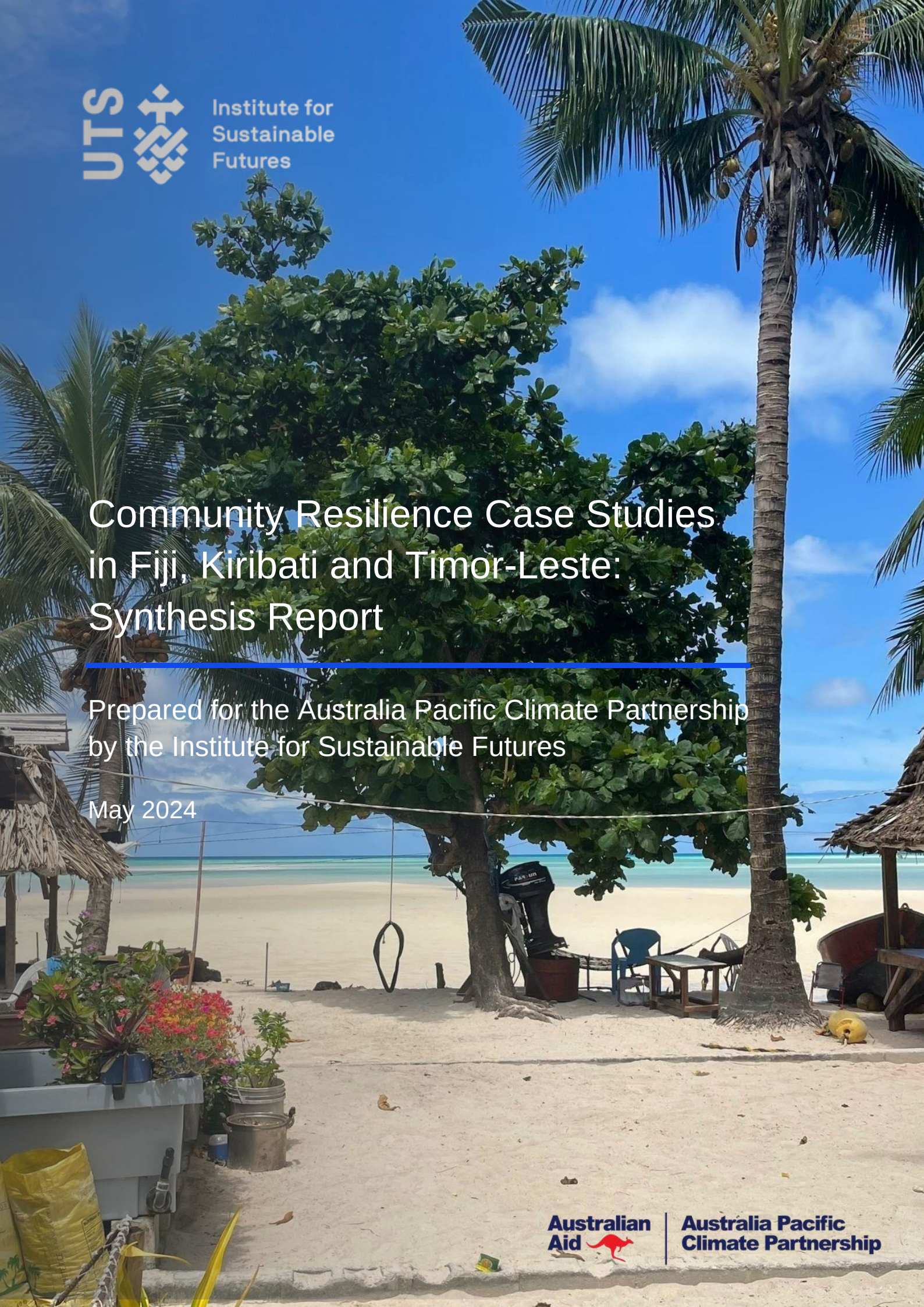

UTS Institute for Sustainable Futures

Community Resilience Case Studies in Fiji, Kiribati and Timor-Leste: Synthesis Report

Prepared for the Australia Pacific Climate Partnership by the Institute for Sustainable Futures

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Australian Aid | Australia Pacific Climate Partnership

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Executive Summary

Introduction and research approach

This synthesis report presents the findings of case study research undertaken by the University of Technology Sydney, Institute for Sustainable Futures (UTS-ISF) for the Australian Government through the Australia Pacific Climate Partnership in 2024. The report provides insights into experiences of community resilience to climate change and disasters in the Pacific and Timor-Leste, drawing from three case studies in selected communities. The case studies are linked to specific Department of Foreign Affairs and Trade (DFAT) investments relevant to each country and community context, and were undertaken with partners in each country as described below.

Country	Community	DFAT investment and case study country partners (in bold)
 **Fiji**	Waikalou community in Serea village, Naitasiri Province	**Women's Fund Fiji** and support offered to the Naitasiri Women in Dairy Group.
 **Kiribati**	Betio, South Tarawa	Atoll Food Futures, implemented by **Live and Learn Kiribati**, is contributing to improve food security and reduce over-reliance on imported food in Kiribati.
 **Timor-Leste**	Morcoluli in Manufahi Municipality	**PARTISIPA** collaborates with national and sub-national governments to enhance policies, systems, and skills for decentralised service delivery and village level infrastructure.

The case study research answered research questions which focus on how Pacific communities are building resilience to climate change and disasters; factors contributing to or serving as barriers to climate resilient development; and lessons and insights for development partners.

UTS-ISF's Community Resilience Framework[1] was used to frame the research, from data collection, analysis and write-up. A strengths-based approach was foundational to the research methodology. UTS-ISF researchers collaborated closely with partners from the three case study countries to develop the data collection methodology, and continued the partnership approach during data collection, analysis and write-up of findings. Data collection in each community involved interviews, focus group discussions, transect walks, observations and a community workshop which provided communities the opportunity to validate emerging findings. Diverse community members including women, men, people with disabilities, young people, community leaders, religious leaders as well as external stakeholders such as government representatives actively participated in the research.

Findings, lessons and proposed actions for DFAT and development partners

The ability of communities to adapt and transform to the impacts of climate change and disasters is dependent on broad and holistic aspects of resilience and adaptive capacity that exist at local level. In the Pacific, social capital (belief systems, leadership and collective action - key aspects of Pacific traditional governance) and human capital (change agents, and the blending of traditional and modern skills and knowledge systems) are key underlying aspects of climate resilient communities.. Key findings highlight that community resilience is influenced by a complex interplay of context-specific and locally defined social, economic, environmental and political factors, and that support for access to climate information and resources to action in local contexts is needed.

Key contributors to community resilience were:

- Motivated and responsive local leadership,
- Willingness to adapt and change; and collective and communal attitudes,

[1] See Gero, A., Winterford, K. and Davila, F. (2024) A Pacific Community Resilience Framework: exploring a holistic perspective through a strengths-based approach and systems thinking, Asia Pacific Viewpoint. https://doi.org/10.1111/apv.12411

- Combined traditional and external knowledge, applied to issues prioritised by the local community.

Barriers to resilience include:

- Lack of access to resources such as water, land and resilient infrastructure,
- Lack of adaption options (socially determined barriers and limits can restrict adaptation options (e.g. ineffective policy or lack of financial resources), as can 'hard' limits such as environmental factors such as loss of land, lack of water) and competing concerns constrain the ability of communities to take transformative action.

Reported climate hazards and impacts:

	Reported hazards	Reported impacts
Fiji 	• Increased frequency of cyclones • Heavy rainfall • Widening of the river • Unpredictable seasons • Longer, hotter summer season and heat waves	• Damage to crops, infrastructure and land • Overflow of drainage systems • Contamination of water sources • Increased landslides • Relocation of some houses • Reduced accessibility to farmlands • Altered growing of root crops and unavailability of some varieties • Heat stress, difficulty to work in heat waves
Kiribati 	• Increased temperatures • Erratic rainfall • Increased storm intensity coupled with king tides • Coastal flooding and inundation • Coastal erosion	• Warmer temperatures makes growing food more difficult • Health impacts on older people and people with disabilities • Impact on fish stock • Damaged homes and infrastructure • Water and food insecurity
Timor-Leste 	• Longer dry seasons • Erratic, unpredictable rainfall • Heavier rainfall in wet season	• Less available water in dry season • Limited access to health care (clinic closed when no water) • Food insecurity • Health impacts e.g. skin rashes • Conflicts over water • Reduced income • Damaged crops • Landslides and damaged roads • Limited access to markets

Demonstrations of resilience: In Fiji - Livelihood diversification, altered agricultural practices, tree planting, relocation of vulnerable assets. In Kiribati - seeking financial and economic opportunities, strengthening local governance, addressing food security with the use of Foodcubes, traditional sea wall structures, use of sandbags and mangrove planting. In Timor Leste – use of traditional ecological knowledge, sharing of resources, kinship obligations.

Diverse experiences of resilience: In Fiji – gender dynamics were evolving and men were supporting women's leadership in the dairy sector; positive views of women's economic participation were described by both women and men. In Kiribati - Men and women described proactive efforts to strengthen economic resilience; young people stressed the need for more and diverse sources of income, employment and grants; people with disabilities highlighted the positive impact of the introduction of social protection. In Timor-Leste - men and women described saving seeds for use in future seasons, changed and diversified their agricultural crops, and women collectively managed microfinance loans. Families walked long distances to collect water, shared food, grew food only for consumption, and borrowed money from family members and neighbours in times of water insecurity.

Aspirations for future resilience: Fiji – continuing their religious faith, improved knowledge around women's economic empowerment and business skills and ongoing efforts to maintain *solesolevaki* (unity, mutual support and collaboration). Kiribati – increasing efforts to collaborate, continue their cultural practices and maintain their cultural identity and desire for increased women's participation community decision making. Timor-Leste – Continuing their hard working attitudes and collaborative approaches, ongoing cultural identity and customs, improvement to water facilities to ensure equal and improved access to water.

Women in Waikalou community participant in a focus group discussion as part of the research. [Photo credit: Tazrina Chowdhury, UTS-ISF]

Examples of how broad resilience characteristics can support climate change adaptation:

Communities with a willingness to change and adapt are more readily able to change the crops they grow when the climate is no longer suitable. A flexible attitude enables farmers to change the timing/season in which crops are normally harvested, sometimes going against traditional practices taken for generations. A willingness to change and adapt enables people to diversify their sources of livelihood so they are not reliant on activities that are directly affected by weather and climate.

Strong and collaborative community networks enable early warning messages to be shared more effectively and efficiently. Information sharing in times leading up to disasters are critical to take anticipatory actions. Strong community networks enable people with specific needs (e.g. disabled and elderly people and people living in highly exposed locations) to be better cared for in times of disaster. Community members will know their roles and responsibilities to ensure they are looked after.

Communal attitudes fostered a practice of supporting each other in times of food and water insecurity. Communities demonstrated how a communal approach to resources enabled the sharing of food, water, labour and money for survival in times of crisis.

Strong local leadership enabled responses to climate and disaster events to be coordinated, with known roles, responsibilities and communication channels. Local leaders that have comprehensive awareness of the community, aspirations for resilient development and plans in place to take action support resilient development in communities.

Women's economic empowerment and supporting women's leadership fostered increased women's confidence, enabling them to take action, play leadership roles and attain new levels of respect in the community. This leadership and respect from the community can translate to leadership in times of disasters, where women can play key roles in community organising, e.g. data collection, managing evacuation centres, and coordinating the care of children, elderly and people with disabilities.

Entrepreneurship and innovative livelihood activities can create opportunities for income generation. Income can fund activities to increase resilience of infrastructure (e.g. houses made stronger using more robust materials), purchasing food, or funding household health and education costs.

Key lessons learned and proposed actions for DFAT and development partners relate to governance; locally-led development and the importance of co-design; the need for greater coordination; gender equality, disability and social inclusion; infrastructure and urban contexts; and the role of research and the usefulness of a conceptual framework, such as the Community Resilience Framework used in this research, to explore community experiences and demonstrations of resilience.

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Acronyms

AFF	Atoll Food Futures
DFAT	Department of Foreign Affairs and Trade
DPO	Disabled person's organisation
FGD	Focus Group Discussion
FRDP	Framework for Resilient Development in the Pacific
ICRT	In-country research team
NWDG	Naitasiri Women in Dairy Group
UTS-ISF	University of Technology Sydney, Institute for Sustainable Futures
WFF	Women's Fund Fiji

1. Introduction

In 2024, the Australian Government through the Australia Pacific Climate Partnership (the Climate Partnership) commissioned the University of Technology Sydney, Institute for Sustainable Futures (UTS-ISF) to conduct case study research on community resilience. The research was carried out in three communities in Fiji, Kiribati and Timor Leste. These case studies are linked to specific Department of Foreign Affairs and Trade (DFAT) investments relevant to each country and community context. The objective of the case studies was to explore and capture insights about selected Pacific community's lived experience in responding to climate and disaster risk and building resilience.

