: _____ **Date:** _____

Full Name - printed _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

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Appendix 8: Consent Form – Single Mothers in Keakalo language



MASSEY UNIVERSITY
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AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

PARTICIPANT CONSENT FORM (Key Informant)

The Information Sheet has been read out, and all details were explained clearly to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time

E pepa ganina pege orua eh, ganina mapege varipa namanamaku. Thau geku verenagi mapararia pege va guguluria, thau maina thau ripaku thau geku verenagi ma pana renagiria e ulavunu thaunai ganina thau geku ripa eh rauneka ma pene kamu.

- I agree not to disclose any information discussed in this interview.
  Thau pa ririwa thau geku rauneka eh, eh pepa valina pai gene vevaripa ma aunilimalima elerai

- I agree/do not agree with the discussion being tape recorded.
  Thau pap ririwa /thau na ririwani eh rori rori pige recodia

Thau raraku eh thau geku ulavunu eveaina pige ilagia (I would like to be referred to in this study in the following way)

goi ari gau o ririwania gauna pono walao(fill in your preference):

- Raraku (My name) ……
- Thau geku ulavunu (My title or a descriptor i.e.) ……
  - Ie. Titia ,engineer, pilot,toketa (e.g. Nutritionist, Teacher, Curriculum writer)

Thau a vau auna aunania (I acknowledge that)

- Ririwaku ai pa veamai , ulavunu paga me ala.Thau mai ripaku pene thau pa'ana ririwa thau e ulavunu pana va ikara ma pa'ana vanekaria neni ragau pige ilagiku repana thau geku ririwai pa veamai. thau mai ripaku thau geku rauneka eh ra valiria paga ilagiria eh ulavunu thaunai neni thau pana verogowairi pana gapiwaia wa geku ririwa.
  (Taking part in this research is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and withdraw any unprocessed data I have provided),

- Eh ulavunu gena vali/rori/rauneka ma uma elerai pai gene vevariparia mulinai ma rara apuai ma paigene ilagiku
  (Any information I give will be kept confidential, and no names will be used to identify me with this study without my approval).

Thau pa ririwa eh ulavunu e alara (I agree to participate in this study under the conditions set out in the Information Sheet).

Thau geku ririwa wa e ulavunu pene vagavu thau pige varipaku /pai gene varipaku

(I would/would not like a summary report of the findings sent to me on completion of this research).

Sign /Signature: _____ **Date/Date:** _____

Raraku/ Full Name – printed _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher (s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

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Appendix 9: Consent Form – Single Mothers in Ikolu Language

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

Participant Consent Form

The Information Sheet has been read out and all details were explained clearly to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

Na ve ribageni pepana, au gegu bege duai and kilagi karevaia.Au gegu vedenagi maki bege kilagi karevaia, e au ribagu ma bavedenagini gabei.

- I agree not to disclose anything discussed in this focus group discussions.
  Au a ulani guluata asi ba kilagiani na guluagulua/sisiba dogolona aunai

- I agree/do not agree with the interview discussions being tape-recorded.
  Au a ulani/asi a ulani na uluagulua/sisiba begene recodia.

I would like to be referred to in this study in the following way (fill in preference):

Au a ulani, au na veitana begene keagu na stadi aunai :

- My name and title i.e. _____
  (e.g. Bushy Rakara, Gavuone Village Councilor, PNG)
- Au aragu e gegu dagi _____
  (vegelegele. Bushy Rakara, Gavuone Village Councilor, PNG)

- My title or descriptor i.e _____
  - (e.g. Councilor, PNG)
- Au gegu dagi _____
  - Vegelegele Councilor, PNG)

I acknowledge that

Au a gabirageni

- Taking part in this research is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and withdraw any unprocessed data I have provided.

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Na stadi aunai ba gaukalani be bave duruni mogo asi bege pei guni, au ribagu au bagulani asi bana durugia basiani genai, bave gaivagini gegu ribai, asi bave kilagiani au gegu tuamagi atagau, atagau bave kilagia maki begene gaivagia.

- Any information I give will be kept confidential, and no names will be used to identify me with this study without my approval.

  Ba ve ribagiani guluaia tauta asi ba vekilagiani, au aragu korikorina maki asi bave kilavara giani na stadi aunai, bema augeguai kilamaoro bege gabini vau.

Signature (Aramu no taloa): _____ Date (Toma garona):_____

Full Name – Printed (Aramu guguluna no torea) _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher (s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

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Appendix 10: Consent Form - Focus Groups

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

PARTICIPANT CONSENT FORM - YSM

The Information Sheet has been read out and all details were explained clearly to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

- I agree not to disclose anything discussed in this focus group discussion.
- I agree/do not agree with the interview discussions being tape-recorded.

I would like to be referred to in this study in the following way (fill in your preference):

- My name and title i.e. .....
  - (e.g. Bushy Rakara, Gavuone Village Councilor, PNG)
- My title or a descriptor i.e. .....
  - (e.g. Councilor, PNG)

I acknowledge that

- Taking part in this research is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and withdraw any unprocessed data I have provided,
- Any information I give will be kept confidential, and no names will be used to identify me with this study without my approval.

I agree to participate in this study under the conditions set out in the Information Sheet.

I would/would not like a summary report of the findings sent to me on completion of this research.

Signature: _____ **Date:** _____

Full Name - printed _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

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Appendix 11: Consent Form - Key Informant

MASSEY UNIVERSITY
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AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

TOK STORI: PARTICIPANT CONSENT FORM

The Information Sheet has been read out and all details were explained clearly to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

- I agree not to disclose anything discussed in this focus group discussions.
- I agree/do not agree with the interview discussions being tape-recorded.

I would like to be referred to in this study in the following way (fill in your preference):

- My name and title i.e. .....
  - (e.g. Bushy Rakara, Gavuone Village Councilor, PNG)
- My title or a descriptor i.e. .....
  - (e.g. Councilor, PNG)

I acknowledge that

- Taking part in this research is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and withdraw any unprocessed data I have provided,
- Any information I give will be kept confidential, and no names will be used to identify me with this study without my approval.

I agree to participate in this study under the conditions set out in the Information Sheet.

I would/would not like a summary report of the findings sent to me on completion of this research.

