



PACIFIC ISLANDS FORUM



# PACIFIC CLIMATE SECURITY ASSESSMENT GUIDE





Under no circumstances shall UNDP and PIFS be liable for any loss, damage, liability, or expense incurred or suffered that is claimed to have resulted from the use of any information, contained herein; including, without limitation, any inaccuracy, error, omission, interruption or delay, deletion, defect, alteration, or use with respect thereto, infection by virus or any other contamination of, by anything which has destructive properties, communication line failure, regardless of cause. Under no circumstances, including but not limited to negligence, shall UNDP and PIFS be liable for any direct, indirect, incidental, special, or consequential damages, even if UNDP and PIFS has been advised of the possibility of such damages. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United Nations Development Programme and the Pacific Islands Forum Secretariat.

Copyright - UNDP and PIFS 2023. All rights reserved.

Preferred citation: UNDP and PIFS (2023). *Pacific Climate Security Assessment Guide*. Fiji

# Contents

<b>Acknowledgements</b>	<b>5</b>
<b>Acronyms</b>	<b>6</b>
<b>Foreword</b>	<b>7</b>
<b>Executive Summary</b>	<b>8</b>
<hr/>	
<b>SECTION 1 – Understanding the Assessment Guide</b>	<b>10</b>
1.1 Background	10
1.2 Aims and Approach of the Assessment Guide	11
1.3 Guide Development process	11
1.4 Targeted Users	11
1.5 Utilizing the Assessment Guide	12
1.6 Adding Value to Existing Work, Approaches, and Frameworks	12
<hr/>	
<b>SECTION 2 – Setting the Climate Security Context</b>	<b>13</b>
2.1 Climate Change Trends in the Pacific	13
2.2 Regional Climate Security Pathways	13
– <i>Pathway 1: Climate change challenges livelihood and the blue economy</i>	14
– <i>Pathway 2: Climate change threatens land availability and usability, putting pressure on food, water and health security</i>	17
– <i>Pathway 3: Climate risks exacerbate disasters and erode the resilience of vulnerable groups and governments</i>	21
– <i>Pathway 4: Climate change affects mobility trends and can exacerbate risks</i>	24
– <i>Pathway 5: Climate Change urges securing maritime boundaries and sovereignty and could undermine regional stability</i>	26
2.3 Conclusion	29
<hr/>	



<b>SECTION 3 – Suggested Practices</b>	<b>30</b>
Practice 1: Improve climate security knowledge, capacities, communication and programming	30
Practice 2: Mainstream climate security across policies, frameworks and planning	32
Practice 3: Avoid maladaptation and mitigation through climate-, conflict- and culturally sensitive approaches	33
<hr/>	
<b>SECTION 4 – Guide for Conducting Climate Security Assessments</b>	<b>35</b>
4.1 Description of Analytical Approach	35
– 4.1.1 <i>Conceptual Foundations</i>	35
– 4.1.2 <i>Elements of the Assessment Approach</i>	36
– 4.1.3 <i>Methods and Tools</i>	38
– 4.1.4 <i>Identification of Responses</i>	41
4.2 Guiding Questions for Research	42
<hr/>	
<b>References</b>	<b>48</b>

# Acknowledgements

The Pacific Regional Climate Security Assessment Guide is a joint product of the Pacific Islands Forum Secretariat (PIFS) and the Climate Security in the Pacific Project, jointly implemented by the United Nations Development Programme (UNDP) and the International Organization for Migration (IOM), and supported by the UN Secretary General's Peacebuilding Fund.

The Assessment Guide was prepared by Spencer McMurray (lead author, Adelphi), Lukas Ruttinger (author, Adelphi) and Serena Arcone (author, UNDP Climate Security Specialist), under the close coordination and guidance of Michael Crowe (Regional Security Advisor, PIFS), and supported by, building upon the methodology of, the Weathering Risk Initiative<sup>1</sup>.

Important contributions and support to the Assessment Guide were provided by Lisa Binder (research analyst, Potsdam Institute for Climate Impact research (PIK) and Barbora Sedova (lead, FutureLab, PIK), and regional organizations and experts, including the Pacific Climate Security Network, Secretariat of the Pacific Commission (SPC), Secretariat of the Pacific Regional Environment Programme (SPREP), IOM, UNDP, PIFS, and Shifting the Power Coalition among others.

Guidance to the overall process and coordination support was provided by UN Resident Coordinator Office in Fiji and Micronesia as well as from United Nations Peacebuilding Support Office (PBSO) and the Climate Security Mechanism.

---

<sup>1</sup> <http://www.weatheringrisk.org/>

# Acronyms

<b>AAL</b>	Average Annual Losses	<b>PICs</b>	Pacific Island Countries
<b>ADB</b>	Asian Development Bank	<b>PICT</b>	Pacific Island Countries and Territories
<b>CROP</b>	Council of Regional Organisations of the Pacific	<b>PIF or Forum</b>	Pacific Islands Forum
<b>EEZs</b>	Exclusive Economic Zones	<b>PIFS</b>	Pacific Islands Forum Secretariat
<b>FFA</b>	Forum Fisheries Agency	<b>PIK</b>	Potsdam Institute for Climate Impact Research
<b>FRDP</b>	Framework for Resilient Development in the Pacific	<b>PNG</b>	Papua New Guinea
<b>FSM</b>	Federated States of Micronesia	<b>RCP</b>	Representative Concentration Pathway
<b>GDP</b>	Gross Domestic Product	<b>RMI</b>	Republic of Marshall Islands
<b>ICT</b>	Information and Communication Technology	<b>SIDS</b>	Small Island Developing States
<b>IOM</b>	International Organization for Migration	<b>SPC</b>	Secretariat of the Pacific Commission (The Pacific Community)
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>SPREP</b>	Secretariat of the Pacific Regional Environment Programme
<b>NAPs</b>	National Adaptation Plans	<b>UN</b>	United Nations
<b>NCDs</b>	Non-Communicable Diseases	<b>UNCLOS</b>	United Nations Convention on the Law of the Sea
<b>NDCs</b>	Nationally Determined Contributions	<b>UNDP</b>	United Nations Development Programme
<b>NGO</b>	Non-Governmental Organisations	<b>UNEP</b>	United Nations Environment Programme
<b>ODA</b>	Official Development Assistance	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>OECD</b>	Organisation for Economic Cooperation and Development	<b>USP</b>	University of the South Pacific
<b>PBSO</b>	United Nations Peacebuilding Support Office		

# Foreword

**In the 2050 Strategy for the Blue Pacific Continent, Forum Leaders re-affirmed the region’s expanded concept of security and highlighted that in the midst of an increasingly complex regional security environment, climate change remains the single greatest threat to the livelihoods, security and wellbeing of the peoples of the Pacific.**

To achieve our Leaders’ ambition of securing our sovereignty and territorial integrity in the face of the impacts of climate change, we need to first understand the impacts that climate change will have on the regional security landscape, as is highlighted in the Boe Declaration Action Plan.

In sharing this Regional Climate Security Assessment Guide with you, I hope to place a spotlight on climate change as a security issue for our Blue Pacific Continent and provide a helpful tool for policymakers across the region.

Through this assessment, we learn how climate change will challenge livelihoods and the blue economy, threaten land availability and usability, put pressure on food, water and health systems, exacerbate disasters and erode the resilience of our governments and vulnerable groups, affect mobility trends and challenge national sovereignty and regional stability.

But here in the Blue Pacific, we are up to the challenge. Indeed, work on climate change mitigation and adaptation cuts across all facets of Forum Leaders’ agenda. This Assessment Guide continues that approach, as an important part of the region’s broad-based effort to combat the impacts of climate change in all its complexity.

This guide compliments the Framework for Resilient Development in the Pacific by focusing specifically on climate change-induced drivers of social conflict, and by suggesting ways we can better understand and mitigate those drivers.

At the Pacific Islands Forum Secretariat, our key focus is delivering the Leaders’ vision of a region of peace, harmony, security, social inclusion, and prosperity.

This Regional Climate Security Assessment Guide helps move us one step closer to achieving that vision.



**Henry Puna**  
**SECRETARY GENERAL**  
**PACIFIC ISLANDS FORUM**

# Executive Summary

Forum Leaders, through the Boe Declaration, have defined climate change as “the single greatest threat to the livelihoods, security and well-being of the peoples of the Pacific”.

This is one of the most comprehensive statements on the link between climate change and human security globally. It highlights the way climate change affects every dimension of Pacific countries’ governance, external relations, identity and culture, threatening livelihoods, social cohesion, land, food, water, health, economies, and posing significant risks for individual, community, national and regional stability.

In some cases, these risks are already manifesting into increased social pressure and disputes resulting in the erosion of social norms that guide community life, and, ultimately, pose key questions around a future that seems deeply uncertain for Pacific countries and its communities.

If left unexplored and unaddressed, these interactions could cause further social discord, leading to social or political instability, or even violent conflict. Understanding and addressing those risks is an essential step to challenges that are new and complex in nature.

This Assessment Guide, developed through extensive consultation with regional specialists, key regional institutions, civil society and with Forum member representatives, aims to support the region’s effort to unpack those risks so that appropriate responses can be put in place.

It particularly targets national and subnational governments from Forum Member countries while also constituting an important reference for a broader range of stakeholders, including international organizations, regional bodies and interested individuals and practitioners. In alignment to the Boe Declaration Action Plan, it responds to Pacific countries’ need to have a context specific methodology to identify local climate security priorities that can inform decision making at different levels.

This methodology, based on the global “Weathering risks”, is included in section 4 named the “Guide on how to conduct Climate Security Assessments”. This constitutes the core part of this document and it includes a description of the analytical approach (including conceptual foundations, main elements of analysis, methods and tools, and how to identify responses) as well as guiding questions that users can adapt and/or adopt when conducting their own climate security assessments.

While this Assessment Guide was not conceived to, and is not designed to constitute a comprehensive regional climate security risk assessment (doing so would not be helpful given the diverse nature of climate risks present in individual Pacific Islands Countries), a section describing the main climate security pathways in the region has been included as section 2, to reinforce understanding of the predominate climate security trends across the breadth of the Blue Pacific Continent, and to provide a sound starting point for countries to then contextualize the analysis at a national or local level.

The identified regional climate security pathways cover five themes:

- How climate change challenges Pacific livelihood and its blue economy;
- The way climate change threatens land availability and usability, putting pressure on food, water and health security;
- How climate risks exacerbate disasters and erode the resilience of vulnerable groups and governments;
- The way climate change affects mobility trends and related risks and finally,
- The urgency that climate change creates to secure maritime boundaries and sovereignty and how climate change could undermine regional stability.

Suggested practices and approaches are described in section 3, as a way to outline the forms of action regional actors, Forum Members, and international partners could take to ensure plans, policies, and





© Maloff (Shutterstock)

interventions are more informed by climate security considerations. They are not meant to be prescriptive or comprehensive (the diversity of Forum Members' national contexts prohibits this). Rather, they aim to provide ideas and options to guide further actions by relevant stakeholders.

Building on other existing regional analytical approaches and frameworks, and extensive knowledge and expertise already present in the region, the Assessment Guide's value-add is its emphasis on exploring the relationship between context, climate impacts, and security risks, and their collective security implications.

The key message underlying this Assessment Guide is its attempt to challenge the traditional view of security and to broaden the understanding of how diverse security threats in the Pacific are.

In doing so, the Assessment Guide is intended to encourage decision makers and the international community to think outside the box and to find innovative ways to respond to challenges that are new and very complex in nature, bringing new players onto the scene, and even reconsider how traditional responses to security threats have been managed thus far.

Ultimately, this Assessment Guide is intended as a contribution to the far-reaching effort required to achieve the Forum Leaders' vision of a safe, secure and prosperous region for Pacific Peoples.

## SECTION 1

# Understanding the Assessment Guide

### 1.1 Background

Climate change poses significant security risks<sup>2</sup> across the Pacific. The economic well-being and livelihoods of many of the estimated 12 million Pacific Islanders is threatened by climate change as it increases water, food and land insecurity, and increasingly pushes people to move from their homes.

These risks resulting from climate change in combination with increasing urbanization and growing inequality, can overwhelm societies and push them towards further instability and insecurity. While violent conflict and political instability remain relatively rare across the region, climate-related security risks<sup>3</sup> are becoming increasingly evident and presenting socially divisive consequences.

Since the establishment of the Pacific Islands Forum (PIF or Forum) in 1971, the region has collectively been working to counter security challenges and to build peace, harmony, social inclusion, and prosperity. Through the Forum, the region has adopted a broad definition of security developed through a human security<sup>4</sup> lens, which encompasses threats to livelihoods, physical security and well-being. Successive declarations including the Honiara Declaration (1992), Aitukaki Declaration (1997), Biketawa Declaration (2000), Niue Declaration

(2008), Port Moresby Declaration (2015), and Kainaki II Declaration (2019) have been integral in advancing this conceptualisation.

More importantly, the 2018 Boe Declaration on Regional Security (Boe Declaration) underlines the centrality of climate change as a security issue in the Pacific region. The Boe Declaration represents one of the most comprehensive statements on the link between climate change and human security globally and specifically describes climate change as the “single greatest threat to the livelihoods, security and well-being of the peoples of the Pacific”.

As part of the Boe Declaration, Forum Members recognised the need address the security implications of climate change by strengthening regional security cooperation and encouraging collective action on climate-related security risks.

This recognition was reaffirmed in the 2050 Strategy for the Blue Pacific Continent that was launched in July 2022. This strategy establishes a framework for the region’s approach to working together to achieve the Forum Leaders’ long-term vision and regional aspirations through seven key thematic areas, including on Peace and Security, and on Climate Change and Disasters.

To advance the implementation of the Boe Declaration, the Boe Declaration Action Plan (Action Plan) proposes a set of priority actions to shape the regional security environment at the national and regional levels. The first strategic area within the Action Plan specifically focuses on climate security with one the key proposed actions being ‘understanding and contextualising the impact that climate change will have on the regional security landscape through its interaction with human security and conflict, through research and evidence-based knowledge products’.

<sup>2</sup> Risk is defined as the potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems. In the context of climate change, risks can arise from potential impacts of climate change as well as human responses to climate change. Relevant adverse consequences include those on lives, livelihoods, health and wellbeing, economic, social and cultural assets and investments, infrastructure, services (including ecosystem services), ecosystems, and species as defined by the IPCC. For more information, please see : [https://www.ipcc.ch/site/assets/uploads/2021/02/Risk-guidance-FINAL\\_15Feb2021.pdf](https://www.ipcc.ch/site/assets/uploads/2021/02/Risk-guidance-FINAL_15Feb2021.pdf)

<sup>3</sup> See the conceptual foundations paragraph (pag.35) for an in-depth discussion on climate-related security risks.

<sup>4</sup> See the conceptual foundations paragraph (pag. 35) for more information on the concept of human security.



This Regional Climate Security Assessment Guide, referred to as the Assessment Guide, is the first of its kind in the Pacific region. The Assessment Guide is a crucial knowledge product that will bolster the understanding and articulation of key climate-related security risks and strengthen advocacy by Forum Member Countries in global fora and negotiations.

## 1.2 Aims and Approach of the Assessment Guide

The Assessment Guide aims to support Forum Members to identify and articulate the impacts climate change has on national and regional security landscapes through its interaction with human security and conflict. National and regional actors can then better ensure their policies, plans, approaches, frameworks and strategies capture climate security issues and advance implementation of the Boe Declarations Action Plan.

The climate security trends described throughout Section 2 of this document are intended to provide a regional overview that actors can use to begin conducting national assessments. The suggested actions in Section 3 should then provide further guidance on how to adopt those findings and embed them throughout the policy landscape.

The core component of the Assessment Guide is outlined in Section 4, which outlines the methodology of conducting climate security assessments. This section is intended to assist national and regional actors to develop further understanding of climate security priorities specific to their local contexts.

While providing guidance and tools, the Assessment Guide is not meant to act as a policy framework itself but rather to support future evidence based national and regional policy formulation.

This Assessment Guide provides Forum Members with:

- An overview of key climate-related security risks along five pathways that are based on climate impacts;
- Suggested actions for improving climate security integration and conducting assessments at the regional and national levels; and
- A guide to support regional and national actors to conduct their own climate security assessments or integrate climate security considerations into existing analyses.

## 1.3 Guide Development process

The human centered approach to security in the Pacific underpins this Assessment Guide.

The development of this Assessment Guide is based on a mixed methodology, which combines quantitative and qualitative elements.

While specific climate-related information and impacts have been provided by the PIK, the qualitative analysis was informed by extensive review of pre-existing assessments, frameworks, research, strategies, briefs, plans, policies, and other analysis from global, regional and national entities, including Council of Regional Organisations of the Pacific (CROP) agencies, such as SPC, SPREP, University of the South Pacific (USP), Forum Fisheries Agency (FFA) and PIFS, civil society actors, academia, Pacific UN entities, and international organisations, such as Asian Development Bank (ADB).

Both regional and bilateral workshops have informed this Assessment Guide, which involved key regional experts, development partners, government actors, academia and civil society representatives. Global methodologies, particularly the 'Weathering Risk' methodology, underpin the development of this Assessment Guide.

## 1.4 Targeted Users

While national and subnational governments from Forum Member countries are the main target audience, the Assessment Guide can be tailored to, and utilized by, a broader range of stakeholders. These can include national-level government actors, international organisations, regional bodies and interested individuals and practitioners.

Those working on peace, security and conflict, climate change, disaster risks, resilience-building, community development and humanitarian responses should find this Assessment Guide helpful for their own work.

In particular, this Assessment Guide is intended to support:

- Security and peacebuilding actors to understand how climate change will impact security risks;
- Climate change and disaster risk actors to understand the knock-on effects that climate and disaster risks can have for social cohesion and security; and





© UNDP

- Development and humanitarian actors and thematic experts who, as an example, work gender, equality and social inclusion, governance, energy, food and/or water, to understand how their work is affected by climate security risks.

## 1.5 Utilizing the Assessment Guide

The Assessment Guide provides users with a methodology to analyse and understand the links between climate change and security. It also provides guidance on how to use this knowledge to better inform policies, programs, and projects to address climate-related security risks. It is applicable across different sectors and thematic areas dependent on the needs of those areas.

Forum Members and other actors are able to use this Assessment Guide at any stage of analysis in order to ensure their assessments, policies or approaches are holistic and inclusive of climate security challenges.

This might range from identifying climate-related security risks to articulating what responses can be taken to address them. For example, it can be used to inform the development or revision of national security policies, national climate policies, and development or adaptation plans, and also to develop integrated programs and strategies that address climate-related security risks.

## 1.6 Adding Value to Existing Work, Approaches, and Frameworks

The Assessment Guide builds on other existing regional analytical approaches and frameworks, in particular climate impact and vulnerability assessments, environmental impact assessments, conflict, peace and security assessments, and humanitarian needs assessments.

Building on extensive materials, knowledge and expertise already present in the region, the Guide also uses an approach-focused strategy on the nexus between climate and security, with the aim of developing a comprehensive understanding of climate security in the Pacific without duplicating prior work. The Assessments Guide's value-add is its emphasis on exploring the relationship between context, climate impacts, and security risks, and their collective security implications.

In addition to supporting the achievement of the Boe Declaration Action Plan, the Assessment Guide is closely aligned to other important regional frameworks and policies, including the Framework for Resilient Development in the Pacific (FRDP), the Pacific Women Peace and Security Agenda, the Kainaki II Declaration, the draft Pacific Regional Climate Mobility Framework, and the 2050 Strategy for the Blue Pacific Continent.

## SECTION 2

# Setting the Climate Security Context

### 2.1 Climate Change Trends in the Pacific

Despite some progress being made during the 2021 United Nations Climate Change Conference (COP26), further advanced at the COP27, a significant gap remains in the level of ambition needed to mitigate the worst effects of climate change for the Blue Pacific Continent. Recent reports by the Intergovernmental Panel on Climate Change (IPCC)<sup>5</sup> and the World Meteorological Organisation<sup>6</sup> warn of a 'climate code red'.

The Pacific faces unavoidable and severe climate impacts since climate change is, in some respects, already proceeding at a faster rate in the Pacific than the global average. Climate projections indicate these climate impacts will increase greatly in the future. Air temperatures are projected to increase across the Pacific through to 2050 after already having increased during the last 65 years.

Precipitation patterns are likely to continue to shift, with continued decreases in French Polynesia and the southern subtropics, and continued increases in the northwest and southwest Pacific<sup>7</sup>. Droughts are likely to continue after already having been more pronounced between 1981 and 2010, though with a high degree of variation exists<sup>8</sup>. Sea-level rise will also continue while the Pacific is already experiencing up to four times more than the global average<sup>9</sup>. Sea-level rise poses considerable risks in

<sup>5</sup> Working Group reports to the IPCC Sixth Assessment Report

<sup>6</sup> The State of the Global Climate 2021 Report

<sup>7</sup> Precipitation projections in the Pacific, are uncertain, which is largely related to our limited understanding of and ability to project large-scale climate drivers such as the South Pacific Convergence Zone (SPCZ) or the ENSO circulation. Lack of observational data and limitations in downscaling climate data appropriately further complicate precipitation projections of Pacific island nations (Pringle, 2018 ; Iese et al, 2021 ; IPCC, 2022, 15).