This synthesis report presents UTS-ISF's case study research approach, findings and proposed actions for Australian government and development partners in the Pacific region informed by the case study findings. It is of value to DFAT (Canberra and Post), Pacific country governments (both those of the case study countries and beyond), communities, and other Pacific development partners seeking to support regional priorities, as described in the Framework for Resilient Development in the Pacific (FRDP for example).

This report is prepared by researchers from UTS-ISF, with significant contributions from partner organisations in the three case study countries: Women's Fund Fiji (Fiji), Live and Learn (Kiribati) and PARTISIPA (Timor-Leste). Stand-alone country case study reports are also available *[INSERT LINKS WHEN AVAILABLE].*

2. Case study countries, selected community and DFAT investment

Three case studies were selected for involvement in this research. Case studies were selected based on criteria including:

- A range of different geographic locations (country, and diverse subnational locations)
- DFAT investment focus on community resilience
- Diverse sector focus of DFAT investments
- Support from DFAT Post
- Availability and appetite of partners to engage in the research
- Consent from, and willingness of, community to participate.

Liurai Village, the location of Morcoluli community in Manufahi Municipality, Timor-Leste. [Photo credit: Jessie Meaney-Davis, UTS-ISF]

The Climate Partnership facilitated early discussions with DFAT Posts and in-country partners to select and formalise participation in the research. UTS-ISF then led the management and implementation of the research with in-country partners with support from the Climate Partnership.

The table below describes the selected community and DFAT investment relevant to each case study.

Table 1: Case study community and DFAT investment

 **Fiji**	The Fiji case study explored resilience of the **Waikalou community in Serea village, Fiji,** inclusive of women's involvement with the Naitasiri Women's Dairy Group (NWDG). The case study centred on the DFAT-funded program Women's Fund Fiji (WFF). WFF offers grants to women-led organisations in Fiji and NWDG is one of their grant recipients. Through WFF's grant, NWDG has been increasing community resilience by creating livelihood opportunities and promoting alternative income generation activities.
 **Kiribati**	The Kiribati case study focused on community resilience in **Betio, South Tarawa, Kiribati**. Live and Learn's DFAT-funded initiative Atoll Food Futures (AFF) is contributing to improve food security and reduce over-reliance on imported food in Kiribati. AFF's activities such as installation of food cubes for gardening, seed saving training and various other actions are strengthening community resilience in Betio.
 **Timor-Leste**	The Timor-Leste case study delves into the community resilience of **Morcoluli in Manufahi Municipality, Timor-Leste**, with a focus on PARTISIPA, a DFAT investment supporting the Government of Timor-Leste. PARTISIPA collaborates with national and sub-national governments to enhance policies, systems, and skills for decentralised service delivery and village level infrastructure. Its efforts in improving rural water operations, maintenance, and governance are contributing to community resilience in Morcoluli.

Serea Village, the location of Waikalou community in Fiji. [Photo credit: Tazrina

The three countries are highly exposed to a range of natural hazards and have a history of being affected by different disasters. Climate change is expected to further increase the risks faced by these countries. During community research, members of the case study locations described how climate change and weather events have primarily impacted their lives in recent years. The research also uncovered diverse experiences of climate change among diverse groups. Table 2 provides a snapshot of the country context, community context, and the community's experiences of climate change impacts across the case studies.

Table 2: Snapshot of case study context and community's experience of climate change

	Community context	Community reported climate change and disaster risks	Reported impacts on the community	Experience of diverse community members		
				Men	Women	People with disabilities
 **Fiji**	The Waikalou community is in Serea village within Naitasiri Province, in Viti Levu, Fiji. Total population of the village is 858. Agriculture is the main income source of the community.	• Increased frequency of cyclones • Heavy rainfall • Widening of the river • Unpredictable seasons • Longer, hotter summer season and heat waves	• Damage to crops, infrastructure and land • Overflow of drainage systems • Contamination of water sources • Increased landslides • Relocation of some houses • Reduced accessibility to farmlands • Altered growing of root crops and unavailability of some varieties • Heat stress, difficulty to work in heat waves	Men encounter challenges to farming such as loss of land from river erosion and landslides, crop damage due to heavy rainfall and floods, and decreased productivity due to prolonged heat stress.	Women's stress and workload have been amplified with the increased risk of children drowning due to changes in river flow direction during rainy seasons and floods. Women also face accessibility challenges when floodwaters submerge roads.	People with disabilities do not receive any additional support for disaster preparedness. People with disabilities are often unaware of the support they could avail from government or civil society.
 **Kiribati**	Betio is an urban settlement at southernmost most point of South Tarawa, Kiribati. It is most densely populated area in Kiribati consisting of 15,000 inhabitants per square kilometre.	• Increased temperatures • Erratic rainfall • Increased storm intensity coupled with king tides • Coastal flooding and inundation • Coastal erosion	• Warmer temperatures makes growing food more difficult • Health impacts on older people and people with disabilities • Impact on fish stock • Damaged homes and infrastructure • Water and food insecurity	Men described climate impacts including coastal erosion, extreme heat, changed fishing conditions changed and unreliable / strong winds.	Women described extreme heat, high temperatures, coastal erosion and limited fresh water / salty well water.	People with disabilities noted that they felt the extreme heat more acutely, coastal erosion and salty well water.

 **Timor-Leste**	Morcoluli is one of the six hamlets (aldeias) in Suku Liurai, which is located within Turiscai Administrative region in Manufahi Municipality. The total population is 158 and the village is located in the mountains at 1200m elevation.	• Longer dry seasons • Erratic, unpredictable rainfall • Heavier rainfall in wet season	• Less available water in dry season • Limited access to health care (clinic closed when no water) • Food insecurity • Health impacts e.g. skin rashes • Conflicts over water • Reduced income • Damaged crops • Landslides and damaged roads • Limited access to markets	During dry seasons, men are affected by the loss of crops especially coffee and livestock, leading to reduced income and unpredictable cash flow.	Women are concerned about food security and decreased income as plants, crops (especially coffee), and livestock die during dry seasons.	The prolonged dry season leads to decreased water availability, forcing individuals to walk long distances to collect water, which is not possible for people with mobility impairments.

3. Overview of case study approach

The case study research is framed by three overarching questions and sub-questions which enable synthesis across the three case studies. The research questions are:

1. How are Pacific communities building resilience to climate change and/or disasters?
    a. What climate and disaster risks are Pacific communities responding to?
    b. How are climate and disaster risk experienced differently by diverse groups (men, women, youth, people with disabilities)?
    c. To what extent, and how is resilience within selected communities being /demonstrated?
    d. How is Australian development assistance supporting/or not supporting climate and disaster resilient development in these case studies areas?
2. What are the factors contributing to, or serving as barriers to climate and disaster resilient development?
3. What insights and lessons arise from the case studies that are relevant to development partners and practitioners?
    a. How can Australia's development assistance better support and enable climate and disaster resilient development?

The case study research was conducted from January 2024 to April 2024. UTS-ISF researchers maintained regular communication with Pacific partner organisations from January onwards, finalised travel plans to case study locations, before undertaking research in communities (4-5 days in each community) in February and March. Data was analysed and findings written up in March-April.

Community resilience framework

A Community Resilience Framework developed by UTS-ISF was used to frame the research, from data collection, analysis and write-up. The Framework sets out five elements of community resilience, and building blocks of adaptive capacity which describe foundational elements that support a resilient community. See Annex 1 for a more detailed description of the Framework. The five elements and building blocks of the Community Resilience Framework were used to explore and report on experience of community resilience.

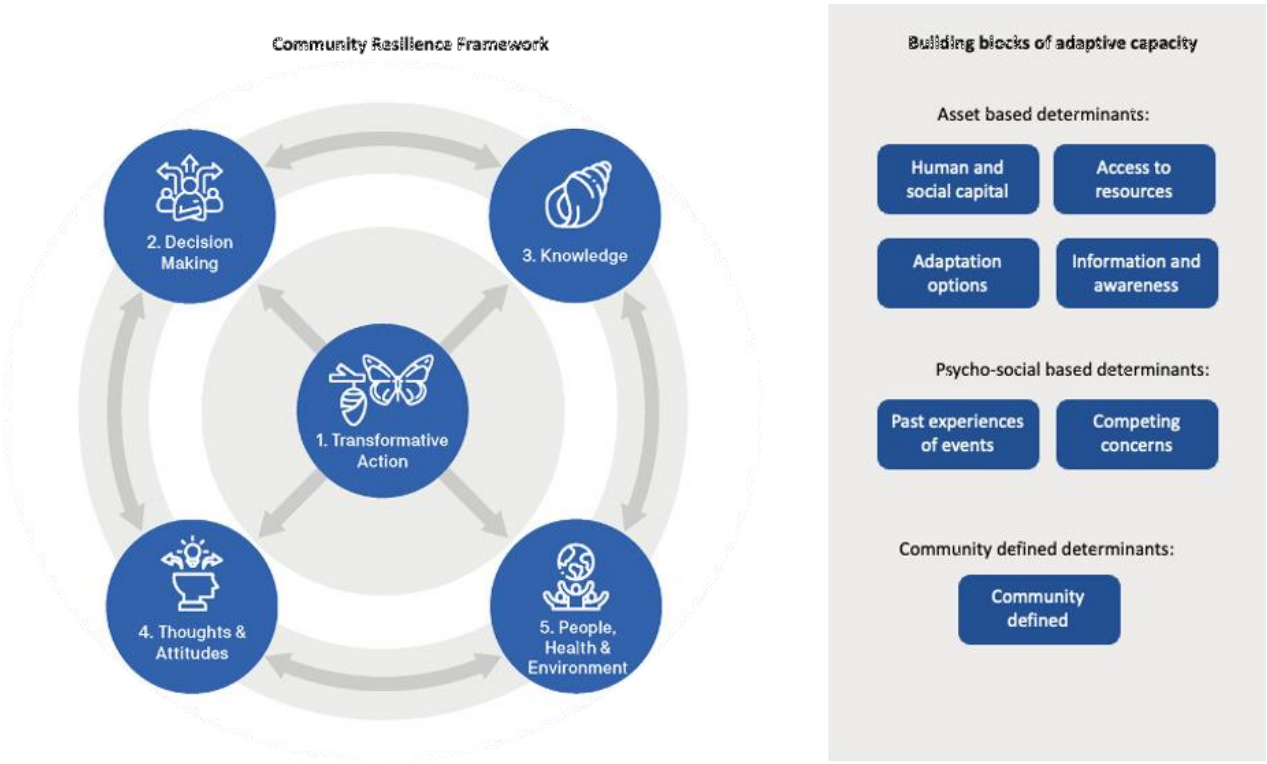
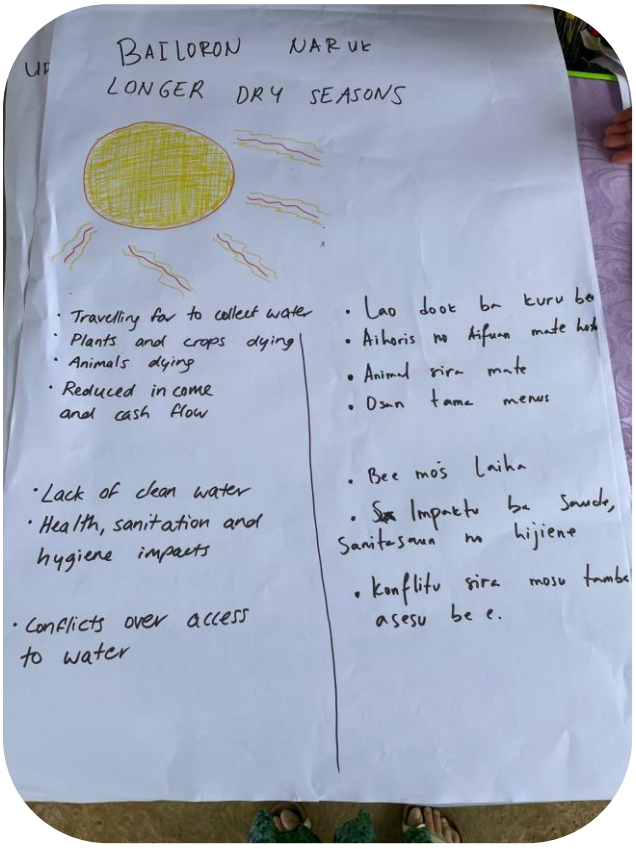


Figure 1. UTS-ISF Community resilience framework

Co-designing the research

UTS-ISF researchers collaborated closely with partners from the three case study countries to develop the data collection approach. This collaborative process involved planning sessions with each partner and forming in-country research teams (ICRTs). The list of ICRT members is provided in Annex 2. The ICRTs engaged in online meetings prior to in-country research to build trust and understanding to work as a team. The meetings also benefitted Pacific partners and UTS-ISF in two main ways: partners gained insights into the research objectives, the UTS-ISF's Community Resilience Framework, and opportunities for them to shape the design; UTS-ISF gained valuable knowledge about the country and community contexts, enabling them to tailor the research approaches accordingly.

