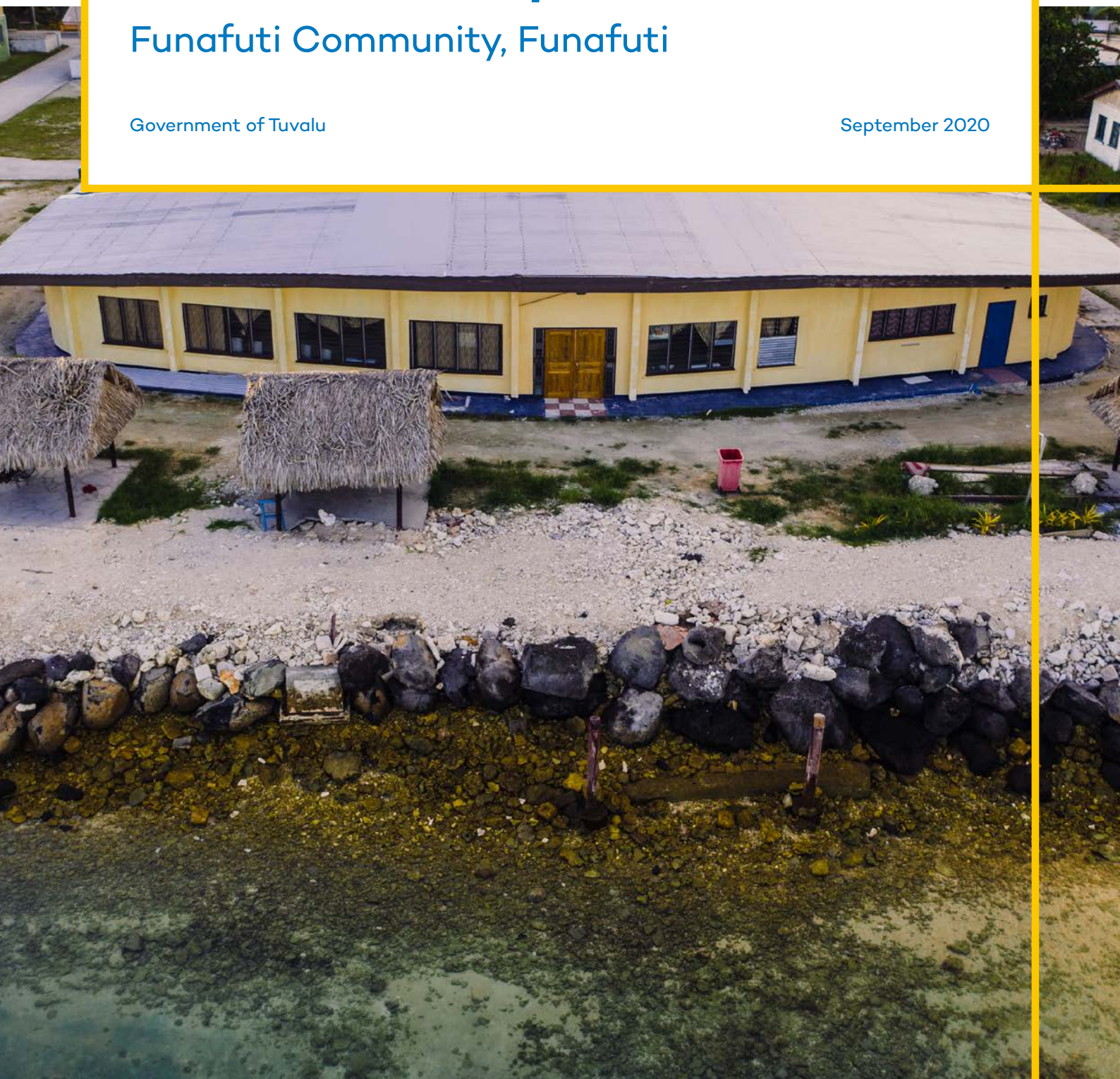
Tuvalu Integrated Vulnerability Assessment Report:

Funafuti Community, Funafuti

Government of Tuvalu

September 2020



This report is the result of a joint initiative between the Department of Climate Change and Disaster (DCCD) of the Government of Tuvalu and the NAP Global Network.

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Authors: Ian Hay (international consultant), Tomu Hauma, Tuitala Lasifo, Saamu Tui (National IVA Consultants), and Joana Latasi (Tuvalu Integrated Vulnerability Assessment Database Officer).

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About the NAP Global Network

The NAP Global Network was created in 2014 to support developing countries in advancing their National Adaptation Processes (NAPs), and help accelerate adaptation efforts around the world. To achieve this, the Network facilitates sustained South–South peer learning and exchange, supports national-level action on NAP development and implementation, and enhances bilateral support for adaptation and climate-sensitive sectors through donor coordination. The Network's members include participants from more than 140 countries involved in developing and implementing National Adaptation Plans, as well as 11 donor members. Financial support for the Network has been provided by Austria, Canada, Germany and the United States. The Secretariat is hosted by the International Institute for Sustainable Development (IISD). For more information, visit www.napglobalnetwork.org.

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Table of Contents

1.0 Introduction – Background and context for the Integrated Vulnerability Assessment and Reporting Process

This report captures the results of the Integrated Vulnerability Assessment (IVA) as conducted in the Funafuti community, Funafuti Atoll, Tuvalu. It includes the outcomes of the technical and community review stages of the IVA process.

1.1 Objectives of This Report

- Communicate and analyse key results of the IVA in a user-friendly way.
- Inform the national adaptation planning process by providing a gender- and youth-responsive evidence base for sub-national vulnerabilities and community-identified adaptation priorities.
- Reinforce the bottom-up and top-down approach to assessment, prioritisation, and planning to institutionalise national to sub-national linkages (vertical integration).
- Ultimately, inform evidenced-based adaptation planning, helping prioritise and direct institutional responses at every level of governance within Tuvalu, including for external funding.

1.2 What Is the IVA framework and Data Collection Approach?

1.2.1 The IVA Framework and Application

The IVA systematically examines how environmental and developmental changes affect local communities and the subsequent impacts of these changes on their ability to meet their basic needs. It provides baseline data about communities' vulnerability through a standardised approach that can be replicated across locations and time periods. The IVA data can be collected, organized, and presented using digital technologies (e.g., tablets, online database and dashboards), which facilitates the analysis and sharing of local-level vulnerability data. IVA can be a valuable tool to inform the comparative analysis, issue and options prioritisation, along with the broader development, implementation, and monitoring and evaluation of the National Adaptation Plan process (Dumaru, 2019).

The IVA framework in Tuvalu covers seven sectors and five livelihood assets, which in combination create 35 subsectors.[1] See Figure 1.1 for an illustration of this framework.

[1] Sectors are also termed "human security objectives" in the IVA Framework. "Livelihood assets" are also termed "assets." Sub-sectors are sometimes referred to as "components."

Figure 1.1. The IVA framework in Tuvalu: 7 sectors x 5 assets = 35 subsectors

Sectors	Assets					
	Natural Resources (n)	Infrastructure & Services (i)	Finance (f)	Human Resources (h)	Institutions * Governance (g)	Total (by sector)
Ecosystem (E)	E(n)	E(i)	E(f)	E(h)	E(g)	
Water Security (W)	W(n)	W(i)	W(f)	W(h)	W(g)	
Security of Place (P)	P(n)	P(i)	P(f)		P(g)	
Energy Security (N)	N(n)	N(i)	N(f)	N(h)	N(g)	
Income Security (I)	I(n)	I(i)	I(f)	I(h)	I(g)	
Community Health (H)	H(n)	H(i)	H(f)	H(h)	H(g)	
Food Security (F)	F(n)	F(i)	F(f)	F(h)	F(g)	
Total (by asset)						(IVA)

35 sub-sectors

1.2.2 The IVA Data Collection Approach

The IVA data is collected using participatory rural appraisals (PRAs) undertaken by members of the National Advisory Council Climate Change (NACCC) agencies together with communities. PRA uses "key informants," such as community members and leaders, to collect information across a wide range of topics, as per the 35 intersecting components of the IVA framework. These are undertaken as gender- and youth- separated focus groups (referred to as "groups" in this report) with each location having three "groups," with the exception of two locations where small population sizes necessitated mixed focus groups. These focus groups followed the methodology outlined in Figure 1.3. There are 38 groups across 14 locations nationally.

Figure 1.2. The IVA being undertaken in Funafuti Community

Source: Tuvalu Climate Change Department

Figure 1.3. IVA focus group methodology stages.

Step 1	• **Issue identification.** Identify presence of issue from checklist • (647 x possible issues in "TIVA issues checklist." Approx. 10–20 per subsector) (see Section 3.1.1)
Step 2	• **Sector prioritisation.** Prioritise top 2 issues per subsector • 70 issues per group: 35 subsectors with 2 priority issues (See Section 3.2.2)
Step 3	• **Qualitative description*** of #1 subsector issues (35 issues) (see TIVA Database) • (see TIVA Database)
Step 4	• **IVA vulnerability scoring** per subsector • 1 = very bad (more vulnerable) to 5 = good (not vulnerable) (see Section 3.2.1)
Step 5	• **Prioritise top five vulnerability issues** overall based on issues identified in step #2 • Five issues per group. 15 issues per location. (see Section 3.1)

**This includes: description of the issue, frequency/duration and location of the issue, magnitude of issue and impacts, affected people, previous adaptation measures and outcomes, and suggested future adaptation measures.*

1.2.3 The IVA Data Collection Instrument

The IVA relies on a detailed set of pre-defined vulnerability "issues" (approximately 650) that form a checklist of possible climate change vulnerability issues present in an island or community (see Table 1.1). These issues have been developed through intensive national engagement. They provide a focus for deliberations in groups and form the basis of later rounds of prioritisation and qualitative description of issues, impacts, and successful and unsuccessful adaptation options.

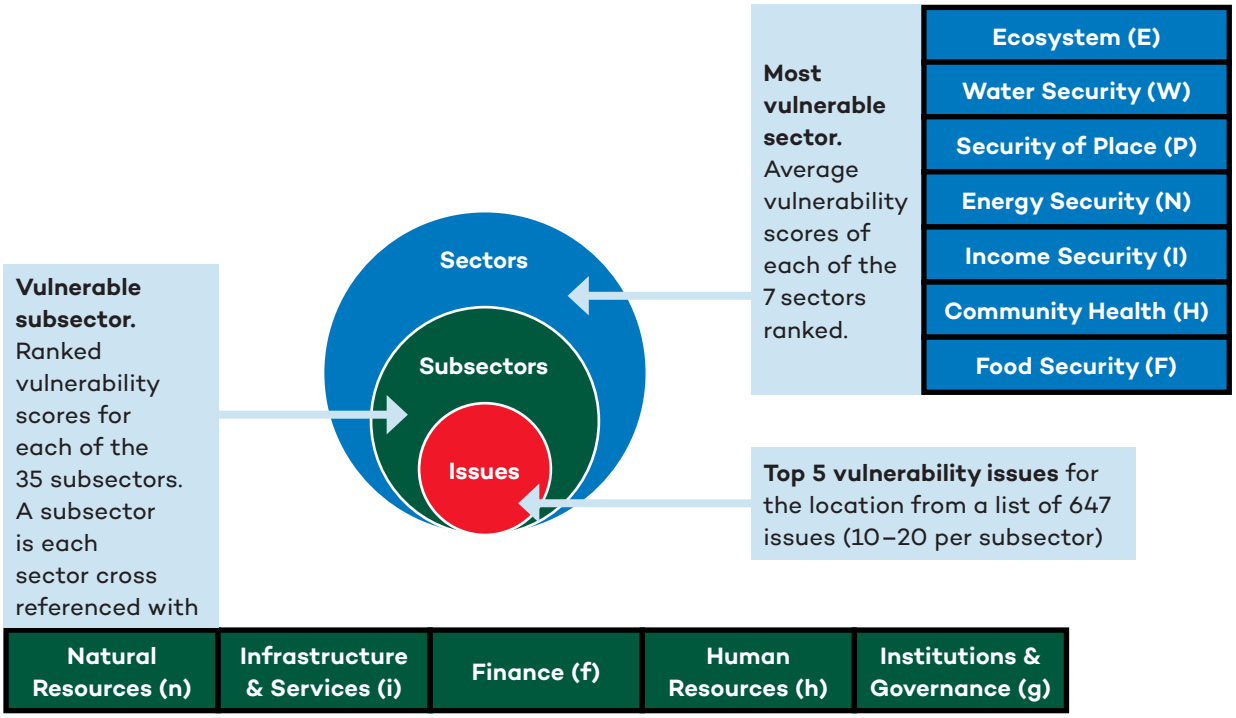
Photo: Silke von Brockhausen/UNDP (CC BY-NC-ND 2.0)

Table 1.1. Examples of issues from the "water security" and "infrastructure & services" subsector

Sector	Asset	Issue
Water Security (W)	Infrastructure & Services (i)	(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity
Water Security (W)	Infrastructure & Services (i)	(Wi.2) Household Water Tank Capacity > Inadequate household water tank capacity due to high household size and demand
Water Security (W)	Infrastructure & Services (i)	(Wi.3) Communal Water Tank Capacity > Inadequate communal water tank capacity
Water Security (W)	Infrastructure & Services (i)	(Wi.4) Communal Water Tank Distribution > Unsuitable system from public cisterns
Water Security (W)	Infrastructure & Services (i)	(Wi.5) Faulty Household Water Tanks > Leaking or faulty household water tanks
Water Security (W)	Infrastructure & Services (i)	(Wi.6) Faulty Communal Water Tanks > Leaking or faulty communal water tanks

Each issue in the IVA issues checklist has a code associated with it that corresponds to the subsector it is in (see Figure 1.1). The first capital letter corresponds to the sector, the second lower case letter to the asset, and the number to the order in the issues checklist within that subsector. For example: (Wi.4) is issue #4 in the "water security" + "infrastructure & services" subsector.