<sup>8</sup> Though the effects of droughts are contingent on other factors, including geophysical characteristics, El Niño-Southern Oscillation (ENSO), and Interdecadal Pacific Oscillation (IPO)

<sup>9</sup> PACCSAP 2014. Sea level rise. CSIRO, Australian Aid, Australian Bureau of Meteorology

particular for low-lying atoll nations, such as Kiribati, Tuvalu, and the Republic of the Marshall Islands (RMI).

Ultimately, increasing climate impacts that compound and reinforce one another will have profound economic, social, cultural, and environmental consequences for Pacific Islanders. For many, their livelihood, food, water, resource, and health security will worsen and only increase pressure on families, communities, states, and the region more as a whole. Section 2.2 will specifically explore how these climate hazards impact the security and well-being of communities in the Pacific. How these trends progress will depend on future global climate action: more ambitious reductions of greenhouse gas emissions to reach net zero as soon as possible remains of utmost importance to prevent more catastrophic outcomes.

### 2.2 Regional Climate Security Pathways

Climate change is expected to impact the Pacific region in various ways. Some of the most pressing impacts include increased annual surface temperatures, sea-level rise, saltwater intrusion, coastal erosion, and increased intensity of extreme weather events.

Collectively, these impacts are increasing water, land and food insecurity, undermining livelihoods and economic growth by hitting key economic sectors, such as tourism, fisheries and agriculture, and straining land and coastal infrastructure. Both internal and external mobility pressures are also being exacerbated as result of climatic impacts, with potential risks that need to be carefully considered and managed. Rising sea level and coastal erosion have huge implications on land usability and habitability.

These effects are likely to seriously impact the security of almost every Pacific Islander and are putting increasing pressure on social, traditional and government institutions at the community, national, and regional levels. Understanding the social and political dimensions of climate change is key to better address climate-related security risks.

This section presents five key climate-related security ‘pathways’ for the Pacific. Each pathway focuses on a set of specific interactions and explains how climate change can contribute to more social and political instability and insecurity.

The five pathways presented below are intended to illustrate the dynamism in how climate, environmental, socio-economic, and political factors interact to potentially increase social and political insecurity and conflict risks.

It is important to highlight that climate impacts will almost certainly intensify over time and interact

with other important political, economic, social and cultural trends in an ever-changing geopolitical context with various and varying effects on societies and states.

As a result, these pathways should not be considered static. They are also broadly applicable across the region, though when and how, and to what degree, they manifest at the country level depends on context specific factors.

Lastly, it is important to clarify that the following pathways do not purport to prescribe national priorities. Rather, they intend to help identify how climate insecurity manifests across the region so countries can identify further pathways and priorities themselves.

Users can also look to these pathways as a launch point from which countries can begin to identify potential signs of climate insecurity.

### PATHWAY 1: Climate Change challenges livelihoods and the blue economy

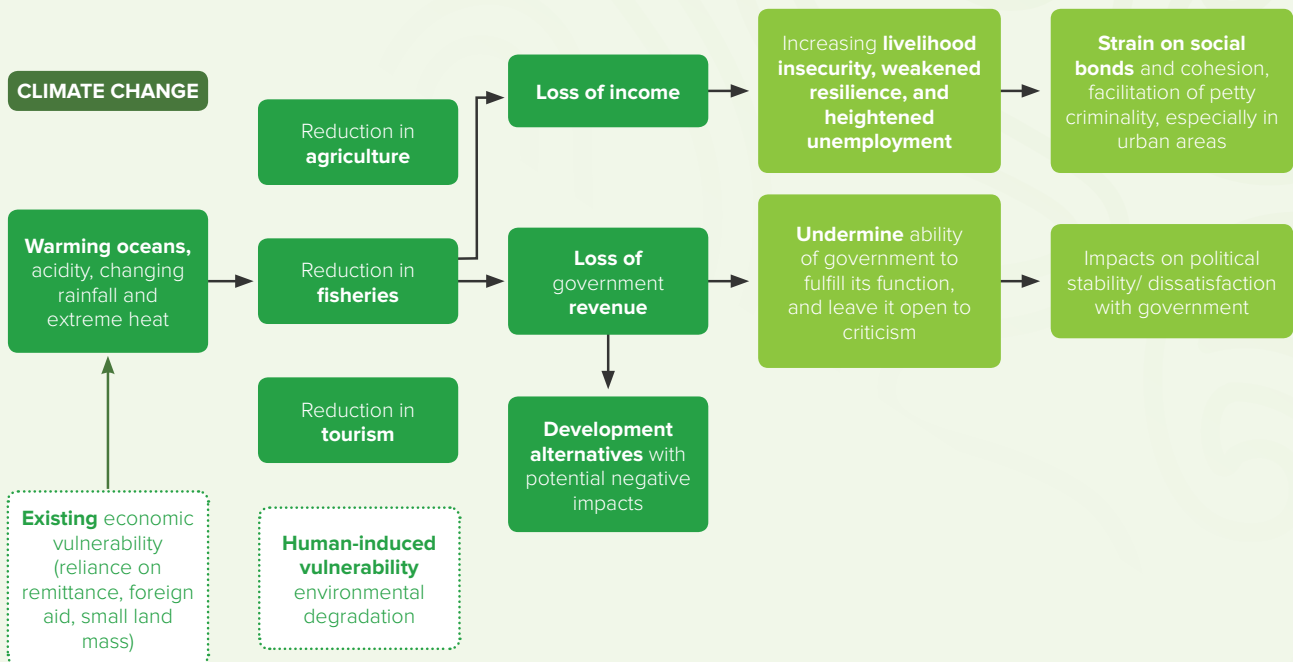


FIGURE 1: Illustration of pathway “Climate change challenges livelihoods and the blue economy”



Forum Members already face significant economic challenges. These include small markets, geographic remoteness, subsequent high import and transportation costs, low formal sector opportunities and high informal sector participation, high unemployment, and reliance on foreign aid.

Climate risks threaten to further exacerbate some of these issues. Many sectors will be affected, but fisheries, including commercial and subsistence, agriculture and tourism will be among the most impacted across the region<sup>10</sup>.

Fisheries are central to the economies of many Forum Members, specifically to low-lying atoll nations. Larger volcanic countries, like Fiji and Papua New Guinea (PNG), have more diversified economies beyond fisheries, including resource extraction and tourism.

Risks for commercial fisheries include warming seas and increasing ocean acidification, which could force fish stocks out of many Forum Members' Exclusive Economic Zones (EEZs), especially under high emission scenarios. This in turn risks the reduction of vital license fee income on which some Forum Member countries rely. Associated industries, such as canneries, which provide formal sector jobs, are also threatened.

Warming seas and acidification, coastal erosion, storms, and some human activities degrade marine ecosystems and reduce biodiversity. Agriculture is threatened by increased heat, shifting rainfall patterns, drought, saltwater intrusion from storm surges and sea-level rise, all of which coalesce to reduce yields, livelihoods, and food security.

Tourism is a generally underdeveloped industry across many Forum Member countries, but it is seen as a possible growth sector. This potential could be stunted by climate risks with coastal erosion threatening to shift pristine beaches and rising sea level to submerge heritage sites, among other climate risks.

Biodiversity loss affects the natural beauty that attracts income-generating tourism and disasters challenge the viability of business for many operators. In addition, increased disasters and extreme weather events can divert tourists' interests to other destinations that are considered safer. These risks may reduce government revenue and individual livelihoods.

For many governments, revenue reductions resulting from longer-term impacts combined with high costs of addressing already present climate impacts undermine already overburdened public service delivery, making equitable development harder to achieve. As a result, governments will feel more pressure to find alternative income streams and diversify their economies.

This could include developing alternatives that bring with them their own social and environmental risks, such as expanding mining, opening protected marine areas for fishing, or seeking riskier investment opportunities. Since some of these risks come with transboundary dimensions, they can strain regional cohesion and cooperation.

Climate impacts affect fisheries and agricultural activities with implications for Pacific communities' livelihoods. Vulnerable groups, including women, youth, urban youth, and remote communities are disproportionately affected. For these groups, livelihood insecurity will also often overlap with water and food insecurity, which further increases pressure on communities and individuals.

Youth are especially affected by unemployment and underemployment with some differences across Pacific countries. In conjunction with other factors, such as limited educational opportunities, weak public services, and high inequality, this unemployment and underemployment could lead to grievances building among an increasingly large segment of the population.

This has had knock-on effects especially for urban youth, who sometimes develop negative coping mechanisms like turning to substance abuse or criminality, which can lead to negative mental health effects in the medium- and long-term. This reality has some precedent in the region as unemployed male youth can succumb to gang behavior and criminal violence. This is augmented by the fact that traditional roles of chiefs or family structures may be absent or be less adhered to in urban areas, ultimately undermining some of the positive social forces in their lives.

Several social and security implications arise from these pressures. In general, social cohesion is eroding at the community level under the weight of increased livelihood pressure and overlapping food and water insecurity. Social norms, in particular norms around collectivism and sharing, common across the Pacific are weakening as families increasingly fend for themselves under compounding environmental, social, and economic pressures.

<sup>10</sup> See Figure 1



© UNDP

This also manifests through rising petty criminality across PICs as well as in increased domestic violence. Increases are particularly prevalent in urban areas, but rural and remote locations are also affected. However, closely knit family groups tend to reduce these incidents.

The implications from loss of livelihoods also affect state-society relationships. As pressures on livelihoods grow, the failure to provide its basic functions in an environment of increasing poverty and inequality can undermine state-society relationships and also increase grievances and democratic alienation. Urban communities are most sensitive to this risk, especially those in informal settlements. Protests against governments due to a lack of political, economic, and social change have occurred in various countries throughout the region, foreshadowing scenarios which may only intensify in the future as a result of climate change.

## PATHWAY 1 Key Insights and Challenges

- Climate effects on subsistence economies will directly impact incomes of an estimated 75 percent or more Pacific Islanders. In some remote communities, the risk could rise to 100 percent.
- Commercial fisheries are increasingly under strain, which are a major revenue source for governments. All Pacific Island Countries and Territories (PICT) could see reduced stocks, though some are likely to be more affected than others. For example, RMI could see 90 percent fall in revenues by the end of the century under high emissions scenarios.
- Coastal fisheries are under pressure, which many Pacific Islanders depend on for sustenance and livelihoods. Reefs, in particular, are under threat, which has important implications for biodiversity. Stark reductions are already observed in some countries. In Samoa, live coral reef cover around the main island of Upolu was found to be below 1 percent cover at 50 percent of sites explored. Two years previous, this coral reef cover was below 10 percent at 78 percent of sites explored.
- The tourism sector is undermined from natural disasters across the region and this is threatening a possible income stream that showed promise prior to the COVID-19 pandemic. In Tonga, even prior to the Hunga-Tonga volcanic eruption and tsunami, sea-level rise had already damaged heritage sites and impacted infrastructure, which affected tourism revenues and economic growth prospects.
- Youth underemployment and lack of future prospects remains a significant challenge. Regionally, 23 percent of the population is unemployed, which is significantly higher than the global average of 12.6 percent. This figure is even higher in the Solomon Islands at 40 percent, RMI at 63 percent, and PNG at 68 percent. High rates of unemployment and a lack of perceived future improvement have put pressure on youth, especially in urban areas, which has led to reported rises in substance abuse and petty criminality.
- Norms that guide social life and that are integral for conflict mitigation, such as those around communal living, family and community relations, and community



leadership structures, are increasingly under pressure. In Fiji, Cook Islands, PNG, Samoa, Vanuatu, Federated States of Micronesia (FSM), and Solomon Islands communities reported feeling these norms, and, by extension, social cohesion, are being eroded due to pressures from loss of livelihoods among other climate induced factors.

- Though there has been marked improvements in gender equality across the Pacific, in particular through regional and national initiatives and policies declaring gender equality as a priority, challenges still remain. Traditional gender norms often perpetuate inequalities and women are still largely absent in decision making. In business and government sectors in particular, women continue to suffer disproportionately at the hands of climate change.
- Individuals are becoming increasingly stressed about providing with less, which is leading to increased instances of domestic violence.
- Extended families are increasingly in dispute over the distribution of resources. Migrants who stay with them also express higher feelings of guilt given resource constraints, especially if they struggle to find work to contribute themselves.

- As quality of life and well-being decreases, Pacific Islanders will expect the government to ameliorate poor conditions. If government fails to act Pacific Islanders may become disenfranchised. This disenfranchisement will only worsen if the government is seen as benefiting through corruption, via development, infrastructure, or material wealth gleaned from their land as high value exports, while fewer people see improvements to their livelihoods. A high proportion of people already view both government and business corruption as a serious problem. Over 50 percent of respondents in a Transparency International survey of 10,000 people across the region believed corruption will worsen.
- Governments are keen to diversify their revenue streams, but they need to be cautious in their chosen means so not to undermine ecological stewardship or regional cohesion. There has been public opposition to some of these activities. For example, increased logging in the Solomon Islands contributed to protests in 2021. Regionally, disagreement on these activities is expressed in regional and international public fora, openly showcasing rare discord between PICT.

## PATHWAY 2: Climate Change threatens land availability and usability, putting pressures on food, water and health security

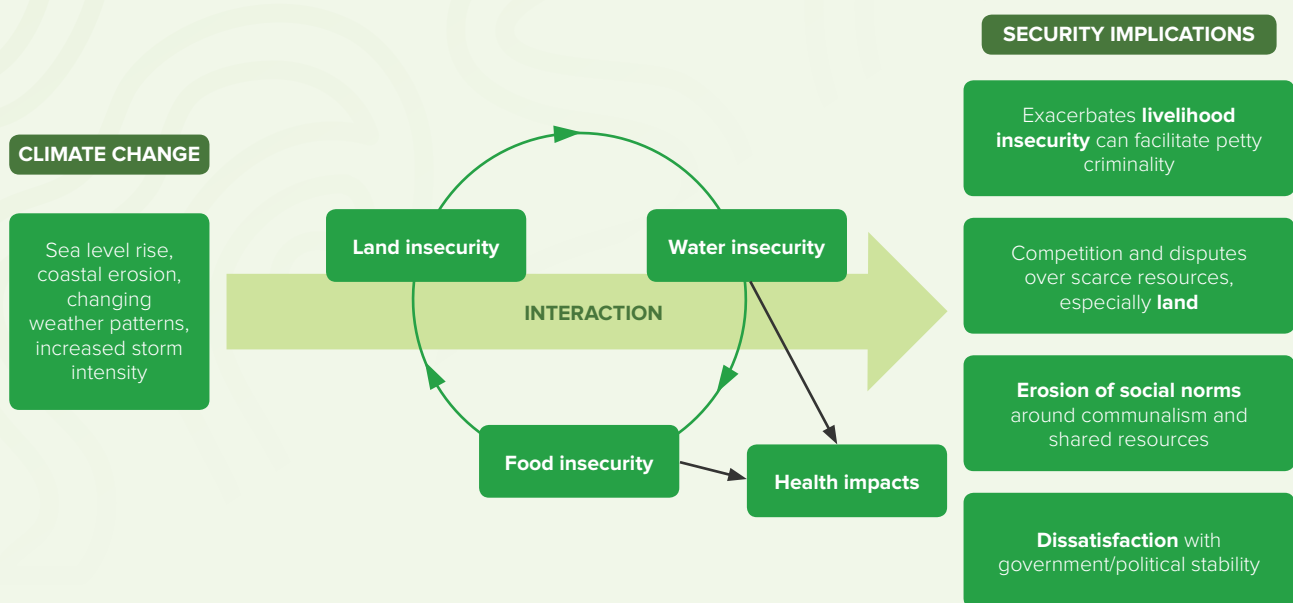


FIGURE 2: Illustration of pathway “Climate change threatens land availability and usability, putting pressures on food, water and health security”





© Fakatokaga Namoto, Tuvalu.

Sea-level rise, coastal erosion, and extreme weather events, such as storm surges, droughts, and flooding, are impacting the availability and usability of land across the Pacific. These risks interact with pre-existing land pressures including continued population growth, increased rates of urbanisation and development, and insufficient urban planning. Both climate risks and human-induced trends, such as population growth and urbanisation, will continue and compound into the future and, as a result, reinforce exposure and vulnerability<sup>11</sup>.

The degree of possible land loss driven by climate change is varied, but the countries that are atoll states are most impacted. In addition to the threat of permanent inundation in the long-term, the more immediate concern is temporary but consistent episodes of flooding.

This is caused by the confluence of sea-level rise, coastal erosion, storm surges and high tides, all of which led to temporary, but devastating, inundation. Repeat episodes can erode the quality of soil and water systems and effectively make land unliveable for inhabitants, as livelihood, food and water insecurity increases.

<sup>11</sup> See Figure 2

Larger volcanic countries, such as Fiji, Vanuatu, Solomon Islands, and PNG, face similar risks as these atoll states as many of their largest cities, towns and developed areas are located along coastlines, on reclaimed land, or on rivers. Even well before permanent inundation, tensions over access to, and availability of, land will increase. The loss of usable land will have severe impacts on food and water insecurity and lead to subsequent health and cultural implications.

Tensions over land are already increasing. Perceived misuse and unfair access over limited shared resources can lead to inter-community and inter-familial disputes. This can have many significant implications for social cohesion given the primacy of family in social life. For example, given that ownership of islands or land-areas may be dominated by a small number of extended family groups, social discord within them can strain social cohesion of the entire community.

Tensions are also rising between family groups, especially in instances of migration, as land is shared with extended families. Mobility results from a range of drivers, including sudden onset events and slow onset processes, but both can contribute to increasingly constrained resources. Remote areas face different challenges in this regard and

the likelihood of this tension depends on the size of islands with atoll islands more constrained than others.

Urban areas are particularly affected by this pathway given the rapid increases in population density. Urban areas often lack habitable land, which creates conflicts between community members who move there and local landowners. Poorer groups are especially vulnerable to tensions since many live in informal settlements that can occupy customary or state lands.

This leads to tensions with customary landowners, or even with other migrant groups, on limited state-owned lands. Violent tensions between urban customary landowners and migrant communities are generally rare across the Pacific. However, instances of violence have occurred before and could reignite again.

Land governance plays an important part in shaping these dynamics, especially in the ways state and customary land systems interact and overlap. Their interaction has important implications for adaptation since the state must manage traditional tenure rights while simultaneously considering national needs. Additionally, governments need to use land for adaptation carefully since certain interventions can aggravate climate risks further.

Efforts to reclaim land can provide some relief for these urban spaces, but, if done incorrectly, they can contribute to ecological degradation. For example, dredging and sea walls can lead to more coastal erosion.

Land loss overlaps with, and worsens, food and water insecurity. As mentioned, coastal erosion due to sea level rise more easily facilitates sea water inland, increasing salinity of soil and fresh water. This combines with other climate factors, such as rising temperatures and changing rainfall patterns which can reduce agricultural yields and reduce fresh water recharge. Together these factors worsen food and water insecurity.

Exacerbated food and water insecurity will, in turn, increase health risks. Increased food insecurity translates into increased reliance on food imports. Often these imports are high in calories, but low in nutrients, leading to malnutrition and non-communicable diseases (NCDs). Lacking access to plentiful and safe drinking water also facilitates the spread of water-borne illnesses and makes sanitation more difficult further compounding health risks.

The loss of land from total inundation or loss of land usability also has implications for identity. Land is intrinsically tied to the self for Pacific Islanders and customs, norms, rituals, and traditions are embedded within that land and its food and water systems.

While efforts are already being undertaken, with climate impacts affecting land availability and its usability there is an increased need to work collectively to avoid the potential loss of cultural practices.

Together, land, food, and water insecurity can increase pressure to the point where existing cooperative norms break down with effects on social cohesion. The increasing challenges and tensions around land, water, and food have the potential to escalate into larger scale insecurity.

## PATHWAY 2 Key Insights and Challenges

- The vast majority of Pacific Islanders live along bodies of water, which increases their exposure to sea-level rise. As of today, excluding PNG, 97 percent of Pacific Islanders live within 10km of the coast, (this reduces to about 50 percent when accounting for PNG), 90 percent live within 5km of the ocean, and 30 percent live within 1km of the coast. For Tokelau and Tuvalu, these figures can reach 100 percent.
- Many Pacific Islanders perceive an increasing loss of land. In Nauru “one third of households” experienced sea-level rise during in the decade leading up to 2016. The rates are even higher in atoll states like Tuvalu and Kiribati at 72 percent and 68 percent, respectively.
- Growing competition over land security can facilitate or exacerbate tensions between those who own land and those who “informally” settle on it. How land is managed and controlled often plays an important role in these dynamics. The vast majority of land in the region, between 80-90 percent on average, is customarily held, offering both opportunities and barriers for management. For example, customary land gives families access to shelter, sustenance, wealth, and history/identity, but this land can also limit options available for disaster displacement or community relocation in extreme scenarios.