Signature: _____ **Date:** _____

Full Name - printed _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

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Appendix 12: Interview Guides – Case Study Interview

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Young mothers

Official use: For my records only

Name: _____ Surname: _____
Code/Number: _____Interview category: _____
Location:_____Time:_____ Date: _____

1. I would like you to tell me a little bit about your life in your family and community.
   a. Can you tell me your name, your parent's name, and the clans you belong to?
   b. How many siblings do you have, and where do you come in the family?

c. Which school did you go to? From which grade did you leave school?

2. You said you went to school; can you describe what you learnt about food and nutrition in school?
3. What do you think about when the words food or nutrition are mentioned?
4. At this time, I would like you to consider the meals you have with your family. Can you describe any of these meals?
5. How would you describe an ideal nutritious food?
6. Think of a person who is healthy looking (without naming the person) what makes you think that that person is healthy?
7. Explain the reasons why you think the person is unhealthy.
8. Explain the reasons why you think the person is healthy.
9. Describe ways the unhealthy person can be assisted to improve their health.
10. Can you describe the relationship between your eating habits and your health?

11. Can you describe times when you were restricted from eating certain types of food?

12. Can you explain why these restrictions were put to stop you from eating certain foods?

13. Can you tell me if there was any time in your life when you did not eat any food or had less food in the house? Describe how you felt.

14. Can you explain how you get food in times of drought and flood?

15. Describe if anything has changed in your cooking since you have had your baby

16. Explain how the village's economy changes (logging, shops, rubber, fishing) affect how you cook.

17. Describe how your cooking and eating changed while you were pregnant.

18. Can you describe some hardships in providing food you have experienced while raising your child/children?

19. Can you suggest ways the community can help you improve nutrition?

20. Tell me what you think can be improved in the community to help young mothers improve nutrition. What would make you feel more empowered?

21. Describe how other organisations have come to your community to assist to improve nutrition in your community.

22. Describe how other help/support is needed for better nutrition in your community.

23. Describe how this can be improved.

Appendix 13: Interview Guide – Case Study interview in Keakalo language

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Young mothers

Official use: For my records only

Name:_____ Surname: _____
Code/Number:_____Interview category: _____
Location:_____Time:_____ Date: _____

1. 1.Thau poro vailaku goi gemu mauli thaunai goi raveaina o maulinia
   [I would like you to tell me a little bit about your life in your family and community.]

2. Raramu poro va ripaku, goi amamu eh inamu rararia ma poro varipaku eh goi ari kwalu melomu pa vavinemu
   [Can you tell me your name, your parent's name, and the clans you belong to?]

3. Mui aumui vira go wala
   [How many siblings do you have, and where do you come in the family?]

4. Goi ari tsikuluai ova gavuo, grade vira na ova gavu?
   [Which school did you go to? From which grade did you leave school?]

5. Goi powa goi tsikulu ai ma o thao pe, goi ganigani gena avanai mage vevaripamui pa?
   [You said you went to school; can you describe what you learnt about food and nutrition in school?]

6. Goi o valavuni thaunai pene ganigani pa nutrition ge eilagirana goi ra rori vearia na o valavurana?
   [What do you think about when the words food or nutrition are mentioned?]

7. E garoa thaunai goi gemu family thaunai goi ari ganigani veairia go gani koukounia rararia ma o riparana pa
   [At this time, I would like you to consider the meals you have with your family. Can you describe any of these meals?]

8. Goi o iania thaunai ganigani guguluna wa raveaina o iania
   [How would you describe an ideal nutritious food?]

9. Au apua poro valavua ia iaiayana wa healthy melona rarana po'ono vaua namu ia wa ragauna goi gemu valavua thaunai ia wa healthy poro eilagia
   [Think of a person who is healthy looking (without naming the person) what makes you think that that person is healthy?]

10. Thau poro va ripaku ragauna ia auniparana wa unhealthy?
    [Explain the reasons why you think the person is unhealthy.]

11. Thau poro varipaku ragauna wa au po valavua wa healthy
    [Explain the reasons why you think the person is healthy.]

12. Poro vailaku raveaina valu na au po ilagia as unhealthy gena mauli pene va namara ia peneme mia as healthy
    [Describe ways the unhealthy person can be assisted to improve their health.

13. Ma poro vailaku goi o ganiganiia thaunai goi gemu health /mauli wa raveaina eh va namania pa eva ravamunia
    [Can you describe the relationship between your eating habits and your health?]

14. Goi gemu mauli thaunai thau poro vailaku garo apunai mapegeva rovamu ganigani vairi po'ono ganiria pa?
    [Can you describe times when you were restricted from eating certain types of food?]

15. Thau poro vailaku ragauna geva rovamu goi ganigani vairi ragauna ai gevenimu ganina wa mageria rova?
    [Can you explain why these restrictions were put to stop you from eating certain foods?]

16. Thau poro vailaku goi gemu mauli thaunai garo vairi ai ganigani vagi pa goi gemu ganigani e gavuvagi o garonai goi o mamilagia wa raveaina?
    [Can you tell me if there was any time in your life when you did not eat any food or had less food in the house? Describe how you felt?]

17. Goi ganigani wa raveaina o gapirana pene kupa gena garoai pa ai nalu thaunai, ganigani raveaina o kokorana?
    [Can you explain how you get food in times of drought and flood?]

18. Goi po vewala thaunai goi gemu narunaru ma peme irauirau pa nowaina?
    [Describe if anything has changed in your cooking since you have had your baby]

19. Vanua maulina moni gena avanai wa raveaina gemu narunaru pa ganigani e va irauirauania?
    [Explain how the village's economy changes (logging, shops, rubber, fishing) affect how you cook.]

20. Thau poro va ripaku goi ma inagemu thaunai goi gemu ganigani eh narunaru raveaina eva irauirauwa?
    [Describe how your cooking and eating changed while you were pregnant.]

21. Thau ma poro vailaku naumu ova u'upurani thaonai iligavi vairi mageme eoraini pa pene goi gemu ansa wa namu poro va ripaku raveaina wa iligavi eme vagimunia?
    [Can you describe some hardships in providing food you have experienced while raising your child/children?]

22. Goi o valavuni wa vanua valu raveaina gere vavamu goi pono nama eh gemu health ene nama
    [Can you suggest ways the community can help you improve nutrition?]

23. Poro vailaku vanua maparana wa raveaina gereme ole koukou avanai iana vavine valivuria pa iauiau gere vava ria
    [Tell me what you think can be improved in the community to help young mothers improve nutrition. What would make you feel more empowered?]