Figure 1.4. Summary of different components of the IVA Framework



THE TUVALU IVA DATABASE

The Tuvalu IVA (TIVA) Database is the repository for information collected as part of the IVA process and contains a number of different dashboards to assist users in accessing and analysing the IVA data. These dashboards have been used to prepare the results in Section 3 and are also available here: https://www.tuvaluiva.com/dashboards.html.

1.3 IVAR Process Methodology and Linkage to the NAP Process

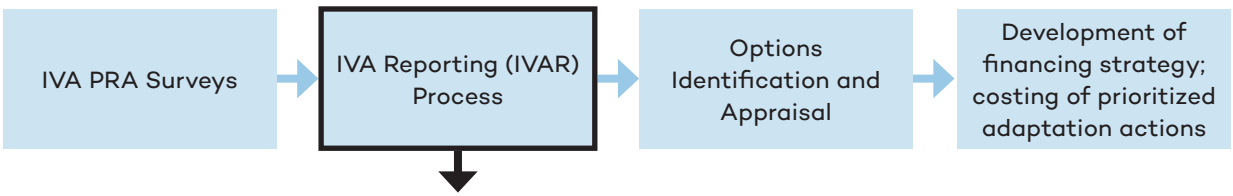
The IVAR process refers to the process of analysing IVA results, compiling reports and presentations, supporting technical and community review, and completing reports based on the results.

The IVARs are a key input into options identification and appraisal stages that follow data collection and analysis. They will aim to provide a clear roadmap of priority vulnerabilities for the government to focus on and point to the supporting studies required for the next stages of climate change adaptation planning.

HOW ARE IVARS LINKED TO THE NAP PROCESS?

The National Adaptation Plan process is a national process to integrate climate adaptation into development planning and budgeting at national, sectoral, and sub-national levels. The ultimate outcome of the NAP process is the reduction of a country's vulnerability to climate impacts in the medium to long term. The IVAR process is part of Tuvalu's NAP process by supporting the climate adaptation options identification and appraisal phase. The **options identification phase** is a process where adaptation alternatives to specific vulnerabilities are proposed and investigated. **Options appraisal** is a process of setting criteria for evaluating the effectiveness, efficiency, and appropriateness of an intervention (an adaptation option) and then systematically rating and ranking them according to those criteria to inform decision making. Tuvalu is currently in the development phase of its NAP process and is formulating the preparatory elements, including this report.

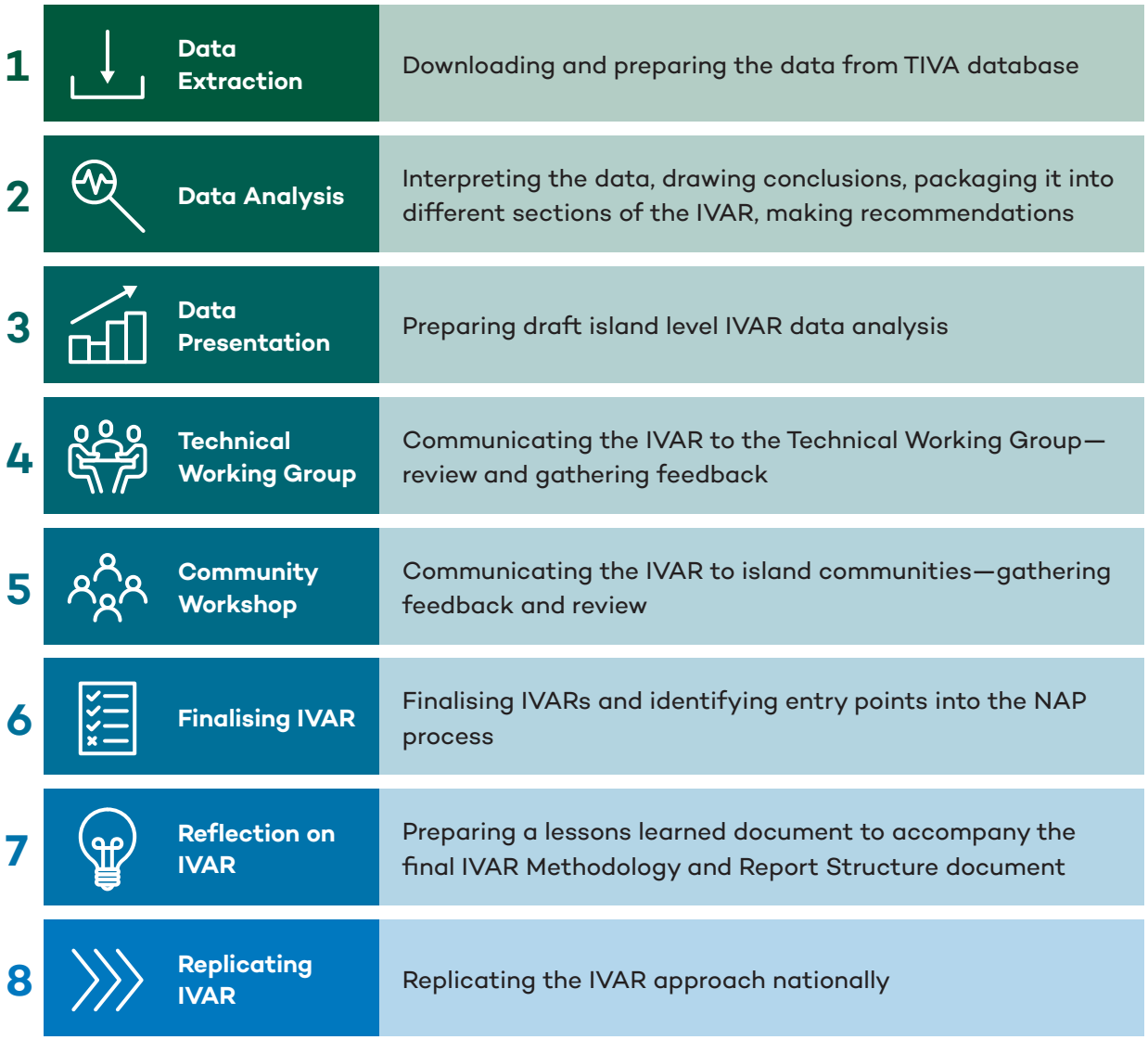
Figure 1.5. The IVARs are a key step within Tuvalu's NAP process



DEVELOPING THE IVARS

The methodology to develop the IVARs consisted of eight distinct steps, as summarized in Figure 1.6.

Figure 1.6. The IVAR process in eight steps



More specifically:

Steps 1–3: Data Extraction, Analysis, and Presentation

First, data was extracted from the TIVA database dashboards. The data was then analysed and interpreted to draw key insights and analysis emerging from the data. The third step was to prepare the data into tables, scorecards, and narratives explain the findings and perform a multi-criteria analysis (MCA). The formatted data was then integrated into the IVAR template report with the addition of accompanying maps and photos. During this step, specific focus questions (such as on sector-specific questions) were identified for the Technical Working Group (TWG) to consider.

Step 4: Technical Working Group Review Session

The TWG, appointed by the National Climate Change Advisory Council, reviewed the results of the IVARs in a series of participatory workshops. The TWG review sessions aimed to

provide the "learned" perspective on the IVA results which came directly from the "lived" experience of the community. The sessions analysed, evaluated, and validated IVA results; provided added technical evidence to shape results, and determined gaps in knowledge to add greater depth to results. The TWG reviewed, considered, and assessed the priorities in a deliberative way informed by their own technical experience, expertise, and their agencies' strategic priorities. This process identified areas of consensus, areas of difference, and areas where further information was needed from communities.

Step 5: Community Information and Feedback Session

The IVA results and the findings from the TWG were then taken back to communities in location-specific community information and feedback sessions. The first objective of these sessions was to report back the results of the IVA PRA process to the communities who took part in the focus groups. This provided an opportunity to validate results with participants. The workshop also aimed to build knowledge and awareness by communicating the value added analysis of the data and the prioritisation process, which included a comparison of local and national vulnerabilities and how climate-impacted issues are.

Steps 6–8: Finalising the IVAR

Using the IVA data, expert analysis, and prioritization along with the results from the TWG and community consultation, the IVARs were drafted, amended, and finalized to create a suite of reports that cover 14 locations nationally.

2.0 National and Location Summary

2.1 National Context

The nine islands of Tuvalu are situated in the South Pacific Ocean with a combined land area of 26 km^2. It has a total population of 10,782, with just over half of whom reside in the country's capital of Funafuti. The average height above sea level is less than 3 metres, with the maximum height above sea level being 4.6 m (Government of Tuvalu [GoTV], 2015).

2.2 Climate and Climate Change in Tuvalu

Tuvalu has a tropical climate characterized by two distinct seasons—a wet season from November to April and a dry season from May to October. This seasonal cycle is strongly influenced by the South Pacific Convergence. The mean annual rainfall in the southern islands of Tuvalu is 3,400 mm: in the north it is 2,900 mm. Temperature ranges from 25°C to 30°C all year round. The tropical cyclone season is from November to April. Tuvalu is particularly vulnerable to cyclone-generated winds, storm surges, and swells, as well as spring tides. Since 1993, Tuvalu's sea level has been rising by approximately 5 mm per year (GOTV, 2015, p. viii).

Anticipated climate trends in Tuvalu are as follows (Pacific-Australia Climate Change Science and Adaptation Planning Program [PACCSAPP], 2015, p. 6):

- El Niño and La Niña events will continue to occur in the future, but there is little consensus on whether these events will change in intensity or frequency.
- Annual mean temperatures and extremely high daily temperatures will continue to rise.
- It is not clear whether mean annual rainfall will increase or decrease, the model average indicating little change, with more extreme rain events.
- Incidence of drought is projected to decrease slightly.
- Sea level will continue to rise.
- Ocean acidification is expected to continue.
- The risk of coral bleaching is expected to increase.
- December–March wave heights and periods are projected to decrease slightly.
- Tropical cyclones are projected to be less frequent but more intense.

2.3 Funafuti Community Summary

The Funafuti community are the traditional landowners of the Funafuti atoll and now reside almost exclusively in the Funafuti localities of Senala and Alapi. This area is located on the west

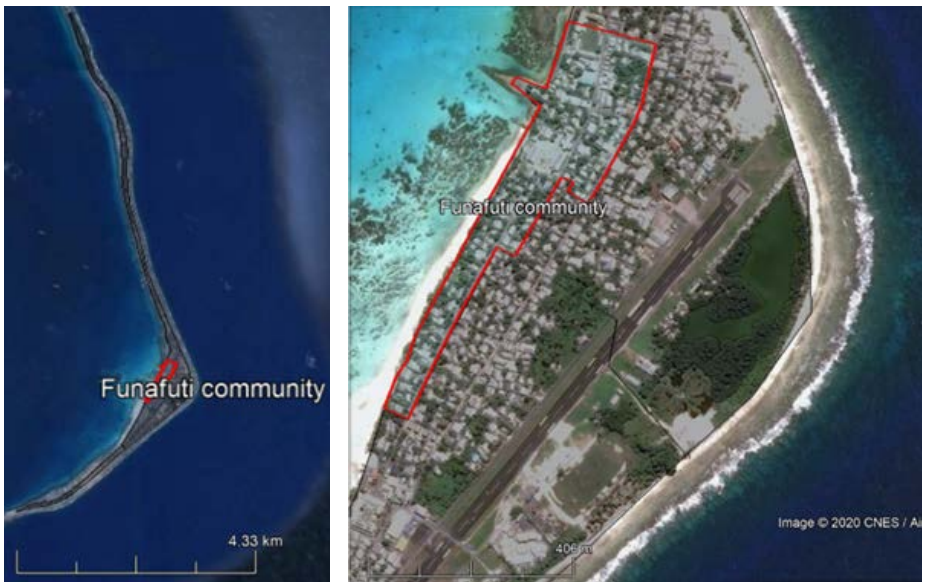
(lagoon) side of Funafuti island in the central part of Funafuti. It has an estimated population of 1,544 people in 2020, which is 14.6% of the national population and is the IVA location with the second highest population. As per Funafuti generally, it has an increasing population with a growth rate estimated at 1.8% annually. It is the smallest locality of Funafuti with by far the highest population density—15,759 people per km^2, which is three times higher than the next highest Funafuti locality of Fakaifou/Nanumasa which sits adjacent to the Funafuti community.