- Tensions over land scarcity are rising, especially within families. Family units may choose to use land in a certain manner without regard for other family members. In response to land availability or usability pressures, chiefs who often have overarching authorities, may use land in a way in which all family members may not explicitly agree or support. Depending on the system, customary kinship members may be obligated to honour chiefs based on social practice. This is more likely to occur in systems where chiefs retain considerable power, such as in Samoa, and in remote communities.
- In response to land loss, individuals and governments have increasingly turned to land reclamation activities. However, land reclamation has key limitations and, if done improperly, can create environmental and conflict risks. New land can lead to new conflicts between governments and local communities over ownership or use.
- Food insecurity continues to intensify across the Pacific due to climatic and other natural disasters, population growth, urbanisation, and poor economic conditions.
- Food imports, in response to climate stress, are contributing to vulnerability due to increased negative health impacts and the potential risks associated with volatility in food supply and cost. 27 percent of the food consumed in Vanuatu is imported, while import rates are as high as 91 percent in RMI. Lower income groups are especially impacted, which means food security may become determined by wealth to a greater extent than ever before. Given that approximately 30 percent of all Pacific Islanders live in poverty rate, many people may find themselves unable to afford food during price elevations.
- Water insecurity remains a key challenge across the region. Water stress especially affects atoll states who are forced to rely almost exclusively on rainwater catchment systems. Currently, clean water infrastructure continues to be lacking as only approximately 20 percent of people having access to piped water across the region and these figures disproportionately affect low-income groups.
- Land governance issues, in particular balancing customary landowner rights with national needs and priorities, could complicate various climate security aspects, like disaster response and climate change adaptation. For example, in the Solomon Islands, customary ownership mandates that the landowner also owns freshwater resources found on those lands, such as rivers, streams, or water tables. With increased recognition of the importance of access to fresh water, landowners are becoming more vigilant about claiming that these water sources reside on their land. Though this is within their right, it can also pose challenges for government who are needing to provide water for a growing population, especially in urban areas. Similar pressures exist in Tuvalu, Kiribati and RMI.
- Economic activities and urban development, though integral for national development, can aggravate land issues, including availability. According to the latest data available, in 2018, agriculture accounts for an average of 14 percent of all land use throughout the Pacific, with variations as low as 4.2 percent in Solomon Islands and as high as 60 percent in Tuvalu. Infrastructure, in the form of causeways, airports, ports, and landfills also utilize a considerable amount of land area. Furthermore, logging, mining, and tourism in select countries such as the Solomon Islands, PNG and Fiji, occupy large tracks of land and in some cases contribute to further land reduction due to related environmental degradation.
- Land loss is not only experienced physically, through reduction in availability or usability, but also culturally. For example, in the Cook Islands and Tonga, climate-induced land loss has strong cultural dimensions where some burial grounds on family land have been eroded due to seasonal storm surges.
- Sea-level rise, coastal erosion, and intrusion of water cause considerable damage to electricity power lines, water utility pipes, and other important infrastructure.



### PATHWAY 3: Climate risks exacerbate disasters and erode the resilience of vulnerable groups and governments

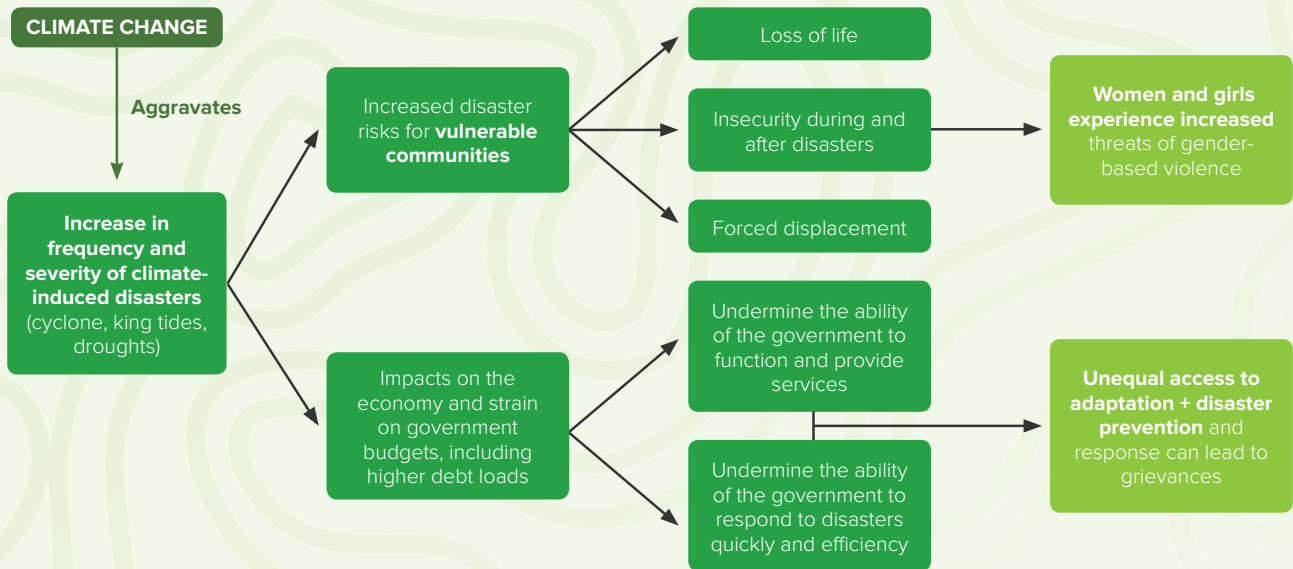


FIGURE 3: Illustration of pathway “climate risks exacerbate disasters and erode the resilience of the vulnerable and the government”

The Pacific Islands region is one of the most exposed to climate-induced disasters, including tropical cyclones, flooding, and droughts. Projections around frequency and intensity are hard to make with certainty.

Yet, historical trends indicate a decrease in frequency but an increase in intensity for some climate risks, like tropical cyclones, which is likely to continue. Regardless, impacts will worsen in the future with implications for the physical well-being of Pacific Islanders, including threats to lives, well-being, assets, and economies<sup>12</sup>.

Exposure to disasters comes from a mix of geographic (e.g., elevation, seismology, location on ring of fire) and human-induced factors, (e.g., settlement, industry, and infrastructure location), including environmental degradation. The latter can be induced by poor economic practices, like illegal logging, which contributes to flash floods during torrent rains, and wastewater dumping from extractives, which breaks down corals and facilitates more intrusive coastal erosion.

This could even include individual attempts to reinforce against disasters, like lagoon soil dredging for sea wall defences, that actually threatens to unintentionally exacerbate these disasters.

<sup>12</sup> See Figure 3

Disasters can directly impact the security of individuals and communities:

- Individuals suffer threats to life, which disproportionately affect women and those who are dependent on others, such as children and people with disabilities.
- Individuals and communities can see property and livelihoods destroyed during disasters with significant consequences for food, water, and health security. That can overlap with pre-existing resource constraints, putting more pressure on individuals and families.
- During, and after, disasters, individuals and communities can experience higher insecurity as security services are often overwhelmed. Women and girls are especially affected, their insecurity can include increased rates of gender-based violence during disaster periods. Such violence manifests not just in the home, but also in disaster evacuation centres.
- Displacement undermines the resilience of those forced to move and puts pressure on communities or families who receive the displaced people because resources may already be overextended.

While disasters impact many in the region, low-income communities are especially vulnerable. Poorer communities are often found in hazard-prone locations or remote areas. This means the community may lack access to basic services, including health services, which leave them susceptible to climate-borne diseases, and will often be harder to reach during and after disasters.

Lack of resources and susceptibility to disasters mean these communities often experience repeated exposure to disaster events, which often leaves them without the means to recover. This creates a poverty-disaster trap which limits the ability for individuals and communities to build resilience.

Disasters also affect governments in important ways. The financial cost of disasters is putting considerable pressure on government budgets. Damage to vital infrastructure, like information and communications technology (ICT), water, and energy utility systems, social infrastructure, like schools and hospitals, core public infrastructure, like roads and transportation networks, and private infrastructure, like property, increases financial stress and significantly disrupts the ability of service providers to continue operations.

Furthermore, damages to economic infrastructure, including agriculture and industry, can drastically reduce public revenue streams and livelihoods. Disasters can also lead to higher debt burdens, as countries need to finance more disaster preparedness or recovery, or weaken financial system stability, especially in scenarios where widespread loss and damages could force a run on financial institutions.

From a security perspective, the inability of governments to prepare for, respond to, and recover from disasters can also have wider impacts on political stability and state-society relationships. In general, the economic burden of disasters and loss of revenue can lead to situations where governments must make trade-offs between social investment and disaster preparedness and recovery.

If these trade-offs affect those already disadvantaged, in real or perceived terms, the feeling of being forgotten can be fuel grievances. Furthermore, in disaster responses, instances of perceived corruption or exclusion can deepen resentment for the government. If this occurs in a politically unstable situation where trust in the government is low or if certain population groups already feel marginalised or excluded, risks of instability will rise.

## PATHWAY 3 Key Insights and Challenges

- Pacific Island states are some of the most vulnerable in the world to climate-induced disasters, including extreme weather events, and the region often ranks highest for the number of people affected by disasters per capita. From 1950 – 2011, 9.2 million people were directly affected by climate-induced disasters.
- The economic losses and costs associated with disaster risks are high. Annual economic losses due to climate-induced disasters in Pacific Small Island Developing States (SIDS) are estimated to be USD \$1.075 billion or 5 percent of the combined gross domestic product (GDP) of Pacific SIDS. Losses are especially high for Palau, Tonga, and Vanuatu with average annual losses (AAL) valued at 11.98 percent, 19.20 percent and 20.67 percent of national GDP, respectively.
- Debt burdens are increasing across the Pacific, made worse by the confluence of the COVID-19 pandemic, declining GDP and the high cost of disasters. Average debt-to-GDP ratio for Pacific Island states rose from 32.9 percent in 2019, one year before the pandemic, to 42.2 percent in 2021. Fiji, Vanuatu and Palau all have debt-to-GDP ratios greater than 70 percent. High levels of debt with reduced capital to service them makes spending on pressing issues, like equitable development, more difficult and exposes countries to external financial shocks.
- Rural and urban areas are both at risk though for different reasons. Following a disaster, it may be more difficult to deliver critical provisions to communities in remote areas, which only exacerbating their vulnerability. Urban communities are concentrated along coasts, which puts thousands of people at risk with those in informal settlements being the most vulnerable.
- Urban poor communities are often under-resourced and under-protected from disaster scenarios. Many inhabit weaker structures built in hazard-prone areas with limited or inadequate water and electricity provision and poor sanitation facilities. In Vanuatu, 92 percent of respondents that participated in





© Chewy Lin

a displacement survey stated having only one of these three services available even before a disaster.

- Disaster displacement is a major challenge for poor population groups who are often subject to repeat displacement. In a survey conducted in Port Vila, 77.2 percent of survey respondents stated they had been displaced more than once, and 20.5 percent had been displaced three times or more. In Fiji, in Ba Town, 94 percent of displaced survey respondents stated having been displaced more than three times.
- Women and girls are most susceptible to bodily harm and gender-based violence during, and after, disasters. During the 2014 flooding in the Solomon Islands, 96 percent of the deaths were women. Following the Gizo Tsunami, incidents of rape were reported in evacuation centres. In Fiji, women living in relief centres reported being raped.
- Persons with disabilities and children are significantly impacted by disaster events, and are themselves more vulnerable to insecurity in the immediate aftermath of disasters than other groups. For example, children may be separated from their parents and persons with disabilities may be without their usual aids or services in post disaster periods. During Cyclone Pam, a higher

degree of cyclone-related injuries was associated to people with disabilities, 5.8 percent of people with disabilities sustained injuries versus 2.4 percent of people without disabilities.

- Women are underrepresented in disaster risk management and planning, as well as security provision, at all levels of society. Just 3 of 18 Forum Member countries have women in top jobs managing national disaster response and women often have limited visibility in disaster committees.
- If governments are unable to prepare for, respond to, and recover from disasters effectively and fairly, political stability and state-society relationships will be affected. In some countries, accusations of corruption or favouritism in relief distribution are affecting public opinion and increasing feelings of abandonment, even if distribution is handled by non-governmental entities.
- Working closely with relief partners, such as church groups, non-governmental organisations (NGOs) and regional organisations, helps mitigate some of the challenges governments could face in delivering equitable relief and recovery. Monitoring is needed to ensure equitable distribution otherwise governments risk being implicated in possible mal-practices.



## PATHWAY 4: Climate change affects mobility trends and can exacerbate risks<sup>13</sup>

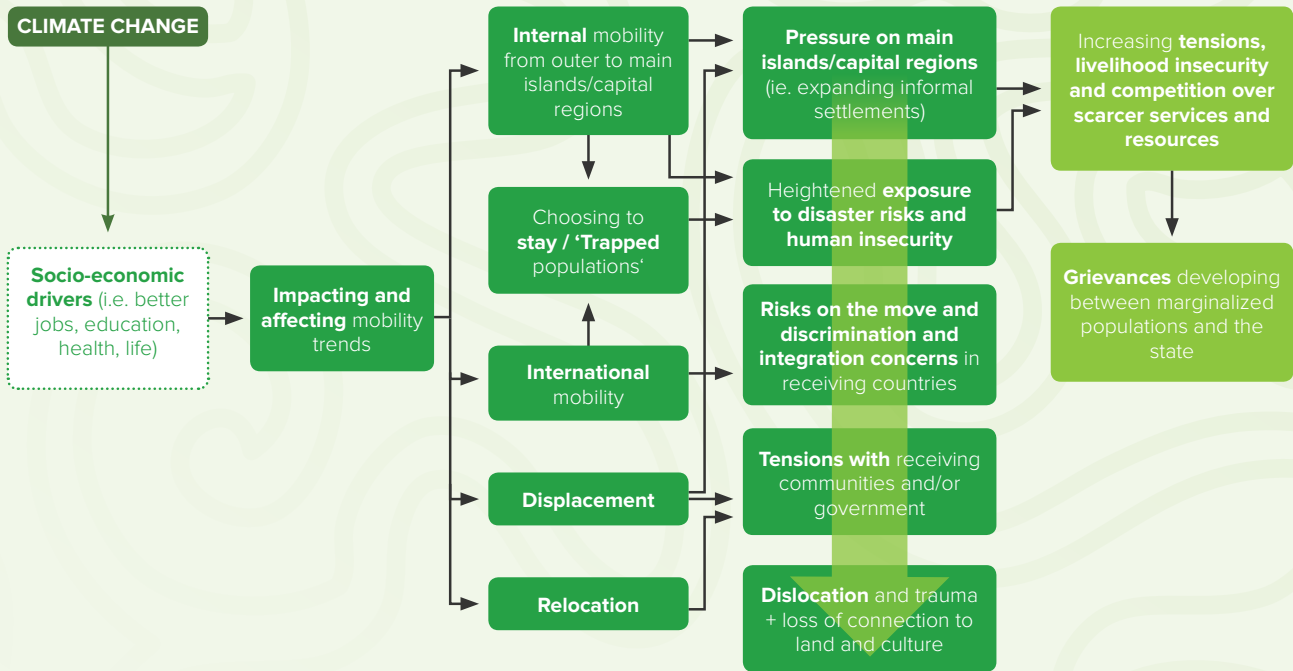


FIGURE 4: Illustration of pathway “Climate change affects mobility trends and can exacerbate risks”

Mobility is a long occurring phenomenon in the Pacific Islands. Socioeconomic factors have typically influenced why people move, including access to education, employment, and better health services. Up to this point, climate impacts have not been the leading factor for migration, but as climate change increasingly impacts livelihood, food, water, health and land security, it will likely become a more prominent factor in decision making and increase mobility rates among those who can afford to move. Conversely, climate change impacts will also increase the number of people who seek to move, but are unable given their insufficient resources. Therefore, climate change will increase the already existing mobility trends<sup>14</sup>.

<sup>13</sup> This section identifies the main climate security risks in the Pacific region coming from mobility issues, but it is not meant to provide an exhaustive analysis. A dedicated regional framework on mobility is currently being developed (as per Feb '23), under the The Pacific Climate Change Migration and Human Security Programme (PCCMHS), delivered through a partnership between the International Organisation for Migration (IOM), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), International Labour Organization (ILO), and Office of the High Commissioner of Human Rights (UNOHCHR), as well as the Platform on Disaster Displacement (PDD) and Pacific Islands Forum Secretariat (PIFS). For more information : <https://environmentalmigration.iom.int/pccmhs-enhancing-protection-and-empowerment-migrants-and-communities-affected-climate-change-and-disasters-pacific-region>

<sup>14</sup> See Figure 4

Internal migration is the primary mode of mobility. This has largely comprised of rural-to-urban migration for better livelihood opportunities and access to education, health, and other public services. Rapid urbanisation and the resulting population density, combined with often inadequate land management in urban areas, is overextending already scarce land, water and food resources.

As a result, tensions between individuals, communities, and governments are rising. Informal settlers, in particular, face increased exposure to climate risks since they are often forced to live in under-developed and climate exposed areas. In many countries, governments are attempting to incentivise urban-to-rural mobility through development practices in rural areas. However, rural communities continue to suffer from a variety of issues, including population loss and brain drain.

International mobility is a less worn path for most PICT and will often be motivated by historical or familial ties to other countries. International migration can also provide relief to overcrowded cities and improve the resilience of those who remain by generating personal financial benefits and remittances from those that migrate over the short-term (e.g., labour schemes or education visas) or long-term (residences in other countries).

If used well, remittances can support adaptation necessary to counteract climate impacts in home countries at the household level. However, the cost of migration is high, which limits the number of people who can move. As a result, this can widen disparities back home while reinforcing the vulnerability of poorer communities.

Migrants may also face challenges integrating into receiving countries due to racism and discrimination or to an inability to find work or access services. Feelings of loneliness and isolation can also result in significant mental health issues among other challenges.

Internal disaster displacement is a widespread phenomenon in the region. Tensions in receiving communities, especially when displacement is longer-term, can lead to social problems, but also put displaced communities at risk of material insecurity.

Relocation pressure also increases as land stress builds and weather-induced disasters intensify, effectively reducing habitability. Relocation can be prone to conflict and so it is essential to manage it with effective planning and consultation to ensure sustainability. Proximity to customary lands or familiarity with communities and resources can help mitigate issues. However, without appropriate management, tensions can build between stakeholder communities and even between relocated communities and governments.

Voluntary or forced migration comes with significant challenges and risks. Cultural and spiritual attachments to 'place' are often considered an integral component of the self. By being removed from the physical, socio-cultural, spiritual, and ancestral connections to land, Pacific Islanders' identity, wellbeing, community/social networks, and sense of place can be severely impacted.

More broadly, dislocation can also contribute to the erosion of culture and traditions. Both in home and migrant communities. In home communities, dislocation reduces opportunities for knowledge transfer, while in migrant communities, traditional practices and materials may be harder to access. These factors are already having consequences for the preservation of language and cultural knowledge.

Moreover, not all people are able to, or desire to, migrate. Those who cannot move may come from lower-income communities and vulnerable groups, while others may actively choose not to migrate for a multitude of reasons, including, but not limited to, their connection to land, sea, and community and for religious convictions.

If managed appropriately and effectively, migration could be a potential climate change adaptation measure. However, if unplanned and poorly governed, the added pressure of climate change risks could make the short- and/or long-term movement of people a conflict risk multiplier.

## **PATHWAY 4 Key Insights and Challenges**

- Climate change can exacerbate drivers of mobility, such as livelihood, food, and water insecurity. More than 70 percent of households in Kiribati feel that international migration will be a likely adaptation response if agricultural production becomes more difficult or if sea levels rise, which contribute to flooding or worsening saltwater intrusion into food and water systems and affect sanitation systems.
- Most migration is internal to urban areas, which further strains land and water resources, public services, and employment opportunities. On average, 23 percent of the region is urbanised although differences across PICs are stark. Nauru and RMI have 100 percent and 78 percent urbanisation, respectively, while just 13.5 percent of PNG's population live in urban areas. In some parts of the Pacific, urban density exceeds major world cities. Ebeye in RMI has a population density of 40,000 persons/km<sup>2</sup> surpassing the urban density of Hong Kong at persons/km<sup>2</sup> and Betio in Kiribati has a population density of 15,000 persons/km<sup>2</sup>, which is 2.5 times the density of Tokyo, Japan.
- Internal migration to urban areas will result in informal settlement expansion, which already accounts for a large proportion of urban dwellers. Up to 50 percent of the urban population comprises squatter and informal settlements in Melanesia and Micronesia. These settlements are likely to be hot spots for tension and conflict in the future.
- In these urban areas, and in the context of increasing environmental, social, political, and cultural pressures and competition, tensions and issues arise between groups at three main levels: between migrant communities, between migrant and local communities, and between migrants and governments. However, across all levels, the reduction in traditional norms and systems,

including conflict resolution mechanisms, due to the competing systems governing these spaces increases the potential for tensions to escalate into insecurity and conflict.

- Though the majority of migration is internal, many Pacific Islanders permanently or temporarily migrate internationally for a diverse set of reasons, including impacts resulting from climate change. Climate change related migration is expected to grow in the future. A recent UN study on pre-COVID-19 international migration stated that there is an estimated 751,000 Pacific Islanders living outside their country of birth. Of those who have migrated, 310,000 are living in the Pacific Islands region.
- International migration can provide significant benefits. Remittances are an important source of income for many countries and communities. Studies have also shown that those who receive remittances have increased resilience against many climate impacts, like accessing better building materials or purchasing more secure land.