24. Organization vairi ge veamaini thaunai ila geria vevava iana vavine elrai raveaina geme vevavania?
    [Describe how other organisations have come to your community to assist to improve nutrition in your community.]

25. Raveaina vevava ere me mia gelegele iana vanua thaunai ganigani gena avanai?
    [Describe how other help/support is needed for better nutrition in your community.]

26. Raveaina iagera vanua thaunai, vanua aulimalimaria pige alu namanama, ari veaina pige venamara?
    [Describe how this can be improved.]

Appendix 14: Interview Guide – Case Study interview in Ikolu language

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Young mothers

Official use: For my records only
Name: _____ Surname: _____
Code/Number:_____ Interview category: _____
Location: _____ Time: _____ Date: _____

1. I would like you to tell me a little bit about your life in your family and community.
   Gemu maguli gegu keta boro kilagia gemu family aonai e na vanua aonai

   a. Can you tell me your name, your parent's name, and the clans you belong to?
      Goi aramu rai?, goi sinamu e tamamu aria rai, goi ata dogolo?

   b. How many siblings do you have, and where do you come in the family?
      Goi kakamu e tarimu vira, goi be atai gemu family aonai?

   c. Which school did you go to? From which grade did you leave school?
      Goi ata sikuli gana wagoto? Ata graid na okolito?

2. You said you went to school; can you describe what you learnt about food and nutrition in school?
   Goi bo kila goi sikuli gana wagoto, gegu boro kila goi ataga geve ribamuto ganigani e nutrition sikuli aonai?

3. What do you think about when the words food or nutrition are mentioned?
   Goi atagau o tuamagi bema ganigani e nutrition araia gekilagiani genai?

4. At this time, I would like you to consider the meals you have with your family. Can you describe any of these meals?
   Na garo aonai, au aulani goi no ve tuamagi laukule ganigani o ganiani goi ma gemu family gosi. Bema namo, nogo ganigani go ganigiani gaua boro kilagia?

5. How would you describe an ideal nutritious food?
   Bema namo goi gemu tuamagi e ribai aonai, nutritious ganigani na be atagau?

6. Think of a person who is healthy looking (without naming the person)
   Tauta o vavine ta aumuai no tuamagia, ia tauganina asi kevena (arana asi bono kilagia)

   a. what makes you think that that person is healthy?
      Atagau genai goi o tuamagini nogo tau o vavine be asi keveia o gitagitaia namo asi geia visivisi?

   b. Explain the reasons why you think the person is unhealthy.
      Goina no kila karevaia, atagau genai goi o tuamagini ia be kevekeve o visivisi taulimalimana.

   c. Explain the reasons why you think the person is healthy.
      Goina no kila karevaia, atagau genai ia be asi gena kevekeve o visivisi.

   d. Describe ways the unhealthy person can be assisted in improving their health.
      Ata daubarai nogo kevekeve tauna bita duruani bene namo gana.

7. Can you describe the relationship between your eating habits and your health?
   Goina no kilagia, ata daubarai goi gemu ganigani kolemaia e goi tauganimu be asi girau

8. Can you describe times when you were restricted from eating certain types of food?
   Goin na no kilagia, garo ketaia geve kilagimugoni ganigani keta bono ganigia e keta asi bono ganigia ge siagoni ba asgina?

9. Can you explain why these restrictions were put to stop you from eating certain foods?
   No kilagi maoroa, atagau genai baraki rova ge gatogoni ganigani ataiai.

10. Can you tell me if there was any time in your life when you did not eat any food or had less food in the house? Describe how you felt.
    Goi gemu tanu mabaraia aonai, garota aonai goi ganigani asi o ganito o numa asi ganiganina. Ata ove mamilagi siato nogo ora aonai ganigani asigina genai?

11. Can you explain how you get food in times of drought and flood?
    Ganigani ata go davali siani o gogosiani gabata ragani genai o garo siau lelevagini genai.

12. Describe if anything has changed in your cooking since you have had your baby.
    Goi gemu dalidali kolemaia bege senisi ba asigina, goi natumu magulito genai.

13. Explain how the village's economy changes (logging, shops, rubber, fishing) affect how you cook.
    Moni lakatogana daubarana vanua aonai bege gogo e moni gena davali gabuna bege girau (timba, sitoa, raba, maina laka), goi gemu dalidali ata ge senisi sia giani.

14. Describe how your cooking and eating changed while you were pregnant.
    Goi gemu dalidali togaia e ganigani togaia ge senisito goi ma diamu aonai, boro kilagia.

15. Can you describe some hardships in providing food you have experienced while raising your child/children?
Natumu ove baragiagoni aonai, ganigani davali daubarai kavanai, maguli gwagigia keta o davalito, gegu no kilagia.

16. Can you suggest ways the community can help you improve nutrition?
Goi o tuamagini, ata daubarai vanua na nutrition berege ve namoa be kevekeve vanua aonai bere kei.

17. Tell me what you think can be improved in the community to help young mothers improve nutrition. What would make you feel more empowered?
Goi o tuamagini vanua aonai, vavine ata begere duru sia nutrition begere ve namoa. Goi ata o tuamagi siani, goi atagauna goi bere ve kokolemu?

18. Describe how other organisations have come to your community to assist in improving nutrition in your community.
Gaukala tauia keta ba gavamani gaukalaia, vanua gana ge gomaini genai, ata veitana veduruia ge wamaini vanua aonai nutrition venamona kavanai.

19. Describe how other help/support is needed for better nutrition in your community.
Ata veitana veduru daubaraia vanua aonai nutrition begere venamoa.

20. Describe how this can be improved.
Ata daubarai begere ve namoa, boro kilagia

Appendix 15: Interview Guide - Focus group interview

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Focus Group

Official use: For my records only

Name: _____ Surname: _____
Code/Number _____ Interview category: _____ Location: _____
Time:_____ Date: _____

1. I would like you to tell me a little bit about your work in your community.
   a) Can you tell me your name, who you are married to, and which clan you belong to?
   b) How many children do you have? Can you tell me about your children?
   c) What role do you play in the community?
2. At this time, I would like you to think about issues you have experienced in getting food/eating food.
3. Can you explain how you get food in times of drought and flood? Can you explain what hardships/difficulties you have been experiencing in feeding your family?
   a) Tell me about a situation when you had to overcome a problem; how did you respond?
   b) Describe if anything has changed?
4. Describe some difficulties you and the community face in trying to gather food in different seasons of the weather.
5. Can you explain if there have been changes in your eating habits and health now compared to when you were growing up?
6. Do you find that people eat differently compared to 10 years ago?
7. Can you describe how you stored and preserved your food for the future?
8. Describe what kinds of decisions you make to ensure your household has food.