Table 2.1 Location and population statistics

Total estimated population by place of enumeration (percentage of national)	1,544 (14.6%)
Area (km^2) and distance from Funafuti International Airport	0.098 km^2 800m (nth east)
Estimated population density (persons per km^2)	15,759 per km^2
Estimated population change 2012–2020 (percentage annual change in period)	194 (1.8%)
Households in 2017 (average household size on Funafuti)	15 (7.9)

Source: Secretariat of the Pacific Community (SPC), 2020; Central Statistics Division, Ministry of Finance, Economic Planning and Industries, Government of Tuvalu (GoTV), n.d., adapted by NAP GN/author.

Map 1. Funafuti community within Funafuti (left) and detail (right).



Source: Google Earth, 2020; CCD, 2020.

2.3.1 The IVA Survey in the Funafuti Community

The IVA survey on Funafuti was conducted on May 13 and 14, 2020. The Funafuti community survey included 24 participants, including separated groups of nine women, seven young people, and eight men. The survey followed the process outlined in Section 1.2.2.

3.0 Funafuti Community IVA Results and Analysis

This report presents and discusses the results of the IVA conducted in the Funafuti community in May 2020. It includes presentation and analysis of the top five vulnerability issues, vulnerable sectors, and further analysis of each compared to the national IVA results.

The results below are presented according to the key stages of the IVA including:

5	top five vulnerability issues (IVA Step #5)
	sectoral IVA scores and priority issues (Steps #2 and #4)

In examining these results, this analysis explores the following questions:

	How **frequently reported** are the top five and sector priority issues in this location relative to national results? Frequency is measured by the number of groups reporting an issue. To establish the significance of an issue, different thresholds are set: for example, reported by more than **75% of groups**.
	Which are the **priority issues** either in the top five or at a sector-level?
	Which are the **most vulnerable sectors by IVA score**, and how do these compare to national results?
	MCA to **target** the overall priority issues using each stage of the analysis to build a comprehensive picture of **locally prioritised and nationally significant issues.**

3.1 Top Five Vulnerability Issues

As part of the IVA survey, participants in the focus groups are asked to prioritise the overall top five vulnerability issues in their location (island or Funafuti locality). This follows a multi-stage process of identifying and prioritising issues at a subsector level (see Section 1.2). This section presents analyses and discusses these top five vulnerability issues.

3.1.1 Overview and Comparison of Top Five Vulnerability Issues With National Results

Table 3.1 lists the top five vulnerability issues in the Funafuti community. Red highlights show where the top five vulnerability issues in the Funafuti community are also *frequently reported* in national results. A *frequently reported* top five vulnerability issue is defined as:

- an issue reported >75% in IVA Step #1 for the whole of the IVA survey, suggesting this is a *common issue nationwide;* and
- an issue reported as a top five priority issue by five or more other groups (IVA Step #5), suggesting that this is also a *priority issue amongst communities nationwide.*

Table 3.1 Overview of the top five vulnerability issues reported in the Funafuti community in May 2020 compared to national results.

Issue rank*	Group	Top five vulnerability issues in Funafuti community (issue code)	% of groups reporting issue nationally**	N. groups reporting issue in the top five*** nationally
1,2	Male, youth	*(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*	100%	12
1,5	Female, male	*(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services*	100%	8
1	Youth	*(Fn.8) Land for Farming > Limited to no access to land for farming*	71%	2
2	Male	*(Ei.3) Fisheries & Marine Environmental Management > Limited or no access to fisheries and marine environmental management support services from government and NGOs*	93%	2
2	Female	*(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*	93%	19
3	Male	*(Pf.9) Ability to Access Loans or Credit to Build Safe Or Adequate House > Limited or no ability to access credit to build safe or adequate house (for majority of households)*	57%	1
3	Female	*(Fn.8) Land for Farming > Limited to no access to land for farming*	71%	2
3	Youth	*(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/storm/inundation*	93%	1
4	Male	*(Ph.6) Mobility – Internal > Unsustainable rate of migration out of the island to live in Funafuti or other islands in Tuvalu.*	79%	1

Issue rank*	Group	Top five vulnerability issues in Funafuti community (issue code)	% of groups reporting issue nationally**	N. groups reporting issue in the top five*** nationally
4	Female	*(Wi.2) Household Water Tank Capacity > Inadequate household water tank capacity due to high household size and demand*	36%	3
4	Youth	*(En.13) Marine Pollution > Marine pollution (from rubbish and wastewater from toilets and shipping vessels)*	93%	1
5	Female	*(Pn.1) Land for Housing & Settlement > Limited or no access to adequate land for housing and settlement*	71%	3
5	Youth	*(Ig.11) Island& Developing Planning – Income Security > Income sourcing and management concerns are not adequately addressed in the island development plan (e.g., within five-year plan)*	100%	1

** 1 is ranked as most important. ** IVA Step #1 ***IVA Step #5*

Key Insights and Analysis

- Eight of the 13 top five vulnerability issues are frequently reported as present by more than 75% of other groups in the survey nationwide.
- Three of these eight issues are also prioritised by five or more groups nationwide, and are:
  - *(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity which was reported twice: male – rank #1, youth – rank #2; and*
  - *(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services which was reported twice: female – rank #1, male – rank #5; and*
  - *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion which was reported once: female – rank #2).*
- One other of the top five vulnerability issues was common across the two groups (but not meeting either criteria above):
  - *(Fn.8) Land for Farming > Limited to no access to land for farming (Reported twice: youth - rank #1, female - rank #3).*
- These results suggest that eight (of the 13) of the Funafuti community's top five vulnerability issues are common to those reported by other groups, with three being frequently prioritised and/or common to male, female, and youth groups. This shows these issues are not unique to this location and are high priority across multiple areas: they may represent a justification for prioritisation in the NAP Process.

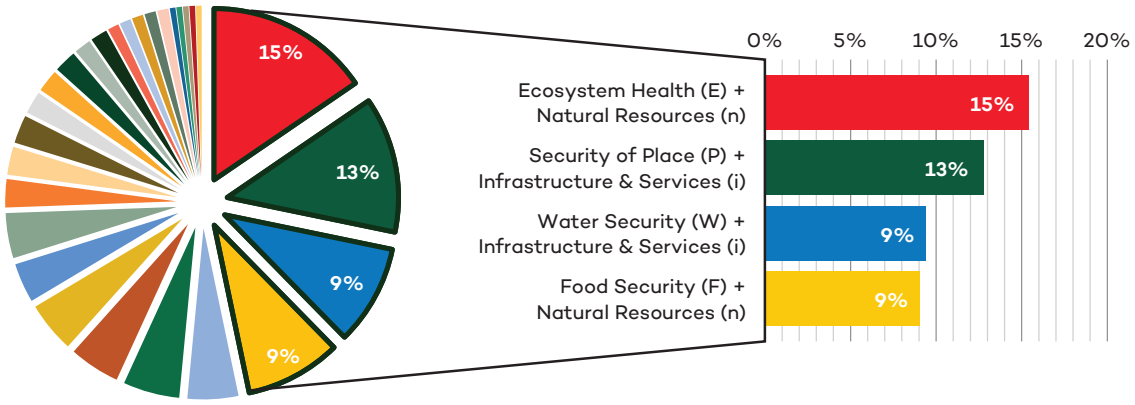
3.1.2 Subsector Comparison of Top Five Vulnerability Issues – Hotspot Subsectors

This section examines how the top five vulnerability issues reported in the Funafuti community compare to the national results at a subsector level. We see that almost half of all top five vulnerability issues fall within four subsectors, and we will call these "hotspot subsectors" (see definition in Box 1).

Box 1. Defining "Hotspot Subsectors"

Analysing the top five vulnerability issues by subsector can show where both *related* and *frequently reported* issues occur in a given subsector. Thus, it shows clusters of top five priority issues (henceforth "hotspot subsectors"). These are defined as subsectors that, nationally, have 9% or more of the top five vulnerability issues. Combined, close to half (47%) of all (n. 191) top five vulnerability issues fall into these four hotspot subsectors.

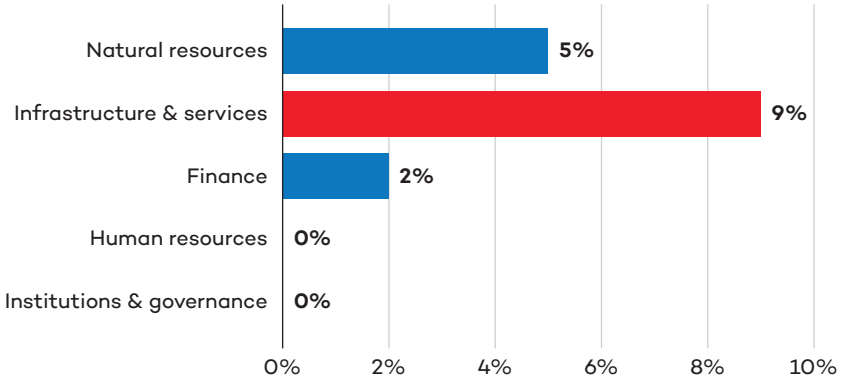
Figure 3.1. Hotspot subsectors in the Tuvalu national IVA survey (2018, 2020).



Figures 3.2–3.4 show where a top five issue in Funafuti community (red highlight) falls into a hotspot subsector (bars show national results). For all charts on the subsectors of the top five vulnerability issues, go to https://www.tuvaluiva.com/dashboards.html

The #1, #2, & #4 top priority issues reported in the Funafuti community (Wi.1 – reported twice, and Wi.2) are in the "Water security + infrastructure & services" subsector, which has **the third highest proportion of top five issues** (10% of top five vulnerability issues).

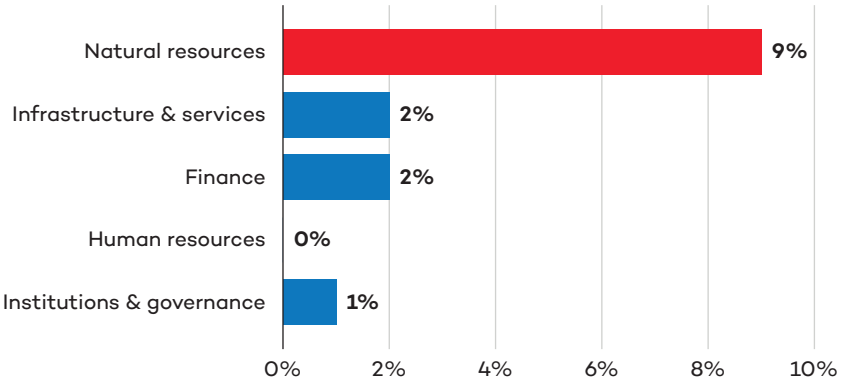
Figure 3.2. Percentage of top five vulnerability issues reported in the "food security" sector by subsector with Funafuti community top five issue subsector(s) highlighted.



Note: Bars show national results. Red highlight shows the subsector(s) that Funafuti community's top five vulnerability issues fall into.

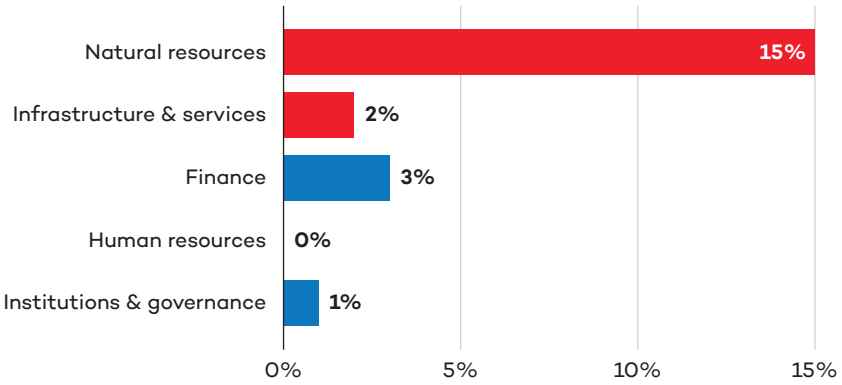
The #1 & #3 top priority issues reported in the Funafuti community (Fn.8 – reported twice) is in the "food security + natural resources" subsector. This subsector has the **fourth highest proportion (9%) of top five vulnerability issues.**

Figure 3.3. Percentage of top five vulnerability issues reported in the "food security" sector by subsector with Funafuti community top five issue subsector(s) highlighted.