- It is hard to plan for community relocation and it requires extensive consultative processes with all affected community groups to limit potential security risks. Important factors can influence the degree to which a relocation is conflict-prone, including proximity to customary land or whether the community instigated the movement or were forced to move. Those who were involuntarily displaced from customary lands, such as the Manam community in PNG, face the most acute challenges.
- People who move also face a number of challenges and risks. Displacement can come with consequences for mental health given how integral home is to identity. Changes to dietary preferences will also reduce well-being. There are high incidences of NCDs present in migrating populations. Disabled family members are disadvantaged as receiving countries do not allow for reunification of families of people living with disabilities. The financial cost of returning to one’s home country is high, as is the social stigma of failing to integrate in countries of destination, meaning the capacities to return to one’s home country is limited.

### PATHWAY 5: Climate Change urges securing maritime boundaries and sovereignty and could undermine regional stability

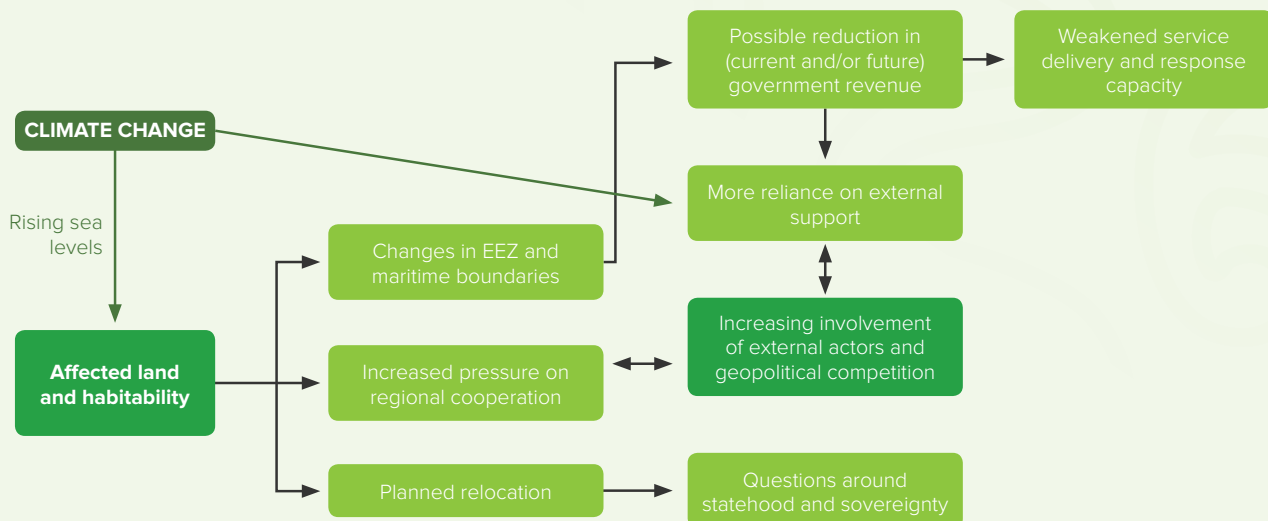


FIGURE 5: Illustration of pathway “Climate change urges securing maritime boundaries and sovereignty, and could undermine regional stability”





© Mark Garten (UN Photographer)

Sea-level rise and more intense extreme weather events threaten the habitability of islands and atolls, especially of low-lying atoll in PICT, and could have implications for the territorial integrity of all Pacific States. In addition, if the habitability of large parts or the whole of PICT is impacted, alternatives for long-term adaptation will have to be considered. Some of these alternatives, such as large-scale community relocation, may pose new and unanswered questions around sovereignty and identity<sup>15</sup>.

Sea-level rise threatens to inundate land on islands and atolls across the Pacific. For low-lying atoll states, this threat is even more severe given their limited overall landmass and lower elevation. The threat to land is posed by a confluence of climate impacts, including sea-level rise, coastal erosion, and storms, which interact and reinforce one another. This land loss has already occurred in various island areas in the Solomon Islands and Nauru and in low-lying atoll states, like Kiribati.

Under current interpretations of international law up to this point, maritime zones have been demarcated based on the low coastal water line, but it has been suggested these baselines may shift as result of land loss induced by sea-level rise. However, to address this risk, PICT have proactively taken assertive and novel steps to clarify their position on the issue through calls of actions and declarations.

<sup>15</sup> See Figure 5

Notable steps and actions were taken in 2019, but most notably during the PIF leaders meeting in 2021, when PIF leaders issued the ‘Declaration on Preserving Maritime Zones in the Face of Climate Change-Related Sea-Level Rise’ (2021 Declaration). The 2021 Declaration received a high level of acceptance and positive responses. It supports the interpretation that once a Forum Member’s maritime zones are delineated in accordance with the 1982 United Nations Convention on the Law of the Sea (UNCLOS) that Member’s maritime zones could not be challenged or reduced as a result of sea-level rise and other climate impacts.

Collectively, PICT have begun to fix the geographic location of baselines according current to coordinates and submit them without contest and in accordance with standard protocol to UNCLOS and the UN Division for Ocean Affairs and the Law of the Sea.

These efforts have been ongoing for the past two decades, but continue today. Securing maritime boundaries and zones remains a compelling and urgent priority for all Pacific countries, which means even stronger regional and global cooperation is necessary on these matters.

Though permanent inundation remains an acute threat, particularly for atoll states, land is likely to be uninhabitable well before permanent inundation would occur. According to some RPCs, reoccurring

and severe inundation caused by the confluence of climate risks will affect livelihoods, food, and water security to such a degree that some land will be uninhabitable by as early as 2050.

That reality means some PICT, and low-lying atoll states in particular, must grapple with the possibility of considering alternative adaptation strategies, including community relocation as a last-resort adaptation measure. Community relocation is a challenging process with significant implications for the security and well-being of Pacific Islanders those who migrate and also for those in communities who receive migrants, given the centrality of land to livelihood, culture, custom, identity and spirituality. Extensive consultative and inclusive processes and buy-in is required from all national and international stakeholders to ensure sustainability and the well-being of all those affected.

Should relocation processes be undertaken, this will raise complicated questions on statehood and identity and this needs to be addressed by PICT and the wider international community. Statehood relies on conventional international law, which outlines specific definitional criteria, including populations being governed on terrestrial land under a sovereign government's control.

However, The Blue Pacific, is proactively dealing with this issue and recognises the need for the region to unpack these issues further<sup>16</sup>. It also continues to be actively engaged in the work of the International Law Commission, which is currently studying the topic of sea-level rise in relation to international law in its current work programme.

In addition, national responses are being developed. For example, Tuvalu has proposed a “digital citizenship”, which might effectively act as a “citizenship registry” beyond a time Tuvalu has habitable territory should the impacts of climate change continue to intensify.

Additional risks may also emerge from the growing geopolitical contest in the Pacific, which is important to consider given the reliance many PICT have on international partners. Indeed, as the effects of climate change intensify, PICT will need more external resources to respond. As geopolitical competition increases, major powers could politicise funding and put PICT in the position of having to balance geopolitical alliances with development finance opportunities. As external actors become more assertive to advance their interests, Pacific efforts to advance climate security through resilience building

and adaptation could be compromised. Geopolitical competition and compounding pressures on PICT will make cooperation more challenging.

## PATHWAY 5 Key Insights and Challenges

- Land loss from permanent inundation remains an acute risk for some PICT. For example, in the Solomon Islands, Hetaheta and Sogomou Islands lost 62 percent and 55 percent of their islands, respectively, due to sea level induced coastal erosion. Some of the Solomon Islands and islands in Micronesia, like Kale & Rapita Islands, have already disappeared completely. This trend is set to continue. In New Caledonia, studies suggest that up to 30 percent of islands will have between 1 percent – 25 percent of their land submerged if sea level rises by one metre.
- A more immediate concern is the threat of persistent and consistent temporary flooding. This will impact livelihoods and food and water systems, as well as health and safety, and, ultimately, make land uninhabitable. In some countries, such as Tuvalu and other low-lying atolls, this could be a reality in the next 30 years. This phenomenon occurs due to reinforcing and compounding climate risks, including sea-level rise, coastal erosion, king tides, and storm surges. That risk is even higher for low-lying atolls and raised atolls, such as Tokelau, Cook Islands, parts of the FSM, Tuvalu, Kiribati, RMI. Though the region is home to some of the world's smallest countries by landmass, collectively totalling only 550,000km<sup>2</sup>, the region's territorial claim covers an area approximately 30,569,000km<sup>2</sup>. This is equivalent to the size of Africa.
- As of today, most countries have submitted their boundaries where there were no contesters or need to negotiate and many have reached negotiated settlements with Pacific Island neighbours where boundaries were disputed or unclear.
- Land reclamation is increasingly becoming an option for PICT to combat land loss, especially in low lying atoll states, and

<sup>16</sup> At the time of writing, a regional conference is being organised for 2023 on this specific matter.



alleviate pressure in urban areas. These activities usually imply high investments. Furthermore, land reclamation interventions present their own risks, including environmental risks.

- International relocation has very limited precedent with most having been undertaken during colonial times. Generally, these have had mixed success, with the i-Kiribati Banaban community settled in Rabi, Fiji experiencing continued grievances while Tuvaluans living in Kioa, Fiji feel more settled. The complexity of these processes requires deep thinking and strong inclusive processes and procedures in place, among others, to reduce potential for conflicts in the future.
- Questions around sovereignty following relocation are real and present. There are both historical and contemporary examples showcasing some of the likely trade-offs associated with undertaking such a process. However, under current international law interpretations, initiatives to clarify the issue of statehood and sovereignty as result of climate impacts are ongoing and will likely increase in the near future.
- The region is experiencing increasing interest by larger powers within, and beyond, the region, who are all pledging to focus attention in the area due to its strategic importance. This interest has been experienced in Britain's "Pacific Uplift", Indonesia's "Pacific Elevation", New Zealand's "Pacific Reset", Australia "Pacific Step-up", China's "Belt and Road Initiative" and as "an essential part" of the US's "free and open Indo-Pacific region."
- Collective action is key to address the security implications of climate change, but considering the region's high level of reliance on Official Development Assistance (ODA), Pacific countries can be exposed to external actors' own interests. Per capita ODA is higher in the Pacific than in any other region. When representing ODA as a proportion of national income, 10 Pacific region countries can be found among the 25 countries in the world that have the highest proportion.
- However, PICs have showed strong agency in addressing this circumstance and even utilise these strategic power games to achieve regional goals. Collectively, PICs routinely demand for climate-related security

risks to be considered and addressed at the highest levels and they can turn the increased strategic interest into bargaining power.

## 2.3 Conclusion

The five pathways outlined and discussed in Section 2 showcase some of the security challenges Forum Members face from the impacts of climate change. The threats to livelihoods, social cohesion, governance, health, budgets, culture, and identity, among others, pose significant risks for individual, community, national, and regional stability.

In some cases, these risks are already manifesting into increased social pressure and disputes resulting in the erosion of social norms that guide community life, and, ultimately, pose key questions around a future that seems deeply uncertain for Pacific countries and communities.

If left unexplored and unaddressed, these interactions could cause further social discord, leading to political instability, or even violent conflict, particularly in those states that have a history of conflict and persistent underlying tensions. Understanding and addressing those risks is an essential step to face challenges that are new and complex in nature.

Responding to climate security risks requires thinking outside the box, bringing new players onto the scene, and even reconsidering how traditional responses to security threats have been managed. Concerned stakeholders at different levels, including community leaders, national governments, regional bodies and institutions, and global partners, among others, need to acknowledge the need for this alternative approach and act today in a conflict prevention capacity. Underlying this approach is the necessity to be aware that what the future holds depends on the choices made in the present.

The first step is to build a strong evidence base on which to craft policies, plans, strategies and approaches. Using the pathways explained in Section 2 as a starting point, the Assessment Guide intends to suggest tools and methodologies to do just that.

By utilizing the information from Section 3 - Suggested Practices and Section 4 - Guide for Conducting Climate Security Assessments, users are encouraged to identify their own climate security pathways or tailor the regional pathways presented in Section 2.



## SECTION 3

# Suggested Practices

**The following suggested practices and approaches are intended to support the achievement of Action I (iii) of the Boe Declaration Action Plan and advance a better understanding and contextualisation of the impact that climate change will have on the regional security landscape through its interaction with human security and conflict. These practices are also meant to support relevant stakeholders to better embed climate security considerations in decision-making bodies and into the subsequent assessments, plans, policies and approaches.**

The suggested practices are based on regional and global best practices in the field of climate security assessments and they aim to provide ideas and options to guide further actions by relevant stakeholders in the future. They are not meant to be prescriptive or comprehensive, but rather outline the forms of action regional actors, Forum Members, and international partners could be taken to ensure plans, policies, and interventions are more informed by climate security considerations.

### **PRACTICE 1: Improve climate security knowledge, capacities, communication and programming**

In order to address the security implications of climate change, it is important to have a better understanding of the security implications of climate change that is disaggregated across countries, sectors and themes. While there are many risk mitigation activities already underway, critical knowledge gaps and incomplete data throughout the region on various issues related to climate security still remain.

Better information needs to be accompanied with comprehensive, measured, and cautious communication. It is important to underline the urgency of the risks Pacific Islanders face without reinforcing fatalist and harmful narratives. Communication needs to acknowledge the resilience and agency of Pacific communities.

Reaching a broader set of stakeholders, the society at large, and youth populations especially, requires new approaches to knowledge dissemination, including the use of multimedia given the expanding digital audience.

In order to achieve this form of communication, specific capacities and technical expertise must be developed at local, national, and regional levels. This development is necessary to undertake climate security analyses and to design and implement integrated programming to address the multidimensional and multidisciplinary nature of climate-related security risks and bring together human security, environmental, political, and gender-specific aspects.

**Establish a system and process to collect relevant data to advance the analysis of issues touched on in this Assessment Guide.**

This can include:

- Complementing the risk analysis with additional resources.
- Reviewing priority actions and exchanges on lessons learned.
- Conducting region-wide scenario building and foresight exercises to further understand risks and to stress-test response measures.

**Conduct thorough and comprehensive climate security assessments on different levels.**

This can include:

- More country-wide assessments to inform strategy and planning processes on the national level. These analyses can also be used as a starting point for building capacities on the national level and to mainstream climate security action across governments.
- Conducting sectoral and thematic climate security assessments to identify, and to develop, sectoral and thematic-specific responses. These can focus on topics such as energy, tourism, extractives, and foreign aid.

**Build specific climate security capacities at the national and regional levels.**

This can include:

- Building capacities to undertake climate security assessments and to inform, develop, and implement programming. One key part of this could be a regional training program that pools resources and supports Forum Member countries to ensure regional learning and the exchange of experiences. This is especially important for translating analysis from those assessments into action.
- Working with CROP agencies and other regional institutions to identify gaps and establish capacity building as a prioritisation.

**Develop and expand comprehensive communication strategies which can reach a multitude and range of relevant stakeholders.**

This can include:

- Incorporating Indigenous knowledge and experiences with new multimedia materials that can be viewed across multiple formats.
- Focusing on capturing national or regional examples of resilience in addressing climate security risks. To do so, consider working with local community organisations, NGOs, and associations, especially church groups, to showcase community-level activities and ensure a wide reach. Where possible and resource feasible, ensure these are captured in shareable content and support its distribution.

## **PRACTICE 2: Mainstream climate security across policies, frameworks and planning**

The multi-sectoral nature of climate-related security risks affecting food, water, livelihood, health, and energy security means different actors are needed to address the risk pathways outlined in Section 2. Therefore, coordination and integrated approaches that operate across sectoral silos are

key to addressing climate-related security risks. If coordination is lacking, duplication and misalignment of resource allocation can hinder efficient and effective responses.

In order to avoid duplication and increase efficiency and efficacy in addressing climate-related security risks, climate security should be mainstreamed across policies, frameworks and initiatives where it can add value and contribute to holistic responses to climate insecurity.

### **Support better coordination for climate security action at the national level, bringing together diverse range of stakeholders with relevant competencies (including climate change, disaster risk management, public finance, security sector, and the climate change community of practice).**

This can include:

- Establishing a coordination mechanism for climate security action on the national level. Given climate security is a cross-cutting issue and does not normally have an institutional home, a cross-sectoral coordination structure can be an effective tool to coordinate and motivate action across government.
- Embedding climate security in an already established coordination structure.

### **Ensure that climate security is mainstreamed across and integrated into key national policies and plans.**

This can include:

- Mainstreaming climate security in development plans and strategies, climate-related policies, such as Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), and security-related policies such as national security strategies.
- Establishing a process to assess new policies in their climate security considerations to help identify concrete entry points and to ensure that they contribute to, and do not undermine, resilience against climate-related security risks.

### **Integrate climate security into current frameworks and the development of key regional frameworks in the future.**

This can include:

- Mainstreaming climate security concerns into frameworks such as the FRDP. One approach would be to incorporate pillars based on climate security considerations.
- Ensuring the uptake of climate security considerations in the implementation of the 2050 strategy.
- Solidifying this Assessment Guide as a tool to assist governments in conducting their own climate security assessments across the breadth of the Boe Declaration's strategic areas.
- Mainstreaming climate security in the upcoming Pacific Regional Framework on Climate Mobility.
- Clearly assessing and referencing the linkages between different frameworks, including this Assessment Guide, to ensure alignment on goals and targets.





© UNDP

### **Strengthen institutional homes and landing points for climate security on the regional level.**

This can include:

- Helping to support climate security integration throughout the region, or within USP, to lead research prioritisation and information dissemination by normalising discussions on climate security within existing regional bodies, such as the PIFS or their programs of work and by establishing focal points within CROP agencies, such as the SPREP, SPC, and FFA.
- Promoting knowledge exchange including exchange through the Pacific Fusion Center.
- Formalising the recently established Pacific Climate Security Network to further enhance knowledge production and dissemination through a dedicated community of practice.

### **PRACTICE 3: Avoid maladaptation and mitigation through climate-, conflict- and culturally sensitive approaches**

Mitigation and adaptation activities are important to mitigate and address the worst effects of climate change. However, if done incorrectly, well-intentioned mitigation and adaptation measures can have negative consequences that are both seen and unseen. To avoid this, responses need to be sensitive to their context and be especially focused

on gender, conflict prevention, peacebuilding while also being climate-sensitive in order to not worsen conditions for marginalized groups.

Context specific approaches that consider and harness cultural, historical, political, social, and environmental benefits should be prioritized. Integrated approaches should always be explored and applied. Given the increased perception by citizens of unfair aid distribution, tracking the utilization of funds should also be reinforced to minimize grievances among citizens.



**Ensure that considerations accounting for gender, conflict, and climate sensitivity are integrated and addressed in policy and in interventions design and implementation.**

This should include:

- Understanding the links between climate change and security in a specific context through dedicated analysis.
- Using local, national, and regional experts on gender and gender-based violence, conflict prevention, peacebuilding, and climate analyses that draw on the respective communities of practice.
- Applying existing tools and methodologies developed regionally and globally on gender, conflict prevention, peacebuilding, and climate.
- Ensuring inclusion of all relevant stakeholders, including those with disabilities, youths, marginalised groups, and private sector actors in different stages of policy and program design and implementation.
- Relying on collected best practices and lessons learned from relevant agencies, including CROP agencies, development partners, UN agencies, international financial institutions, and regional organisations.

**Develop integrated, cross-sectoral programs and initiatives that link livelihoods, climate change adaptation, conflict prevention, and peacebuilding aspects in culturally sensitive way aiming to address underlying causes of marginalisation and inequality as core objectives.**

**Identify effective models of working with customary/community systems in relation to relocation, displacement and adaptation efforts.**

This can include:

- Focusing on ensuring maximum inclusiveness and transparency.
- Conducting continuous and comprehensive communication.
- Engaging and empowering of the vulnerable and marginalised groups to more effectively participate in decision-making processes.



## SECTION 4

# Guide for Conducting Climate Security Assessments

The following section presents the guide Forum Members and regional actors can utilize to identify and better understand climate-related security risks to inform relevant policies, priorities, and interventions. The section comprises of two main parts:

1. Description of the analytical approach that informs and underpins this guide. This includes conceptual foundations, main elements of analysis, methods and tools, and how to identify responses;
2. Guiding questions users can adapt and/or adopt and that can be a starting point when conducting their own climate security assessments.

### 4.1 Description of Analytical Approach

#### 4.1.1 Conceptual Foundations

This Assessment Guide is based on the concept of human security. Human security is people-centred lens that includes economic, food, health, environmental, personal, community, and political security<sup>17</sup>. The Assessment Guide relies on the definition of security as illustrated in the Boe Declaration and Action Plan.

The Assessment Guide also considers the Organisation for Economic Cooperation and Development's (OECD) definition of instability and fragility as “the combination of exposure to risk and insufficient coping capacity of the state, system, and/or communities to manage, absorb, and mitigate those risks”. Political and social instability,

<sup>17</sup> For all dimensions and a definition of human security see [UNDP \(2006\)](#) and [Adger et al 2014](#).

(organised) crime, urban violence, terrorism, and violent conflict are different ways in which insecurity manifests.

In the context of the Pacific and low-lying atoll nations, security also takes on an existential dimension given the threat posed to land, governance and identity by rising sea levels. It also considers the global security landscape and, in particular, insecurity stemming from geopolitical tensions and the impact of climate change on maritime borders, fish stocks, and other applicable concerns.

Climate-related risks, including climate-related security risks, are driven by a range of climatic hazards including both slow onset changes, such as rising temperatures, sea-level rise, ocean acidification, saltwater intrusion, coastal erosion, and changes in precipitation patterns, and fast onset events, such as increased intensity of extreme weather events like storms and floods.