9. Can you describe some factors influencing your decisions to provide food for your family?

10. May you describe in what activities/ways you have involved young women in your community? How can you empower women in the community?

11. How do you organise women to participate in the activities in the village?

a) Describe how women are important in your village

12. How have other organisations come to your community to assist the young women?

13. What is your opinion about the impact of these programs? Explain.

14. Tell me about a situation in your community where you had to overcome a problem; how did you respond to the situation?

15. Describe if there is a relationship between the food you consume now and your health.

16. Explain if there is a connection between how food is prepared, and food grown and bought from the shops.

17. Can you explain if organisations from NGOs or Government come to your community to assist?

18. Describe the activities that were organised for the young women.

19. In what ways do you think they would help your community?

20. Would you describe what it means for a household/family to have enough appropriate food?

21. Describe what people did in the past if they needed help/assistance/if there was a problem.

22. What factors influence your decisions in choosing between custom/culture and modern knowledge in the process of improving your gardening selecting/ planting seeds food storage

23. Do you make decisions in groups or as individuals? Explain

24. What are some customs and traditions related to food that affect the health and nutrition of the community?

25. Describe some customs and traditions related to food.

Appendix 16: Interview Guide - Focus group interview in Keakalo language



Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Focus Group

Official use: For my records only	
Name: _____	Surname: _____
Code/Number: _____	Interview category: _____
Location: _____	Time: _____ Date: _____

1. I would like you to tell me a little bit about your work in your community.
   Goi geenu inagulu/raki vanua racaai geku poro ilagia

   a) Can you tell me your name, who you are married to, and what clan do you belong to?
      Goi raramu ragau? Goi garawamu rarana ragau? Geenu clan rarana ragau?

   b) How many children do you have? Can you tell me about your children?
      Goi nauenu vira? Nauenu ragau gealani vanuai?

   c) What role do you play in the community?
      Vanua raunai, geenu raki ragau?

2. At this time, I would like you to think about issues you have experienced in getting food/eating food.
   E raunai, goeni iligavi vairi go gapini ganigani koko avariai pa nogai? E iligavi poro ilagiaria.

3. Can you explain how you get food in times of drought and flood? Can you explain what hardships/difficulties you have been experiencing in feeding your family?
   Ganigani ariveaina go kokoni, gapini pene ai e kupani or nalu e kamuni garoai? Pene nalu e kamuni or ai nalu garoai, goeni naumui ariveaina go gupurana?

   a) Tell me about a situation when you had to overcome a problem; how did you respond?
      Wani, goeni ai geenui ganigani taiminai, wa e kuparai o ai e kupa garorai, ariveaina go inagulu, wa problem gove naena

   b) Describe if anything has changed?

Goi o uamagini senisi vairi ge vewala pa noai?

4. Describe some difficulties you and the community face in trying to gather food in different seasons of the weather.
Ganigani rawali magulia vairi ge kamuni goi e vanua thaonai vairi o rawalini e garo thaonai aonai pa noaia?

5. Can you explain if there have been changes in your eating habits and health now compared to when you were growing up?
Goi gemu valavu thaonai goi gemu ganigani raupararia o ganigani magulia o gemu valavu oi aniparamu gena iligamu, goi i kirikiri po veamai po mei kamukamu, senisi vairi o giarana pa noai?

6. Do you find that people eat differently compared to 10 years ago?
Gemu uamagi thaonai, sunilimalima geria ganigani maguliria pege mei senisi e lagani thaonai poro va gelegele kuinena laganina?

7. Can you describe how you stored and preserved your food for the future?
Kuinenai, gemui ganigani ariveaina go oleoaora, wa garo kapikapi rai ma ipo pigo ulavunu agiria.

8. Describe what kinds of decisions you make to ensure your household has food.
Ari veaina go rori koukouwai, wa gemui numa ganiganiri pio gapiria avanai, pe gemui ganigani paigene gavu avarai.

9. Can you describe some factors influencing your decisions to provide food for your family?
Ariveaina iligaviria goi gemu numa ganigani koko avaria everavariani?

10. May you describe in what activities/ways you have involved young women in your community? How can you empower women in the community?
Vanua vavineria pa vavine valivuria ariveaina vanua inaguluria gove inaguluriani? Vavine ariveaina gove iligaria ni?

11. How do you organise women to participate in the activities in the village?
Vavine ariveaina gove koukou rana vanua inagulura thaorai?

    a) Describe how women are important in your village
    Vavine valivuria, geria inagulu ariveaina gove gapirageriani vanua thaorai?

12. How have other organisations come to your community to assist the young women?
Inagulu vairia, gavamani o NGO vairia vanua thaorai geveamaini vanuai pa noai, gemi gemi vanua ariveaina ge vavariani?

    a) What is your opinion about the impact of these programs? Explain.
    Goi gemu valavu thaonai, inagulu vairia geveamaini vanua thaonai, mageria program, goi gemu valavu thaorai, vavine geria alu geve namani pa noaia?

13. Tell me about a situation in your community where you had to overcome a problem; how did you respond to the situation?
Goi gemu valavu thaorai, gemu vanua thaonai, meau apua eve walawai veainai, kupana vanua eve varava, ari veaina vanua aunilimalimaria ove kokoria, wa meau ove namara?

14. Describe if there is a relationship between the food you consume now and your health.
Goi gemu valavu thaorai, ariveaina wa ganigani o ganiani evanamo maigena irau goi aniparamu pa noai, ariveaina ia maigena irau?

15. Explain if there is a connection between how food is prepared, and food grown and bought from the shops.
Goi gemu valavu thaorai, evanamo ganigani o naruani, ariveaina ganigani o varoani, e ganigani o voiani sitaai, ma geria connection pa noai?