When UTS-ISF researchers arrived in the case study countries, they co-facilitated an in-person workshop with the ICRT. This workshop allowed for discussion of research methods, translation, daily research planning and logistics, ethical considerations and mutual expectations, leading to the finalisation of the community research approach before travelling to case study sites.



Emerging findings were presented at the community workshops in English and local language (Tetum) in Timor-Leste. [Photo credit: Anna Gero, UTS-ISF]

Throughout the data collection phase, UTS-ISF researchers have been guided by Pacific partners to uphold community protocols and ensure that community engagement was both safe and enriching for community members. This partnership approach facilitated open dialogue, allowing community members to share their perspectives in a secure environment and contribute valuable insights to the research.

A strengths-based approach[2] (SBA) was foundational to the research methodology. In each community, researchers explored what was working well and strengths of individuals and groups. Strengths were identified by community members as enablers of past responses to climate change and disaster risks. These were used as a foundation for community members to describe aspirations and future improvements to build resilience in their communities. This inquiry was a key activity in the community workshops.

Data collection methods

Through the co-designing approach, the research teams across the three case studies agreed to use four qualitative methods to guide community consultations with various stakeholders.

- **Interviews** with community leaders, men, women, people with disabilities and government stakeholders
- **Focus group discussions** (FGDs) for men's and women's groups
- **Transect walk and observations of the community** with youth (both male and female)
- **Community workshop** to feedback and validate emerging research findings

[2] Winterford, K., Rhodes, D., Dureau, C. (2023). A strengths-based approach to international development: Reframing Aid, Practical Action Publishing, Rugby, UK.

A woman and man with disabilities participated in the research in Kiribati. [Photo credit: Jessie Meaney-Davis, UTS-ISF]

Research participants

Diverse community members including women, men, people with disabilities, young people, community leaders, religious leaders as well as external stakeholders such as government representatives, actively participated in various methods and activities throughout the data collection process. The total number and diversity of participants in each case study is included in Annex 3.

Data analysis and write-up

Analysis of data began with the ICRTs developing the participatory workshop at the end of each community visit. The process of sense-making and validation was undertaken with community members contributing through workshop activities. Analysis and write-up continued, with UTS-ISF leading the process with support and contributions from partners in Fiji, Kiribati and Timor-Leste.

4. How are communities building resilience to climate change and disasters?

Community resilience is influenced by a complex interplay of context-specific social, economic, environmental and political factors, as demonstrated in the case studies. It is therefore not always constructive to compare similarities and differences in climate resilience across contexts. What works in one context may not necessarily work in another due to these complexities. The use of the Community Resilience Framework helped to unpack these context-specific complexities and explore how elements of resilience act together to enable or disrupt progress to achieving stronger resilience.

In this section we synthesise key contributors and barriers to resilience and in Table 3, summarise the findings of how community resilience is being demonstrated in each case study.

Key contributors and enablers of resilience are described below.

Motivated and responsive local leadership. Where local (formal and informal) governance included motived leadership (e.g. in Morcoluli, Timor-Leste), a coordinated approach to resilient development activities could occur, and transformative action was possible. Effective leadership provides channels for community members to voice their concerns and priorities, that could then be shared with other levels of government (e.g. in Betio, Kiribati). Progress is needed to provide opportunities for women to take up leadership positions in all three communities, which would further support inclusive decision-making. Further efforts could also explore ways to strengthen coordination between levels of government (see Lesson 1 in Section 5).

Willingness to adapt and change; and collective and communal attitudes. Communities that demonstrated a willingness to change, try new things, and displayed entrepreneurial attitudes could more readily change and adapt to the dynamics associated with climate change. E.g. changing agricultural practices or growing alternate crops (e.g. Waikalou, Fiji and Morcoluli, Timor-Leste) and learning new skills to diversify livelihoods (e.g., Betio, Kiribati and Waikalou, Fiji). Communities also placed a high value of their collective attitudes and ways of working, which was a contributor to resilience through acts of sharing labour and resources, and offering support in times of crisis.

Combined traditional and external knowledge, applied to issues prioritised by the local community. Resilience was strengthened when external knowledge was provided on issues prioritised by the local community, complementing and integrating with traditional knowledge. For example, traditional knowledge about water management in Morcoluli and Betio (local water customs) was linked with municipal government technical support to the local water users group. Live and Learn increased knowledge of climate-resilient farming techniques in Kiribati; and Fiji's Ministry of Agriculture provided women of NWDG and local Waikalou farmers with scientific information to enhance their climate and disaster resilience through improving agricultural practices. Agriculture, food security and water management were high priorities for the communities of Betio and Morcoluli, and participants in both countries described strong local knowledge on these issues.

Barriers to community resilience were:

Lack of access to resources such as water, land and resilient infrastructure. Community members in Morcoluli, Timor-Leste and Betio, Kiribati described times of crisis when access to food and water were insufficient and adaptive (and sometimes maladaptive) measures were taken that did not support their wellbeing but were taken for survival e.g. rationing water. The lack of resilient infrastructure was also most evident in Morcoluli (particularly the road and water infrastructure) and Betio (particularly the water and sanitation infrastructure).

Lack of adaptation options due to limits of the environment, urban development and competing concerns act as barriers to resilience. These barriers were particularly evident in Betio, where the community had an increasing urban population with limited access to land and water. The increasing urgency and severity of climate change impacts led to immediate and short-term solutions being prioritised, and there were limited long-term viable climate change adaptation options present in Betio. The competing concerns of over-crowding and urgency around access to food and water meant longer term planning and thinking about community resilience was constrained. This is a significant barrier to community resilience, and feelings of disempowerment were evident amongst some community members.

Part of South Tarawa, Kiribati from above shows the limited land available the population to grow food. [Photo credit: Jessie Meaney-Davis, UTS-ISF]

Inadequate access to information, and limited information coordination and sharing between community members and government have acted as barriers to strengthening community resilience. Across all three case studies, participants described mixed or limited access to information about climate change, including adaptation options. For example, in Kiribati, national government policy on climate change has reversed over recent years, sending mixed messages on how to respond at community level. In Waikalou, participants noted lack of coordination and information sharing between Provincial government and the community and in Morcoluli, community members expected more from government on information about environmental protections.

Table 3. Summary of community resilience findings across three case studies

	Demonstrations of resilience	Diverse experiences of resilience	Contributors and barriers to resilience	Aspirations for future resilience	Lessons for supporting climate change adaptation and disaster resilience
 Fiji	The community of Waikalou, Fiji, demonstrates resilience in the face of climate change through their **proactive efforts to adapt**, and their **cultural ethos of *solesolevaki*** (unity, mutual support and collaboration). In response to shifting weather patterns and increased climate hazards affecting farming and agricultural production, **residents have diversified their sources of income** and **altered agricultural practices** while **actively mitigating risks** through tree planting and relocation of vulnerable structures away from riverbanks.	**Gender dynamics have been evolving**, with women assuming entrepreneurial roles in initiatives like the Naitasiri Women's Dairy Group (NWDG), supported by Women's Fund Fiji and Australian Aid), and **men supporting women's leadership** in the dairy sector. Increasingly **positive views of women's economic participation** were described by both women and men, and women were eager to expand their activities.	**Access to information on climate-resilient practices** from provincial government has empowered NWDG and **local farmers to adopt new techniques,** however research participants also noted **ongoing challenges** in accessing other types of information from provincial levels, the need to **improve disaster response coordination**. The commercial gravel extraction operation on the local river, and its **negative impacts on riverbank erosion** and blocking access to farmland are also of concern to Waikalou residents. **Social structures** including churches, youth groups, and government agencies have **collaborated** to establish a more sustainable waste management system.	Research participants emphasised the **importance of continuing their religious faith**, **knowledge** (e.g. for women's economic empowerment, business skills), and **culture of *solesolevaki*** to ensure their resilience into the future, and women expressed the need to continue to **prioritise women's empowerment and social inclusion** in local governance.	**Women's economic empowerment and supporting women's leadership** fostered increased women's confidence, enabling them to take action, play leadership roles and attain new levels of respect in the community. Women are well positioned to undertake preparedness actions such as saving money for emergencies and retrofitting their houses. Women's leadership and respect in the community can enable women to voice their priorities and influence development of inclusive disaster management plans for communities. **Communities with a willingness to change and adapt** are more readily able to change the crops they grow when the climate is no longer suitable. In Waikalou, a flexible attitude enabled farmers to harvest new crop varieties other than root crops and relocating farming plots, sometimes going against traditional practices taken for generations. Their willingness to change enables farmers and women to respond to climate change.

 Kiribati	People in Betio, Kiribati, live in a highly challenging context of **rapid urbanisation**, **overcrowding**, and **overexploitation** of natural resources, and **limited availability of land and water** on the small island of Betio, all of which exacerbates the effects of climate change. People in Betio are building their resilience through **actively seeking financial and economic opportunities** and beginning to strengthen **local governance and collaboration**. A variety of actions were being taken to respond and recover from the impacts of **water insecurity, increased heat, the reduced ability to grow food,** and the damage caused by king tides, coastal erosion and strong winds. They have been **planting trees** to improve water and soil quality and cool their homes, **using Foodcubes** (raised garden beds) to grow vegetables and fruit in fertile soil, and **using *bwibwi*** (traditional sea barriers made of natural materials), **sandbags** and **mangrove planting** to protect assets from king tides, sea level rise and strong winds.	Men and women described **proactive efforts to strengthen economic resilience**, for example through applying for **small grants**, **pooling resources**, and creating new and **innovative employment and income** generation activities. **Young people** stressed the **need for more and diverse sources of income, employment and grants** into the future to support their resilience. **People with disabilities** highlighted the positive impact of the introduction of **social protection for people with disabilities** in 2019.	The majority of the population (22,000 people) in Betio have migrated from other islands in Kiribati, and people belong to a wide variety of different Christian denominations. This means that **traditional systems of governance and social cohesion are not intact** in many parts of Betio. Local government has demonstrated its ability to share information with residents and motivate action (e.g. community clean ups) and research participants consistently expressed a **desire and necessity to work together** more into the future. A growing population faced with an unpredictable climate is only putting further pressure on **already constrained infrastructure** (e.g. housing, water and sanitation systems) and **resources** (e.g. access to water). Addressing the **urgent infrastructure and resource challenges** in urbanising contexts such as Betio will be a critical part of supporting community resilience, particularly in places where **adaptation options are limited**.	Research participants recognised that people in Betio are **increasingly coming together to collaborate**, and the continuation of cultural identity, knowledge and practices, especially *ikarekebai* (sharing and working together) would be essential for their community resilience into the future.	In Betio, **entrepreneurship and innovative livelihood activities** created opportunities for income generation. Income from selling vegetables grown in Foodcubes funded activities to increase resilience of infrastructure (e.g. houses made stronger through the purchase of more robust materials), purchasing fresh food, and also household health and education costs. **Strong and collaborative community networks** enable early warning messages to be shared more effectively. Information sharing in times leading up to disasters are critical to take anticipatory actions. Strong community networks enable people with specific needs (e.g. disabled and elderly people and people living in highly exposed locations) to be better cared for in times of disaster. Community members will know their roles and responsibilities to ensure they are looked after.

 Timor-Leste	The community of Morcoluli has built upon a **long history of *amizade*** (unity and interdependence) and **traditional ecological knowledge** and practices by adopting a range of new measures to adapt to climate change. In response to the longer dry seasons, unpredictable and often heavier rainfall, people continue to use **traditional water and land care practices** and laws that promote responsible use of natural resources, water conservation, enhancing biodiversity, working within the natural parameters of the natural world, and **sharing of resources and kinship obligations**.	**Climate change is driving water, food and financial insecurity** in Morcoluli, all of which are exacerbated by the poor quality of the main connecting road, which limits access to markets and services outside the *suku* (village). Both men and women described **saving seeds** for use in future seasons, **changing and diversifying their agricultural crops**, and women are collectively managing **microfinance loans**. When access to water is more limited during dry seasons, and crops and livestock are dying, **families resort to walking long distances to collect water**, **digging for water**, **sharing food**, **growing food only for consumption**, and **borrowing money** from family members and neighbours.	There are a range of formal and informal community decision-making structures in Morcoluli with **highly motivated leaders**, which act as a **positive foundation to community resilience**. Most formal **leadership positions are held by men**, except in the newly established GMF (Water User Group), in which fifty percent of members are women. The new GMF and its responsibilities for **managing water facilities** in Morcoluli have the potential to **improve aspects water governance**, **women's leadership and gender dynamics** in Morcoluli, though more technical assistance is required from the municipal water, sanitation and environment services and **more financial resources** are required to **improve water infrastructure**.	The people of Morcoluli repeatedly described the **perseverant, hard-working and collaborative attitudes** of community members as core to their ongoing resilience. They expressed pride in their **connections to each other** and their **natural environment**. Their priorities for the future include the continuation of their **cultural identity and customs** the **rehabilitation of the road** to enable access to markets and basic services; the **improvement of the water facilities** to ensure equal and improved access to water; increased access to information about water conservation and climate resilient livelihoods; and **increased access to opportunities and services for people with disabilities.**	**Communal attitudes** in Morcoluli fostered a practice of supporting each other in times of food and water insecurity. Participants described how their communal approach facilitated the sharing of food, water, labour and money for survival in times of crisis. **Strong local leadership** enables responses to climate and disaster events to be coordinated, with known roles, responsibilities and communication channels. Local leaders with a comprehensive understanding of community needs, aspirations for climate resilient development and actionable plans can better promote resilience in communities.