These hazards are also referred to as climatic stressors or shocks. The impact of these climate stressors on communities, economic sectors, or geographic areas, including on that of security and peace, is dependent on:

1. its exposure to these hazards and;
2. its vulnerability to adverse impacts of climate change, which can be described as the degree to which geophysical, biological, and socio-economic systems are susceptible to, and require additional capacity to manage, these impacts<sup>18</sup>.

<sup>18</sup> This is based on the definition of the [IPCC \(2018\)](#) and the conceptual approach put forward by the [UN Climate Security Mechanism \(2020\)](#).



Climate-related security risks are driven by one or more climatic stressors that have direct and/or indirect impacts on human security and challenge the peace and stability of states and societies. They are systemic risks that emerge through complex interactions between climate change and different social, economic, environmental, demographic, and political factors. These interactions are clustered around a number of impact pathways that articulate and map out those interactions.

The Assessment Guide is meant to provide guidance on how to navigate this complexity and unpack these interactions and pathways to inform suitable response.

#### **4.1.2 Elements of the Assessment Approach**

In order to identify specific climate-related security risks in a certain geographic area, it is key to understand:

- i. Climatic changes and their direct impacts (*Climate Change Lens*):** For example, temperature rise and its impacts on agriculture or flooding and its impact on infrastructure.
- ii. The peace and security context (*Peace and Security Lens*):** This includes the history and state of economic, social, and political (in)stability, past and ongoing security risks and conflict dynamics, the drivers and causes of insecurity, and the main actors that have an impact on security and stability.
- iii. The interactions between climate change, security and peace (*Climate-related security risks and possible pathways*):**
  - Link certain climatic impacts with specific security risks and conflicts. For example, linking how more pressure on natural resources, such as land and water, can increase competition and tensions over access and availability of these resources.

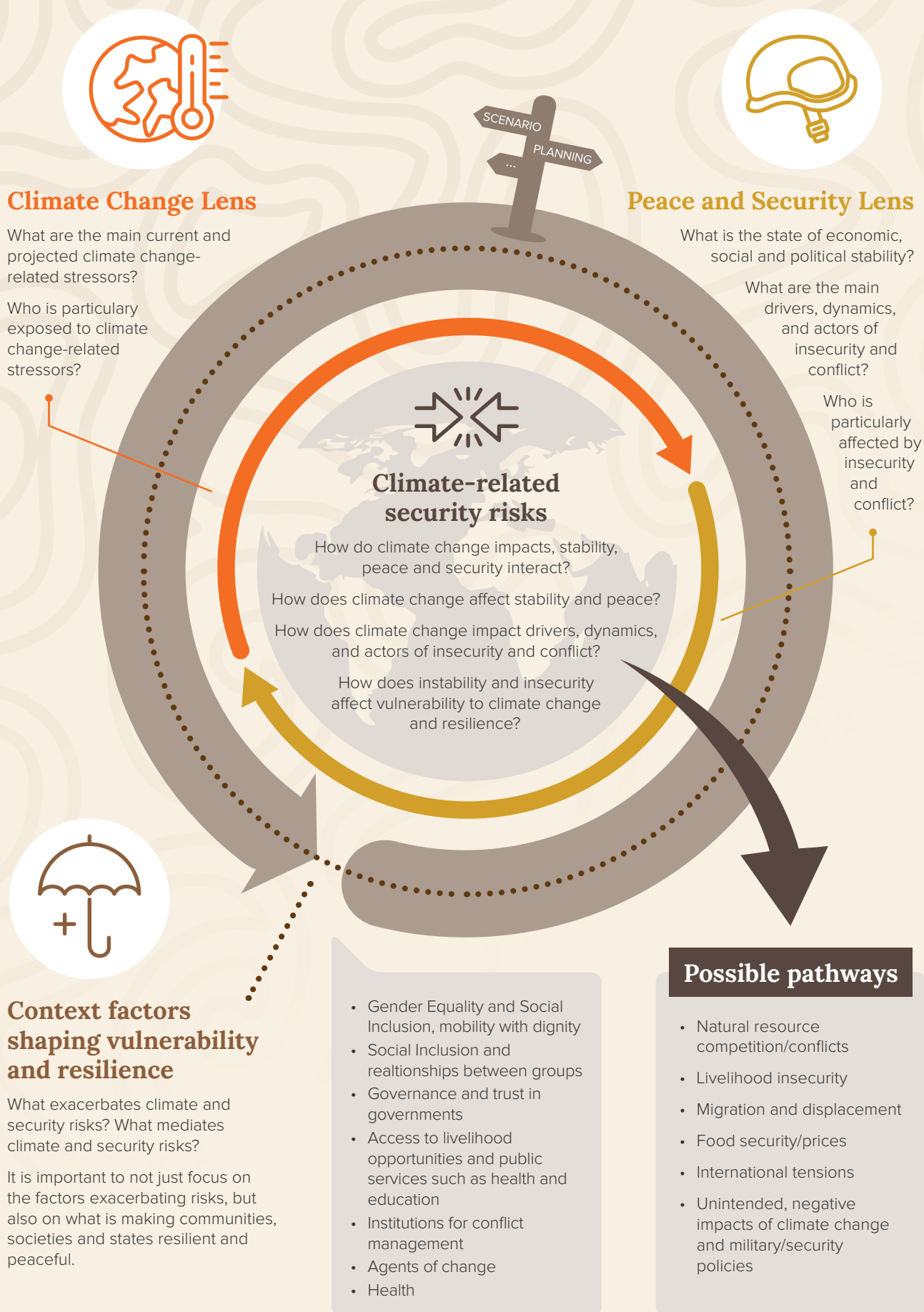
- Show how security risks and conflicts affect resilience and climate change. For example, showing how insecurity can contribute to increased environmental degradation, which, in turn, can undermine the resilience of local communities.

#### **iv. Important context factors shaping vulnerability and resilience to climate and security risks (*Context factors shaping vulnerability and resilience*):**

This includes gender equality and social inclusion as cross-cutting topics. These context factors normally play a decisive role in all pathways and should be at the centre of the analysis.

It is important to consider that parts of these elements might already have been studied through existing analysis. For example, climate impact assessments analysis might already provide necessary information for the climate lens. Peace, conflict and security assessments might already provide a good overview of the existing dynamics of insecurity. Vulnerability and resilience, gender, and/or governance assessments might provide users with in-depth information on the context factors shaping vulnerability and resilience. If users already have existing analysis, this Assessment Guide can complement the analyses and help to identify areas where additional information and data are needed.

The figure below illustrates the different elements of the analytical guide:



Graphic illustration of the climate security analytical framework used to identify the pathways (Ruttinger et al. 2021)





© UNDP

The order in which the elements are presented here does not imply an order in which the assessments must take place. The analysis can begin at any point in the Assessment Guide and the different parts of the assessment may overlap. The overlaps are not meant to require users to duplicate certain steps, but rather these overlaps are meant underline the links between the different elements of the assessment. It is important to cover all the elements of the analytical guide and assess the interactions between them. The cross-cutting elements and context factors, such as gender, social inclusion, spirituality and governance, will play a role across the different elements.

The pathways discussed in Section 2 of the Assessment Guide are based on the regional trend analysis. The pathways are:

- Pathway 1 – Challenges to the blue economy and livelihoods;
- Pathway 2 – Land, food, water, and health security;
- Pathway 3 – Exposure to natural disasters and implications for governments and communities;
- Pathway 4 – Implications of, and for, mobility;
- Pathway 5 – Threats to habitability and regional stability.

These pathways are intended to act as starting and entry points for analysis. They are hypotheses that should be carefully assessed in every context and should be further tested and explored for local relevancy and specificities. The pathways are not meant to limit the analysis of the Assessment Guide to these pathways exclusively. Depending on the scope and scale of the targeted context, the pathways may change all together. However, these pathways do provide a good starting point from which to start an assessment.

Importantly, the approach seeks to identify not only the peace and security risks, but also dimensions of resilience across different groups and communities.

#### 4.1.3 Methods and Tools

Four central methodological elements guide the approach:

1. Developing a tailored set of questions to guide the assessment;
2. Incorporating qualitative and quantitative elements;
3. Conducting field research and considering visual approaches to map interlinkages; and
4. Harnessing the breadth of work already done to avoid duplication and ensure a holistic understanding.



Users should devise a set of questions for each assessment element and pathway described above. A set of general guiding questions are presented in Section 4 that can be used to develop context-specific questions. As the Assessment Guide is meant to be a guide, flexibility in its utilization is an important aspect to keep in mind. With further research and analysis, and as more is learned, guiding questions may be included, removed or adapted.

In order to answer these questions, it is most effective to collect a combination of quantitative and qualitative data and to pursue approaches motivated by both forms of research. When exploring the knock-on effects of climate impacts, qualitative data is often not exhaustive enough and quantitative models alone are not able to capture the complex feedback loops and interactions that link climate impacts and security.

The complexity of these knock-on effects, like how increased extreme weather events or sea-level rise can impact livelihoods, the economy, social cohesion, conflict, political instability, trust in governments, and gender-based violence, means that an analysis of any available quantitative data should be combined with qualitative approaches.

If possible, assessments of peace and security, contextual factors, and pathways should include field research from, and interviews with, a broad range of stakeholders. This should be in addition to a thorough and locally-grounded literature review. All field research needs to be conducted using conflict-sensitive research methods<sup>19</sup>. The general approach preferred is one of storytelling, which allows respondents to share their truths and experiences without limitations.

A gender-sensitive and intersectional research approach ensures that findings are disaggregated by gender and age and it will also identify groups to better understand the heterogeneity of risks and dimensions of resilience across contexts and actor groups. A special focus should be put on capturing the voices and perspectives of marginalised groups that are harder to reach, including those of women and youth. This will require additional resources and time to identify such groups and individuals and to create spaces and formats in which they feel comfortable sharing their perspectives.

Lack of data is a major concern for climate assessments in the Pacific region. There is a lack of reliable projections related to climate change for critical impacts, including drought, wind, and tropical storms. There are also limitations to the resolution of climate projections from global climate models because the grid cell size is too coarse compared to the small size of PICT, limiting the ability of the models to simulate specific regional or local characteristics.

Further limitations include logistical impediments to data collection, such as facilitating assessments in remote locations, poor internet connectivity, time zone constraints impeding coordination, and limited stakeholder capacities. Nevertheless, projections are improving and there are some good data sources available<sup>20</sup>.

Visual approaches to map interactions between different drivers of instability and conflict can also be part of the qualitative analysis. One approach is to map the links between climate change and insecurity along certain pathways. For example, see the below mapping of the blue economy and livelihoods pathway.

<sup>19</sup> For more information see [https://postconflict.unep.ch/Climate\\_Change\\_and\\_Security/CFRA\\_Guidance\\_Note.pdf](https://postconflict.unep.ch/Climate_Change_and_Security/CFRA_Guidance_Note.pdf)

<sup>20</sup> For example, see World Bank Climate Change Knowledge Portal and Risk Country Profiles (<https://climateknowledgeportal.worldbank.org/> and <https://climateknowledgeportal.worldbank.org/country-profiles>), UNFFFC National Communications (National Communication submissions from Non-Annex I Parties | UNFCCC ) or IPCC WG2 Chapter 15 (<https://www.ipcc.ch/working-group/wg2>)

## Climate Change Challenges Livelihoods and the Blue Economy

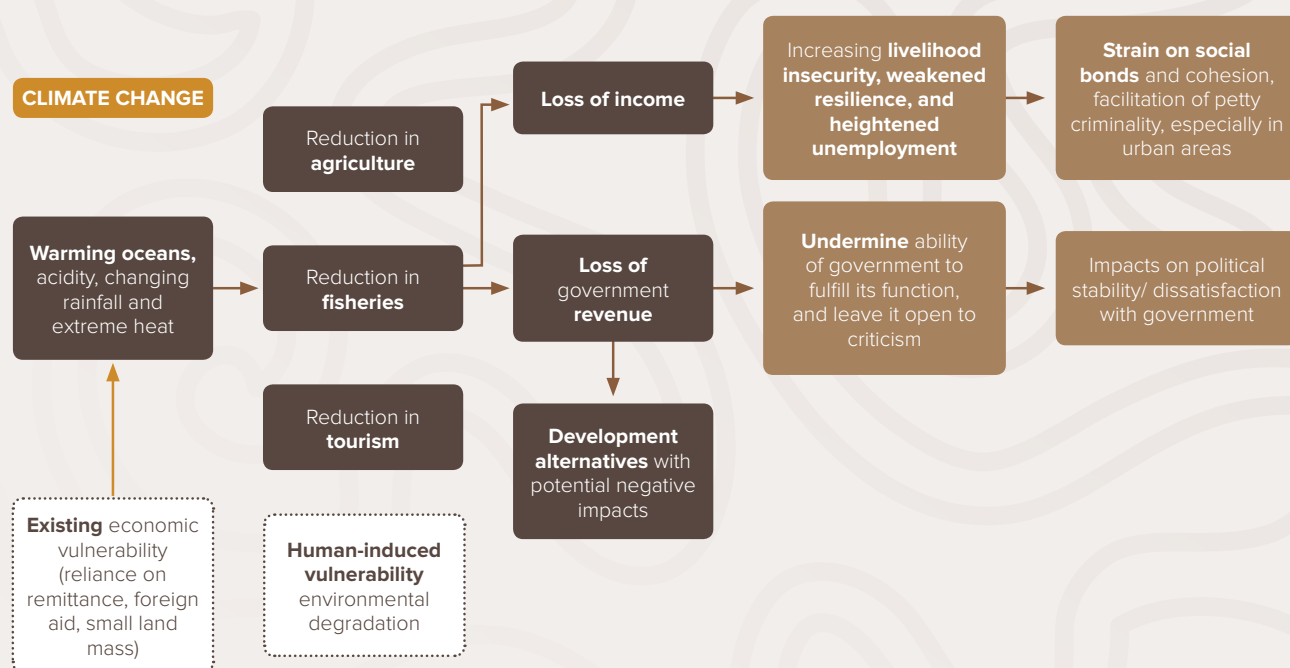


FIGURE 6: Illustration of pathway “Climate change challenges livelihoods and the blue economy”

Lastly, given that the region has been at the forefront of addressing climate change and that climate risks in the region are among the highest in the world, a significant number of vulnerability assessments, frameworks, methodologies and policies exist.

This includes assessments of specific sectors, like food and energy, on different actors, like women and youth, and at different levels, such as community, regional, or national levels. National and regional actors can, and are encouraged to, rely on this work when developing climate security assessments.

The different analytical lenses of this Assessment Guide, including climate, security, context, and resilience/vulnerability, means that users can embed research already completely and focus new research on elements that may be missing.

For example, users may already have an assessment on the degree of sea-level rise in an urban zone and who is likely to be affected. However, the research may lack context, vulnerability, and resilience factors that overlap with those risks that could contribute to social issues or instability. Similarly, social inclusion or gender analysis may map who faces structural

vulnerabilities and why, but the mapping could miss viewing those same dynamics through a conflict or climate lens.

Also, a conflict analysis around resource management may have already been undertaken, but lacks complementary climate data on how that risk might evolve into the future. All these examples are meant to showcase the adaptability of this approach, which allows users to deploy analyses that may have been missed former analyses and assessments.

By adding different perspectives and layers of analysis as needed to already existing work, users can enhance and adapt a wide range of assessments with less upfront capacity costs. Doing so will advance understanding around climate insecurity quicker and more efficiently, which will only be to the benefit of those these assessments seek to support.

The Assessment Guide is therefore not intended to duplicate work that has already been done, but rather provide a guide to bring these various elements together in order to showcase how they interact and overlap to address insecurity.



© KKKvintage (Shutterstock)

#### 4.1.4 Identification of Responses

The final aspect of the Assessment Guide methodology focuses on identifying context-specific response measures and actions to address the identified climate-related security risks. Responses should build resilience against both climate and security risks and include a special focus on ‘no regret options’ in the face of uncertainty and shifting probabilities of climate-related hazards and future socio-political developments.

Evidence from existing projects and programs shows that there are considerable mutual benefits when integrating climate considerations with approaches from gender and social inclusion, peacebuilding, in particular with focus on conflict management, and social cohesion and trust building, or when integrating these approaches with climate action<sup>21</sup>.

There is not a universal set of activities that can simultaneously provide climate change adaptation, peacebuilding, and development benefits. Interventions and strategies that are most appropriate to tackle the climate-related security risks are context specific. However, evidence from existing programming and research points to some general entry points for integrated peacebuilding and climate resilience measures:

- Target vulnerable communities and make sure no one is left behind.
- Improve knowledge, capacities, and communication.
- Better incorporate climate security and its operationalisation across policies and planning.
- Avoid maladaptation and mal-mitigation through climate- and conflict-sensitive approaches.
- Promote and work with local knowledge and approaches to build and shore up resilience.
- Target insecurity pathways determined to be most insecure, for example land, food, and water.

<sup>21</sup> See [https://climate-security-expert-network.org/sites/climate-security-expert-network.org/files/documents/linking\\_adaptation\\_and\\_peacebuilding\\_lessons\\_learned\\_and\\_the\\_way\\_forward\\_0.pdf](https://climate-security-expert-network.org/sites/climate-security-expert-network.org/files/documents/linking_adaptation_and_peacebuilding_lessons_learned_and_the_way_forward_0.pdf)





© UNDP

In addition to these elements, there are also some cross-cutting elements that are important to consider when designing and implementing climate security risk assessments in order to address climate-related security risks:

- Carefully identify relevant stakeholders for consultation, being mindful of power relations and gender considerations.
- Ensure vulnerable groups and marginalised voices are prioritised in assessments and that these groups and voices complement a well-rounded cohort of stakeholders.
- Ensure your assessments takes human and institutional capacities into account so as not to overwhelm institutions or individuals.
- Ensure extensive consultation with community groups before undertaking especially sensitive assessments.
- Consider that interlocutors and actors may put themselves at risk by sharing information that is politically sensitive for the sake of aiding the analysis of the climate security assessment. Ensure confidentiality where relevant and take measures to conduct information sharing in secure environments.

## 4.2 Guiding Questions for Research

The guiding questions below are based on, and informed by, the climate security risk assessments on Tuvalu, RMI, Kiribati, and the region and include consultations with experts. They are based on the methodology of the Weathering Risk Initiative<sup>22</sup> and incorporate insights from the Shoring up Stability<sup>23</sup> methodology, UN Climate Security Mechanism's Toolbox, the assessments carried out by the Climate Security Expert Network<sup>24</sup>, United Nations Environmental Program's (UNEP) climate and security project and their Joint Program on Women, Natural Resources and Peace<sup>25</sup>.

Please note that overlapping questions indicate links and interactions between the different parts of the Assessment Guide and are not intended to duplicate certain parts of the analysis. The order of the questions does not imply an order for the analysis. This is particularly true for the cross-cutting questions that play a role across all elements.

The general approach preferred is one of storytelling, allowing respondents to share their truths and experiences without limitations. The following questions are meant as a repository to guide conversations and literature review, as well as shape coding and analysis.

<sup>22</sup> <http://www.weatheringrisk.org/>

<sup>23</sup> <https://shoring-up-stability.org/>

<sup>24</sup> <https://climate-security-expert-network.org>

<sup>25</sup> <https://www.unep.org/explore-topics/disasters-conflicts/what-we-do/environment-security/women-natural-resources-and>

### **Climate Change Lens: What are the most important climate impacts (on human security)?**

- What sudden-onset changes, such as storms and floods, are affecting the population/community/country?
- What are the slower, longer-term effects of climate change (e.g. slow onset changes such as temperature increase, ocean acidification, land degradation or sea-level rise)?
- What are predicted future climate impacts?
- Are there specific regions, groups, communities, economic assets, infrastructural assets, or cultural assets that are particularly exposed to climatic pressures and shocks? For example:
  - Rural vs. urban spaces
  - Key economic sectors, such as agriculture, fisheries, and/or tourism
  - Biodiversity and ecosystem services
  - Different genders or groups, including age, ethnicity, and/or religion
  - Social Infrastructure, such as education, health, and government administration buildings
  - Critical infrastructure, such as energy plants/systems, water systems, transportation, digital and communication, climate-related mitigation/adaptation systems (flood defences, etc).
  - Cultural heritage or religious sites

### **Peace and Security Lens: What are the most important security risks?**

- What are current and past dynamics of insecurity? This may include:
  - Instances of violent conflict and political instability, such as protests
  - Challenges surrounding crime
  - Scale and extent of violence against women
- What is the state of social cohesion and relationships?
  - Increasing social problems?
  - Tensions within families and/or between different groups?
- What are the main drivers and root causes of instability and insecurity? For example:
  - Land tenure and management
  - Resource constraints
  - Unfair aid and relief distribution
  - Lack of livelihoods and/or opportunities
  - Intercommunal grievances
- Who are the main actors of instability and conflict?
- How are different groups, including gender, age, ethnicity, and religion, affected by insecurity, violence and conflict?