The #2 & #4 top priority issues reported in the Funafuti community (En.5 – reported twice) is in the "ecosystem health + natural resources" subsector. This subsector has the **highest proportion (15%) of top five vulnerability issues.**

Figure 3.4. Percentage of top five vulnerability issues reported in the "ecosystem health" sector by subsector with Funafuti community's top five issue subsector(s) highlighted.



Key Insights and Analysis

- Four of Funafuti community's top five vulnerability issues fall into the "hotspot subsectors." These are:
  - *(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*
  - *(Wi.2) Household Water Tank Capacity > Inadequate household water tank capacity due to high household size and demand*
  - *(Fn.8) Land for Farming > Limited to no access to land for farming*
  - *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*
- Further investigations into these hotspot subsectors in the Funafuti community can inform national responses, and likewise national investigations in these subsectors may bring insights and solutions for the Funafuti community. A focus on hotspot subsectors may be justified given the high proportion of top five vulnerability issues in these subsectors. These may be a basis for locally relevant but nationally scalable investigations as part of the NAP process.

3.2 Sector-Level Scores and Priorities

The IVA approach provides information on the sectors and subsectors that are particularly vulnerable as perceived by participants. The results are captured using the IVA score. This section examines the results according to vulnerable sectors, vulnerable subsectors, and the prioritised issues within those subsectors.

3.2.1 Sector IVA Vulnerability Scores

This section examines the overall vulnerability scores reported by the participants in the IVA process. This aims to provide information on:

- How a selected location/group's vulnerability scores compare across sectors & subsectors? ("local vulnerability")
- How does this compare to the national total? ("national vulnerability")

The results are presented below in tables according to sector and subsector grouping (see Box 1 for further information). In these tables, 1 = high reported vulnerability and 5 = not reported as vulnerable. See colour coding below.

← more vulnerable **less vulnerable →**

1	2	3	4	5
very bad	poor	OK	good	very good

Table 3.2 shows the IVA vulnerability scores for the Funafuti community.

Table 3.2. IVA vulnerability scores reported for Funafuti community in May 2020 from 1 = "high vulnerability" to 5 "not vulnerable"

Sector	Subsector					Total (Avg.)
	Natural resources	Infrastructure & services	Finance	Human resources	Institutions & governance	
Ecosystem health	1.0	1.0	1.7	1.3	1.0	**1.2**
Water security	2.0	2.0	2.3	2.3	2.3	**2.2**
Security of place	1.7	1.7	1.7	2.3	2.0	**1.9**
Energy security	3.7	2.0	2.0	2.3	2.0	**2.4**
Income security	1.7	1.3	1.3	1.3	1.7	**1.5**
Community health	1.7	2.3	3.7	1.7	2.0	**2.3**
Food security	1.0	2.3	1.7	2.3	2.3	**1.9**
Total (Avg.)	**1.8**	**1.8**	**2.0**	**2.0**	**1.9**	**1.9**

Note: (1 = high reported vulnerability – 5 = not reported as vulnerable)

Table 3.3 shows the overall national average IVA scores for each sector and subsector.

Table 3.3. National average IVA vulnerability scores

Sector	Subsector					Total (Avg.)
	Natural resources	Infrastructure & services	Finance	Human resources	Institutions & governance	
Ecosystem health	1.4	1.5	1.7	1.7	1.7	**1.6**
Water security	2.0	2.3	1.9	2.4	2.4	**2.2**
Security of place	1.4	1.6	2.0	2.7	2.4	**2.0**
Energy security	2.2	1.9	1.9	2.1	1.9	**2.0**
Income security	1.8	1.8	1.9	1.9	2.1	**1.9**
Community health	2.0	2.3	3.2	1.8	2.5	**2.4**
Food security	2.1	2.2	2.1	2.6	2.5	**2.3**
Total (Avg.)	**1.8**	**1.9**	**2.1**	**2.2**	**2.2**	**2.1**

Table 3.4 shows the difference between the average IVA scores for the Funafuti community and the overall national average IVA scores for each sector and subsector according to the colour coding below.

← more vulnerable than comparison area **less vulnerable than comparison area →**

lowest in table				highest in table

Table 3.4. Difference between Funafuti community and national average vulnerability scores.

Sector	Subsector					Total (Avg.)
	Natural resources	Infrastructure & services	Finance	Human resources	Institutions & governance	
Ecosystem health	-0.4	-0.5	0.0	-0.4	-0.7	**-0.4**
Water security	0.0	-0.3	0.4	0.0	0.0	**0.0**
Security of place	0.3	0.0	-0.3	-0.3	-0.4	**-0.1**
Energy security	1.5	0.1	0.1	0.3	0.1	**0.4**
Income security	-0.1	-0.4	-0.6	-0.6	-0.4	**-0.4**
Community health	-0.4	0.0	0.5	-0.1	-0.5	**-0.1**
Food security	-1.1	0.1	-0.4	-0.2	-0.1	**-0.4**
Total (Avg.)	**0.0**	**-0.1**	**0.0**	**-0.2**	**-0.3**	**-0.1**

Note: The difference indicates that energy security is substantially less vulnerable compared to national results, and "food security" and "ecosystem health" are substantially more vulnerable. This food sector vulnerability is particularly in the subsectors of "natural resources" and slightly in "finance."

Examining Tables 3.2 and 3.3 together, we see that there are certain sectors where a) either local and national vulnerability are high (IVA score <2) and b) both are at least high-medium (IVA score >2 <3). Table 3.5 illustrates how local and national vulnerability intersect to highlight sectors of particular priority based on IVA vulnerability scoring.

Table 3.5. Comparison of high-vulnerability sectors in Funafuti community with the average vulnerability from the whole IVA survey

Sector	Funafuti community high vulnerability (<2 IVA Score)	National high vulnerability (1-2 IVA Score)	Priority based on IVA scoring
Ecosystem health	1.2 (high)	1.6 (high)	**very high**
Water security	2.2 (high/med)	2.2 (high/med)	**med**
Security of place	1.9 (high)	2 (high/med)	**high/med**
Energy security	2.4 (high/med)	2 (high/med)	**med**
Income security	1.5 (high)	1.9 (high)	**very high**
Community health	2.3 (high/med)	2.4 (high/med)	**med**
Food security	1.9 (high)	2.3 (high/med)	**high/med**

Priority key: "very high" = both local and national IVA score of < 2. "high" = local IVA score 2–2.9 and national <2. "high/med" = local IVA score < 2 and national 2–2.9. "med" = both local and national IVA score of 2–2.9.

Key Insights and Analysis

When looking at Tables 3.2, 3.3, and 3.4, three key findings emerge in terms of local vulnerability and national vulnerability.

Local vulnerability:

- "Ecosystem health" is rated as the most highly vulnerable sector, followed by "income security." "Security of place" and "Food security" are also rated below 2.
- "Ecosystem health" is rated as slightly less vulnerable relative to the total, particularly in the subsectors of "institutions & governance" and "infrastructure and services."
- "Energy security" is rated as somewhat less vulnerable relative to the total, particularly in the subsector of "natural resources."

National vulnerability:

- "Ecosystem health" and "income security" were rated the most vulnerable of all sectors.

Combined vulnerability:

- Looking at both national and local vulnerability reveals that "ecosystem health" followed by "income security" and then "security of place" and "energy security" are the most vulnerable sectors.

3.2.2 Identifying Funafuti Community's Sector Priority Issues Compared to the National Level

This section examines what the overall sector priority issues are in the Funafuti community and how they compare to most prevalent national sector priority issues (IVA Step 2). This analysis looks at which sector priority issues are *frequently reported* both in Funafuti community and nationally. This examines issues according to four criteria, which are:

1. **Locally prioritised:** are listed as a sector priority issue in Funafuti community; and,
2. **High vulnerability score:** are in the medium to high categories of vulnerability (from Table 3.5 above); and,
3. **Nationally prioritised:** are in the top 10 of all sector priority issues nationwide; and,
4. **Nationally prioritised:** more than 30% of groups nationwide report this issue.

This is a measure of issues that are both nationally significant and are a local priority. Figure 3.5 shows an example from the "community health" sector, showing the top 10 sector priority issues with those reported in Funafuti community highlighted in red. (All charts are linked here).

Figure 3.5. "Community health" top sector priority issues nationally, with Funafuti community sector priority issues highlighted red.

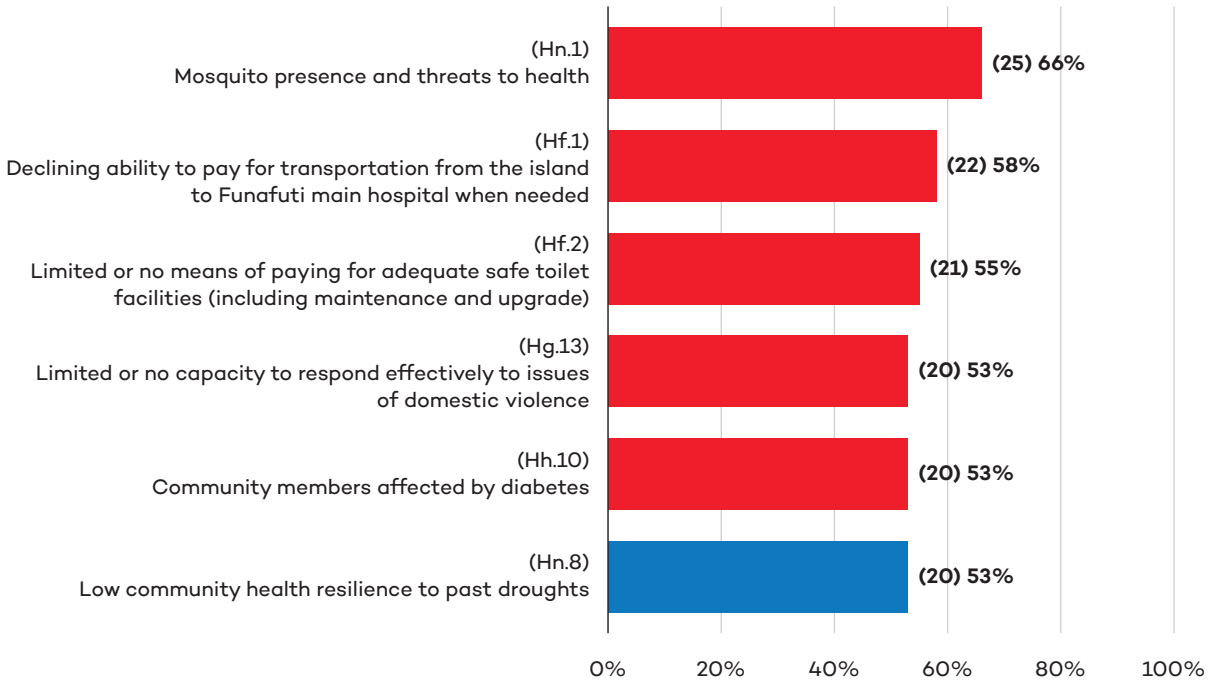


Table 3.6 shows the sector priority issues for the Funafuti community organised by sector.