16. Can you explain if organisations from NGOs or Government come to your community to assist?
Inagulu vairia, NGO or Government, ge veamaini gemui vanua geve vavamuni pa noaia?

    a. Describe the activities that were organised for the young women.
    Ari veaina unaguluria o ulaularia gemi vanuai o vavine valivuria geve ripamuini or varipamuini?

    b. In what ways do you think they would help your community?
    Ari veaina rarapararia pige varipamai o vanua pigere veriparia?

17. Would you describe what it means for a household/family to have enough appropriate food?
Goi gemu valavu thaorai, pene ganigani vogovogoria e nanamaria gemui numui thaonai ganina ragau?

18. Describe what people did in the past if they needed help/assistance/if there was a problem.
Kuinenai, aunilimalima ari veaina ge vavaria pene wa problem vanuai o geria family thaonai?

19. What factors influence your decisions in choosing between custom/culture and modern knowledge in the process of improving your
Ari veaina meauria goigemu rorikou thaorai, ariveaina go valavuni, wa vanua gena alamavu avarai pa tauvau geria alamavu avarai go inaguluna pene

    a. Gardening
    (ulakapu ai)

    b. selecting/ planting seeds
    (vua koukou/ vua varoria)

    c. food storage
    (ganigani oleveniria)

d. Do you make decisions in groups or as individuals? Explain
Rori koukou ariveaina go alani, wa geregamu pa uma goi genu decisions go alani?

20. What are some customs and traditions related to food that affect the health and nutrition of the community?
Goeni mai gennui vanua custom ria ganigani avanai, aunilimalima aniparia o vivi vanua geveni riani thaorai pa noai?

21. Describe some customs and traditions related to food.
Poro rori veraleva, gennui vanuai mai genni custom ganigani eleriai pa noai?

Appendix 17: Interview Guide – Focus Group interview in Ikolu language



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Focus Group

Official use: For my records only	
Name: _____	Surname: _____
Code/Number: _____	Interview category: _____
Location: _____	Time: _____ Date: _____

1. I would like you to tell me a little bit about your work in your community.
   Goi gemu gaukala atagau, misina keta boro veikilagu goigemu gaukala kolemana anua aunai o atagau o kalani vanua aonai?

   a) Can you tell me your name, who you are married to, and what clan you belong to?
      Goi aramu atagau? Goi rai o garavaiato? Goi ata dogolo vavinemu?

   b) How many children do you have? Can you tell me about your children?
      Goi natumu vira? Goi natumu guluaia keta gegu boro kilagia?

   c) What role do you play in the community?
      Goi vanuai ata dagi gaukalana o kalaiani?

2. At this time, I would like you to think about issues you have experienced in getting food/eating food.
   Na ora ounai, au a ulani goi magulini gwagiginata gemu tano ai odavaliato ena ganigani davali daubaraia kavanai ba asigina

3. Can you explain how you get food in times of drought and flood? Can you explain what hardships/difficulties you have been experiencing in feeding your family?
   Boro kila kareva rogo, vanuai gura asi ketone genai, ganigani ata go gabisiani?
   Ataveitana maguli gwagigia go ragagauni gemu family aunai?

   a) Tell me about a situation when you had to overcome a problem; how did you respond?
      Gegu no kilagi, ata daubarai nogo maguli gwagigina omei lakasito, ata o kalagitakau ato?

b) Describe if anything has changed?
Goi otuamagini senisi keta ge valato ba asigina?

4. Describe some difficulties you and the community face in trying to gather food in different seasons of the weather.
Ganigani davali magulia keta ge gwagigia goi e vanua aonai keta o davalini ena garo girauiai lagani aonai ba asigina?

5. Can you explain if there have been changes in your eating habits and health now compared to when you were growing up?
Keta boro kila karevaia bema goi gemu ganigani daubaraia o ganigani magulia o tauganimu gena kokole, goi keimuai e na bomei vavine, e na garo aonai bege senisi, o senisi keta o gitani?

6. Do you find that people eat differently compared to 10 years ago?
Goi o tuamagini taulimalima geia ganigani magulina bege senisi na lagani auonai e gonenai lagani gabanana?

7. Can you describe how you stored and preserved your food for the future?
Gonenai, gomi gemia ganigani ata go gatotoga sia goni bema gomina gabeai vau bogono gaukala gia gana genai? Gonena laganinai, ganigani ata go gatotoga siagoni veilalagani nai vau bogoro gaukalagia?

8. Describe what kinds of decisions you make to ensure your household has food.
Gomi ata go gulua sebona goni be gemia numa ganiganina bena gogo gana.

9. Can you describe some factors influencing your decisions to provide food for your family?
Bema namo goina boro kila kareva bema gau ketaiana goi gemu gulua vegogo, ganigani gato vegogoia daubaraia keta asi ge namogoni?

10. May you describe in what activities/ways you have involved young women in your community? How can you empower women in the community?
Bema namo boro kila karevaia, ata veitana gaukalai vavine gove gaukala vegogoni vanua aonai? Vavine ata gove kokolegiani vanua aonai?

11. How do you organise women to participate in the activities in the village?
Vanua vavineia ata o gato vegogo sagiani vanua gaukalai ai?

a) Describe how women are important in your village
Vavine ata bo kila namo siagini goi gemu vanua aunai. Gegu boro kilagi gitakau, vavine geia gaukala barana vanuai aonai be atagau, gomina vavine geia gaukala ata go gabirage siani vanua aonai?

12. How have other organisations come to your community to assist the young women?
Gaukala gabuia keta ge gomaini vavine valiguia veduru kavai iai gemia vanuai ba asigina?

a) What is your opinion about the impact of these programs? Explain.
Goi gemu tuamagi aonai, na gaukalataia geia program na keta vavine geia tanu venamo giani ba asigina? No kilagi karevaia.

13. Tell me about a situation in your community where you had to overcome a problem; how did you respond to the situation?
Gegu no kilagi karevaia, garotai, goi gemu vanua aonai metau ta valato genai, goina nogo metau ata o kilavaiato?

14. Describe if there is a relationship between the food you consume now and your health.
Goi o tuamagini, na ganigani o ganiani e goi tauganimu mamilagina ma girauna ba asigina

15. Explain if there is a connection between how food is prepared, and food grown and bought from the shops.
Goi o tuamagini ganigani o kalarogoani, ganigani o varoani e ganigani situana o goiani ma geia

16. Can you explain if organisations from NGOs or Government come to your community to assist?
Gomi veduru keta gogabini NGOs ba gavamani ofisia o keta gegomaini gemia vanua gana ba asigina

a. Describe the activities that were organised for the young women.
Ata veitana ulaulaia o gaukalaia vavine gemei varibagiato vanua aunai, boro kila karevaia.

b. In what ways do you think they would help your community?
Ata daubarai ia goi otuamagini, vavine begere durugia o vavuna begere durugia?