### **Climate-related security risks and possible pathways: How do climate stressors and security risks interact to undermine human security?**

#### **► Challenges to the blue economy and livelihoods**

- How do climate change and environmental degradation impact key economic sectors, especially sectors related to the 'blue economy'? In particular:
  - Fisheries
  - Agriculture
  - Tourism
  - Industry
  - Mining
  - Forestry



- Which groups, including geography, gender, age, ethnicity, and religion, are experiencing livelihood insecurity and how?
- How are different livelihood practices contributing to environmental degradation and/or conflict (e.g. harvesting coral reefs or blast fishing)?
- What are vulnerable groups doing to adapt to livelihood insecurity? What opportunities and challenges are linked to these alternative livelihood strategies?
- How do livelihood pressures affect social relations within, and between, families and communities?
  - Are social norms of cooperation and social cohesion affected?
  - Is crime increasing?
- What alternative sources of income are being considered by the government to compensate for economic losses? What kind of opportunities, but also environmental and social risks, are linked to these alternative sources of income?
- How are declining public revenues affecting the government's ability to deliver essential services?
  - Are disaster risk management capacities affected?
  - Is equitable development affected?
  - Are state and society relations affected?
- How does climate change impact a country's energy supply? What are the related consequences for society?

#### ► **Challenges to land, food and water**

- How does climate change affect the availability of, and access to, natural resources, including arable land, fresh water, and ocean resources?
- How does the availability of, and access to, natural resources vary between different societal groups based on geography, gender, age, ethnicity, and religion?
- Are there already tensions and conflicts over access and availability of natural resources? If yes, what are the main dynamics and who are the actors involved?
- How have disputes over access, use, and/or control of natural resources, like arable land, fresh water, and ocean resources, contributed to triggering or perpetuating social tensions, conflicts and/or violence?
- If disputes around natural resources arise, how are they managed? Are they often resolved? If so, how? Who participates in these processes? Is dispute resolution inclusive?
- What are the main challenges in land/water management? How do customary and modern systems overlap? What are the opportunities and challenges around this overlap?
- How does climate change affect food production and water supply and how does this affect social relations?
- How important are food imports? What are the economic, social, and political consequences of reliance food imports, including health, price spikes, and/or food shortages?
- What health consequences stem from climate change (e.g. waterborne diseases, heat related mortality, disease related to changing eating habits)? Who is affected most and why?

#### ► **Exposure to natural disasters and implications for governments and communities**

- How are different economic sectors and infrastructure affected by extreme weather events?
  - For governments, how does that affect government revenue? How does that affect government response capacity?
  - For individuals, what are implications to livelihoods? Does it overlap with other challenges, such as food and water insecurity? What, if any, social pressures and challenges are born from this insecurity?



- How are different societal groups, including geography, gender, age, ethnicity, and religion, affected by extreme weather events? Are the needs of different groups considered in disaster risk responses of the government and international partners?
- How effective is the governments disaster response capacity?
  - What, if any, constraints exist around human capacity? Technical capacity? Financial capacity?
  - How does the public receive this response and planning? Is it considered fair? What sort of criticisms exist? What is praised?
- To what degree are marginalised groups involved in disaster risk management and planning? Do certain population groups or regions feel excluded from disaster response and/or preparedness strategies?
- What are the main security challenges during and immediately after disasters?
  - Who is most insecure? Is it localised in any specific space?
  - Are crime, abuse and gender-based violence increasing during or after disasters?
  - What processes or policies has the government implemented to respond to increases in insecurity?
- Are there incidences of maladaptation or unintended effects from adaptation?
- Do climate change mitigation/adaptation/livelihood projects account for insecurity and/or conflict dynamics? Are they implemented in a conflict-sensitive way? Do they take human rights risks into account? Do they have environmental and social safeguards?
- If displacement occurs, where do people go? Why do they select those locations? What are the benefits and associated costs? Are there any particular security concerns associated with the process? Are any particular groups especially susceptible to displacement? If so, why? What sort of formal and informal protections exist for displaced persons?
- Does government have any plans or processes in place to manage displacement before it occurs? After? What challenges do they face in supporting displaced persons, especially around land access?

► ***Implication of, and for, mobility***

- How are the impacts of climate change affecting the movement of people? What sorts of opportunities or challenges exist? Specifically, what are the impacts on:
  - Internal migration and, in particular, migration from rural communities to urbanised areas (circular, seasonal, and permanent)
  - International migration
  - Displacement
  - Planned relocations
  - Those who cannot, or chose not, to move
- Is climate change intensifying internal migration, in particular migration to urban areas?
  - If so, how does this increased mobility affect living conditions in urban and rural areas?
  - How is migration affecting competition over land, services, and livelihood opportunities?
  - How are the relationships between migrants and their own families or with other groups? Are there tensions or social problems?
- Do people have opportunities for international migration? Who? What opportunities and challenges are migrant communities facing in host countries? This can include:
  - Livelihoods
  - Public service access
  - Social inclusion
  - Personal and cultural identity

- Are remittances sent by migrants?
  - What role do remittances play for home families and communities?
  - For those families who do not receive remittances directly, do they benefit from remittances at the community level?
  - How do remittances influence social relations in home communities?
- How does migration impact human capital and productivity and resilience in areas of origin? What about in receiving communities?
- What are the costs and social impacts of displacement?
- Is planned relocation considered?
  - How effective is the process?
  - Have there been positive or negative experiences?
- Are any groups unable, or chose not, to migrate? If so, why?
  - What are the consequences?
  - Have strategies been put in place that capture otherwise trapped populations? If so, which ones? Are they effective?
- How is migration perceived among communities? What are perceived negative and positive connotations associated with migration?
- What are the impacts of migration on identity, cultural norms, and/or mental health?

► **Threats to countries habitability challenging regional and international cooperation**

- How will climate change impact the region's political economy? In particular impacts on:
  - Fish migration patterns
  - EEZs
  - Government efforts to find alternative income streams, such as through expanded mining
  - Regional cooperation
- Do changing geophysical features, like rising sea levels, affect governance?
- What would be the best options for dealing with land insecurity resulting from climate impacts?
- What role do external actors play and how is climate change impacting geopolitical tensions in the region? Are countries or communities affected by increased geopolitical pressure? If so, how?
- What fault lines, if any, threaten to undermine regional cooperation or cohesion? How are regional actors bolstering cooperation and cohesion against joint risks?

**Context factors shaping vulnerability and resilience: What are other important factors and trends that are affecting vulnerability and resilience to climate and security risks?**

- What are existing community adaptation and resilience approaches that could be used to address challenges posed by climate change and the resulting insecurity?
- What traditional knowledge approaches are particularly useful to address challenges related to, for example, climate change, health, economy, and social cohesion could, or should, be upscaled?
- Broadly, which groups are marginalised and excluded (e.g. economically, socially and politically)? Why?
- How are different genders affected by insecurity and climate change? Why?
- How are differently abled people affected by insecurity and climate change? Why?
- How are people of different ages affected by insecurity and climate change? Why?



© UNDP

- What access do different genders/groups have to:
  - productive assets (financial, technological, etc.)?
  - education?
  - health services?
  - political processes/decision making?
  - justice and the legal system?
- What is the state of relationships between different groups, communities and actors?
- What is the state of social capital and cohesion?
- What attempts, if any, have been made to prevent or resolve disputes? What mechanisms have been used? Who has been involved and who has been excluded?
- Which role do different actors and genders play in conflict prevention, peacebuilding, and climate change adaptation?
- What are points of cooperation exist between different conflicting actors?
- How is the government able to fulfil its main functions in:
  - providing public safety and security?
  - providing basic services?
  - making legitimate political decisions?
- How is the legitimacy of the government perceived by different actors and groups? What is the state of trust in the government?
- How is the government responding to challenges and crisis? What is the impact of their response?
- Is there sufficient capacity at the local, national, and/or regional levels to cope with the impacts of climate change and insecurity? For example:
  - Do local or national governments possess the capacity and legitimacy to act decisively?
  - Do national climate change adaptation policies and plans include climate-related security risks?
  - Are decision-making mechanisms inclusive? How strong is civil society?



# References

- Adeoti, T.; C. Fantini; G. Morgan; S. Thacker and P. Ceppi 2020: Infrastructure for Small Island Developing States. The role of infrastructure in enabling sustainable, resilient and inclusive development in SIDS. Copenhagen, Denmark: UNOPS.
- Ahluwalia, P. and T. Miller 2021: Aid, dependence, climate—a pacific dilemma. In: *Social Identities* 27:1, pp 1–2.
- Albert, S.; J. X. Leon; A. R. Grinham; J. A. Church; R. B. Gibbes and C. D. Woodroffe 2016: Interactions between sea-level rise and wave exposure on reef island dynamics in the Solomon Islands. In: *Environmental Research Letters* 11:5, p 54011.
- Alefaio, S. 2020: Mobilizing the Pacific Diaspora: A key component of disaster resilience. Honolulu: East-West Center.
- Amin, S. N.; D. Watson und C. Girard (eds.) 2020: Mapping security in the Pacific. Abingdon, Oxon: Routledge.
- Andrew, N. L.; P. Bright; L. de La Rua; S. J. Teoh and M. Vickers 2019: Coastal proximity of populations in 22 Pacific Island Countries and Territories. In: *PLoS one* 14:9, e0223249.
- Anggadi, F. 2022: Establishment, notification, and maintenance: The package of state practice at the heart of the Pacific Islands Forum Declaration on Preserving Maritime Zones. In: *Ocean Development & International Law* 53:1, pp 19–36.
- Asch, R. G.; W.W.L. Cheung and G. Reygondeau 2018: Future marine ecosystem drivers, biodiversity, and fisheries maximum catch potential in Pacific Island countries and territories under climate change. In: *Marine Policy* 88, pp 285–294.
- Asian Development Bank 2009: Building Climate Resilience in the Agriculture Sector of Asia and the Pacific. Mandaluyong City, Philippines:
- Asian Development Bank 2012: The State of Pacific Towns and Cities. Urbanization in ADB’s Pacific developing member countries. Mandaluyong City, Philippines: Asian Development Bank.
- Asian Development Bank 2013: Disaster Risk Reduction and Management in the Pacific: Asian Development Bank.
- Asian Development Bank 2016: The Emergence of Pacific Urban Villages: Urbanization trends in the Pacific islands (Pacific Studies Series, Mandaluyong City, Philippines: Asian Development Bank.
- Asian Development Bank 2019: Pacific finance sector briefs. Marshall Islands: Asian Development Bank.
- Asian Development Bank 2020: Preparing the Funafuti water and sanitation project: Project readiness financing report. Project Number: 53417-001: Asian Development Bank.
- Asian Development Bank 2021: Climate Change, Water Security, and Women. A Study on Water Boiling in South Tarawa, Kiribati. Manila: Asian Development Bank (ADB).
- Asian Development Bank 2022a: Asian Development Outlook 2022.
- Asian Development Bank 2022b: Sea level change in the Pacific Islands Region. A Review of Evidence to Inform Asian Development Bank Guidance on Selecting Sea-Level Projections for Climate Risk and Adaptation Assessments. Manila: Asian Development Bank.
- Australian Agency for International Development 2008: Making Land Work. Volume One: Reconciling customary land and development in the Pacific. Canberra, Australia: Australian Agency for International Development.
- Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation 2011: Climate change in the Pacific: Scientific assessment and new research. Australia: Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation.
- Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation 2014: Climate variability, extremes and change in the Western Tropical Pacific: New science and updated country reports. Pacific-Australia Climate Change Science and Adaptation Planning Program. Melbourne, Australia: Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation.

- Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation 2021: NextGen' Projections for the Western Tropical Pacific: Current and Future Climate for the Republic of Marshall Islands. Final report to the Australia-Pacific Climate Partnership for the Next Generation Climate Projections for the Western Tropical Pacific project. Melbourne, Australia:
- Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation: Solomon Islands: Climate Change in the Pacific: Scientific Assessment and New Research.
- Australian Bureau of Meteorology: Monthly sea levels for KIRIBATI. Retrieved 02 Sep 2022, from <http://www.bom.gov.au/ntc/IDO70060/IDO70060SLD.shtml>.
- B.Flis 2012: Correlations among yield, taste, tuber characteristics and mineral contents of potato cultivars grown at different growing conditions. In: *The Journal of Agricultural Science* 4, p 197.
- Baarsch, F. and L. M. Berg 2015: The significance of contextual vulnerability in effective adaptation to climate change on Tuvalu. In: Leal Filho, W. (ed.): *Climate change in the Asia-Pacific region*. Cham: Springer.
- Baleinakorodawa, Paulo 2021: China, Kiribati, Fiji, and a Village on Vanua Levu: A Textbook Example of the Multi-Scalar Effects of Climate Change. Retrieved from <https://toda.org/global-outlook/china-kiribati-fiji-and-a-village-on-vanua-levu-a-textbook-example-of-the-multi-scalar-effects-of-climate-change.html>.
- Balesh, R. 2015: Submerging Islands: Tuvalu and Kiribati as case studies illustrating the need for a climate refugee treaty.
- Barclay, Kate 2010: Impacts of tuna industries on coastal communities in Pacific Island countries. In: *Marine Policy* 34:3, pp 406–413.
- Barnett, J. 2019: Climate Change and Food Security in the Pacific Islands. In: *Food Security in Small Island States*, pp 25–38.
- Barnett, J. and W. N. Adger 2003: Climate Dangers and Atoll Countries. In: *Climatic Change* 61:3, pp 321–337.
- Beck, J. 2020: Logging is ripping apart the Solomon Islands. One man is fighting back. In: *National Geographic*, 03 Jan 2020.
- Beck, M. W.; I. J. Losada; P. Menéndez; B. G. Reguero; P. Díaz-Simal and F. Fernández 2018: The global flood protection savings provided by coral reefs. In: *Nature Communications* 9:1, p 2186.
- Becken, S. 2004: *Climate change and tourism in Fiji. Vulnerability, Adaptation and Mitigation*. Suva, Fiji: The University of the South Pacific.
- Bell, J. D.; M. Kronen; A. Vunisea; W. J. Nash; G. Keeble; A. Demmke; S. Pontifex and S. Andréfouët 2009: Planning the use of fish for food security in the Pacific. In: *Marine Policy* 33:1, pp 64–76.
- Bell, J. D.; I. Senina; T. Adams; O. Aumont; B. Calmettes; S. Clark; M. Dessert; M. Gehlen; T. Gorgues; J. Hampton; Q. Hanich; H. Harden-Davies; S. R. Hare; G. Holmes; P. Lehodey; M. Lengaigne; W. Mansfield; C. Menkes; Simon Nicol; Yoshitaka Ota; Coral Pasisi; Graham Pilling; Chis Reid; Espen Ronneberg; Alex Sen Gupta; Katherine L. Seto; Neville Smith; Sue Taei; Martin Tsamenyi and Peter Williams 2021: Pathways to sustaining tuna-dependent Pacific Island economies during climate change. In: *Nature Sustainability* 4:10, pp 900–910.
- Bell, J. D.; M. Taylor; M. Amos and N. Andrew 2016: *Climate Change and Pacific Island Food Systems. The future of food, farming and fishing in the Pacific Islands under a changing climate*. Copenhagen, Denmark and Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security, and Technical Centre for Agricultural and Rural Cooperation.
- Bell, L.; C. van Gemert; O. E. Merilles; H. L. Cash; M. Stoové and M. Hellard 2022: The impact of COVID-19 on public health systems in the Pacific Island Countries and Territories. In: *The Lancet Regional Health – Western Pacific* 25, p 100498.
- Bellard, C.; C. Leclerc and F. Courchamp 2013: Potential impact of sea level rise on French islands worldwide. In: *Pensoft Publishers* 5, pp 75–86.
- Bennett, N. J. 2020: *Blue growth and blue justice*. White Paper.
- Bernard, L.; M. Petterson; C. Schofield and S. Kaye 2021: Securing the Limits of Large Ocean States in the Pacific: Defining Baselines Limits and Boundaries amidst Changing Coastlines and Sea Level Rise. In: *Geosciences* 11:9, p 394.
- Bhandari, N. 2020: *How Some Pacific Women are Responding to Climate Change and Natural Disasters: Reliefweb*.
- Birch-Thomsen, T.; A. Reenberg; O. Mertz and B. Fog 2010: Continuity and change: Spatiotemporal land use dynamics on Bellona Island, Solomon Islands. In: *Singapore Journal of Tropical Geography* 31:1, pp 27–40.

- Birkeland, C.; P. Craig; D. Fenner; L. Smith; W. E. Kiene and B. M. Riegl 2008: Geologic setting and ecological functioning of coral reefs in American Samoa. In: *Coral Reefs of the World 1*, pp 741–765.
- Bourke, R. M. 2006: Solomon Islands Smallholder Agriculture Study. Main findings and recommendations. Canberra, Australia: AusAID.
- Bower, E. and Weerasinghe, S. 2021: Planned Relocation in the Pacific. A Regional Snapshot: Platform on Disaster Displacement.
- Boydell, S. and H. Holzknacht 2003: Land—caught in the conflict between custom and commercialism. In: *Land Use Policy* 20:3, pp 203–207.
- Brady, A. M. 2022: How China is using humanitarian aid to gain a military foothold in the Pacific. In: *The Sydney Morning Herald*, 14 Feb 2022.
- Breuning-Madsen, H.; T. B. Bruun and B. Elberling 2010: An indigenous soil classification system for Bellona Island - a raised atoll in Solomon Islands. In: *Singapore Journal of Tropical Geography* 31:1, pp 85–99.
- Brück, T. and M. d’Errico 2019: Food security and violent conflict: Introduction to the special issue. In: *World Development* 117, pp 167–171.
- Burkett, M. 2011: In Search of Refuge: Pacific Islands, Climate-Induced Migration, and the Legal Frontier. In: *Asia Pacific Issues*.
- Byrant-Tokalau, J. 2011: Artificial and Recycled Islands in the Pacific: Myths and Methodology of “Plastic Fantastic”. In: *The Journal of the Polynesian Society* 120:1, pp 71–86.
- Cabezón, E.; L. Hunter; P. Tumbarello; K. Washimi and Y. Wu 2015: Enhancing Macroeconomic Resilience to natural disasters and climate change in the Small States of the Pacific. Washington, D.C: International Monetary Fund.
- Cambell, J. R. and O. Warrick 2014: Climate change and migration issues in the Pacific. Suva, Fiji: Economic and Social Commission for Asia and the Pacific; International Labour Organization.
- Campbell, J. R. 2008: International Relocation from Pacific Island Countries: Adaptation Failure? Bonn, Germany: Environment, Forced Migration & Social Vulnerability International Conference.
- Campbell, J. R. 2019: Climate Change and Urbanisation in Pacific Island Countries: Toda Peace Institute.
- Campbell, J. R.; R. Oakes and A. Milan 2016: Nauru: Climate change and migration – Relationships between household vulnerability, human mobility and climate change. Bonn: : United Nations University Institute for Environment and Human Security (.
- Cao-Lormeau, V. and D. Musso 2014: Emerging arboviruses in the Pacific. In: *The Lancet* 384:9954, pp 1571–1572.
- Cardno 2016: An Assessment of the Costs and Benefits of Mining Deep-sea Minerals in the Pacific Island Region. Deep-sea Mining Cost-Benefit Analysis. Suva, Fiji: Secretariat for the Pacific Community.
- Castellanos, E. M.; L. Lemos; N. Astigarraga; N. Chacón; C. Cuví; L. Huggel; M. Miranda; J. P. Moncassim Vale; P. L. Ometto; J. C. Peri; L. Postigo; L. Ramajo and M. Rusticucci: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.
- Cauchi, J. P.; I. Correa-Velez and H. Bambrick 2019: Climate change, food security and health in Kiribati: a narrative review of the literature. In: *Global health action* 12:1, p 1603683.
- Cauchi, J. P.; S. Moncada; H. Bambrick and I. Correa-Velez 2020: Coping with environmental hazards and shocks in Kiribati: Experiences of climate change by atoll communities in the Equatorial Pacific. In: *Environmental Development* 37, p 100549.
- Chand, S. and C. Yala 2012: Institutions for improving access to land for settler-housing: Evidence from Papua New Guinea. In: *Land Use Policy* 29:1, pp 143–153.
- Chang, Y.; J. Hsu; P-K. Lai; K-W. Lan and W-P. Tsai 2021: Evaluation of the Impacts of Climate Change on Albacore Distribution in the South Pacific Ocean by Using Ensemble Forecast. In: *Frontiers in Marine Science* 8.
- Collins, J. 2022: Bang for buck: Getting the most out of Pacific Islander remittances. Retrieved 15 Sep 2022, from <https://www.lowyinstitute.org/the-interpreter/bang-buck-getting-most-out-pacific-islander-remittances>.
- Connell, J. and R. P. Brown 2005: Remittances in the Pacific. An Overview (Pacific Studies Series, Philippines: Asian Development Bank.
- Constable, A. L. 2017: Climate change and migration in the Pacific: options for Tuvalu and the Marshall Islands. In: *Regional Environmental Change* 17:4, pp 1029–1038.
- Corcoran J. 2016: Implications of climate change for the livelihoods of urban dwellers in kiribati. Hamilton, New Zealand.