Table 3.6. List of issues that are both reported in Funafuti community and in the top 10 sector priority issues across all locations

Sector	Sector priority issue (in top 10 nationally reported and >10% of groups report)	% of groups reporting as a sector priority issue nationally
"Ecosystem health"	*(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*	63%
	(Ef.3) Marine Conservation > Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)	58%
	(Ef.1) Waste Management > Limited or no means to pay for waste management related costs (e.g., rubbish collection and disposal/recycling/rubbish bins/rubbish collection)	42%
	(Eg.1) Traditional Knowledge > Limited or no transmission of marine & land-based traditional ecological knowledge and practices to the next generation	39%
	(Eh.5) Skills – Solid Waste Management > Lack of people in the community skilled at sustainable solid waste management (reduce/reuse/recycle and composting)	32%
"Water security"	*(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*	82%
	(Wf.1) Ability to Pay for Household Water System > Limited ability to pay for the operations/maintenance and upgrade of the household water system	71%
	(Wn.1) Rainfall > Rainfall not sufficient to meet community water security requirements	50%
	(Wn.6) Natural Water Source > Existing natural water source insufficient to support water security needs	32%
"Security of place"	*(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement*	68%
	(Pi.34) Evacuation Centre > Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones	47%
	(Ph.6) Mobility – Internal > Unsustainable rate of migration out of the island to live in Funafuti or other islands in Tuvalu	47%

Sector	Sector priority issue (in top 10 nationally reported and >10% of groups report)	% of groups reporting as a sector priority issue nationally
"Energy security"	*(Nn.4) Petroleum Reliance > At least 50% of the community relies on petroleum (kerosene/benzene/diesel/ LPG)*	68%
	(Nh.1) Skilled Electricians > Limited to no community members that are skilled and/or experienced electricians	68%
	(Nf.1) Household Energy Affordability > Limited ability to pay for household energy requirements (e.g., cooking/ lighting/communications/etc.)	47%
	(Nf.4) Energy Technology Upgrade Affordability > Limited to no access to a trust or other fund source to upgrade and maintain energy equipment and technology	34%
	(Ni.5) Energy Connection > Faulty or limited energy connection from source to house (e.g., unsecured/low hanging lines)	34%
	(Nh.6) Past Experience – Disasters & Generators > Limited to no community members with skills to repair disaster-induced damage to existing generators and other sources of energy	32%
"Income security"	*(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services*	53%
	(In.1) Land Availability for Commercial Agriculture > Limited land availability for commercial agriculture	45%
	(Ih.1) Financial Literacy > Limited to no community members trained in financial literacy (e.g., basic budgeting skills)	39%
	(Ii.2) Telecommunications to Support Market Access > Limited to no access to telecommunications from the island to support market access (e.g., internet/mobile phone/etc.)	32%

Sector	Sector priority issue (in top 10 nationally reported and >10% of groups report)	% of groups reporting as a sector priority issue nationally
"Community health"	*(Hn.1) Vector-Borne > Mosquito presence and threats to health*	66%
	(Hf.1) Transportation Costs > Declining ability to pay for transportation from the island to Funafuti main hospital when needed	58%
	(Hf.2) Safe Toilet Facilities Cost > Limited or no means of paying for adequate safe toilet facilities (including maintenance and upgrade)	55%
	(Hg.13) Domestic Violence > Limited or no capacity to respond effectively to issues of domestic violence	53%
	(Hh.10) Diabetes > Community members affected by diabetes	53%
	(Hf.6) NO ISSUES > Communities' ability to pay for health-related needs is fine (in normal and disaster times)	37%
	(Hg.1) Traditional & Modern Governance > Limited to no transmission of traditional medicinal healing knowledge and practices	37%
"Food security"	*(Ff.4) Ability to Pay for Marine-Based Food Production > Limited ability to pay for fisheries or marine-based food-production expenses (e.g., fishing gear/boat/fuel/etc.)*	42%

Key Insights and Analysis

- This analysis shows that of the 210[2] possible sector priority issues in the Funafuti community, 30 meet the criteria above, illustrating they are both locally relevant and nationally significant.
- Two "water security" issues are particularly nationally significant (Wi.1 and Wf.1) in that they are reported both in the Funafuti community and by more than 70% of groups nationally.
  - *(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity (82%)*
  - *(Wf.1) Ability to Pay for Household Water System > Limited ability to pay for the operations/maintenance and upgrade of the household water system (71%)*
- The "ecosystem health," "security of place," and "energy security" sectors all have issues prioritised by more than or close to 60% of groups nationwide. Examples include:
  - *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion (63%)*

[2] 3 x groups, 35 sub-sectors, 2 x priorities = 210 possible issues.

- *(Ef.3) Marine Conservation > Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas) (58%)*
- *(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement (68%)*
- *(Nh.1) Skilled Electricians > Limited to no community members that are skilled and/or experienced electricians (68%)*
- *(Nn.4) Petroleum Reliance > At least 50% of the community relies on petroleum (kerosene/benzene/diesel/LPG) (68%)*

- The "community health" sector has the most issues (n. 7) that are prioritised by more than 30% of groups. The most reported issues being:
  - *(Hn.1) Vector-Borne > Mosquito presence and threats to health (66%)*
- "Security of place" has three frequently mentioned issues. (Pn.5, Pi.34 and Ph.6) one of which is reported by close to 70% of groups nationally:
  - *(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement (68%)*
- These highlight specific issues that are both local priorities as well as being nationally significant and may be given particular attention in the IVAR and potentially later stages of the NAP Process more broadly.

3.3 Summary and Prioritisation of Results and Conclusions

The IVA is a national survey and it is important to identify key emerging results that reflect priorities at both the local and national levels. As such, this section seeks to prioritise the IVA issues according to a combination of local and national priorities using a series of MCAs to further prioritise IVA results. These MCAs use previous analyses to further prioritise vulnerability issues according to a series of criteria. These analyses seek to highlight which issues may be further prioritised in the context of the whole IVA survey results, particularly those that are *frequently reported* in other locations, are particularly *vulnerable*, and/or that are highly climate related.

These MCAs focus only on a narrow range of criteria derived primarily from the results of the IVA itself. This is a narrow focus for prioritisation, relying only on the patterns in the results themselves, so should only be considered an aid to later consultative and technical prioritisation processes. These cannot be considered a true multi-dimensional assessment that may draw on, for example, expert knowledge, secondary literature, and targeted studies.

3.3.1 MCA of Top Five Vulnerability Issues

This section is an MCA of indicators linked to the top five vulnerability issues, namely whether they are: widespread, nationally and locally prioritised, in a hotspot subsector, in a vulnerable sector, and/or highly climate related. The criteria used for this analysis are:

	1.	**Frequently reported issue.** (Indicator: more than 75% of groups nationally report the issue [from Section 3.1.1])
	2.	**Frequently reported top five issue.** (Indicator: Five or more groups report this issue in their top five [from Section 3.1.1])
	3.	**Frequently reported sector priority issue.** (Indicator: issue is also in the top 10 survey wide sector priority issues [from Section 3.2.2])
	4.	**Is in a hotspot subsector.** (Indicator: issue is in one of the four subsectors which, nationally, have 9% or more of the top five vulnerability issues [from Section 3.1.2])
	5.	**High local vulnerability.** (Indicator: Rated as a highly vulnerable sector by IVA score in Funafuti community [from Section 3.2.1])
	6.	**High national vulnerability.** (Indicator: rated as a highly vulnerable sector by IVA score at the national level [from Section 3.2.1])
	7.	**Highly climate related.** This refers to the extent to which extreme weather events are connected to this issue, either as a result of direct exposure to a hazard or demonstrably clear sensitivity to hazards. For example, many issues are likely to be primarily development issues, whereas others have a much more direct connection to extreme weather events

Table 3.7 shows the results of the MCA of the top five vulnerability issues in the Funafuti community.

Table 3.7. MCA of Funafuti community's top five vulnerability issues according to prioritisation criteria (low priority not included).

Issue rank*	Group	Top five vulnerability issues in Funafuti community	Meets criteria							Total no. criteria met	Priority
			1	2	3	4	5	6	7		
2	Female	*(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion.*	Y		Y	Y	Y	Y	Y	6	very high
1, 2	Male, Youth	*(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity.*	Y	Y	Y	Y			Y	5	very high
1, 5	Female, male	*(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services.*	Y	Y		Y	Y	Y		5	very high
3	Youth	*(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/ storm/inundation.*	Y		Y		Y	Y	Y	5	very high
2	Male	*(Ei.3) Fisheries & Marine Environmental Management > Limited or no access to fisheries and marine environmental management support services from government and NGOs.*	Y		Y		Y	Y		4	high
4	Male	*(Ph.6) Mobility – Internal > Unsustainable rate of migration out of the island to live in Funafuti or other islands in Tuvalu.*	Y		Y	Y	Y			4	high
4	Youth	*(En.13) Marine Pollution > Marine pollution (from rubbish and wastewater from toilets and shipping vessels).*	Y		Y		Y	Y		4	high

Issue rank*	Group	Top five vulnerability issues in Funafuti community	Meets criteria							Total no. criteria met	Priority
			1	2	3	4	5	6	7		
5	Youth	*(Ig.11) Island& Developing Planning – Income Security > Income sourcing and management concerns are not adequately addressed in the island development plan (e.g., within five-year plan).*	Y				Y	Y		3	high/ med
4	Female	*(Wi.2) Household Water Tank Capacity > Inadequate household water tank capacity due to high household size and demand.*			Y				Y	2	med
5	Female	*(Pn.1) Land for Housing & Settlement > Limited or no access to adequate land for housing and settlement.*			Y		Y			2	med

** The rank of these issues in the original top five.*

Photo: Silke von Brockhausen/UNDP (CC BY-NC-ND 2.0)

Key Insights and Analysis

- It is likely that four of the 13 top five vulnerability issues in the Funafuti community may be particularly high-priority considerations at the national level as they meet several of the criteria including being:
  - Widespread
  - Locally and nationally prioritised
  - In identified climate vulnerable sectors and subsectors
  - Highly climate related.
- These are particularly in the "ecosystem health," "water security," and "income security" sectors:
  - *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*
  - *(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/storm/inundation*
  - *(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*
  - *(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services*
- Two high-priority environmental management issues are likely to be relevant in considering the combined impact of urban development and climate change on natural environments.
  - *(Ei.3) Fisheries & Marine Environmental Management > Limited or no access to fisheries and marine environmental management support services from government and NGOs*
  - *(En.13) Marine Pollution > Marine pollution (from rubbish and wastewater from toilets and shipping vessels)*
- High-priority issues should be considered for further investigation as part of the IVAR process and potentially the NAP Process more broadly.

3.3.2 MCA of Sector Issues by Vulnerability

Like Section 3.3.1 (above), this section performs an MCA of the sector priority issues using four indicators of whether an issue is: in a vulnerable sector, widespread, frequently prioritised, and/or climate related. Having already been prioritised in Section 3.2.2, this section prioritises according to four criteria listed below:

1. **High frequency reporting as a sector priority issue** (Indicator: % of groups reporting issue. From Section 3.2.2, Table 3.6).
2. **Priority of sector** according to vulnerability score (Indicator: high/med/low score – from Section 3.2.1 Table 3.5).
3. **Top five issue** (Indicator: whether the issue was also mentioned in the top five list by any group; Indicator: Yes/No).

4. **Highly climate related.** This refers to the extent to which extreme weather events are connected to this issue, either as a result of direct exposure to a hazard, demonstrably clear sensitivity to hazards. (Indicator: high/med/low. Also defined in Section 3.3.1).

Each of these ratings is weighted to a series of weightings[3] to identify the priority. Through this analysis, the following ranking of issues emerges (see Table 3.8). Like those identified above, **these may be particularly high-priority considerations for the NAP process.**

Table 3.8. MCA of Funafuti community's sector priority issues according to prioritisation criteria (very high to medium priorities only)

Sector* priority issues in Funafuti community	Ranking against criteria				Priority
	1	2	3	4	
(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion	63%	very high	Y	high	very high
(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement	68%	high/med	Y	high	very high
(Ef.3) Marine Conservation > Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)	58%	very high	Y	med	high
(Pi.34) Evacuation centre > Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones	47%	high/med	Y	high	high
(Hn.1) Vector-Borne > Mosquito presence and threats to health	66%	med	Y	high	high
(In.1) Land Availability for Commercial Agriculture > Limited land availability for commercial agriculture	45%	very high	Y	med	high
(Ii.2) Telecommunications to Support Market Access > Limited to no access to telecommunications from the island to support market access (e.g., internet/mobile phone/etc.)	32%	very high	Y	med	high
(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity	82%	med	Y	high	high

[3] 1) Sector vulnerability: Very High = 4. High = 3. High/Med = 2. Med = 1
2) High frequency reporting (%): >59% = 3. 45-59% = 2. <45% = 1
3) Top five list: Yes = 2. No = 0 (blank)
4) Highly climate related: High = 5. Med = 3. Low = 1
Resulting priority: P<6 = Low. <8 = Med. <10 = High/Med . <12 = High. >12 = Very High

Sector* priority issues in Funafuti community	Ranking against criteria				Priority
	1	2	3	4	
(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services	53%	very high	Y	low	high/med
(Ph.6) Mobility – Internal > Unsustainable rate of migration out of the island to live in Funafuti or other islands in Tuvalu	47%	high/med	Y	med	high/med
(Wn.1) Rainfall > Rainfall not sufficient to meet community water security requirements	50%	med	Y	high	high/med
(Eg.1) Traditional Knowledge > Limited or no transmission of marine & land-based traditional ecological knowledge and practices to the next generation	39%	very high		med	high/med
(Eh.5) Skills – Solid Waste Management > Lack of people in the community skilled at sustainable solid waste management (reduce/ reuse/recycle and composting)	32%	very high		med	high/med
(Wf.1) Ability to Pay for Household Water System > Limited ability to pay for the operations/maintenance and upgrade of the household water system	71%	med	Y	med	high/med
(Wn.6) Natural Water Source > Existing natural water source insufficient to support water security needs	32%	med	Y	high	high/med
(Ef.1) Waste Management > Limited or no means to pay for waste management related costs (e.g., rubbish collection and disposal/ recycling/rubbish bins/rubbish collection)	42%	very high		low	med
(Nh.6) Past Experience – Disasters & Generators > Limited to no community members with skills to repair disaster-induced damage to existing generators and other sources of energy	32%	med		high	med
(Ih.1) Financial Literacy > Limited to no community members trained in financial literacy (e.g., basic budgeting skills)	39%	very high		low	med

Key Insights and Analysis

- This analysis shows that of the 30 sector priority issues in Funafuti community, 22 are ranked medium priority or above using the MCA.
- Seven issues (Pn.5, Ef.3, Pi.34, If.1, Wi.1, In.1) are very high or high priority, and should be considered for inclusion in further investigations as part of the IVAR and NAP process.
- Further consideration should be given to further investigation into the medium-high ranked (n. 6) issues (Wn.1, Ph.6, Eg.1, Eh.5, Wn.6, Ii.2) either through the IVAR process and/or in sector-specific NAP Process investigations.
- Four medium-ranked issues (Ef.1, Wf.1, Nh.6, Ih.1) should be factored into considerations by relevant sector agencies in relation to Funafuti community.