17. Would you describe what it means for a household/family to have enough appropriate food?
Goi gemu tuamagi aonai, ganigani gelegeleia e namoia numa aonai e gemu dogolo geia ganina atagau?

18. Describe what people did in the past if they needed help/assistance/if there was a problem.
Gonena laganinai, bema taulimalima veduru gegulagoni genai o bema ma geia kerere genai, ata ge kalasiagoni nogo veduru ge gabigiagoni.

19. What factors influence your decisions in choosing between custom/culture and modern knowledge in the process of improving your

a. Gardening
(aragai)

b. selecting/ planting seeds

(vegogo/varovaro)

c. food storage
(ganigani gatotoga gabei gaukalana gauna)

d. do you make decisions in groups or as individuals? Explain
Gulua vegogo or kila kareva be geregamu o kalani ba dogoloi o kalani? no kila karevaia

20. What are some customs and traditions related to food that affect the health and nutrition of the community?
Gita ma gera kala goneia (customs) e maguli goneia (traditions) ba tuburagatara magulina, ganigani bo ganiani genai goi tauganimu bei verakavaiani o bokevekeveni, o vanua tauia bege kevekeveni.

21. Describe some customs and traditions related to food.
Gita tuburagatara magulina aonai ganigani kavanai ma rovana ba asigina, ganigani rovaia keta no kila karevaia.

Appendix 18: Interview Guide – Key Informant Interview

Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Key informant

Official use: For my records only

Name: _____ Surname: _____
Code/Number: _____ Interview category: _____ Location: _____
Time: _____ Date: _____

1. I would like you to tell me a little bit about your role in this organisation.
    a) Can you tell me your name?
    b) How long have you worked in this organisation?
    c) Can you describe the type of work you do in this organisation?
2. Can you describe the type of work you do?
3. Describe some hardships you have encountered in your role with regards to improving nutrition
    a) at work?
    b) culture?
    c) community?
    d) other?
4. Can you explain your views about food and nutrition in Papua New Guinea communities? What are the nutritional challenges that PNG face in your view?
5. What are some best examples of community empowerment to improve nutrition in PNG? Please describe some of these.
6. Describe how you communicate the importance of food and nutrition in the community?
7. Describe your views about food and nutrition in Papua New Guinea communities?
8. How often do you go to the communities?
9. How do you make an impact in the community?
10. Explain what you do in the communities?
11. What are the key topics/discussions of your awareness in the community, explain?

12. How do you monitor the effectiveness of your programs/policies in the community and organisations?
13. Can you describe how the policies (nutrition/curriculum) are implemented in other organisations?
14. Can you describe how the policies work in the organisation?
15. How effective are these policies and curriculum in the organisations?
16. Describe the difficulties in disseminating the Home Economics curriculum in schools and other organisations.
17. Describe and explain how the curriculum/policies comply to the living standards and the region?
18. Describe how the policies and curriculum make an impact in reducing malnutrition in Papua New Guinea.
19. How does the curriculum tie in with the state policies?
20. Describe the difficulties in disseminating the curriculum/Policies to the schools.
21. What are your thoughts on the nutrition curriculum/nutrition policy?
22. Do you think using the Home Economics/Nutrition curriculum will improve the people's health and nutrition, please explain?
23. Can you describe or explain ways people's eating behaviour can be improved?
24. Explain your expectations for the future of young mothers' health in Papua New Guinea.
25. In your opinion does the policy/curriculum meet the nations needs/goals to improve the livelihood of the female?
26. Explain in what ways could these be improved?
27. Describe the level of Indigenous knowledge utilisation when designing the policy/curriculum/plans in teaching?
28. What is your view of using Indigenous knowledge in preparing nutrition materials for the community/school?
29. In your opinion does the nutrition policy/curriculum meet the nations needs/goals to improve the livelihood of the female?
30. Explain in what ways could these be improved.
31. Describe the level of Indigenous knowledge utilisation when designing the nutrition policy/curriculum/plans in teaching?
32. What in your view is needed to improve nutrition?

Appendix 19: Interview Guide – Key Informant Interview in Keakalo language



Improved nutrition through rural community empowerment in Central Province, Papua New Guinea.

Interview guide for Key informant

Official use: For my records only

Name: _____ Surname: _____
Code/Number: _____ Interview category: _____ Location: _____
Time: _____ Date: _____

1. Thau poro varipaku goi gemu ulavunu wa ragau eh organization thaunai
   [I would like you to tell me a little bit about your role in this organisation.]
   a) Goi raramu ri-
      [Can you tell me your name?]

   b) Rigolo vira po ulavunu eh organization thaunai –
      [How long have you worked in this organisation?]

   c) Poro vailaku ari ulavunu veairia o alarana –
      [Can you describe the type of work you do in this organisation?]

2. Thau poro vailaku raveaina o ulavununia –
   [Can you describe the type of work you do?]

3. Poro vailaku goi o ulavununia thaunai goi raveaina na gemu ulavunu eme gauania pa iligavi ome rawalirana pene goi ganigani pa nutrition gena avanai o ulavununia –
   [Describe some hardships you have encountered in your role with regards to improving nutrition]
   a) Ulavunu avanai?
      [at work?]

   b) Vanua magulirai?
      [culture?]

   c) Vanua thaunai –

[community?]

d) Magau vairia –
other?

4. Goi magemu valavu pa thau poro varipaku ari veaina valu wa ganigani eh nutrition PNG vanua ria wa raveaina e naparana – thau poro va ripaku iligavi vairi mage vilagirana pah goi gemu valavu wa raveaina? –
[Can you explain your views about food and nutrition in Papua New Guinea communities? What are the nutritional challenges that PNG face in your view?]

5. Goi iani thaunai gau geleria ma ge walania iana vanua thaunai pa PNG thaunai nutrition wa raveaina e naparana? Poro vailaku
[What are some best examples of community empowerment to improve nutrition in PNG? Please describe some of these?]