- Corrin, J. n.d.: Resolving land disputes in Samoa. In: *Dispute Resolution* 2, p 199.
- Curry, G. N.; G. Koczberski und J. Connell (eds.) 2016: *Migration, land and livelihoods*. London: Routledge.
- Curtain, R. and M. Dornan 2019: *A pressure release valve? Migration and climate change in Kiribati, Nauru and Tuvalu*. The Australian National University: Development Policy Centre.
- Deenik, J. L. and R. Yosts 2005: *Chemical properties of atoll soils in the Marshall Islands and constraints to crop production*.
- Deo, A.; S. S. Chand; R. D. McIntosh; B. Prakash; N. J. Holbrook; A. Magee; A. Haruhiru and P. Malsale 2022: Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. In: *Climatic Change* 172:3-4, pp 1–23.
- Doan, D.; M. Dornan; K. Parsons; P. Kirstie and S. Yi 2020: *Pacific labor mobility, migration and remittances in times of COVID-19. Interim Report: The World Bank*.
- Doan, D. and K. Petrou 2022: *Labor mobility and remittances in the Pacific during COVID-19*. Retrieved from <https://blogs.worldbank.org/eastasiapacific/labor-mobility-and-remittances-pacific-during-covid-19>.
- Donald, R. 2022: Analysts point to logging and mining to explain Solomon Islands unrest. In: *Mongabay Environmental News*, 13 Jan 2022.
- Donner, S. D. and J. Carilli 2019: Resilience of Central Pacific reefs subject to frequent heat stress and human disturbance. In: *Scientific reports* 9:1, p 3484.
- Dornan, M. and J. Pryke 2017: *Foreign Aid to the Pacific: Trends and Developments in the Twenty-First Century*. In: *Asia & The Pacific Policy Studies* 4:3, pp 386–404.
- Duvat, V. K.; A. K. Magnan; R. M. Wise; J. E. Hay; I. Fazey; J. Hinkel; T. Stojanovic; H. Yamano and V. Ballu 2017: Trajectories of exposure and vulnerability of small islands to climate change. In: *WIREs Climate Change* 8:6.
- Duvat, V. K. and V. Pillet 2017: *Shoreline changes in reef islands of the Central Pacific: Takapoto Atoll, Northern Tuamotu, French Polynesia*. In: *Geomorphology*: 282, pp 96–118.
- Economic and Social Commission for Asia and the Pacific 2020: *The Disaster Riskscape across the Pacific Small Island Developing States. Key Takeaways for Stakeholders: United Nations, Economic and Social Commission for Asia and the Pacific*.
- Economic and Social Commission for Asia and the Pacific 2022: *Asia-Pacific Disaster Report 2022 for ESCAP Subregions. Summary for Policymakers*. Bangkok: Economic and Social Commission for Asia and the Pacific.
- Edwards, J. B. 2014: Phosphate mining and the relocation of the Banabans to northern Fiji in 1945: Lessons for climate change-forced displacement. In: *Journal de la société des océanistes*:138-139, Pp. 121–136.
- Ellison, J. C. 2018: *Effects of climate change on mangroves relevant to the Pacific Islands: Commonwealth Marine Economies Programme*.
- Emma Fulu; Maere Tekanene; Eretia Monite and Lilian Sauni 2010: *Kiribati Family Health and Support Study. A Study on Violence Against Women and Children*. Tawara, Kiribati: Secretariat of the Pacific Community for Ministry of Internal and Social Affairs.
- European Commission 2019: *European Civil Protection and Humanitarian Aid Operations*.
- Fabricius, K. E. 2005: Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis. In: *Marine pollution bulletin* 50:2, pp 125–146.
- Falkland, T. 2011: *Water security and vulnerability to climate change and other impacts in Pacific Island Countries and East Timor*. for Department of Climate Change & Energy Efficiency, n.a.: Pacific Region Infrastructure Facility.
- Farran, S. 2010: Law, land, development and narrative: a case-study from the South Pacific. In: *International Journal of Law in Context* 6:1, pp 1–21.
- Fay-Sauni, L.; S. P. Veikila Vuki and M. Rokosawa 2008: Women’s subsistence fishing supports rural households in Fiji. A case study of Nadoria, Viti Levu, Fiji. In: *SPC Women in Fisheries Information Bulletin* 18.
- Firth, S. 2018: *Instability in the Pacific Islands: A status report*. Canberra, Australia: Lowy Institute.
- Fisheires, Aquaculture and Marine Ecosystems Division 2019: *Implications of climate-driven redistribution of tuna for Pacific Island economies (SPC Policy Brief, 32)*. Noumea, New Caledonia: Secretariat of the Pacific Community.
- Fisher, B. 2011: Climate change and human security in Tuvalu. In: *Global Change, Peace & Security* 23:3, pp 293–313.
- Fitzpatrick, D. 2022: *Research Brief on Land Tenure and Climate Mobility in the Pacific*. Suva, Fiji: Pacific Islands Forum Secretariat.

- Fletcher, L. 2022: Don't saddle Pacific Islands with disaster debt. Sydney Australia: Lowy Institute.
- Fomby, T.; Y. Ikeda and N. V. Loayza 2013: The growth aftermath of natural disasters. In: *Journal of Applied Econometrics* 28:3, pp 412–434.
- Forum Fisheries Agency 2020: Economic and Development Indicators and Statistics: Tune Fisheries of the Western and Central Pacific Ocean: Forum Fisheries Agency.
- Fouad, M.; N. Novta; G. Preston; T. Schneider and S. Weerathunga 2021: Unlocking access to climate finance for Pacific Island Countries: International Monetary Fund.
- Franklin, B.; M. Hogan; Q. Langley; N. Mosdell und E. Pill (eds.) 2009: Key concepts in public relations. Los Angeles, CA, London: SAGE.
- Frazer, I. 1997: The struggle for control of Solomon Island's forests. In: *The Contemporary Pacific* 9:1, pp 39–72.
- Freestone, D. and D. Çiçek 2021: Legal dimensions of sea level rise: pacific perspectives: The World Bank.
- Frieler, K.; L. Warszawski; V. Huber; F. Piontek; O. Serdeczny and J. Schewe 2013: The Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP): Project framework. In: *Proceedings of the National Academy of Sciences* 111:9, pp 3228–3232.
- Froese, R. and J. Schilling 2019: The nexus of climate change, land use, and conflicts. In: *Current Climate Change Reports* 5:1, pp 24–35.
- Frölicher T.L.; E. M. Fischer and N. Gruber 2018: Marine heatwaves under global warming. In: *Nature* 560:7718, pp 360–364.
- Ganpat, W. G. und W.-A. P. Isaac (eds.) 2015: Impacts of climate change on food security in small island developing states. Hershey, Pennsylvania (701 E. Chocolate Avenue, Hershey, Pa., 17033, USA): IGI Global.
- Gao, X. 2018: Women's empowerment in the Marshall Islands needs improvement. In: *The Borgen Project*, 2018.
- Gebremedhin, B. and G. Schwab 1998: The Economic Importance of Crop Rotation Systems: Evidence from the Literature. In: *AEC Staff Paper*: 98-12, p 30.
- Geoscience, Energy and Maritime Division 2022: Pacific women leadership progressing in disaster risk Mmanagement.
- German Institute for Global and Area Studies 2021: "Micronexit" overshadows golden anniversary of the Pacific Islands Forum. Retrieved 30 Sep 2022, from <https://www.giga-hamburg.de/en/publications/giga-focus/micronexit-overshadows-golden-anniversary-of-the-pacific-islands-forum>.
- Gharbaoui, D. and J. Blocher 2018: Limits to adapting to climate change through relocations in Papua-New Guinea and Fiji: Limits to Climate Change Adaptation. Springer, Cham.
- Gheuens, J.; N. Nagabhatla and E. Perera 2019: Disaster-risk, water security challenges and strategies in Small Island Developing States (SIDS). In: *Water* 11:4, p 637.
- Gibson, J. and R.-L. Bailey 2021: Seasonal labor mobility in the Pacific: Past impacts, future prospects. In: *Asian Development Review* 38:1, pp 1–31.
- Gibson, K.; N. Haslam and I. Kaplan 2019: Distressing encounters in the context of climate change: Idioms of distress, determinants, and responses to distress in Tuvalu. In: *Transcultural psychiatry* 56:4, pp 667–696.
- Gillett R. and Ikatonga, T. M. 2018: Fisheries in the Pacific Islands. Regional and national information. Apia: Food and Agriculture Organisation.
- Gilman, E.; H. van Lavieren; J. Ellison and V. Jungblut 2006: Pacific island mangroves in a changing climate and rising sea. In: *UNEP Regional Seas Reports and Studies*. 179
- Gotschall, I. 2021: An overview of I-Kiribati women in fisheries (*Women in Fisheries Information Bulletin*, 33).
- Graham, N. A.; S. K. Wilson; S. Jennings; N. V. Polunin; J. P. Bijoux and J. Robinson 2006: Dynamic fragility of oceanic coral reef ecosystems. In: *Proceedings of the National Academy of Sciences of the United States of America* 103:22, pp 8425–8429.
- Graves, C. A.; A. Powell; M. Stone; F. Redfern; T. Biko and M. Devlin 2021: Marine water quality of a densely populated Pacific atoll (Tarawa, Kiribati): Cumulative pressures and resulting impacts on ecosystem and human health. In: *Marine pollution bulletin* 163, p 111951.
- Griffin, R. W. (ed.) 2013:- Oxford bibliographies. [New York]: Oxford University Press.
- Grover, V. I. (ed.) 2007: Water in the Pacific Islands: case studies from Fiji and Kiribati. Enfield N.H.: Science Publishers.
- Guan, Qing; James Raymer and Juliet Pietsch 2022: Estimating international migration flows for Pacific Island Countries: A research brief. In: *Population Research and Policy Review* 41, pp 1917–1930.

- Gulev, S.K., P.W. Thorne, J. Ahn, F.J. Dentener, C.M. Domingues, S. Gerland, D. Gong, D.S. Kaufman, H.C. Nnamchi, J. Quaas, J.A. Rivera, S. Sathyendranath, S.L. Smith, B. Trewin, K. von Schuckmann, and R.S. Vose 2021: Changing state of the climate system. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Climate Change 2021: the Physical Sciences Basis.
- Hansell, J. R. and J.R.D. Wall 1976: Land resources of the Solomon Islands. Surbiton, Eng.: Land Resources Division, Ministry of Overseas Development.
- Harm, A.: Speech during the Pacific Islands Forum Statement for 6th Committee. New York, NY, 2021.
- Harper, S.; D. Zeller; M. Hauzer; D. Pauly and U. R. Sumaila 2013: Women and fisheries: Contribution to food security and local economies.
- Hassall, G. 2005: Conflict in the Pacific: Challenges for governance. In: Pacific Economic Bulletin 20:1, pp 192–197.
- Haywood, M. D.; D. Dennis; D. P. Thomson and R. D. Pillans 2016: Mine waste disposal leads to lower coral cover, reduced species richness and a predominance of simple coral growth forms on a fringing coral reef in Papua New Guinea. In: Marine Environmental Research 115, pp 36–48.
- Heffernan, O. 2019: Seabed mining is coming - bringing mineral riches and fears of epic extinctions. In: Nature 571:7766, pp 465–468.
- Heslin, A. 2019: Climate Migration and Cultural Preservation: The case of the Marshallese Diaspora. In: Mechler, R.; Bouwer, L. M.; Schinko, T.; S. Surminski; J. Linnerooth-Bayer (ed.): Loss and Damage from Climate Change. Concepts, Methods and Policy Options. Cham: Springer.
- Hoeke, R. K.; H. Damlamian; J. Aucan and M. Wandres 2021: Severe flooding in the atoll nations of Tuvalu and Kiribati triggered by a distant tropical Cyclone Pam. In: Frontiers in Marine Science 7.
- Huffer, E. (ed.) 2008: Land and Women: The Matrilineal Factor. Suva, Fiji: Pacific Islands Forum Secretariat.
- Hughes, T. P.; A. H. Baird; D. R. Bellwood; M. Card; S. R. Connolly; C. Folke; R. Grosberg; O. Hoegh-Guldberg; J. B. Jackson; J. Kleypas; J. M. Lough; P. Marshall; M. Nyström; S. R. Palumbi; J. M. Pandolfi; B. Rosen and J. Roughgarden 2003: Climate change, human impacts, and the resilience of coral reefs. In: Science 301:5635, pp 929–933.
- Hughes, T. P.; J. T. Kerry; M. Álvarez-Noriega; J. G. Álvarez-Romero; K. D. Anderson; A. H. Baird; R. C. Babcock; M. Beger; D. R. Bellwood; R. Berkelmans; T. C. Bridge; I. R. Butler; M. Byrne; N. E. Cantin; S. Comeau; S. R. Connolly; G. S. Cumming; S. J. Dalton; G. Diaz-Pulido; C. M. Eakin; W. F. Figueira; J. P. Gilmour; H. B. Harrison; S. F. Heron; A. S. Hoey; J-P. A. Hobbs; M. O. Hoogenboom; E. V. Kennedy; C. Kuo; J. M. Lough; R. J. Lowe; G. Liu; M. T. McCulloch; H. A. Malcolm; M. J. McWilliam; J. M. Pandolfi; R. J. Pears; M. S. Pratchett; V. Schoepf; T. Simpson; W. J. Skirving; B. Sommer; G. Torda; D. R. Wachenfeld; B. L. Willis and S. K. Wilson 2017: Global warming and recurrent mass bleaching of corals. In: Nature 543:7645, pp 373–377.
- Hughes, T. P.; M. J. Rodrigues; D. R. Bellwood; D. Ceccarelli; O. Hoegh-Guldberg; L. McCook; N. Moltschaniwskyj; M. S. Pratchett; R. S. Steneck and B. Willis 2007: Phase shifts, herbivory, and the resilience of coral reefs to climate change. In: Current Biology 17:4, pp 360–365.
- Iddle, G.; D. M. Luke; D. Mitchell; P. Jones and S. Mecartney 2017: Unpacking the pacific urban agenda: Resilience challenges and opportunities. In: Sustainability 9:10, p 1878.
- Iese, V.; Anthony S.; A. Mariner; P. Malsale; T. Tofaeono; D. G.C. Kirono; V. Round; C. Heady; R. Tigona; F. Veisa; K. Posanau; F. Aiono; A. Haruhiru; A. Daphne; V. Vainikolo and N. Iona 2021: Historical and future drought impacts in the Pacific islands and atolls. In: Climatic Change 166:1-2, pp 1–24.
- Iese, V.; S. Halavatau; A. de N'Yeurt; M. Wairiu; Elisabeth Holland; Annika Dean; Filipe Veisa; Soane Patolo; Robin Havea; Sairusi Bosenaqali and Otto Navunicagi 2020: Agriculture under a changing climate. In: Climate Change and Impacts in the Pacific. pp 323–357.
- Iese, V.; J. Maeke; E. Holland; M. Wairiu and S. Naidu 2015: Farming adaptations to the impacts of climate change and extreme events in pacific island countries. In: Ganpat, W. G.; Isaac, W.-A. P. (ed.): Impacts of climate change on food security in small island developing states. Hershey, Pennsylvania (701 E. Chocolate Avenue, Hershey, Pa., 17033, USA): IGI Global.
- Immigration New Zealand 15.09.2022: Information about Pacific Access Category Resident Visa. Retrieved 15 Sep 2022, from <https://www.immigration.govt.nz/new-zealand-visas/apply-for-a-visa/about-visa/pacific-access-category-resident-visa>.
- International Organisation for Migration and International Labour Organization 2021: Powering Past the Pandemic. Bolstering Tuvalu's Socioeconomic Resilience in a COVID-19 World. Suva, Fiji: International Organization for Migration and International Labour Organization.
- Intergovernmental Panel on Climate Change 2022a: Climate change 2022. Geneva: IPCC.



- Internal Displacement Monitoring Centre 2022a: Pacific Response to Disaster Displacement. Urban Case Study: Port Vila. Geneva Suisse: Internal Displacement Monitoring Centre.
- Internal Displacement Monitoring Centre 2022b: Pacific Response to Disaster Displacement. Urban Case study: Ba Town. Geneva, Suisse: Internal Displacement Monitoring Centre.
- Internal Displacement Monitoring Centre 2022c: Sudden-Onset Hazards and the Risk of Future Displacement in the Marshall Islands. Risk Profile. Geneva, Suisse: Internal Displacement Monitoring Centre.
- International Bank for Reconstruction and Development 2021: Republic of the Marshall Islands. Country economic memorandum and public expenditure review: International Bank for Reconstruction and Development; World Bank Group.
- International Federation of Red Cross and Red Crescent Societies (IFRC) 2016: Unseen, Unheard. Gender-Based Violence in Disasters Asia-Pacific case studies. Kuala Lumpur: International Federation of Red Cross and Red Crescent Societies.
- International Federation of Red Cross and Red Crescent Societies (IFRC) 2019: Dengue fever another blow for the Pacific Islands: International Federation of Red Cross and Red Crescent Societies.
- International Federation of Red Cross and Red Crescent Societies (IFRC) 2022: DREF Final Report. Fiji/Pacific: Tropical Cyclone Yasa/Ana: International Federation of Red Cross and Red Crescent Societies.
- International Finance Corporation 2020: A New Financial Lifeline for Tongans. Retrieved from [https://www.ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/impact-stories/tonga-remittances-2020](https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/tonga-remittances-2020).
- International Labour Organisation 2017: Commitments made to reduce high youth unemployment in Marshall Islands.
- International Organisation for Migration 2020a: Pacific Regional Policy Dialogue on Climate Mobility. Background Paper. Suva, Fiji: International Organisation for Migration.
- International Organisation for Migration (ed.) 2020b: Summary Report.
- International Renewable Energy Agency 2021: Energy Profile Kiribati: International Renewable Energy Agency.
- International Renewable Energy Agency; Secretariat for the Pacific Community and Pacific Power Association 2017: Kiribati Integrated Energy Roadmap: 2017–2025: International Renewable Energy Agency; Secretariat for the Pacific Community; Pacific Power Association.
- International Women's Development Agency 2021: This gender-based violence service in the Solomon Islands is ensuring rural women are not left behind.
- Jacobs Engineering Group n. d.: Temaiku land and urban development. Retrieved 16 Jun 2022, from <https://www.jacobs.com/projects/kiribati>.
- Japan Water Research Center 2019: South Tarawa Water Supply Project, Kiribati: Japan Water Research Center.
- Jaschik, K. 2014: Small states and international politics: climate change, the Maldives and Tuvalu. In: *International Politics* 51:2, pp 272–293.
- Jetfiil-Kijiner, K. and H. Heine 2020: Displacement and out-migration. The Marshall Islands Experience: Wilson Center.
- Jones, P. 2012: Figure 3: Percentage Share of Rural and Urban Population in Melanesia, Micronesia, and Polynesia: The State of Pacific Towns and Cities. Urbanization in ADB's Pacific developing member countries. Mandaluyong City, Philippines:
- Jones, P. and J. P. Lea 2007: What has happened to urban reform in the Island Pacific? Some Lessons from Kiribati and Samoa. In: *Pacific Affairs* 80:3, pp 473–491.
- Joshua, T. H. 2021: The Impact of COVID-19 on Pacific Islander Communities. Washington, D.C: Office of Insular Affairs.
- Kabutaulaka, T. 2021: Pacific Way(s) and regionalism. Retrieved 30 Jun 2022, from <https://devpolicy.org/pacific-ways-and-regionalism-20210325-2/>.
- Kapoor, A. 2021: Climate change impacts on health and livelihoods: Fiji assessment. Kuala Lumpur: IFRC.
- Kench, P. S.; M. R. Ford and S. D. Owen 2018: Patterns of island change and persistence offer alternate adaptation pathways for atoll nations. In: *Nature communications* 9:1, p 605.
- Kessaram, T.; J. McKenzie; N. Girin; A. Roth; P. Vivili; G. Williams and D. Hoy 2016: Alcohol use in the Pacific region: Results from the STEPwise approach to surveillance, Global School-Based Student Health Survey and Youth Risk Behavior Surveillance System. In: *Drug and alcohol review* 35:4, pp 412–423.
- Kidd, A. 2016: Building market resilience to climate change. Suva, Fiji: UN Women.