3.3.3 Conclusions and Implications

This section combines all the previous analysis into a summary of the highest priority issues and most vulnerable sectors by IVA score.

The aim of the MCA above has been to give a progressively more prioritised list of issues and high-vulnerability sectors in the Funafuti community that are also nationally relevant. This targeted list is likely to be relevant to the IVAR process and potentially later to the NAP process. Therefore, the main point of this analysis has been to identify issues and sectors that are:

- **Locally relevant**, in that they have been identified as priorities by communities themselves.
- **Widespread and nationally significant**, in that they are frequently mentioned as issues and prioritised as key issues nationwide.
- **In sectors rated as vulnerable** by participants in the IVA, both locally in Funafuti community and nationally.
- **Climate relevant**, there is a close link between extreme weather events and this issue.

KEY VULNERABLE SECTORS AND SUBSECTORS

As a result, key vulnerable sectors identified here are:

- "Ecosystem health," particularly in the subsectors of "institutions & governance," "human resources," and "natural resources"
- "Income security" particularly in the subsectors of "finance" and "human resources."

Following this are the sectors of

- "Food security," particularly in the subsectors of "natural resources" and "finance"
- "Security of place" particularly in the subsector of "institutions & governance."

SUMMARY OF ALL TOP PRIORITY ISSUES

This section combines the top priority issues from the MCAs in the sections above and identifies some common emerging themes. Table 3.9 shows the issues, the emerging themes,

and where they have been prioritised, either in the MCAs or the hotspot subsectors. The key emerging themes in the Funafuti community are:

- Local water infrastructure
- Shoreline protection infrastructure
- Income security
- Environmental management
- Disaster risk management
- Agriculture and farming

Table 3.9. Top priority emerging issues according to the MCAs they have been derived from and presence in a hotspot subsector.

Emerging theme	Group (sector priority*)	Issues	MCA #1	MCA #2	Hotspot subsector
Local water infrastructure	male/ youth (youth/ female / male)	*(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*	yes	yes	yes
Shoreline protection	Youth	*(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/ storm/inundation*	yes		
	Female	*(En.5) Coastal Erosion > Declining/ retreating shoreline due to coastal erosion*	yes		yes
	(youth/ female/ male)	*(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement*		yes	
Income security	Female, male (youth/ female/ male)	*(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services*	yes	yes	

Emerging theme	Group (sector priority*)	Issues	MCA #1	MCA #2	Hotspot subsector
Environmental management	female/ youth	*(Ef.3) Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)*		yes	
	Male	*(Ei.3) Fisheries & Marine Environmental Management > Limited or no access to fisheries and marine environmental management support services from government and NGOs*	yes		
Disaster risk management	(youth/ male)	*(Pi.34) Evacuation centre > Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones*		yes	yes
Agriculture and farming	Youth	*(Fn.8) Land for Farming > Limited to no access to land for farming*	yes		yes
	(youth/ female / male)	*(In.1) Limited Land availability for commercial agriculture*		yes	

**The gender or age group that reported this in the sector priorities is included brackets.*

IMPLICATIONS FOR THE IVAR AND NAP PROCESS

The key implication of these results is that they provide an evidence base for technical and community review as part of the IVA Reporting Process. This review will focus on key areas of investigation, including the following:

- What is the current awareness of, and knowledge about, the issues and vulnerable sectors reported above? This applies both to knowledge of these issues in the Funafuti community specifically and in the context of climate change more broadly.
- What further information is needed, and what planning considerations should inform decision making?
- How much do these IVA results align with technical/institutional understandings of the issues and sectors?
- What improvements can be made to the IVAR process and outputs to enhance value and policy relevance for the NAP and sector planning processes?

There are further implications of these results for the IVAR and the NAP process which are also discussed in more detail in Section 5.

4.0 Results of the TWG Review

This section covers the results of the TWG review of the IVA results above. The TWG was comprised of members of the National Advisory Council on Climate Change (NACCC). A full-day workshop was undertaken on June 10, 2020 with the NACCC TWG.

The agenda was:

PART 1: Introduction and Presentation of Results (morning session)

1. Introduction to team, project, and workshop
2. Overview of IVAR process
3. Overview of IVA
4. Results of the IVA in Amatuku and Funafuti Community

PART 2: NACCC Review of Results (afternoon session)

Technical specialist analysis of IVAR report and issues (from Section 3.3.3 above)

1. Is this a known issue?
2. What do we already know about this issue, including in this place?
3. What do we already know or need to know about this issue in the context of climate change generally?
4. What further information is necessary to be able to make planning decisions?
5. Do vulnerability scores align with institutional understandings of priority vulnerabilities?
6. What may account for gender differences in top five priority issues?
7. Do you have suggestions or comments, on the IVA results, reporting, and process?

The workshop was led by the NAP GN Regional Advisor's national counterpart, Feue Tipu, with sections delivered by three National IVA Reporting Consultants (part 1.4) and the National IVA Coordinator (part 1.3). The workshop covered the IVA results from two locations: Amatuku islet and Funafuti community.

Workshop participants are listed in Appendix A. Not all TWG members attended the workshop, so some relevant technical specialists were not present to enable technical investigation of several issues. The coverage of the issues in the workshop as per the presence of technical subject matter experts is listed in Table 4.1.

Table 4.1. Key IVA issues and coverage in the TWG

Emerging theme	Key issues	Covered in TWG review
Local water infrastructure	*(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity*	Yes
Shoreline protection	*(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/storm/ inundation*	Yes
	(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion	Yes
	(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching a housing and settlement	Yes
Income security	*(If.1) Income for Basic Needs > Household income insufficient to meet basic needs and services*	Yes
Environmental management	*(Ef.3) Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)*	Yes
	(Ei.3) Fisheries & Marine Environmental Management > Limited or no access to fisheries and marine environmental management support services from government and NGOs	No
Disaster risk management	*(Pi.34) Evacuation Centre > Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones*	Yes
Agriculture and farming	*(Fn.8) Land for Farming > Limited to no access to land for farming*	No
	(In.1) Limited Land availability for commercial agriculture	No

4.1 Results of the TWG's Investigations

The following section outlines the results of the TWG review process. It is organised according to the priority issues in Table 4.1.

4.1.1 (Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity

The technical review session confirmed that inadequate household water tank capacity is an ongoing issue both in Funafuti and nationally, and endorsed the results of the IVA. The IVA scores in relation to "water security" + "infrastructure & services" were also endorsed as an accurate reflection of the subsector's vulnerability.

CHARACTERISTICS OF THE ISSUE

Participants noted that household-level water shortages can be caused by various factors including: poor water storage, poor water catchment/gutters, number of household members, and poor management of water at the household level. It was reported that there is a tendency in the community for household water consumption to increase when people have enough water stored. It was reported that people tend to use water wisely only during drought periods.

The TWG noted that limited land and "congested" housing development (houses built close to each other) hinder many households' ability to install enough water tanks around their houses. It was noted that in this part of Funafuti, the majority of houses are located in such congested areas. As a result, it is difficult for each household to install enough water tanks given the limited space they have.

The TWG noted that the water reticulation as a supply option is expensive for low-income households, and the construction of cisterns is expensive. The Tuvalu Building Code provisions relating to water infrastructure have generally not been enforced. It was reported that authorities are aware that enforcement of such requirements may be difficult as many households may struggle financially to meet these standard building code requirements and/or the costs that go with major water infrastructure.

The government requires all public buildings to have water storage facilities as a means of improving water storage capacity at the community level. There are also water cisterns built for the local community with government financial assistance, for example, adjacent to churches. However, participants noted that these water supply facilities are often only open to active members of the faith community. Thus, inactive members of the faith community and/or members of minority churches become victims during drought as they are restricted from accessing these community water supply sources.

Participants noted that the elderly, people with a disability, infants, and children are the most vulnerable people to water security issues.

CHARACTERISTICS OF THE ISSUE IN THE CONTEXT OF CLIMATE CHANGE

In terms of climate change impacts, TWG noted that the Funafuti community depends entirely on rainwater and so is extremely vulnerable to changes in rainfall patterns resulting from climate change.

The Water Department (WD) is responsible for the management of the government's water storage facilities on public buildings. Typically, when there is no rainfall for approximately five to six weeks and when 50% of the government water supply has been used, the WD will warn the public about possible drought by issuing a drought watch (a form of alert).

FURTHER INFORMATION NEEDED AND KEY PLANNING CONSIDERATIONS

The TWG reported that there are potential health risks of using PVC water tanks. A participant reported that it is believed that plastic water tanks can undergo a chemical reaction when exposed to sunlight that can potentially increase the risk of cancer and other diseases. It was reported that further scientific study is required to investigate this concern.

Participants noted that it is important to make gender analysis an integral part of water management planning.

Further investigation which may respond to the issues discussed include:

- Investigate social differences in access to community water storage, i.e., those associated with community buildings such as places of worship.
- Investigate differences in household-level water use efficiency in different rainfall and water storage scenarios.

4.1.2 (En.5) Coastal erosion, (Ei.10) shoreline protection and (Pn.5) encroachment on housing and settlement

This emerging theme includes three related issues listed below:

- *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*
- *(Pn.5) Coastal Erosion & Housing> Coastal erosion encroaching housing and settlement*
- *(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/storm/inundation)*

The technical review session confirmed these are ongoing issues in Funafuti and nationally and thus endorsed these IVA results. The IVA scores in relation to these subsectors were also endorsed as an accurate reflection of their vulnerability.

CHARACTERISTICS OF THE ISSUE

Participants noted that Funafuti, like the rest of the islands of Tuvalu, is experiencing declining or retreating shorelines due to severe coastal erosion. This coastal erosion threatens coastal settlement and other public assets along the coastlines. It was noted that the challenge is enormous given that managed retreat appears impractical considering Tuvalu's limited space.

The TWG reported the coastal erosion evident in Funafuti (and nationally) is due to the lack of hard coastal protection measures. It was noted that there is wide-ranging support for the

implementation of hard shoreline protection structures; however, the cost for construction of hard structures and engineered measures is very expensive and often cost prohibitive.

While coastal erosion was reported as a widespread and severe issue, participants noted that the accretion processes should also be taken into consideration. It was reported that while some coastal areas have been experiencing retreating shorelines, other coastal areas can benefit or gradually increase due to accretion (a gradual buildup of sand).

The TWG noted there are major projects seeking to address coastal erosion. For instance, the Tuvalu Coastal Adaptation Project (TCAP) is promoting the construction of hard measures to ensure the resilience of shorelines. Tuvalu development partners have donated a very significant amount of money to the Government of Tuvalu for the TCAP to implement suitable coastal adaptation measures and prevent coastal erosion. The endorsement and approval of the multi-million dollar TCAP Project funded by the Green Climate Fund is a prime example of the continuous support from overseas donors and development partners to strengthen coastal adaptation measures in Tuvalu.

An additional project mentioned at the technical review session was the Asian Development Bank (ADB) project that includes the construction of boat harbours together with shoreline protection measures such as groynes.

CHARACTERISTICS OF THE ISSUE IN THE CONTEXT OF CLIMATE CHANGE

Participants reported that strong ocean currents and forceful waves, especially during cyclones, significantly accelerate coastal erosion. Cyclones are expected to become more intense in the future, so the impact of coastal erosion will be significant, especially during tropical cyclone events. Participants said this indicates that the establishment of houses and other valuable infrastructure along the coastline should be discouraged.

The TWG noted that a recent scientific study claims that Tuvalu's landmass is increasing, thus potentially bringing into question predictions about the possible future disappearance of Tuvalu due to climate change. However, the Director of Environment noted that Tuvalu's overall landmass is not a major concern, but rather its low elevation that makes it vulnerable to climate change-induced disasters such as cyclones, storm surges, and seawater inundation.

FURTHER INFORMATION NEEDED AND KEY PLANNING CONSIDERATIONS

The TWG put forward several recommendations and considerations that may inform responses to this issue.