5. Lessons learned and proposed actions to strengthen community resilience

Informed by the case study findings, key lessons learned and proposed actions for DFAT and development partners are described below.

Lesson 1: Inclusive local governance that connects to, and coordinates with sub-national and national government paves the way for effective community resilience programs.

The case studies provide examples of diverse governance contexts, e.g. strong local governance in Morcoluli in Timor-Leste, with motivated local leadership and decision-making, is a significant strength supporting their resilience. Conversely, in Kiribati, the traditional governance in Betio was less prominent due to the population predominantly made up of residents from across Kiribati's outer islands and other parts of Tarawa, which meant traditional governance structures were not intact. In Fiji, the local formal and informal governance systems in Waikalou lacked inclusivity, which meant that many community members were not aware of, and did not benefit from, formal preparedness and response initiatives supported by the government or other government initiatives seeking to address climate change and disaster risk.

The cultural leader in Morcoluli was important to informal governance. [Photo credit: Anna Gero, UTS-ISF]

Across all case studies, research teams observed that most formal leadership positions were held by men, indicating that inclusion of women's voices in local governance is an area where progress is needed. Findings from case studies also point to the need to strengthen coordination and collaboration between local governance (including government and civil society stakeholders) and higher levels of government to support integration of climate resilient development. Stronger collaboration would enable national governments to better understand the strengths and priorities of local communities for acting on climate change, and for national policies to therefore better reflect the aspirations of communities for actions on climate change. In parallel, strong collaboration would allow communities, and those supporting them (e.g. civil society organisations), to align their efforts to progress national priorities – including climate policy and strategy. Communities would be able to identify where external support is needed to build resilience to climate change impacts, that are outside their capacity and expertise.

Proposed action: Community resilience investments contribute to strengthening connections and coordination between local (formal and informal) governance to sub-national and national government policy. Investments can intentionally build relationships with sub-national and national government stakeholders, share project progress and findings with government, and describe the links to national climate change policy within project designs to strengthen these connections. Once described clearly and built into project designs, activities can be implemented that provide a platform for communities, sub-national and national dialogue and collaboration for climate resilient development that is mutually agreed at multiple scales.

Lesson 2: Community resilience investments can leverage existing communal attitudes and practices present in Pacific and Timorese communities to build on existing strengths and facilitate local ownership.

In Fiji, Kiribati and Timor-Leste, the traditional ethos and culture of working together and communal solidarity emerged as a key strength contributing to community resilience. Practices like *solesolevaki* in Waikalou (Fiji), *ikarekbai* in Betio (Kiribati) and *amizade* in Morcoluli (Timor-Leste) emphasise the profound sense of community unity and collective effort. These attitudes and practices are a significant strength for any climate resilient investment and should be considered including for dialogue on adaptation options.

Proposed action: DFAT and development partners have an opportunity to recognise collective traditional practices as an entry point to support community resilience, and foster collaborative community action for holistic climate resilience initiatives. Community resilience investment designs and activities could explicitly recognise communal attitudes and practices as a strength to build on, ensuring they reflect local strengths, needs and adopt a bottom-up approach to build community resilience. Further, opportunities to complement these attitudes and practices with tailored information about, and in response to, climate impacts should be explored. This is opposed to introducing external technical 'fixes' and approaches that do not consider existing practices, which are ineffective and unsustainable.

Lesson 3: It is worthwhile to invest time and resources in locally led context analyses and collaborative design processes for community resilience investments. **Engagement with diverse community members through participatory processes during design and implementation helps to tailor resilience investments to local priorities and strengths.**

Pacific organisations and local/national experts have greater reach to community members and can facilitate meaningful community participation (e.g. in local language, with strong understanding of local context) to drive transformative outcomes. Community resilience investments need to build on existing strengths, which are more readily identified and understood by communities themselves, local organisations and experts. Effective community resilience investments need to consider a range of contextual factors at local level including traditional governance (e.g. gender and local power dynamics), local thoughts and attitudes and willingness to change, traditional knowledge on weather, climate and environmental systems as well as broader environmental factors. Local experts and community members themselves need to lead and participate in context analyses to develop an accurate picture, to design feasible adaptation options and build local ownership for initiatives that will be implemented. Externally led or desk-based context analyses are insufficient to design climate resilient investments that address diverse community perspectives, priorities and strengths.

The NWDG leader from Waikalou community is showing the land leased for dairy farming by NWDG members [Photo credit: Elesi Nailati, WFF]

Proposed action: Community resilience investments could provide budget, resources and time to explore and document local contexts (including what resilience means in each community), to design investments that are fit for purpose, aligned to local priorities and are sustainable through local ownership and leadership. Engagement with communities can also help to ensure all DFAT and development partner investments recognise community priorities. Community consultation could therefore play a stronger role in broader strategic approaches such as bilateral Development Partnership Plans.

Lesson 4: National level mechanisms to support sharing of information and insights about community resilience would support collaboration and integration of lessons learned.

Across all case studies, limited information and awareness on climate change and adaptation options between community members and decision-making levels has been cited as a barrier to strengthening community resilience. Practices that enable sharing of lessons within and across sectors (e.g. agriculture and food security, water and sanitation, infrastructure, health, and social protection) for government, civil society and development partners would build relationships, increase awareness of intersecting issues and allow for collaborative approaches to develop.

Proposed action: DFAT and development partners could support and strengthen existing climate specific national mechanisms or communities of practice, with a view to improve collaboration, networking and information sharing across sectors relating to community resilience. Collaboration is also a way to begin to address limited resources and adaptation options. Multiple stakeholder views, contacts and networks can create new ideas, opportunities, funding streams and solutions to strengthen community resilience.

Participants of the men's focus group discussion in Betio, Kiribati. [Photo credit: Jessie Meaney-Davis, UTS-ISF]

Lesson 5: Advancing disability inclusion is needed in resilience building efforts. **Across all case studies, the necessity for greater inclusion of marginalised groups in community resilience investments, particularly people with disabilities, remained a consistent theme.**

In Waikalou, Fiji, people with disabilities have limited access to resources from government and civil society sector, highlighting the need for better connections of individuals with disabled person's organisations (DPOs) and strengthened role of DPOs in project designs and implementation. Similarly, in Betio, Kiribati, although *unimane* (older men) serve as community representatives in discussions with local government. Efforts to promote resilience should intentionally incorporate diverse perspectives from men, women, youth, and people with disabilities. In Morcoluli, Timor-Leste, while progress has been made in actively promoting GEDSI and disability rights, there is a need for more inclusive approaches and safe environments to ensure the inclusion of individuals with intersecting identities (such as women with disabilities). Further, climate change will impact marginalised groups the most. Advancing inclusion investments will not only promote equality, but help avoid the most severe impacts of climate change within a community.

Proposed action: DFAT and development partners should ensure inclusion is embedded in project designs, guided by the principles of 'leaving no one behind'. Working with DPOs is an important step to integrate locally inclusive activities for resilience building. If not inclusive, programming will reinforce existing inequalities and compound the impacts, costs and losses caused by climate change.

Lesson 6: Supporting women's organisations is an effective approach to resilience building. **The Fiji and Timor-Leste case studies demonstrated that community resilience can be strengthened by supporting women-led and women-focused organisations and initiatives.**

In Waikalou, Fiji, contributions from the NWDG to community resilience and transformative actions to respond to climate change provide evidence of the benefits of ongoing partnerships with local women-led organisations. In Morocluli, Timor-Leste, women's microfinance groups worked collectively to help each other repay their loans. The program was an important financial safety net for disadvantaged women for various

reasons including in times of crisis, supporting children's access to education and supporting women's financial independence. These two different examples demonstrate how supporting women's organisations can create pathways for women to play more meaningful leadership and economic roles for locally-led climate change and disaster resilience efforts in the future. Increased women's leadership in economic activities readily translates to leadership in times of disaster, where women can play key roles in community organising, e.g. data collection, managing evacuation centres, and coordinating the care of children, elderly and people with disabilities.

Proposed action: DFAT and development partners explore opportunities to support diverse women-led organisations to help build women's leadership and participation in community resilience investments.

Lesson 7: The impacts of climate change and disasters on infrastructure are eroding multiple aspects of community resilience. Access to markets, health and education facilities; impacts on health and wellbeing; and existing inequity were all affected by exposed infrastructure that was susceptible to climate change impacts.

Travel to Morcoluli during the research period was challenging due to a fallen tree blocking the road, a common occurance faced by residents. [Photo credit: Jessie Meaney-Davis, UTS-ISF]

Case studies identified strong connections between the condition of infrastructure and community resilience. In Betio, Kiribati, climate and disaster impacts exacerbated the already inadequate infrastructure (e.g. housing, water and sanitation). A growing population faced with an unpredictable climate is putting further pressure on already constrained infrastructure, services and resources. In Timor-Leste, the poor road condition in Morcoluli made it extremely difficult for people to travel to the market to sell their agricultural products. The water infrastructure was also a challenge for Morcoluli residents, with climate change (both heavy rain downpours and periods of low / no rainfall) also undermining the resilience of the community. In Fiji, heavy rainfall triggered landslides in Waikalou, damaging infrastructure such as roads and limiting women's (who rely on public transportation) access to markets to sell their produce.

Proposed action: Community resilience investments need to factor in the role infrastructure plays in enabling access to income generation for men and women, and the importance of basic infrastructure (e.g. water and sanitation) for health and wellbeing. Infrastructure also needs to be resilient to future climate and disaster impacts. Resilient infrastructure is best delivered and maintained at the community level through meaningful consultation and collaboration with sub-national government, and with appropriate incentives that are financially sustainable in the long-term.

Lesson 8: Programming approaches that are specific to urbanising contexts in the Pacific are needed.

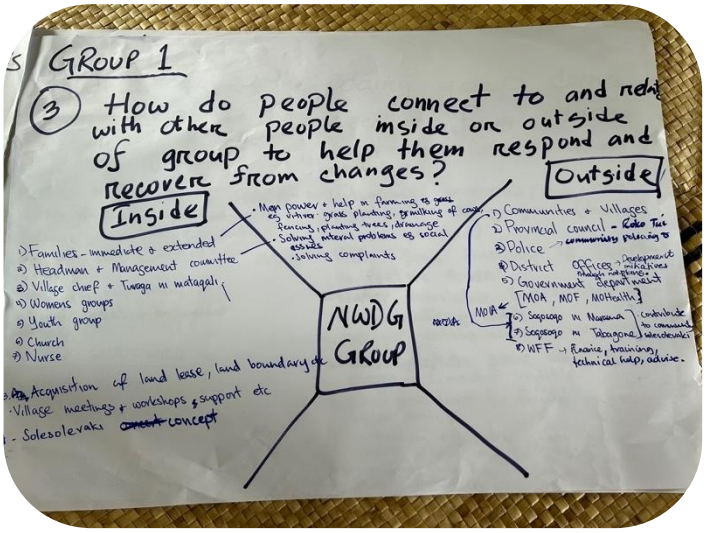
The experience of community resilience in Betio, Kiribati – an overcrowded, urban setting – was in stark contrast to the rural community settings of Waikalou and Morcoluli in Fiji and Timor-Leste respectively. While issues of governance, management of natural resources, infrastructure, and the compounding impacts of climate change were present in both urban and rural settings, the priorities and challenges in urban areas

are not addressed in climate policies that often focus on rural and remote island settings. The urban community of Betio requires specific appropriate approaches to address climate change and disaster risks.

Proposed action: Given the patterns of urbanisation across the Pacific region, DFAT and development partners could explore urban-specific priorities and solutions in growing towns and cities, paying particular attention to supporting local governance, land use planning and infrastructure.

Lesson 9: Action research with Pacific partners helps to build deeper awareness of local resilience contexts as well as ongoing capacity for effective implementation.

Local partners participating in the case study research (Women's Fund Fiji, Live and Learn Kiribati and PARTISIPA) reflected on the benefits of co-designing and implementing the research for their ongoing roles. Given the dynamic nature of climate change, Pacific partners need to constantly adapt their practices and activities to strengthen community resilience. Action research can support Pacific partners to be 'learning on the job' and contribute to ongoing monitoring, evaluation, research and learning objectives.