6. Goi raveaina ganigani gena ulavunu go ve roriveronia. Pa ganigani valina wa raveaina go ilagiania vanua thaunai –
[Describe how you communicate the importance of food and nutrition in the community?]

7. Goi gemu valavu wa raveaina ganigani gena ulavunu wa raveaina PNG thaunai –
[Describe your views about food and nutrition in Papua New Guinea communities?]

8. Garo vira go thauni vanua thaunai –
[How often do you go to the communities?]

9. Goi raveaina vanuai gemui ulavunu go Alania thaunai vanua maparana ge mamilaginia mui gemu ulavunu pogo ala auna aunara
[How do you make an impact in the community?]

10. Ulavunu ari veaina go alarana vunua vairi thaunai –
[Explain what you do in the communities?]

11. Go ulavunininia thaunai gemui ve rori pa gemui ulavunu auna auna wa ragau ve alavenina wa ragau ppene mui awerness go Alani thaunai -
[What are the key topics/discussions of your awareness in the community, explain?]

12. Go ulavununia thaunai mui gemui ulavunu ganina eh resaltsi wa raveaina go iania ulavunu pene gavu thaunai –
[How do you monitor the effectiveness of your programs/policies in the community and organisations?]

13. Poro vailaku policy eh vevaripa wa raveaina geria ulavunu thaunai e vevainia ma organization thaunai
[Can you describe how the policies (nutrition/curriculum) are implemented in other organisations?]

14. Ingulu rova ria (Policy) gena ulavunu mui gemui ulavunu thaunai wa raveaina eve vainia –
[Can you describe how the policies work in the organisation?]

15. E policy geria iliga ia kamu pa nowaina?
[How effective are these policies and curriculum in the organisations?]

16. Poro vailaku home-economics gena vevaripa rovaria gena vewalavi wa ari veaina tsikulu organization ge rawalirana ?
[Describe the difficulties in disseminating the Home Economics curriculum in schools and other organisations.]

17. Rova ariveaina ge me miania eh region gena mauli thaonai geme mia gelgele nia pa nowaina
[Describe and explain how the curriculum/policies comply to the living standards and the region?]

18. Rova ariveaina vanua gena anulima limaria eva ve vavania pene ila mageria vii
[Describe how the policies and curriculum make an impact in reducing malnutrition in Papua New Guinea.]

19. PNG gena rova ma evanaginia tsikulu gena rova elerai pa nowaina.
[How does the curriculum tie in with the state policies?]

20. Goi gemu valavu thaonai rova, vairina gemui vevaripa ma eva vewalavenimuinia pa. pene namu raveaina mui gemui vewalavi eva parania
[Describe the difficulties in disseminating the curriculum/Policies to the schools.]

21. Goi o valavuni thaonai tsikulu gena ganigani vevaripa rovaria geria nama eh geria rava poro eilagirairi?
[What are your thoughts on the nutrition curriculum/nutrition policy?]

22. Goi o valavunia thaunai home economics/ganigani gena vevaripa rovaria aunilimalima elerai maene vanamaria pa poro varipaku
[Do you think using the Home Economics/Nutrition curriculum will improve the people's health and nutrition, please explain?]

23. Goi aunilimalima raveaina geganiganinia olemaria ariveainai pige ve vanamaria rorina poro eilagia
[Can you describe or explain ways people's eating behaviour can be improved?]

24. Goi gemu ririwa parana iauiau eh vavine geria mauli ari veaina ene nama poro eilagia?
[Explain your expectations for the future of young mothers' health in Papua New Guinea.]

25. Goi gemu valavu thaunai rova eh vevaripa rovaria iana country gena vevaripa maeva mia gelgelenia vavine geria mauli ma ene va namaria pa
[In your opinion does the policy/curriculum meet the nations needs/goals to improve the livelihood of the female?]

26. Thau poro vailaku ari veaina gere va namaria
[Explain in what ways could these be improved?]

27. Vanua gena vevaripa ari veaina geva ulavunuagiania pene veamai rova gena tharapara geva magaiania wa ariveaina
[Describe the level of Indigenous knowledge utilisation when designing the policy/curriculum/plans in teaching?]

28. Goi gemu valavu wa ragau pene veamai iana vanua gena vevapripara eh raunekana ge ulavunuagiania ari veaina ganigani vevaripa olemana wa raveaina?
[What is your view of using Indigenous knowledge in preparing nutrition materials for the community/school?]

29. Goi gemu valavu thaunai ganigani gena rova national level thaunai ma geve mia gelegelenia iana vavine geria mauli ma eva namana pa
[In your opinion does the nutrition policy/curriculum meet the nations needs/goals to improve the livelihood of the female?]

30. Ari veaina gere ala namarau
[Explain in what ways could these be improved.]

31. Vanua gena rauneka arikamuna eh vanua raunekana wa ari veaina ge ulavunu agiania pene pige ve varipa ulavunu gororai
[Describe the level of Indigenous knowledge utilisation when designing the nutrition policy/curriculum/plans in teaching?]

32. Ganigani wa ari veaina gera va namara poro eilagi rai ri
[What in your view is needed to improve nutrition?]

Appendix 20: Confidentiality Agreement – Research Assistant

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

RESEARCH ASSISTANTS' CONFIDENTIALITY AGREEMENT

I ..... (Full Name - printed)

agree to keep confidential all information concerning the project

.....

.....

.....

..... (Title of Project).

I will not discuss, retain, or copy any project information. All matters discussed during the interview and tok stori will be kept confidential. Any issue of concern will be raised and discussed with the researcher.

Signature: _____ **Date:** _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

Te Kunenga ki Pūrehuroa

School of People, Environment & Planning
Private Bag 11222, Palmerston North 4442, New Zealand. T +64 6 350 4343 F +64 6 350 5737. http://pep.massey.ac.nz

Appendix 21: Confidentiality Agreement – Transcriber

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE RUHA PŪKENGA TANGATA

Improved nutrition through community empowerment in Central Province, Papua New Guinea

TRANSCRIBER'S CONFIDENTIALITY AGREEMENT

I ..... (Full Name - printed) agree to transcribe the recordings provided to me.

I agree to keep confidential all the information provided to me.

I will not make any copies of the transcripts or keep any record of them, other than those required for the project.