Tuvalu should learn from other countries in terms of their coastal adaptation experiences. This learning can inform Tuvalu's (and the Funafuti community's) approach to adopting effective coastal erosion protection measures.

- A feasibility study should be done before the implementation of any shoreline protection measures to get baseline data and provide a cost-benefit analysis of implementing shoreline protection measures.
- A Strategic Environmental Assessment (SEA) (in addition to Environment Impact Assessment [EIA]) should always be conducted to assess the impacts of coastal erosion, thereby identifying both strategic and pragmatic project-based solutions to minimise severe coastal erosion. These assessments could also prevent possible environmental hazards resulting from the implementation of coastal shoreline protection measures.
- The government should develop a coastal policy guideline to prevent people constructing new houses along coastlines.
- Participants noted a key challenge facing the TCAP is to implement pragmatic coastal adaptation measures that are effective in protecting coastal settlements and other valuable infrastructure. The TCAP must manage tensions between community and political preferences alongside sound environmental and engineering science—and finite budgets.
- In the context of recent studies and observations on coastal accretion in Tuvalu, more specific analysis of current (and emerging) elevation needs to be more carefully considered in designing reclamation and coastal resilience measures.

4.1.3 (Pi.34) Evacuation Centre> Limited or no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones

The technical review session confirmed they were aware of the level of availability of Evacuation Centres (ECs). However, the TWG noted that there were other locations in Funafuti which are more exposed and where vulnerability scores for this issue are higher than.

CHARACTERISTICS OF THE ISSUE IN THIS PLACE

The TWG noted that there are already existing ECs in the event of major disasters. These include: Lofeagai EKT Community Hall, Princess Margaret Hospital, Primary School Classrooms, Chapel of EKT Lofeagai, and Chaplain/Pastor's house.

Participants noted that ECs need to have the appropriate facilities such as a kitchen, first aid kits, and toilets. However, most of the existing ECs do not have these necessary facilities. The Disaster Department (DD) was of the opinion that this is not a major concern as the ECs do perform their primary function of providing shelter.

The TWG noted that each of the settlements on Funafuti (Tekavatoetoe, Vaiaku, Indigenous Funafuti, Fakaifou, Lofeagai, and even Amatuku) has a Disaster Committee (DC). The DD has established the DCs as required by the Disaster Act.

Participants mentioned that disaster plans for the local and national levels are in place for various disasters; however, the Funafuti community has limited awareness of these plans.

This was compared to communities/localities like Lofeagai and Kavatoetoe which are more vulnerable to disasters (storm surges and cyclones) and are aware of the readiness of ECs and of the evacuation plans and procedures during disasters. Similarly, it was reported that there are members of the Funafuti community who may not be aware that there are designated ECs available to them during natural disasters.

DD mentioned that they have specific responses to different types of disasters. The DD have National Disaster Policy procedures such as the Standard Operating Procedures, NDAP, and the Act that they work to comply with.

CHARACTERISTICS OF THE ISSUE IN THE CONTEXT OF CLIMATE CHANGE

The TWG noted there is sufficient access for the Funafuti community to an adequately sized EC that is safe from storm surge and cyclones. For instance, the DD and the Funafuti Falekaupule have set up an EC as an arrangement for disasters.

FURTHER INFORMATION NEEDED AND KEY PLANNING CONSIDERATIONS

The TWG suggested considering ideas from other islands, not just those that come from the Funafuti community. For example, to have underground evacuation locations and to have large ECs with lifeboats available in those shelters.

One participant suggested the DD considers ensuring each household has a boat, especially in times of tsunami warnings.

4.1.4 (Ef.3) Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)

The TWG supported the IVA results for this issue. However, it noted they do not have a high level of concern about the limited means to pay for marine and land-based environmental protection and conservation. This is because the Environment Department works together with projects such as Ridge to Reef (R2R) to manage protected areas including the Marine Protected Area (MPA) and the Locally Managed Marine Areas (LMMA) for the rest of the outer islands.

The technical review session confirmed the vulnerability score aligns with institutional understandings of priority vulnerability.

CHARACTERISTICS OF THE ISSUE IN THIS PLACE

Participants observed that Funafuti has an MPA, which differs from an LMMA. The difference being that island leaders on the outer islands make decisions on when to close and open their LMMAs, which is not the case for an MPA.

CHARACTERISTICS OF THE ISSUE IN THE CONTEXT OF CLIMATE CHANGE

The TWG observed that increasing sea temperature and ocean acidification adversely affects the marine environment such as corals and other marine life.

FURTHER INFORMATION NEEDED AND KEY PLANNING CONSIDERATIONS

The TWG identified several considerations for future planning on this issue:

- Further information on the financial impacts of this issue is needed to address this issue.
- Increase awareness of young people and women about financial support and environmental projects delivered by the government. Participants believed young people and women are more supportive of environmental initiatives, with higher participation in environmental protection or conservation activities, for instance, planting of mangroves.

4.1.5 (If.1) Income for Basic Needs> Household income insufficient to meet basic needs and services

The technical review session confirmed that the IVA results reflect the current household income situation in the Funafuti community. The IVA scores in relation to this subsector were also endorsed as an accurate reflection of their vulnerability.

CHARACTERISTICS OF THE ISSUE IN THIS PLACE

The TWG noted that the Department of Planning and Statistics is conducting an assessment of the standard of living relative to the current government salary. The assessment is expected to be completed in July 2020 and will provide further clarity on this issue. The current Tuvalu national poverty line is AUD 1.47 per day per adult equivalent—the value in monetary terms of a basket of food to achieve the WHO minimum dietary intake of 2,400 kilojoules per day. This is based on the Household Income and Expenditure Survey, together with research and studies including the unpublished work by the World Bank in 2019.

CHARACTERISTICS OF THE ISSUE IN THE CONTEXT OF CLIMATE CHANGE

Participants noted that low-income households have specific vulnerabilities in the context of climate change. For instance, they are unable to afford to construct climate-resilient housing due to poverty or economic hardship.

FURTHER INFORMATION NEEDED AND KEY PLANNING CONSIDERATIONS

The TWG noted that further information on the specific characteristics of income security in the Funafuti community (and nationally) may be available via the Household Income and Expenditure Survey (HIES) available from the Tuvalu Central Statistics Division.

Participants noted that a project concept, such as climate-proofing houses for the nation, is worth considering in relation to poverty-related housing vulnerability.

Participants noted that there is a government business scheme via The Development Bank of Tuvalu (DBT) that is open to the public to assist small businesses.

The TWG noted that government benefits to older people should consider differences in life expectancy between males and females, as women have a much longer life expectancy than men. For instance, government income benefits for the elderly currently start at 70 years old. However, men may not be able to access the benefits given their comparatively short life expectancy.

5.0 Community Validation of IVA Results and TWG Feedback

A validation workshop was held with the Funafuti community on June 20, 2020. The purpose of the workshop was to review and validate the IVA results and TWG's feedback with the community. The workshop agenda and participant list are at Appendix A1 and A2.

The workshop provided the community with an opportunity to seek clarification about the IVA process and results, verify the IVA findings, and raise issues for further consideration. It also sought the community's comments on the TWG's analysis of the priority issues.

5.1 Community Validation of IVA Results

The community agreed with the results of the MCA. However, in general, they believed that all of the issues identified were high priorities, not only the top five selected for analysis. In future, the community suggested that up to 10 issues should be selected for analysis.

Given the large volume of information, participants requested further training on the IVA approach. They also recommended that more people should be included in the original IVA data collection process.

5.2 Community Validation of TWG Feedback

The Funafuti community provided comments on the TWG analysis of the five priority issues as follows:

5.2.1 (Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity

Participants fully endorsed the TWG's feedback on the IVA result.

GENERAL CHARACTERISTICS OF THE ISSUE

Workshop participants highlighted that water shortage is an ongoing issue. Therefore, there is an increasing demand for water tanks. They noted that the government has provided water tanks for community buildings.

Participants said the Tuvalu Building Code should be enforced as a means of improving water storage capacity at the community level.

CLIMATE CHANGE ISSUES

Participants at the workshop reported that typically the Funafuti community will experience water shortages when there is no rainfall for approximately three weeks, rather than the five to six weeks identified by the TWG.

The participants asserted that even government water supply usually cannot meet the public's water needs, especially during a prolonged period of little or no rainfall.

FURTHER INFORMATION NEEDED AND PLANNING CONSIDERATIONS

The Funafuti community emphasised that there is a difference in household-level water use which may be attributed to the difference in the number of household members.

They said the need for each household to have a good-sized water cistern should be part of water management planning considerations.

Participants suggested that the government should consider the option of waiving import charges (custom duties) for importing water tanks. They also said the government should consider providing water tanks for every newly built house.

The workshop recommended that the government enforce Tuvalu's Building Code and at the same time, provide financial assistance to help people comply with building code requirements.

5.2.2 Shoreline Protection

This theme consists of the following three interlinked issues:

- *(En.5) Coastal Erosion > Declining/retreating shoreline due to coastal erosion*
- *(Pn.5) Coastal Erosion & Housing > Coastal erosion encroaching housing and settlement*
- *(Ei.10) Shoreline Protection > Low resilience of shoreline protection structures to disasters (cyclone/storm/inundation).*

Participants agreed with all of the TWG's comments on the general characteristics of the issue, climate change issues, and the further information needed and planning considerations.

5.2.3 (Pi.34) Evacuation Centre> Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones

Unlike the TWG, the Funafuti community workshop participants believed that the high risk vulnerability rating on this issue was relevant since there is no EC in Funafuti that is adequately sized and safely located for storm

surge and cyclones. They believe that this issue should be assessed as a "very high risk" due to the unsafe conditions of the existing ECs.

GENERAL CHARACTERISTICS OF THE ISSUE

The Funafuti community questioned the safety and strength of the current ECs. Participants said the DD needs to do more assessments on the safety of existing ECs.

CLIMATE CHANGE ISSUES

Participants at the meeting were not aware of the EC discussed by the TWG. Some participants said the Kaupule needs to notify everyone about this, as opposed to only some people in the community.

FURTHER INFORMATION NEEDED AND PLANNING CONSIDERATIONS

Participants said the idea of establishing ECs underground does not align with their thinking. They reasoned that the deeper they go underground, the greater the risk of sea-level rise. They said ECs should be elevated and situated on hard ground rather than on soft ground (sand).

They suggested that further assessment should be done on the type of ECs that should be built in Funafuti.

5.2.4 (Ef.3) Marine Conservation > Limited to no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)

Participants agreed with all of the TWG's comments on the general characteristics of the issue, climate change issues and the further information needed and planning considerations.

In addition, they recommended that any technical advisors recruited should be local people.

5.2.5 (If.1) Income for Basic Needs> Household income insufficient to meet basic needs and services

Participants agreed with all of the TWG's comments on the general characteristics of the issue, climate change issues, and the further information needed and planning considerations.

Additionally, participants recommended that the government increase financial support for people due to the reduced income available from natural resources.

6.0 Summary of TWG and Community Feedback

6.1 IVA Validation

Overall, both the TWG and the Funafuti community agreed with all the IVA results, as illustrated in Table 6.1. Only the TWG questioned the vulnerability score in relation to ECs.

The community reported that all the issues identified were high priorities, not only the top five selected for analysis. Given the large volume of information, community participants requested further training on the IVA approach. They also recommended expanding the number of people included in the IVA process.

Figure 6.1. Summary of TWG and community validation of IVA results by priority issue

Priority	TWG	Funafuti Community
(Wi.1) Household Water Tank Capacity > Inadequate household water tank capacity	Validated issue and vulnerability score	Validated issue and vulnerability score
(En.5) Coastal erosion, (Ei.10) shoreline protection and (Pn.5) encroachment on housing and settlement	Validated issue and vulnerability score	Validated issue and vulnerability score
(Pi.34) Evacuation Centre> Limited to no access to adequately sized and safely located evacuation centre that is safe from storm surge and cyclones	Validated issue. Noted vulnerability score was not higher than other locations.	Validated issue and vulnerability score
(Ef.3) Limited or no means to pay for various marine and land-based environmental protection or conservation activities (e.g., protected areas)	Validated issue and vulnerability score	Validated issue and vulnerability score
(If.1) Income for Basic Needs> Household income insufficient to meet basic needs and services	Validated issue and vulnerability score	Validated issue and vulnerability score

6.1.1 (Wi.1) Inadequate Household Water Tank Capacity

Both the TWG and the community had a significant discussion of the causes of water shortages in Funafuti. There was disagreement between the TWG and the community over the number of weeks of no rainfall that leads the WD to issue a drought alert. The TWG suggested it was five to six weeks, whereas the community said it was three weeks.

The TWG and the community agreed the Building Code should be enforced as a means of improving water storage capacity at the community level. While TWG suggested investigating

differences in access to community water storage and differences in household-level water use efficiency, the community participants recommended more government support for household water tanks.