Community consultations involved exploring connections inside and outside the village to respond to disasters and climate change. [Photo credit: Tazrina Chowdhury, UTS-ISF]

Proposed action: DFAT and development partners could consider supporting action research between academic institutions and Pacific partners to build capacity for effective community resilience design and implementation. This could be incorporated into short and long term monitoring and evaluation strategies to support ongoing implementation of the new International Development Policy[3], including to build a more robust evidence base and knowledge of resilient development pathways.

Lesson 10: Research on community resilience benefits from the use of an appropriate framework to define community resilience and to support research design, data collection, analysis and write-up. For this research, the Community Resilience Framework proved to be a useful tool for analysing the complexities of local climate change and disaster impacts without overlooking specificities of different contexts.

Research teams across all case studies found the Community Resilience Framework helpful to guide community level inquiry into resilience. Resilience a complex concept used across multiple disciplines, and the Community Resilience Framework proved useful in allowing various differences across communities to surface. Its application helped to identify community perspectives on their experiences of climate and disaster risks (e.g. under element 3. Knowledge in Figure 1). Improvements to the framework may include providing additional guidance on the importance of *how* the framework is applied, given its intention to support strengths-based, inclusive and locally led activities.

Annex 4 presents examples of community resilience in the three case studies, demonstrating their alignment with the Community Resilience Framework and the complex interactions of the elements.

Proposed action: DFAT and development partners could consider using the Community Resilience Framework to help frame community resilience investments in the Pacific, including for program design, community engagement, monitoring, evaluation, research and learning.

[3] https://www.dfat.gov.au/sites/default/files/international-development-policy.pdf

6. Annexes

Annex 1: Community Resilience Framework

Five elements of a resilient community	Building blocks of adaptive capacity
1. **Transformative Action**: Evolving, dynamic and undergoing transformative change in response to disturbances, whilst retaining core elements of the community's identity. Aspects of change might be present in behaviours, actions, relationships, policies and practices within a community, and may reflect anticipatory actions in response to early warnings to reduce risk. 2. **Decision Making: Inclusive and robust leadership and governance**. This includes participation of diverse voices within communities (men, women, youth and young people, people living with disabilities, gender minorities and other marginalised groups) for the ongoing leadership and management of community life. 3. **Knowledge: Combining local and external knowledge**. This element demonstrates strengths-based principles by prioritising existing cultural knowledge and ways of knowing and bringing in external knowledge as needed e.g. climate change projections about sea level rise. 4. **Thoughts and Attitudes: Incorporating a willingness to accept change and respond and adapt**. A resilient community is able to accept new ways of doing things and willing to take on new knowledge about climate change. 5. **People, Health and Environment:** Acting in balance within biophysical limits to support thriving communities. This element recognises the need to work within the limits of the environment, which may be changing as a result of climate and disaster risks.	**Asset-based determinants of adaptive capacity**: Human and social capital: Elements such as governance, leadership, traditional and modern skills, institutions, change agents, health, support services and networks. Access to resources: Access to land, fisheries, supply chains and incomes, and also resilient infrastructure such as evacuation centres or climate resilient water and sanitation infrastructure. Adaptation options: Options for adaptation such as through the ability to grow or acquire food or money (e.g. through employment, selling goods or remittances). Information and awareness: Access to information regarding climate and disaster risks and the awareness and ability to analyse and act on this information. **Psycho-social determinants adaptive capacity**: Personal experience of past event/s: Individual history of experiencing severe weather events influences adaptive capacity. Intense personal experiences result in higher levels of preparedness, however facing multiple and/or severe events can have negative impacts on mental health. Competing concerns: Individuals or communities facing multiple stressors unrelated to climate change and disaster response may de-prioritise climate change given their focus on more immediate concerns. Community defined determinants: Community defined building blocks acknowledge the need for local understandings and experiences of climate change and the importance of cultural and political perceptions of risk.

For a full description of the Community Resilience Framework, see:

Gero, A., Winterford, K. and Davila, F. (2024) A Pacific Community Resilience Framework: exploring a holistic perspective through a strengths-based approach and systems thinking, Asia Pacific Viewpoint. https://doi.org/10.1111/apv.12411

Annex 2: In-Country Research Team

ICRT	
 **Fiji**	UTS-ISF: Dr Keren Winterford Dr Tazrina Chowdhury
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	University of the South Pacific: Jasman Taylor Abigail Lucille
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 **Kiribati**	UTS-ISF: Anna Gero Jessie Meaney-Davis
	Live & Learn Kiribati: Tukabu Teroroko Teera Eriuta Willie Marera Tabuia Kimberley Aromata Yan Lai (Live and Learn Australia)
 **Timor-Leste**	UTS-ISF: Anna Gero Jessie Meaney-Davis
	PARTISIPA: Leopoldina Magno dos Santos Sofia Oliveira Fernandes Antonio Castro da Costa Ernania Bonifacia Amaral Ali Saikal Annie Sloman
	Translator and researcher: Tarcizio (Myto) Fausto

Annex 3: Research participants

Fiji community research participants:

Participant group	Type of activity	Participant number
NWDG women	Four FGDs	38
Women who participated in follow up activity	FGD	20
Women	Two FGDs	20
Men	FGD	10
Youth	Two Transect walk	22
Village decision makers	Interview	4
People with disabilities	Interview	1
Provincial Conservation officer	Interview	1
Technical Officer, livestock Ministry of Agriculture	Interview	1
Child protection officer, Department of Social Welfare	Interview	1
Community members	Community workshop	52
		Total 172

Kiribati community research participants:

Participant group	Type of activity	Participant number
Women	FGD	14
	Interview	2
Men	FGD	19
Youth	FGD	11
Betio Town Council	Interview	2
People with disabilities	Interview	2
Unimane (older men)	FGD	5
Uniane (older women)	FGD	4
Community members	Community workshop	29
		Total 88

Timor Leste community research participants:

Participant group	Type of activity	Participant number
Women	FGD, interviews	31
Men	FGD	25
Youth	FGD	13
Suku Council	Interview	2
SMASA	Interview	2
GMF	FGD	8
Person with disability	Interview	3
Savings and loans group	Interview	2
Community members	Community workshop	36
		Total 122

Annex 4: Examples of community resilience in alignment with Community Resilience Framework

Case Study 1 | Community resilience in Waikalou community, Serea Village, Fiji

The Waikalou community provided different examples of community resilience, which are presented in the section below, aligned with the elements of the Community Resilience Framework.

Transformative action
There are numerous examples of transformative action demonstrated in Waikalou community across a range of different dimensions, including gendered division of labour, household infrastructure, farming and livelihood activities, and diet.

Women of the NWDG are taking up entrepreneur roles within the community, introducing innovative techniques to strengthen climate resilience in the dairy business. This included incorporating climate-resilient, locally available grass varieties such as *vetiver*, relocating pastures to highlands to reduce risks from flooding, and upskilling themselves to make cheese from milk, thereby reducing losses from transport disruptions during disasters. Other income generating activities, including mushroom cultivation, and handicrafts production.

Men are supporting women's leadership in the dairy business, which has traditionally been a male-dominated sector. Households are considering NWDG members' businesses as family enterprises and men are actively participating in and supporting the women's dairy group.

The community has prioritised the construction of stronger houses following Tropical Cyclone (TC) Winston in 2016. Housing structures have transitioned from bamboo to concrete. Houses near the riverside have been relocated inland to mitigate the risk of riverbank erosion and flooding.

Farmers are adjusting their agricultural practices in a variety of ways to respond to the changing climate. Farmers are using lime powder and *drala*[4] to restore soil fertility and moisture, planting resilient crops such as sweet potato and yam and introducing new root crop breeds such as ginger. Additionally, they are integrating traditional knowledge and new scientific knowledge such as traditional weeding methods and using poultry manure for quicker harvests and improved yields compared to past methods. Farmers are relocating farming lands from near the village to hill locations, and from the riverside to inland in response to changing soil quality and erosion by the river.

Waikalou community are focusing on diversifying income sources beyond traditional root crop farming. Alternative income sources include mushroom cultivation, homestead gardening, and dairy enterprises, in response to changing weather patterns and the environmental impact of climate change, such as topsoil erosion and heat stress.

The community has shifted their dietary habits, with people now selling root crops such as taro, to purchase staples such as rice and flour, which are easier to store. Selling produce also provides additional cash to cover village contributions and rising household and farming expenses such as fertilisers and chemicals. While the change increased the community's income and ensured the availability of food, it also meant reliance on external food sources with prices that might fluctuate and, in times of emergencies, might not be available, potentially having a negative impact on the community's resilience.

Inclusive and robust leadership, governance and decision making
The decision making processes in Waikalou community, and connections to Provincial Council were not especially evident as an element of resilience.

While there is a robust governance structure in Fiji, concerns were raised by community members that **there is a need to improve information flows from provincial to community levels.** The heavy workload of provincial and district staff, who oversee multiple villages, often leads to gaps in information flows from village-district-provincial levels. For example, one Naitasiri Provincial Conservation Officer is responsible for 16 districts and 91 villages. When these responsibilities were explained to village members during the Case Study process, one woman described this as new information and she described a new appreciation of all the work the provincial staff do.

There are plans in place for improving coordinated disaster response and recovery efforts and dedicated individuals with agreed roles including for youth, who were part of village emergency committees.

[4] *Drala* is commonly known as tiger's claw or Indian coral tree, a thorny deciduous tree.

However, there was inconsistent awareness of local disaster arrangements amongst community members. Women especially described not knowing about such decision making processes and structures, suggesting the need for greater engagement of different members of the community in decision making.

Community leaders treat all members of the community equally. Equality and inclusion were described by both people with disabilities and community leaders in Waikalou. Community leaders described treating LGBTQI+[5] the same as other members of the community, though this was not substantiated with LGBTQI+ people during the case study.

The formal and informal governance systems existing in the community **lack inclusivity and bottom-up approaches**, leading to inequality based on gender and financial status, which undermines community resilience.

The village meetings, led by the *Turaga ni koro*, typically involve participation from the village chief, youth leaders, church leaders, female nurses, and female leaders. However, **not all community members are aware of the meeting agenda**, and their voices may not reach these gatherings. Similarly, across the Naitasiri Province, multiple women's groups represent women in various civil sector platforms and at provincial levels. However, these groups may not fully represent the views and perspectives of smaller women's groups who are not engaged in these processes.

Local and external knowledge

External knowledge that has informed NWDG is now being shared internally with other community members and other villages within the province. While different Provincial officers from different ministries provided one-off support, Ministry of Agriculture (MoA) has been the primary source of external knowledge for the community.

The NWDG received various knowledge exchange from external actors, such as WFF and WFF partners, MoA and also the Fiji Cooperative Dairy Company Ltd. The group has since shared this information with others. For example, NWDG conducted training sessions for diverse women's groups and extended training programs to women in remote areas, addressing needs beyond NWDG's primary scope. There is a growing demand among women for further upskilling and training to increase and strengthen income generating activities.

The MoA is providing women of NWDG and local farmers with diverse scientific knowledge to enhance their climate and disaster resilience. This included techniques such as cultivating *vetiver* grass to prevent landslides and soil erosion, implementing integrated farming practices involving mushroom cultivation, and production of vanilla, honey, taro, ginger, and new varieties of root crops.

Local farmers are effectively integrating traditional farming practices with new scientific knowledge. For example, farmers are combining traditional weeding techniques with the application of poultry manure to enhance agricultural productivity. The Provincial officer from MoA and Provincial conservation officer from Ministry of Forestry (MoF) has supported farmers to learn about new farming methods through one-off and occasional engagements.

Thoughts and attitudes

Waikalou community demonstrated positive shifts in attitudes toward gender roles within households, growing openness to adopt new farming practices and explore additional income generation activities.

The role of women in income generating activities is increasingly valued. Both men and women in Waikalou community described how women and men have an increasingly positive view of women taking on more roles in the public sphere and men taking on more household chores previously described for women only.

There is a growing interest to further diversify income sources, especially expressed by women. Examples included dairy farming, mushroom cultivation, vegetable farming, handicrafts and other small business initiatives, which generate income beyond traditional root crop farming. Whilst recognising the expanding list of activities, women expressed interest to explore different types of income generating activities.

The change in farming practices in the community demonstrates flexible community mindsets and willingness to change and adapt. Community members described transition from manual labour to utilising more tools and machinery. Additionally, communal planting of climate-adaptive root crops and vegetables serves as both a source of income and a means of adapting to changing environmental conditions. Willingness to change and adapt are key factors in community resilience.

People, health & environment

Members of Waikalou community have undertaken actions to restore environmental balance and promote health and wellbeing of the community. Actions include planting particular trees and grass

[5] LGBTIQA+ 'LGBTIQA+' is an evolving acronym that stands for lesbian, gay, bisexual, transgender, intersex, queer/questioning, asexual.

varieties to reduce loss and damage from erosion and landslides and introducing new waste management system.