Signature: _____ **Date:** _____

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz

Te Kunenga ki Pūrehuroa

School of People, Environment & Planning
Private Bag 11222, Palmerston North 4442, New Zealand. T +64 6 350 4343 F +64 6 350 5737. http://pep.massey.ac.nz

Appendix 22: Letter - PNG Department of Education

Limu Mou-Vagi
PhD candidate in Development Studies
School of People Environment and Planning
Massey University Private Bag 11222
Palmerston North 4442
New Zealand

Mobile: +64 [redacted]
Email: lmouvagi@massey.ac.nz

12/07/2022

Dr Uke Kombra
Secretary for Education
National Department of Education
FinCorp Building, Waigani Drive
P O Box 446,
National Capital District
Papua New Guinea

Dear Dr Kombra,

SUB: Seeking approval to interview Home Economics/Food Technology Curriculum Officers in the Department of Education for my PhD research.

I am a Papua New Guinean currently doing my PhD in Development studies. Before being a PhD student, I worked at the University of Goroka as a food and nutrition lecturer and Home Economics Secondary School Educator. I am also the Pacific Regions Executive for the International Federation of Home Economics.

My research title is "Improved nutrition through community empowerment in Papua New Guinea". My research seeks to explore how community empowerment can improve nutrition. Also explores indigenous nutrition knowledge and practices in a rural village focusing on young single mothers. Nutrition deficiency is more common in rural villages in PNG. Therefore, this research is situated at the intersection of exploring how nutrition could be improved through community empowerment in PNG. I aim to use community empowerment as my primary theoretical lens, within which I will be linking the Indigenous and Rights-Based Approaches (RBAs) to development. I will adopt an RBA that argues that citizens have the right to food and nutrition to maintain nutrition for their wellbeing. The efforts toward improving nutrition in rural communities will strengthen households to improve their

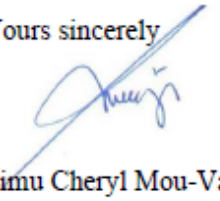
health and nutrition situations. Therefore, my research aims to find already existing strengths and areas where communities could be empowered toward better nutrition.

Given the research background, I sincerely seek your approval to recruit Food Technology curriculum writers within the Department of Education and Home Economics Teachers in the Central Province (specifically Kupiano and Kwikila) to participate in my research.

Your assistance in affirming my request will be greatly appreciated. Should you require further information, please do not hesitate to contact me at my email: lmouvagi@massey.ac.nz

I look forward to your favourable consideration.

Yours sincerely



Limu Cheryl Mou-Vagi

Appendix 23: Letter – Medical Advisory Committee Letter

MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE RURA PŪKENGA TANGATA

Limu Mou-Vagi
PhD candidate in International Development Studies
School of People Environment and Planning
Massey University Private Bag 11222
Palmerston North 4442
New Zealand

Mobile: +64 [redacted]
Email: lmouvagi@massey.ac.nz

22/08/2022

Dr William Pomat
Acting Chair – MRAC
P.O Box 807
Waigani, NCD

Dear Dr Pomat,

SUB: Seeking endorsement to interview Nutrition Officers in the Department of Health and Central Province District health for my PhD research.

I am a PhD candidate in International Development. Before becoming a PhD student, I worked as a Food and nutrition lecturer and a Home Economics Secondary School Educator at the University of Goroka. I am also the Pacific Regions Executive (including Australia and New Zealand) for the International Federation of Home Economics (IFHE).

My research title is "Improved nutrition through community empowerment in Papua New Guinea". My research seeks to explore how community empowerment can improve nutrition. Also explores indigenous nutrition knowledge and practices in a rural village focusing on young single mothers. Nutrition deficiency is more common in rural villages in PNG. Therefore, this research is situated at the intersection of exploring how nutrition could be improved through community empowerment in PNG. I aim to use community empowerment as my primary theoretical lens, within which I will be linking the Indigenous and Rights-Based Approaches (RBAs) to development. I will adopt an RBA that argues that

Appendix 24: PNG Department of Education Approval

DEPARTMENT OF EDUCATION
Office of the Deputy Secretary Policy & Corporate Services

Date: 25/08/2022
File: CM2-4-12

MR. LIMU MOU-VAGI
Massey University
Private Bag 11-222
PALMERSTONE NORTH 4422,
New Zealand

Dear Mr. Mou-Vagi,

SUBJECT: APPROVAL TO CONDUCT RESEARCH

The Department of Education through the Research and Evaluation Division has received your request to conduct research at two Secondary Schools of Kupiano and Kwikila of Central Province as part of your PhD studies.

The Research & Evaluation Steering Committee has vetted your proposal through the 'walkabout process' and grant you the approval to conduct the research at the two Secondary Schools. However, you are reminded to comply with the conditions as highlighted in the DOE Research Request Approval form.

We wish you well in your research study.

Yours sincerely,

MRS. ANNEMARIE KONA
Chairperson – Research & Evaluation Steering Committee
Acting Deputy Secretary

Kincorp Haus L6 B | P.O. Box 446 | Independence Drive | **WAIGANI, NCD** | Papua New Guinea
Telephone: (675) 3288307/ 3288906 | Fax: (675) 325 4646/323 1031
Email: Annemarie_Kona@education.gov.pg Website: www.education.gov.pg

Appendix 25: PNG National Department of Health Approval - Medical Research Advisory



Government of Papua New Guinea
Medical Research Advisory Committee
National Department of Health

PO Box 807
WAIGANI 131, NCD
Papua New Guinea

Phone: + (675) 301 3685
Fax: + (675) 328 9670
Email: william.pomat@pngimr.org.pg

Meeting#: 02-2022
DATE: 06/12/2022

Ms. Limu Mou-Vagi
Massey University
[redacted]
[redacted]
New Zealand

Dear Ms. Limu Mou-Vagi

SUBJECT: MRAC DECISION ON YOUR PROPOSAL SUBMISSION

The Medical Research Advisory Committee (MRAC) of Papua New Guinea has deliberated on your research proposal titled "Improved nutrition through community empowerment in Central Province, Papua New Guinea."

Your proposal was approved and assigned **MRAC#22.60**

MRAC would like to thank you for your submission and wish you all the best in the implementation of your PhD thesis project.

Investigators are reminded of approved research to be conducted according to the MRAC guidelines at all times and the importance of keeping relevant authorities including MRAC informed on the progress and outcomes of their study.

Thank you and best wishes.

.....
Professor William Pomat
Acting Chairperson - MRAC