6.1.2 (En.5) Coastal erosion, (Ei.10) shoreline protection and (Pn.5) encroachment on housing and settlement

The TWG had considerable discussion about coastal erosion. While noting it was widespread and severe, the TWG noted there are many projects addressing this issue, such as the TCAP. The TWG made several recommendations, including the development of a coastal policy guideline to prevent people constructing new houses along coastlines, conducting SEAs to assess the impacts of coastal erosion, conducting feasibility studies of proposed shoreline protection measures, and considering elevation in coastal resilience measures. Community participants agreed with all of the TWG's comments and recommendations.

6.1.3 (Pi.34) Evacuation Centre

Unlike the TWG, the Funafuti community workshop participants believed that the high risk vulnerability rating was relevant since there is no adequate EC in Funafuti for storm surges and cyclones. The TWG discussed whether it is sufficient that ECs exist even if they do not have the necessary facilities. The Funafuti community questioned the safety and strength of the current ECs, and some were not aware of the ECs discussed by the TWG.

The TWG recommended considering ideas from other islands to address the issue. The community participants recommended further investigation of the type of ECs that should be built specifically in Funafuti and rejected underground ECs.

6.1.4 (Ef.3) Marine Conservation

While the TWG validated the IVA results, they noted the issue is not of high concern due to current projects managing protected areas, such as R2R. They recommended considering the financial impacts of the issue and increasing awareness of young people and women. The community participants agreed with the TWG's comments.

6.1.5 (If.1) Income for Basic Needs

There was more limited discussion of this issue by the TWG. They recommended reviewing the pension age for men considering their lower life expectancy. The community participants agreed with TWG's comments. In addition, the community recommended increased financial support for people due to the reduced income available from natural resources.

6.2 Emerging Themes

This report reveals a series of cross-cutting themes emerging from the discussion, outlined below.

- **Climate impacts and contributing factors.** Climate impacts and contributing factors emerged as key themes, specifically:

- Coastal erosion is severe, widespread, and acknowledged as an existential national issue.
- Fluctuating rainfall, water storage, and water usage patterns were noted as a combination of factors affecting overall water security.

- **Infrastructural responses.** The suitability of infrastructure, the need for infrastructure, and the adequacy of existing responses emerged in technical and community-level discussions. These included:
  - Major existing responses to coastal erosion in the form of TCAP.
  - Access to, and availability of, community and household water tanks.
  - Adequacy of ECs.
- **Policy responses.** Development of new policies and implementation of existing policies and procedures was frequently identified by TWG and the community. This included:
  - Development of a coastal building construction policy.
  - Enforcement of the existing Building Code.
  - Requiring Strategic Environmental Assessment of coastal erosion impacts.
- **Financing responses.** Government funding for measures, including household water tank installation and income support for livelihoods affects by depleted natural resources.
- **Further research.** Investigation of the causes and impacts of issues, as well as the feasibility and appropriateness of proposed measures, was a common discussion topic. This included research into:
  - Community water storage and household use.
  - Feasibility of shoreline protection measures.
  - Appropriateness of various EC models.
- **Scoring.** While the TWG and community workshop agreed on most of the IVA results, the TWG did not agree that marine conservation (Ef.3) or income for basic needs (If.1) were priority concerns.

7.0 Conclusions and Next Steps

This section examines the key results of the IVAR process contained in this report and identifies key outcomes, limitations, and options for next steps.

The IVAR process has enabled bottom-up local priorities of the lived experience of climate change to be brought up to the national level for consideration, appraisal, and verification.

The outcomes of the technical review were then reported back to the communities for clarification and consideration. As such, the IVAR process has achieved the overall objectives of clearly communicating the priority issues in the national context and demonstrates a workable process for bottom-up/top-down vulnerability assessment and information sharing. As this process meets the needs of both groups and has achieved a consolidated set of vulnerability priorities, it is likely to be suitable as a future model for joint prioritisation.

KEY OUTCOMES

Several of the key outcomes emerging from this report include:

- Data analysis shows local priority issues are also nationally widespread, clearly demonstrating that these issues are both nationally and locally significant and relevant. Specifically, these are issues around *local water infrastructure* and *coastal erosion and shoreline protection* as well as *income security.*
- With some important exceptions, the majority of priority issues were corroborated by technical subject matter experts as key issues. The exceptions relate to setting a suitable level of service for ECs and financial implications of marine conservation. Further information is needed to reconcile community and technical specialist perspectives on these issues.
- Communities generally accepted and corroborated the technical specialists' perspectives on the issues. Where there were differences, these pointed to specific gaps in knowledge or key divergences in how an issue is assessed. Further communication of evidence may help bridge this gap. For example, in relation to what is the appropriate standard to assess the level of provision and service for ECs.

LIMITATIONS OF THE IVAR PROCESS

There are some key limitations to the IVAR process that should be acknowledged. They include the following:

- **IVAR is not a strategic planning process.** The IVAR process is not a planning process that is intended to set strategic priorities for action—it simply identifies the issues and the extent of consensus between communities and national stakeholders on these issues. National stakeholders are able to use the IVARs in a way they see as appropriate to their own priorities.

- **IVAR is not an options identification and appraisal process.** While ideas came up incidentally during the consultation process, the IVAR process has not actively identified adaptation options for the NAP process. Thus, while the IVAR process does not specifically tell us what to do, it is effective in showing us what to do something about in specific locations.
- **IVAR is not a comprehensive gender analysis.** The reasons for and implications of gender differences in priorities, while touched on, have not been comprehensively examined through this process. Further investigation into gender differences and implications (e.g., including an analysis of national data) may inform a gender-responsive NAP process.

KEY NEXT STEPS

- **Dissemination.** It is recommended that the IVA reports are shared with the National Advisory Council on Climate Change for their full consideration and comment. The IVAR results may also be included in executive reporting to cabinet. IVARs may also inform national development coordination functions and donor engagement. Importantly, as reports on community-level priorities, they should be disseminated to communities.
- **Further research.** There are several areas where further research should be considered. In many cases, short literature reviews and key stakeholder interviews may be effective ways to flesh out key detail not possible through a multi-sectoral NACCC TWG. In other instances, there is significant work already underway that should contextualise any further investigations to avoid duplication. For example, national assessments that have been done through TCAP should be properly considered alongside (and possibly integrated with) the IVAR results. For other issues, there exist good practice primary research projects on specific issues, e.g., an audit of rainwater harvesting systems conducted on South Tarawa, Kiribati, that may be considered/adapted by Tuvalu.
- **Options identification and appraisal.** The results in the IVARs should inform the next stages of options identification and appraisal as envisaged in the NAP Process.

Supplementary uses for these reports beyond the NAP process include the following:

- **Review through sector planning.** While not prioritised as the very highest priority issues for the IVAR and NAP process, the results presented in Sections 3.1 and 3.2 (and lower-priority results in Section 3.3) are nonetheless likely to be relevant to specific sector-level activities. As part of regular sector planning, national practitioners in the public, private, and not-for-profit sectors may use these results as a resource in planning. These results can provide current and specific understanding of climate change issues and may inform adaptation responses in the Funafuti community and more broadly.
- **Community review and mobilisation.** Island councils and local community and civil society groups are likewise encouraged to use the results here as a means of targeting local climate change adaptation planning. Many issues mentioned here may rely on a level of community mobilisation and ownership of solutions. As such, these results may provide a robust and comparable evidence base for building partnerships for adaptation action.

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Appendices

A1. Technical Working Group Participants

Name	Position Title	Sex	Organisation	Email Address
1. Luka Seelu	Community Disaster Resilience Management Specialist (CDRMS)	M	National Disaster Management Office (NDMO)	lukaselu1@gmail.com
2. Alimau Pugameau	Economic Advisor	F	Planning and Budget Aid Coordination Department	alimaupuga@gmail.com
3. Auiluma Lotoala	Project Officer	F	Tuvalu Association of non-government organisations (TANGO)	lloto12@gmail.com
4. Limoni Mativa	TMS Senior Officer	M	Tuvalu Meteorological Service (TMS)	mativano94@gmail.com
5. Sokotia Kulene	Policy Advocacy coordinator	M	Gender Affairs Department (GAD)	skulene@gov.tv
6. Pisi Seleganiu	Water Supervisor	M	Public Works Department (PWD)	afaaso80@gmail.com
7. Soseala Tinilau	Director	M	Department of Environment	butchersn@gmail.com
8. Tuitala Lasifo	National IVA Reporting Consultant (NIVARC)	M	Climate Change Department	tlasifo@gmail.com
9. Tomu Hauma	NIVARC	M	Climate Change Department	haumat01@wairaka.com
10. Saamu Tui	NIVARC	M	Climate Change Department	mataakapau@gmail.com

Name	Position Title	Sex	Organisation	Email Address
11. Vaiaoga Lameko	Tuvalu Readiness 1 Project Coordinator	F	Climate Change Department	vaiaogal@gmail.com
12. Joanna Latasi	TIVA Data Analyst	F	Climate Change Department	jlatazi@gmail.com
13. Pepetua Latasi	Director	F	Climate Change Department/ Acting Assistance Secretary of the Ministry of Finance	PLatasi@gov.tv
14. Feue Tipu	NAP GN Regional Advisor national counterpart	M	MLG&A	tipu1304@gmail.com
15. Fafetai Namoto	Tuvalu Survival Fund Coordinator	F	Climate Change Department	avatahi@gmail.com
16. Faatupu Simeti	National IVA Coordinator (NIVAC)	F	Climate Change Department	4tupu.s@gmail.com

A2. Community Information and Feedback Session Agenda

Community Information and Feedback Sessions: #1 Amatuku and #2 Funafuti community
Kilogafou Funafuti Community Dining Hall, Senala, Funafuti
Agenda (Saturday 20 June, 2020)

PART 1: INTRODUCTION AND UPDATE

10 a.m. – 10:10 a.m. Introduction to team, project, and workshop

- General
- Overview of the NAP process

10:10 a.m. – 10:30 a.m. Overview of the IVAR process

- 8 steps briefly outlined
- The importance of bringing together the lived and the learned experiences
- The importance of harmonising the local and the national through a prioritisation process
- Outline of the workshop

PART 2: LIVED EXPERIENCE – WHAT YOU SAID

10:30 a.m. –11:15 a.m. Location-specific results

- Top five vulnerability issues
- Most vulnerable subsectors
- Most vulnerable sectors
- Explanation of the multi-criteria prioritisation process – analysis that looked at whether issues were frequently reported in other locations, are particularly vulnerable, and/or that are highly climate related
- Show results from the multi-criteria prioritisation process

11:15 a.m. – 12:00 p.m. Small group discussion

12:00 p.m. – 1:00 p.m. Lunch

PART 3: LEARNED EXPERIENCE – WHAT THE TECHNICAL WORKING GROUP SAID

1:00 p.m. – 1:45 p.m. Technical Working Group mandate and process

1:45 p.m. – 3:15 p.m. Small group discussion - harmonising the lived and learned experience

PART 4: INFORMATION SESSION CLOSE

3:15 p.m. – 3:45 p.m. Close

- Cover next steps – including the process for harmonising the "lived" and "learned" experiences to create a comprehensive IVAR
- Reiterate what the data will be used for – who will have access to it and how it will be used
- Conclude by saying it's an iterative process that they will continue to be a part of

A3. Community Information and Feedback Session Participants

Name	Position Title	Sex	Organisation	Email address
1. Toromon Timion	Amatuku community member	M	Amatuku community representative	N/A
2. Logomalie	Amatuku community member	M	Amatuku community representative	N/A
3. Teawa Toromon	Amatuku community member	F	Amatuku community representative	N/A
4. Senitua Semi	Amatuku community member	F	Amatuku community representative	N/A
5 Louise Leitonga	Amatuku community member	F	Amatuku community representative	N/A
6. Enele Opeta	Amatuku community member	M	Amatuku community representative	N/A
7 Tekafa Kutimeni	Amatuku community member	F	Amatuku community representative	N/A
8. Kim T	Amatuku community member	M	Amatuku community representative	N/A

Project Staff Participants

Name	Position Title	Sex	Organisation	Email address
Tuitala Lasifo	National IVA Reporting Consultant (NIVARC)	M	Climate Change Department	tlasifo@gmail.com
Tomu Hauma	NIVARC	M	Climate Change Department	haumat01@wairaka.com
Saamu Tui	NIVARC	M	Climate Change Department	mataakapau@gmail.com
Vaiaoga Lameko	Tuvalu Readiness 1 Project Coordinator	F	Climate Change Department	vaiaogal@gmail.com
Joanna Latasi	TIVA Data Analyst	F	Climate Change Department	jlatazi@gmail.com

Name	Position Title	Sex	Organisation	Email address
Feue Tipu	NAP GN Regional Advisor national counterpart	M	MLG&A	tipu1304@gmail.com
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