Actions to protect the river from erosion and reduce topsoil erosion are a high priority in Waikalou community. Planting of native trees has been carried out by community members with assistance from the MoF to prevent landslides and riverbank erosion. The MoF and community collectively implemented reforestation programs, and planted pastures like *Junchaw* to minimise landslides and provide feed for animals while retaining soil nutrients. A high-protein grass variety, *vetiver* has also been introduced as a diary pasture in response to grass damage due to hot weather. This grass type is usually planted along the riverbank to reduce soil erosion and prevent the loss of topsoil from washing off.

Improved solid waste management and recycling practices have been implemented within the community by Church, youth, development partners and government agencies to better protect the environment. Guided by the Church, community youth members made and installed rubbish bins throughout the village. A solid waste management site has been established near the inland farming area, which has been inspected by government officials and now used by community for the disposal of household waste, bottles, plastics, and agricultural waste, all contributing to a more sustainable waste management system.

Limited to no effort has been made towards rehabilitating the riverside area affected by a commercial gravel extraction operation on the edge of the community, which has a negative impact on community's resilience effort. Community members describe riverbank erosion from the gravel extraction operation in addition to flooding and heavy rainfall, are limiting farmers' access to their land.

Interactions of five elements and contributors and barriers to resilience

Elements of community resilience interact with each other to contribute or hinder resilience. The Waikalou community described different examples of community resilience. However, NWDG's entrepreneurial role and NWDG's leadership in women's economic empowerment (WEE) have been two major transformative actions described by NWDG women as well as community members and these are illustrated in Figure 2.

NWDG is contributing to WEE through dairy enterprises, which used to be a male-dominated industry. Diverse stakeholders are supporting NWDG in enhancing business skills, accessing markets, and receiving training in various income-generating activities), encouraging women to assume leadership and entrepreneurial roles (*Knowledge*). For instance, WFF facilitated connections between NWDG women and participants from another established women's economic group, *Ridge to Reef*, fostering peer learning opportunities for NWDG women. In contrast to this, Provincial offices' limited resources disadvantage NWDG's learning opportunities (*Knowledge*). Encouraged by women's leadership in WEE, community members including men are exploring opportunities for change and diversify their income sources (*Thoughts & attitudes*). Men are supporting women to contribute to economic activity (Thoughts & attitudes). However, climate hazards such as riverbank erosion, flooding and heavy rainfall sometimes disrupt road networks and reduce accessibility, creating barriers for NWDG to sell milk on time.

The community recognises the changing environment and acknowledges the necessity of adapting existing business and agricultural practices (*People, health & environment*). Influenced by community bonding and connectedness, community members are collectively changing their agricultural practices and changing business models, such as forming cooperatives in dairy farming *(Thoughts & attitudes).* However, lack of connections exists between community and provincial government, which is a barrier for communities to explore innovative approaches and access government support for new ventures (*Inclusive leadership, governance and decision making*).

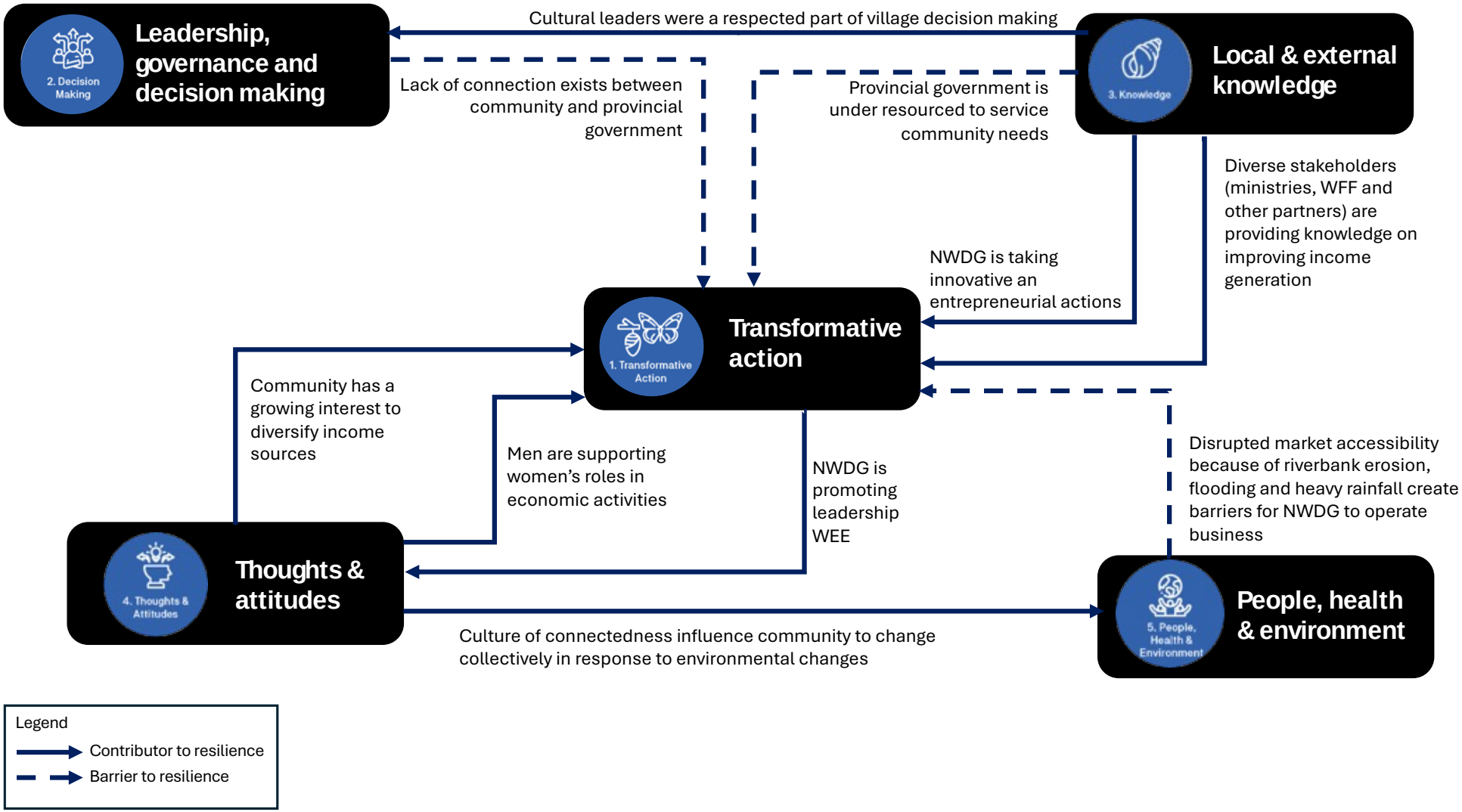

Figure 2: Interactions of five elements of community resilience

Case Study 2 | Community resilience in Betio, South Tarawa, Kiribati

The community of Betio provided different examples of community resilience, which are presented in the next section below, aligned with the framework elements.

Transformative Action

While people in Betio have been responding to climate risks and impacts in a variety of ways, there was limited evidence of transformative change. Due to limited long-term adaptation options, most actions reported by the community have been to absorb shocks and cope with the impacts, or incrementally adapt to impacts of climate change.

The following describe actions being taken by the community in response to climate related impacts and challenges:

Actions to absorb shocks and stresses: To cope with decreased access to water and poor water quality, a range of respondents described rationing their water use, sharing water with neighbours, re-using water from cooking and boiling well-water for gardening, and "having faith" that rain would come. Some respondents described the increased use of outdoor hammocks to cool down in response to increased extreme heat, but most respondents said they simply "deal with" increased heat.

Incremental adaptations: Three participants (a man, and a husband and wife) noted re-building homes, affected by strong winds, with more robust designs (e.g. using more nails to hold roofing materials in place) and tougher materials (e.g. placing old tyres or rocks on the roof) to prevent it blowing off in strong winds. A range of participants – both men and women - described building *bwibwi,* as a means to protect houses from sea water inundation. Some participants (men and women) collected sandbags from the Council to partially protect their homes from sea water inundation during king tides. This was described as a repetitive process and a temporary solution that could not be relied upon in the long-term. Nine participants of Live and Learn's AFF project described how Foodcubes were used to grow fruit and vegetables, because growing directly in soil was becoming increasingly untenable due to salinity.

Nature-based solutions: Some people in Betio (particularly women) have started implementing nature-based solutions for climate change adaptation, for example planting trees and grass to cool their homes and improve soil and water quality, and planting mangroves to reduce erosion and the impacts of storms and king tides. Older women described how tree species were selected based on their ability to provide shade and fruit, e.g. breadfruit trees, so they could consume or sell the fruits. While not necessarily described as transformative solutions, these actions were described as effective, and they were not necessarily dependent on external or expensive inputs.

Emerging transformative actions: Women leaders in Betio described actions they were taking to diversify their livelihood options and build some level of financial security to cope with future shocks and stresses. Success in a grant application enabled the purchase of a large oven to bake and sell bread, and 19 sewing machines to make and sell clothing. One woman explained that profits are used to pay for food, clothes, and household expenses. They also loan between themselves (20 families) with 10% interest. Participants of Live and Learn's AFF project also described emerging transformative actions they had taken. A woman described how she was selling some of the cabbages she grew in a Foodcube to a local Chinese restaurant, with her family consuming the remaining cabbages. Other AFF participants noted how the vegetables they grew and ate made them feel healthier, and selling some of their produce enabled them to purchase necessary household items, while also accumulating savings.

Maladaptive practices: The combination of pressures from climate change, overcrowding and rapid urbanisation have pushed some people to use maladaptive practices such as pouring bleach down wells with the aim to kill bacteria, with the bleach contaminating drinking water and damaging water ecosystems. Participants described cutting down trees to prevent damage during storms, which can intensify urban heat; and poor planning and construction of concrete sea walls, which has further contributed to coastal erosion.

Table 1 summarises the types of actions described by community members, as responses to climate and disaster risks.

Table 1: Actions taken to respond to climate and disaster risks in Betio

	Maladaptive[6] actions	Absorptive[7] actions	Adaptive[8] actions
Water security responses	Pouring bleach down wells to 'clean' water and purify the well	Rationing water use; sharing water	Planting trees to improve water and soil quality
Responses to increased heat		Resting in outdoor hammocks	Planting trees and grass to cool homes
Food and livelihood security responses	Relying on imported food indicates maladaptive trajectory	Fishing in different locations	Using Foodcubes to grow vegetables and fruit; re-using cooking water for gardening; planting fruit trees for consumption and sale
Responses to king tide and coastal erosion damage	Poorly planned or poorly constructed artificial sea walls		Using *bwibwi* and/or sandbags to protect assets; planting mangroves
Responses to strong winds	Cutting down trees to reduce damage to houses		Planting mangroves as a buffer to protect assets; re-building homes using stronger materials

Inclusive and robust leadership, governance and decision making
Formal local governance structures in Betio were visible through the Betio Town Council (BTC), which has been responsive to some of Betio residents' requests. Informal community structures and decision-making bodies are beginning to emerge in Betio, with traditional governance in Betio less prominent due to the population predominantly made up of residents from across Kiribati's outer islands and other parts of Tarawa.

Effective representation: Representatives from BTC as well as residents of Betio described the **effectiveness of BTC's response to people's concerns about the unavailability of water.** The *Maneaba* (traditional political structure led by older men) raised the issue of water insecurity with BTC and the mayor responded by requesting assistance from the national cabinet, resulting in the construction of water piping from Bairiki (nearby town) and eventually the commissioning of the desalination plant in Betio, which is currently under construction. BTC is also directly connected to the Australian High Commission, New Zealand High Commission, the Embassy of People's Republic of China and it has a new, active partnership with a local council in China. These connections have provided various types of support to Betio including grants, investments (e.g. Betio Port upgrades) and emerging partnership arrangements.

BTC representatives and residents of Betio highlighted **residents' responsiveness to the Council.** For example, all groups noted that they were proud of the 'clean up' organised by the council, which brought together residents to collect rubbish on the streets and beaches of Betio. Older men described how they actively raised issues with ward councillors, whereas women said they would not actively contact councillors, and described the Council as providing instructions and guidance. This points to the potential for increased community collaboration and informal governance in the future, though this capacity is relatively latent at present.

[6] Maladaptive actions are actions that increase or exacerbate climate change vulnerability, inequity, and risks for humans and ecosystems (Tignore, M., Poloczanska, E.S., Mintenbeck, K., Alegria, A., Craig, M., Langsdorf, S., Loschke, S., Moller, V., Okem, a, Rama, B. (Eds.) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, and New York, NY, USA.
[7] Absorptive actions are actions to absorb changes, stressors or shocks from climate change, while retaining a system's key functions (for example social, political, economic functions). Source: Béné, C., Godfrey-Wood, R., Newsham, A., Davies, M. (2012). Resilience: New Utopia or New Tyranny? Reflection About the Potentials and Limits of the Concept of Resilience in Relation to Vulnerability Reduction Programmes (No. 405) IDS, Brighton, UK.
[8] Actions facilitating longer-term but incremental adjustments which do not require major qualitative change in a system's structure or functioning (Tenzing, J.(2020) Integrating social protection and climate change adaptation: A review, WIRES Climate Change, 11(2), https://doi.org/10.1002/wcc.626

Informal and traditional community structures appeared cohesive in Betio. Live and Learn Kiribati staff noted that this was because many people in Betio have migrated from various outer islands at different points in time. Most research participants found it difficult to identify informal or traditional community-based structures that actively bring Betio residents together to collaborate and act on climate change. Participants noted that there are no current initiatives to encourage community collaboration on climate change resilience in Betio holistically, rather, NGOs and grant opportunities tend to focus on providing solutions to specific issues, for example, providing tanks, gardening equipment and skills training for food security and access to water. Exceptions included a specific church that regularly brings church members together to identify and discuss issues, and collaborate to support each other (e.g. through group gardening and repairing houses after storms) as well as the *unimane* who came together to discuss issues and raised them with Betio Town Council.

Local and external knowledge

People in Betio have been using a combination of traditional knowledge and new knowledge to try to adapt to climate change. Live and Learn's AFF project also brings together different sources of knowledge. and leadership, to build awareness of options to enhance food security in Betio.

People in Betio are using **traditional knowledge** to adapt to climate change, for example traditional knowledge of constructing *bwibwi*, and traditional knowledge of food preservation methods, though to a limited extent. As described earlier, constructing *bwibwi* provides temporary protection from king tide events, however they have to be reconstructed regularly due to the increasing high tide events driven by sea level rise. There is insufficient supply of traditional foods in Betio due to the depletion of coconut and breadfruit trees, overcrowding and limited space to grow food.

Participants of the Live and Learn AFF project have **increased knowledge of climate-resilient farming techniques** using Foodcubes. Live and Learn draw on existing knowledge from participants on agricultural techniques, as well as using the '*Kainga*[9] family groups to share new knowledge widely.

A woman leader in Betio described various roles she played in the community, and acted as a **knowledge broker**. For example, she noted how she shared grant opportunities she saw online with others. A grant application for the Australian High Commission she worked on with other community members was successful, and enabled the purchase of income-generating assets (oven and sewing machines - as described above). Her role on a board of a local organisation meant she provided counsel, advice and teaching of skills. Her contributions to resilience-building in Betio are through channeling and sharing knowledge, and her ability to operate at local level and (to some degree) donor level.

Thoughts and attitudes

Many people described proactive and motivated attitudes, innovation and resourcefulness as contributing to resilience. Examples of people in Betio experimenting with new ways of doing things also demonstrate a willingness to change, which supports community resilience.

Proactive and entrepreneurial attitudes: Women, men and youth described being proactive in applying for small grants, pooling resources, and creating employment or income opportunities. For example, a group of women has been collectively farming, pooling their produce, selling it and saving funds for emergencies. Young people noted locals were starting hairdressing businesses, and collecting plastic waste to turn into fashion accessories for sale.

Future focused thoughts and motivated attitudes: Participants of the AFF project described their motivation to grow vegetables for their families to eat, increasing nutritious food intake and providing a source of income. These positive experiences, including the simple act of growing and tending to vegetables, was a clear motivator for participants of AFF and inspired them to think about their future in Betio.

[9] A *Kainga* group is an extended family consisting of 5 or more households (40-55 people). Live & Learn Kiribati uses this system because it works best to the local context.

People, health and environment
Overcrowding, rapid urbanisation and climate change impacts pose significant challenges to sustainable natural resource management and living healthy lifestyles in Betio. Residents are trying their best to find innovative ways of living in balance with nature in a challenging and dynamic environment.

Climate change impacts are eroding the ability of people in Betio to access water, grow their own food and withstand severe weather events. Participants across stakeholder groups described how climate change impacts were affecting the environment. For example, coastal erosion and inundation was becoming more frequent, forcing people to move away from the coast (a challenge in already over-crowded Betio). Unpredictable rainfall made access to drinking water a huge challenge. Water and food insecurity, and the insecurity of their homes by the sea were severely impacting the resilience of participants involved in the research. Without an environment that supported them with many options for adaptation (see next section), people in Betio were doing their best to absorb shocks and adapt to stresses where they could.

People in Betio are using innovative methods to conserve, re-use and regenerate natural resources. Young people and men highlighted practices such as re-using cooking water and well water for growing plants; cooking home-grown vegetables to bulk out meals and ration fish consumption; and collecting water through condensation technologies. Older women and people with disabilities described growing trees in Betio for shade, food and a source of income (selling the fruits) and planting mangroves near the airport (not in Betio) to prevent erosion and damage from storms.

Betio participants of the Live and Learn AFF project are benefitting from using climate-resilient gardening techniques. Participants of the project noted their improved knowledge and skills in climate resilient farming; access to Foodcubes and seeds through the project; improved awareness of nutrition; and increased income generation and savings from growing food through the project.

Climate change and unsustainable fishing practices are affecting the availability of fish. The international fishing industry is a significant contributor to the Betio economy and provides employment opportunities, however unsustainable fishing, coupled with increased temperatures, has reduced the availability of fish for both consumption and sale in Betio.

Interactions of five elements and contributors and barriers to resilience

The five elements of community resilience interact with each other to contribute, or create barriers, to resilience. Most of the actions that people in Betio are taking are absorptive or adaptive actions, rather than transformative actions for climate resilience. The Figure below helps to explain the constraints to transformative action, with some examples of interactions between the elements of resilience, which are mentioned below in italics.

Efforts to respond to climate change have been supported by willingness to change and innovation (*Thoughts and attitudes*) in Betio. Research participants described creative activities to help them cope with climate and disaster risks. As noted earlier, actions taken as a result of adaptive and proactive thoughts and attitudes included people starting hairdressing businesses and turning plastic waste into bags and accessories. The strong presence of a collective culture, where there was a willingness to share and work together also supported adaptive actions to cope with climate and disaster risks.

The emergence of community collaboration and informal governance (*Inclusive leadership, governance and decision making)* also supported transformative actions. For example, older men described success in communicating their issues with BTC and action being taken as a result, however this was not described by other stakeholder groups.

Local knowledge (*Local and external knowledge*) about the environment enabled people to utilise natural resources to support their resilience. For example, Betio research participants spoke of building *bwibwi* and cutting toddy (coconut sap) as a sustainable income source. AFF also shared climate-smart techniques to grow food, which was shared via the *Kainga* groups.

Research participants in Betio described how overcrowding limited their access to clean water and safe sanitation, and the lack of space meant housing was cramped, hot and uncomfortable with little space for water tanks or home gardens. Climate change impacts such as warmer temperatures and increased storm surges and saltwater intrusion added to the overcrowding issues, affecting their ability to grow food. The AFF approach took these environmental challenges into consideration and used the Foodcubes as a means to support household food security in a space constrained context. These are examples under the *People health and environment* element of resilience, and relate to limited adaptation options.

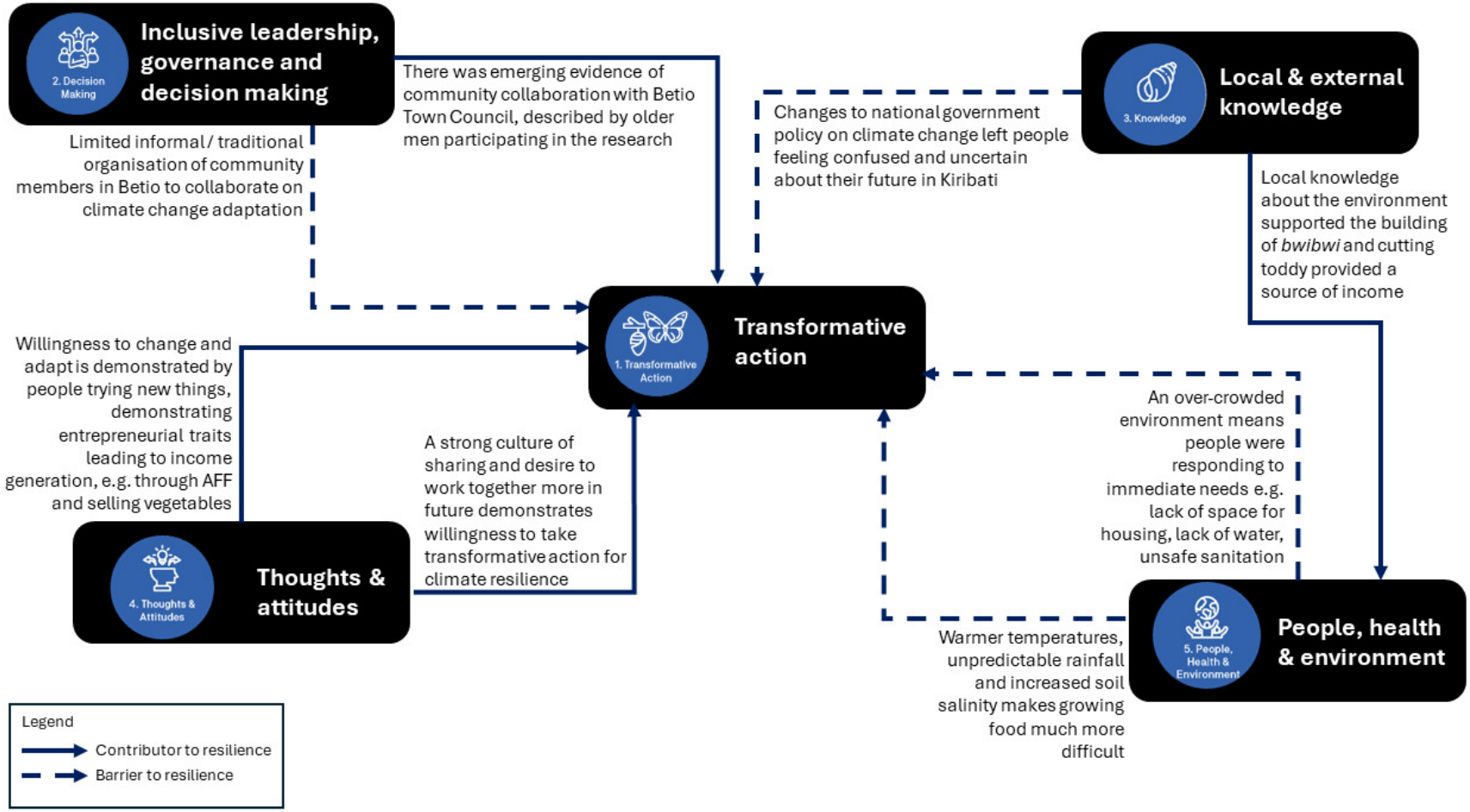

Figure 3: Interactions of five elements of community resilience

Case Study 3 | Community resilience in Morcoluli in Suku Liurai, Manufahi Municipality, Timor-Leste

The community in Morcoluli provided different examples of community resilience, which are presented in the next section below, aligned with the framework elements.

Transformative action

Residents of Morcoluli have built upon existing traditional practices to respond to water insecurity, food security and financial insecurity, while also taking a range of new actions, largely through their own initiative.

Some of the actions that residents are taking are adaptive rather than transformative actions, in that they are incremental adjustments to change but do not significantly change the functions, systems, relations and structures of Morcoluli. Some actions are absorptive, in that they are actions to simply "cope with" or absorb changes, stressors and shocks. This section starts by describing the absorptive and adaptive actions, before describing the more transformative actions.

Absorptive actions: To cope with climate shocks such as reduced access to water during prolonged dry seasons, reduced quantity and quality of produce due to variable rainfall, and the financial challenges that these issues pose, people in Morcoluli have had to walk long distances and on difficult terrain to collect water. Participants described how they dig for groundwater to use for cleaning and share basic food items with other families who have less access to resources. When agricultural produce is affected by dry seasons and unpredictable rain, some people in Morcoluli buy food from markets or grow food only for consumption, and/or borrow money from family and neighbours, sometimes with high interest rates. After heavy storms, people in Morcoluli help each other repair damaged homes.

Adaptive actions: Participants described their continued traditional water and land care practices, which facilitate biodiversity, water and land conservation, but may not be guaranteed to support adaptation to climate change. For example, men in Morcoluli conduct rituals to request ancestors and the land for rain and water; villagers are expected to implement *Tara Bandu* (traditional customary laws, including regulations on land clearing, planting trees to conserve water, and planting a diversity of species); and women practice collective agriculture. Some participants had also experimented with newer practices that may support adaptation, such as saving seeds to plant in future seasons, changing and diversifying crops (corn, kidney beans, potatoes). Research participants, however, expressed mixed views about the feasibility and profitability of continuing to grow these different crops, and the majority of participants expressed concerns about reduced coffee production – a major source of income - due to changes in the climate and the fluctuation of prices.

Women's access to microfinance: Four small self-organised groups of women in Morcoluli have been utilising the **Moris Rasik program** (a microfinance organisation offering loans and financial literacy for disadvantaged women) to take loans and manage repayments collectively since 2014. While loans are held at the household level, the groups of women work collectively to help each other repay their loans. Members described the program as an important safety net for disadvantaged women, because it provides lower interest rates than other informal options; it is available immediately in times of crisis; and it can provide larger sums of money that may not be possible to borrow from family members or neighbours.

Repaying loans is, however, at times challenging, especially during wet seasons when it is not possible to travel to the market to sell produce due to road conditions, and when there is less demand for produce within Morcoluli. Group members described incidents of distress selling of livestock and drastically reducing prices for their produce to repay loans.

Transformative actions: Participants described two potentially transformative actions they are taking to respond to the effects of climate change on livelihood and water security. First, several participants noted that young people are increasingly moving away from Morcoluli to pursue education and employment opportunities in nearby towns, Dili or overseas. Women spoke more favourably of this action as a positive opportunity, while other (male) participants described a need to incentivise youth to stay in Morcoluli. This action is transformative in that it changes the demographics, function and systems within Morcoluli, as well as the livelihoods and future resilience of young people (e.g. provides education opportunities that provide pathways to employment and income generation allowing young people to send money to family in Morcoluli to cope with climate impacts), however, it is not necessarily consistently viewed as a positive transformation.

Secondly, the establishment of the GMF (Grupu Maneja Fasilidade - local water management group, part of Timor Leste's community management systems for operation and maintenance (O&M) of rural water systems) in Morcoluli also has the potential to be transformative, however, the group has only recently formed and begun activities.

Box 2. The new GMF in Morcoluli

Over the last decade, the National Program for Village Development (Programa Nasional Dezenvolve Suku – PNDS) has completed over 900 rural water supply projects nationally, and become the primary implementor in Timor-Leste working on new and rehabilitated rural water supply systems. In 2023, PNDS, with support from PARTISIPA, updated its implementation processes to begin forming GMFs on rural water supply projects. SMASA (Municipal Water, Sanitation, and Environment Services) are responsible for supporting communities to deliver and maintain *suku* water systems. In 2023 SMASA began working more closely with PNDS and together forming GMFs to boost sustainability of PNDS water projects.

In 2019, PNDS rehabilitated a water facility in Morcoluli, and in late 2023, SMASA facilitated the establishment of a new GMF in Morcoluli to manage the O&M of water the facility on an ongoing basis.

The establishment of the GMF in Morcoluli marks a significant shift in water governance of water projects supported by PNDS. It has potential to be transformative in three ways. First, rather than relying on external agencies to manage the O&M of water infrastructure, local community members (elected to the GMF through a voting system) have increased ownership of and responsibility for water management, including O&M, regulating water use and quality, collectively financing repairs, and coordinating with SMASA. Research participants from Morcoluli GMF spoke proudly about these responsibilities. Second, technical training provided by SMASA has introduced new knowledge, skills and practices to GMF members and Morcoluli residents, for example the collection and pooling of funds from community members to contribute to O&M of the facility, new convening and reporting skills, and increased interaction with community members about water quality. Thirdly, the GMF has introduced new opportunities for women's participation and leadership in Morcoluli. Half of Morcoluli's elected GMF members are women.

The GMF in Morcoluli is a very new community structure. Therefore the extent to which this new structure, water management practices, and GMF coordination with SMASA and PNDS will result in transformative change in Morcoluli is yet to be evaluated and learned from. All members of the GMF expressed their appreciation for being elected into their roles and for the opportunity to serve their community. All members also expressed their desires for additional technical training and support from SMASA, and to continue putting their new knowledge into practice in collaboration with each other. Opportunities exist to further build the skills of GMF members, including on climate resilience. For example, the GMF could be supported to incorporate seasonal and shorter term forecasts, and well as longer term climate projections into planning, decision making and monitoring, GMF members expressed a wish for further upskilling, and this could include skills on climate resilient management approaches.

Leadership, governance and decision making

Research participants described the motivated local leadership and decision-making in Morcoluli as a significant strength supporting their resilience.

All demographic groups consistently described the importance of the roles of:

- The Suku Chief (male) in promoting collaboration and communicating with district municipality;
- Cultural leaders (male) in mediating land disputes and preserving natural springs through rituals;
- The Suku Council (male) in mediating other types of disputes, though they do not meet regularly; and
- Veterans (male) and police (male) in maintaining security.

In addition, a teacher spoke about his leadership role in nurturing young people's attitudes and practices related to nature; and the female treasurer and female secretary of the GMF spoke about their leadership roles collecting funds from community members and managing the use of funds), and planning and coordinating meetings, budgeting and preparing activity reports).

The research team observed that **the majority of formal leadership positions in Morcoluli are held by men**. As noted in Box 2, the establishment of the GMF in Morcoluli might in future influence or change gender dynamics of water management and local governance more generally, noting the gender balance in the newly established GMF

in Morcoluli and the expressed pride of female GMF participants.

Young people outlined a long list of government and other external institutions that Morcoluli is connected to in principle, however, other participants described **coordination with external entities (government, NGOs) as rare in practice**. The District SMASA Director also acknowledged that SMASA staff are expected to visit each suko every three months, but because of the challenging road and access conditions the timeframe sometimes has to be extended. **Participants from all represented demographic groups repeatedly and frequently requested more technical and financial support from higher levels of government** for rehabilitating the local road, managing water insecurity, and addressing fluctuating prices for and quality of coffee harvests.

Local and external knowledge
Participants from Morcoluli proudly spoke about their traditional knowledge and practices relating to water and land care, which have been passed down over many generations.

Traditional leaders (male) lead rituals to request water during dry seasons and welcome water during wet seasons, and all villagers are expected to follow *tara bandu*, traditional customary laws, including those relating to planting trees near water sources for protection, planting for biodiversity and regulations for cutting of trees and land clearing.

Members of the GMF also expressed gratitude for the **new knowledge of water management practices they gained from training provided by SMASA**. They described learning new information and skills related to managing water quality (monitoring pollution and advising villagers to keep animals at a distance from water sources); technical operations and maintenance of PNDS built facility (monitoring and fixing hoses and connections, managing a warehouse of materials); collecting and managing finances for operations and maintenance; preparing budgets and reports on their activities; collaborating together and overseeing the management of water in Morcoluli.

As the PNDS program, SMASA provision of water services (including technical training) and GMF water management structures continue, there is an opportunity to learn about how traditional knowledge and land care practices and climate resilient knowledge of water and land management practices interact. They may be kept separate and preserved, one may be preferred, they may interact with each other, and/or complement each other in relation to climate resilience. For example, while traditional knowledge may be preferred, it may need to be complemented by recent climate observations and projections, as it might not be sufficient to meet the scale and rate of transformation required to adapt to a changing climate.

Thoughts and attitudes
Research participants from all demographic groups frequently mentioned community members' perseverant, hard-working and collaborative attitudes as a major factor of their resilience.

Participants in Morcoluli also demonstrated **curiosity, openness and motivation to learn about and adopt new practices** to conserve water resources and sustain their livelihoods. They noted that while there have not been initiatives for holistic climate resilience to date, they would appreciate technical information and advice on water and environmental conservation, and climate resilient livelihoods.

People, health and environment
Morcoluli has a strong culture of protecting and caring for nature, and connection to place.

As noted under 'knowledge', participants from Morcoluli expressed pride in their ongoing traditional knowledge and practices of environmental stewardship handed down to them over generations. Respect for land, water, trees and ancestors is evidently an integral part of Morcoluli culture, with people practicing water and food rituals, *tara bandu* traditional customs for land clearing and water preservation, and school teachers encouraging children and young people to care for the land and plant trees to preserve water and soil. Some research participants also acknowledged that demands for water have increased in Morcoluli in parallel with its increasing population and the introduction of household level toilets, and they were aware and concerned about the pressure this puts on water resources.

Interactions of five elements and contributors and barriers to resilience

The five elements of community resilience interact with each other to contribute, or create barriers, to resilience. Figure 2 explains some of these interactions, which help identify ways to further strengthen community resilience.

Inclusive leadership, governance and decision making is a strong contributor to community resilience in Morcoluli, as seen via the numerous bold arrows into and out of this element in Figure 2. Leadership is demonstrated through the GMF (although in its early stages, it shows potential), the Suku Chief and Council and cultural leaders. *Tara bandu* (customary laws) play a role in traditional governance, which also links with 'local and external knowledge' and 'People, health and environment'. **Strong leadership and governance were the basis of adaptive and absorptive actions** in Morcoluli, with GMF potentially contributing to transformative change in the future through transferring ownership and management of water to local people, enhancing local people's knowledge and skills in water management and contributing to changes in community practices, and changing women's roles in public life and leadership.

Bold arrows extending from 'Thoughts and attitudes' also reflects how this aspect of community resilience is supporting people in Morcoluli. Flexible and adaptive attitudes were present within research participants, and the strong culture of sharing and kinship obligations meant that in challenging times, people looked after each other through sharing resources.

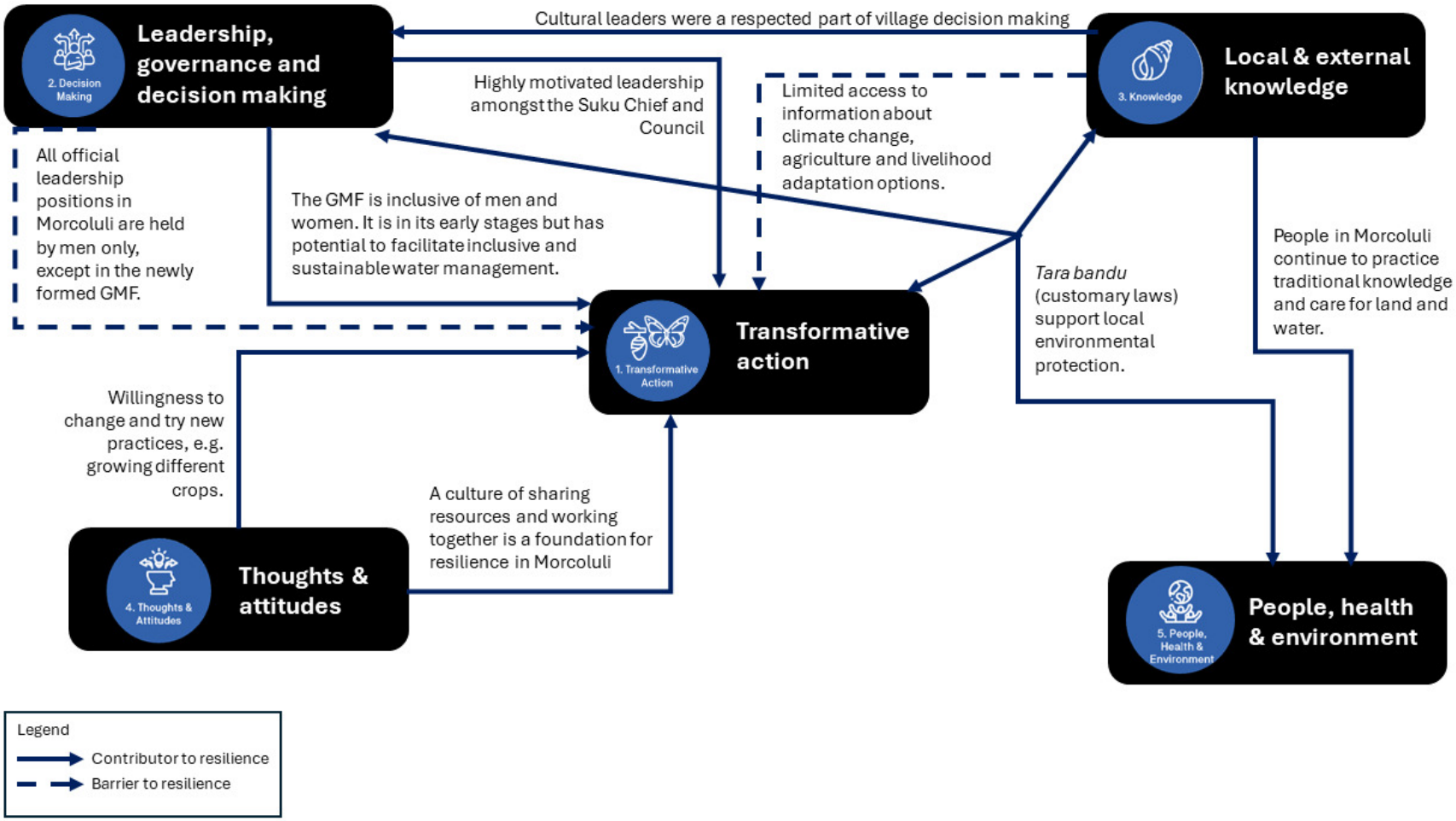

Figure 4: Interactions of five elements of community resilience

UTS Institute for Sustainable Futures