- Kim, P. 2022: Does the China-Solomon Islands security pact potend a more interventionist Beijing? In: Brookings, 2022.
- Kim, P. M. 2022: Order from Chaos.
- Kinrade, P.; N. Arold; P. Pickering; E. Rooke and J. Manfredo 2014: Pacific Adaptation Scenarios (Costs and Benefits): Water security in Tuvalu. Summary Report. Canberra, Australia: Pacific-Australia Climate Change Science Adaptation Planning (PACCSAP), Department of Environment, Australia.
- Kirch, P. V. 1996: Late Holocene human-induced modifications to a central Polynesian island ecosystem. In: Proceedings of the National Academy of Sciences of the United States of America 93:11, pp 5296–5300.
- Kiribati Meteorology Service and the Pacific-Australia Climate Change Science and Adaptation Planning Project 2015: Current and future climate of Kiribati. Retrieved 01 Sep 2022, from [https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/11\\_PACCSAP-Kiribati-11pp\\_WEB.pdf](https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/11_PACCSAP-Kiribati-11pp_WEB.pdf).
- Kitara, T. 2019: Climate change and Tuvalu's sovereignty. Retrieved from <https://search.informit.org/doi/pdf/10.3316/informit.814192016449232>.
- Klepp, S. and H. Fünfgeld 2021: Tackling knowledge and power: an environmental justice perspective on climate change adaptation in Kiribati. In: Climate and Development, pp 1–13.
- Köllner, P. 2022: Australia and New Zealand's Pacific policy: aligned, not alike. In: Political Science, pp 1–22.
- Kulp, S. A. and B. H. Strauss 2019: New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. In: Nature Communications 10:1, p 4844.
- Kumar, L. 2020: Climate Change and Impacts in the Pacific. Springer International Publishing.
- Kumar, L. and S. Taylor 2015: Exposure of coastal built assets in the South Pacific to climate risks. In: Nature Climate Change 5:11, pp 992–996.
- Kupferberg, J. S. 2021: Migration and dignity – relocation and adaptation in the face of climate change displacement in the Pacific – a human rights perspective. In: The International Journal of Human Rights 25:10, pp 1793–1818.
- Kuruppu, N. 2016: Turning the Tide on Urbanisation Policy in the Pacific Islands. Retrieved 06 Nov 2022, from <https://unu.edu/publications/articles/urbanisation-in-pacific-islands.html>.
- Larmour, P. 2013: The governance of common property in the Pacific Region. Canberra, Australia: ANU E Press.
- Leal Filho, W. (ed.) 2015: Climate change in the Asia-Pacific region. Cham: Springer.
- Lederer, E. M. 2013: Islands want UN to see climate as security threat. Retrieved 28 Sep 2022, from <https://cambioclimatico-regatta.org/index.php/es/ultimas-noticias/item/islands-want-un-to-see-climate-as-security-threat>.
- Lee, D.; H. Zhang and C. Nguyen 2018: The economic impact of natural disasters in Pacific Island Countries: adaptation and preparedness: International Monetary Fund.
- Leenders, N.; P. Holland and P. Taylor 2017: Post disaster needs assessment of the 2015-2016 Drought: Republic of the Marshall Islands.
- Lei, Y. and S. Sui 2022: China-Pacific Island Countries strategic partnership: China's strategy to reshape the regional order. In: East Asia 39:1, pp 81–96.
- Li, L.; A. D. Switzer; Y. Wang; C. Chan; Q. Qiu and R. Weiss 2018: A modest 0.5-m rise in sea level will double the tsunami hazard in Macau. In: Science advances 4:8, 1180.
- Loayza, N. V.; E. Olaberría; J. Rigolini and L. Christiaensen 2012: Natural disasters and growth: Going beyond the averages. In: World Development 40:7, pp 1317–1336.
- Loco, A.; P. Sinclair; A. Singh; A. Chand and M. Mataio 2015: Kiriwatsan. Groundwater and rainwater monitoring guidelines for the outer islands of Kiribati: Secretariat of the Pacific Community.
- Lowy Institute 2021: Pacific Aid Map: Australian Aid.
- Lyn, D. 2022: Hate crimes against Asian American and Pacific Islanders on rise in US. Retrieved from <https://www.aa.com.tr/en/americas/hate-crimes-against-asian-american-and-pacific-islanders-on-rise-in-us/2604755>.
- Mallin, M. F. 2018: From sea-level rise to seabed grabbing: The political economy of climate change in Kiribati. In: Marine Policy 97, pp 244–252.
- Månberger, A. and B. Stenqvist 2018: Global metal flows in the renewable energy transition: Exploring the effects of substitutes, technological mix and development. In: Energy Policy 119, pp 226–241.
- Mangubhai, S. and S. Lawless 2021: Exploring gender inclusion in small-scale fisheries management and development in Melanesia. In: Marine Policy 123, pp 1–11.
- Marshall Islands Red Cross Society 2017: Marshall Islands Red Cross Society: Strategic Plan 2017-2022.

- Martinez B. and R. Kukutschka 2021: Global Corruption Barometer Pacific 2021. Citizens' Views and Experiences of Corruption. Berlin, Germany: Transparency International.
- Marto, R. 2017: Building resilience to natural disasters: An application to Small Developing States. Washington, D.C.: International Monetary Fund.
- McAdoo, B. G.; J. S. Ah-Leong; L. Bell; P. Ifopo; J. Ward; E. Lovell and P. Skelton 2011: Coral reefs as buffers during the 2009 South Pacific tsunami, Upolu Island, Samoa. In: *Earth-Science Reviews* 107:1-2, pp 147–155.
- McComb, Jessie et 2020: Fiji COVID-19 Business Survey: Tourism Focus. Impacts, Responses and Recommendations. Suva, Fiji: IFC.
- McCoy, S. J. and N. A. Kamenos 2015: Coralline algae (Rhodophyta) in a changing world: integrating ecological, physiological, and geochemical responses to global change. In: *Journal of Phycology* 51:1, pp 6–24.
- McCubbin, S.; B. Smit and T. Pearce 2015: Where does climate fit? Vulnerability to climate change in the context of multiple stressors in Funafuti, Tuvalu. In: *Global Environmental Change* 30, pp 43–55.
- McDonald, J. 2021: Pacific Island Nations Consider Deep-sea Mining, Despite Risks. Retrieved 17 Nov 2022, from <https://thediplomat.com/2021/06/pacific-island-nations-consider-deep-sea-mining-despite-risks/>.
- McElfish, P. A.; R. Purvis; D. E. Willis and S. Riklon 2021: COVID-19 disparities among Marshallese pacific islanders. In: *Preventing Chronic Disease* 18.
- McGree, S.; N. Herold; L. Alexander; S. Schreider; Y. Kuleshov; E. Ene; S. Finaulahi; K. Inape; B. Mackenzie; H. Malala; A. Ngari; B. Prakash and L. Tahani 2019: Recent Changes in Mean and Extreme Temperature and Precipitation in the Western Pacific Islands. In: *Journal of Climate* 32:16, pp 4919–4941.
- McGregor, A.; R. M. Bourke; M. Manley; S. Tubuna and R. Deo 2009: Pacific Island Food Security: Situation, Challenges and Opportunities. In: *Pacific Economic Bulletin* 24, pp 24–42.
- McIver, L.; R. Kim; A. Woodward; S. Hales; J. Spickett; D. Katscherian; M. Hashizume; Y. Honda; H. Kim; S. Iddings; J. Naicker; H. Bambrick; A. J. McMichael and K. L. Ebi 2016: Health Impacts of Climate Change in Pacific Island Countries: A Regional Assessment of Vulnerabilities and Adaptation Priorities. In: *Environmental health perspectives* 124:11, pp 1707–1714.
- McLean, D. 2014: Food Security and Solomon Islands. Pests and other ravages of climate change are creating a food security challenge for the Pacific island nation: *The Diplomat*.
- McLean, R. and P. Kench 2015: Destruction or persistence of coral atoll islands in the face of 20th and 21st century sea-level rise? In: *WIREs Climate Change* 6:5, pp 445–463.
- McMichael, C.; C. Farbotko; A. Piggott-McKellar; T. Powell and M. Kitara 2021: Rising seas, immobilities, and translocality in small island states: case studies from Fiji and Tuvalu. In: *Population and Environment* 43:1, pp 82–107.
- McNamara, K. E.; R. Westoby; R. Clissold and A. Chandra 2021: Understanding and responding to climate-driven non-economic loss and damage in the Pacific Islands. In: *Climate Risk Management* 33, p 100336.
- Mechler, R.; L. M. Bouwer; T. Schinko; S. Surminski und J. Linnerooth-Bayer (eds.) 2019: *Loss and Damage from Climate Change*. Cham: Springer.
- Mertz, O. 2011: Changes in shifting cultivation systems on small Pacific islands. In: *The Geographical Journal* Milan, A.; R. Oakes and J. Campbell 2016: Tuvalu. Climate change and migration. 18: United Nations University.
- Moore, L. 2022: Putting principles into practice: lessons from Fiji on planned relocations. In: *Forced Migration Review* 69.
- Morello, E. B.; É. E. Plagányi; R. C. Babcock; H. Sweatman; R. Hillary and A. E. Punt 2014: Model to manage and reduce crown-of-thorns starfish outbreaks. In: *Marine Ecology Progress Series* 512, pp 167–183.
- Mortreux, C. and J. Barnett 2009: Climate change, migration and adaptation in Funafuti, Tuvalu. In: *Global Environmental Change* 19:1, pp 105–112.
- Mosello, B. and L. Rüttinger 2020: Linking adaptation and peacebuilding. Lessons learned and the way forward. In: *Climate Fragility Discussion Paper*, pp 1–12.
- Narang, S. 2015: Imaginative geographies of climate change induced displacements and migrations. A case study of Tuvalu. In: *Journal of Alternative Perspectives in the Social Sciences* 7:2, pp 268–283.
- National Cancer Institute 2010: NCI dose estimation and predicted cancer risk for residents of the Marshall Islands exposed to radioactive fallout from U.S. nuclear weapons testing at Bikini and Enewetak: National Cancer Institute.
- Nichols, J. 2022: COVID-19 and the Intersection of Public Health Emergency and Disaster Law in the Pacific. Retrieved from <https://www.internationalaffairs.org.au/australianoutlook/covid-19-and-the-intersection-of-public-health-emergency-and-disaster-law-in-the-pacific/>.



- Noble, C.; N. Pereira; and N. Saune 2011: Urban youth in the Pacific. Increasing resilience and reducing risk for involvement in crime and violence. Suva, Fiji: UNDP Pacific Centre.
- Noy, I. 2017: To leave or not to leave? Climate change, exit, and voice on a Pacific Island. In: CESifo Economic Studies 63:4, pp 403–420.
- Oakes, R. 2019: Culture, climate change and mobility decisions in Pacific Small Island Developing States. In: Population and Environment 40:4, pp 480–503.
- Oakes, R.; A. Milan; J. Campbell; K. Warner and M. Schindler 2017: Climate Change and Migration in the Pacific. Links, attitudes, and future scenarios in Nauru, Tuvalu, and Kiribati. Bonn: United Nations University Institute for Environment and Human Security.
- Oliver-Smith, A. and A. de Sherbinin 2014: Resettlement in the twenty-first century. In: Forced Migration Review, 45
- Otiuea, T.; N. Teariki-Ruatu; E. Timeon and J. A. Francis 2019: The agriculture–nutrition nexus in Kiribati. Wageningen: CTA.
- Pacific Coastal and Marine Science Center 2022: The impact of sea level rise and climate change on Pacific ocean atolls. Retrieved from <https://www.usgs.gov/centers/pcmssc/science/impact-sea-level-rise-and-climate-change-pacific-ocean-atolls>.
- Pacific Islands Forum 2017: The Framework for Resilient Development in the Pacific: Pacific Islands Forum.
- Pacific Islands Forum 2021: Declaration on Preserving Maritime Zones in the Face of Climate Change-related Sea-level Rise. Retrieved 23 Jun 2022, from <https://www.forumsec.org/wp-content/uploads/2021/08/Declaration-on-Preserving-Maritime.pdf>.
- Pacific Islands Forum Secretariat 2014: The Framework for Pacific Regionalism: Pacific Islands Forum Secretariat.
- Pacific Islands Forum Secretariat 2018: Annex 2 – CSO Briefing Note on Climate Change and Human Security. Enhancing access to climate finance & strengthening human security.
- Pacific RISA 2013: Coastal inundation in the Marshall Islands forebodes the future of extreme events. Honolulu: Pacific RISA.
- Pacifica Rising 2021: About Section.
- Pacific-Australia Climate Change Science and Adaptation Planning Program 2013: Current and future tropical cyclone risk in the South Pacific. Country risk profile: Tuvalu: Pacific-Australia Climate Change Science and Adaptation Planning Program.
- Pala, C. 2020: Kiribati’s president’s plans to raise islands in fight against sea-level rise: The Guardian.
- Palacios-Abrantes, J., Frölicher, T. L., Reygondeau, G. U., Sumaila, R., Tagliabue, A., Colette, C., Wabnitz, C., and Cheung, W. 2021: Timing and magnitude of climate-driven range shifts in transboundary fish stocks challenge their management. In: Global Change Biology: 28, pp 2312–2326.
- Pan, C. and M. Clarke 2022: Narrating the South Pacific in and beyond great power politics. In: East Asia (Piscataway, N.J.) 39:1, pp 1–11.
- Interview with Penny Wong, Minister for Foreign Affairs, 2022: Doorstop interview, Suva.
- Permanent Mission of the Republic of the Marshall Islands to the United Nations 2009: Views regarding the possible security implications of Climate Change. New York, NY: Permanent Mission of the Republic of the Marshall Islands.
- Pie Simati, S. 2009: The effect of migration on development in Tuvalu: A case study of PAC Migrants and their families. New Zealand
- Pringle, P. 2018: Effects of climate change on 1.5° temperature rise relevant to the Pacific Islands. Pacific Marine Climate Change Report Card (Science Review: Commonwealth Marine Economies Programme).
- Pryke, J. 2020a: The risks of China’s ambitions in the South Pacific. Retrieved 06.16.2022, from <https://www.brookings.edu/articles/the-risks-of-chinas-ambitions-in-the-south-pacific/>.
- Pryke, J. 2020b: The risks of China’s ambitions in the South Pacific: Brookings.
- Pulea, M. and D. Farrier 1994: Environmental Legislation Review - Tuvalu. Brisbane, Australia: South Pacific Regional Environment Programme.
- Radio New Zealand (RNZ) 2019a: Tuvalu land dispute temporarily resolved. In: Radio New Zealand, 05 Jul 2019, n.a.
- Radio New Zealand (RNZ) 2019b: Opposition organises anti-China protest march in Kiribati.
- Ramsay, D. 2011: Coastal erosion and inundation due to climate change in the Pacific and East Timor. Synthesis report: Australian Government under the Pacific Australia Climate Change Science and Adaptation Planning (PACCSAP), Australia Government.

- Rasmussen, K.; W. May; T. Birk; M. Mataka; Ole Mertz and Douglas Yee 2009: Climate change on three Polynesian outliers in the Solomon Islands: Impacts, vulnerability and adaptation. In: *Geografisk Tidsskrift-Danish Journal of Geography* 109:1, pp 1–13.
- Rasser, M. and B. Riegl 2002: Holocene coral reef rubble and its binding agents. In: *Coral Reefs* 21:1, pp 57–72.
- Reed, E. U. 2012: Small Islands, big food concerns. Retrieved from <https://ourworld.unu.edu/en/small-islands-big-food-concerns>.
- Reenberg, A.; T. Birch-Thomsen; O. Mertz; B. Fog and S. Christiansen 2008: Adaptation of human coping strategies in a small island society in the South West Pacific—50 years of change in the coupled human–environment system on Bellona, Solomon Islands. In: *Human Ecology* 36:6, pp 807–819.
- Reisinger, A. 2022: The concept of risk in the IPCC Sixth Assessment Report: a summary of crossWorking Group discussions. Guidance for IPCC authors. Geneva, Suisse: Intergovernmental Panel on Climate Change.
- Reliefweb 2013: Marshall Islands: Drought - May 2013: United Nations Office for the Coordination of Humanitarian Affairs.
- Reliefweb 9/15/2022: Tropical Cyclone Gita - Tonga. Retrieved 15 Sep 2022, from <https://reliefweb.int/report/tonga/tropical-cyclone-gita>.
- Reliefweb 9/18/2022: Cyclone damage to Tonga’s agriculture and fisheries exceeds \$20 million - Tonga. Retrieved 18 Sep 2022, from <https://reliefweb.int/report/tonga/cyclone-damage-tonga-s-agriculture-and-fisheries-exceeds-20-million>.
- Reuters 2021: Tuvalu minister stands in sea to film COP26 speech to show climate change.
- Rezwana, N. and R. Pain 2021: Gender-based violence before, during, and after cyclones: slow violence and layered disasters. In: *Disasters* 45:4, pp 741–761.
- Richard B. and Graeme H. 2012: Population movement in the Pacific: A perspective on future prospects. New Zealand: Labour and Immigration Research Center, Department of Labour.
- Ritson-Williams, R.; S. Arnold; N. Fogarty; R. S. Steneck; M. Vermeij and V. J. Paul 2009: New perspectives on ecological mechanisms affecting coral recruitment on reefs. In: *Smithsonian Contributions to the Marine Sciences*: 38, pp 437–457.
- Rüttinger, L.; J. Vivekananda; C. König and B. Sedova 2021: Weathering Risk Methodology Paper. Berlin, Germany: adelphi; Potsdam Institute for Climate Impact Research.
- Sabūnas, A.; T. Miyashita; N. Fukui; T. Shimura and N. Mori 2021: Impact assessment of storm surge and climate change-enhanced sea level rise on atoll nations: A case study of the Tarawa Atoll, Kiribati. In: *Frontiers in Built Environment* 7, n.a.
- Sahib, M. and M. White 2018: Policy challenges in the coastal fisheries management of the Marshall Islands: Marshall Islands Marine Resources Authority.
- Sauni, S. and L. F. Sauni 2005: Vulnerability and dependence: The nearshore fisheries of Tuvalu (SPC Women in Fisheries Information Bulletin, 15: SPC.
- Scherrer, V. 2018: Disability Inclusion Policy Brief. Gap analysis on disability-inclusive humanitarian action in the Pacific: Pacific Disability Forum.
- Scott, K. 2018: Rising seas and Pacific maritime boundaries: Australian Naval Institute.
- Secretariat of the Pacific Community 2015: The Pacific Youth Development Framework 2014–2023. A coordinated approach to youth-centred development in the Pacific. Suva, Fiji: Secretariat of the Pacific Community.
- Secretariat of the Pacific Community 2017: RMI: Pacific Resilience Project (PREP) Phase 2: Secretariat of the Pacific Community.
- Secretariat of the Pacific Community 2021a: Stat of the week: proportion of the population in the Pacific aged from 15 to 24 years old.
- Secretariat of the Pacific Community 2021b: Tuvalu Strategic Roadmap for Emergency Management 2021-2023. Strengthening emergency management performance through sector coordination and cooperation: Secretariat of the Pacific Community.
- Secretariat of the Pacific Community 2022: Women in Fisheries Information Bulletin. 35). New Caledonia: Secretariat of the Pacific Community.
- Secretariat of the Pacific Community and Government of the Republic of the Marshall Islands 2018: Gender Equality: Where do we stand. Republic of the Marshall Islands. Majuro, Marshall Islands: Secretariat of the Pacific Community, Government of the Republic of the Marshall Islands.
- Secretariat of the Pacific Regional Environment Programme 2015: The Village That Banned Seawalls. Retrieved 13 May 2022, from <https://www.sprep.org/news/village-banned-seawalls>.

- Shanahan, T. M.; K. A. Huguen; N. P. McKay; J. T. Overpeck; C. A. Scholz; W. D. Gosling; C. S. Miller; J. A. Peck; J. W. King and C. W. Heil 2016: CO<sub>2</sub> and fire influence tropical ecosystem stability in response to climate change. In: *Scientific Reports* 6:1, p 29587.
- Shek, D. M. and S. Yamada 2011: Health care for Micronesians and constitutional rights. In: *Hawaii medical journal* 70 11 Suppl 2, pp 4–8.
- Shen, S. and F. Gemenne 2011: Contrasted views on environmental change and migration: the case of Tuvaluan migration to New Zealand. In: *International Migration* 49, e224-e242.
- Souter, D.; S. Planes; J. Wicquart; M. Logan; D. Obura und F. Staub (eds.) 2020: *Status of Coral Reefs of the World*. n.a.
- Srinivasan, P. 2022: Tuvalu reverses controversial decision to sponsor seabed mining. Tuvalu’s Minister for Justice, Communication & Foreign Affairs Simon Kofe gives a COP26 statement while standing in the ocean in Funafuti, Tuvalu November 5, 2021. In: *ABC Pacific*, 13 Apr 2022, p 1.
- Staats, J. 2022: Four takeaways from China’s tour of the Pacific Islands. As U.S.-China competition in the region heats up, Pacific Island nations want to ensure engagement with both powers is on their own terms: *United States Institute of Peace*.
- Steneck 1997: Crustose corallines, other algal functional groups, herbivores and sediments: complex interactions along reef productivity gradients.
- Taibbi, M. and M. Saltzman 2018: Marshall Islands: A third of the nation has left for the U.S. Retrieved 15 Sep 2022, from <https://www.pbs.org/newshour/show/marshall-islands-a-third-of-the-nation-has-left-for-the-us>.
- Taupo, T. 2017: Sustainable financing for climate and disaster resilience in Atoll Islands. Evidence from Tuvalu and Kiribati (SEF Working Paper, 15).
- Tarte, S. (2022). Reconciling Regional Security Narratives in the Pacific. *East Asia*, 39(1), pp. 29–43.
- Taylor, M.; A. McGregor and B. Dawson 2016: Vulnerability of Pacific Island agriculture and forestry to climate change. Noumea, New Caledonia: Pacific Community (SPC); Australian Aid.
- The Borgen Project 2018: *Cyclone Gita in Tonga: The Impact and Solution: The Borgen Project*.
- The New Humanitarian 2019: *Trade and transfat in the Pacific*. Bangkok: The New Humanitarian.
- The Regional Assistance Mission to Solomon Islands: *The Tensions*. Online.
- The White House 2021: *President Biden Establishes the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders*. Washington, DC.
- Thiruchchelvan, N., Thirukkumaran, G., & Mikunthan, G. 2012: In Vitro Biological Control of *Marasmiellus* sp. The casual of Stem Rot of Banana Grown in Jaffna Peninsula, Sri Lanka. In: *The American Journal of Plants* 5:3, pp 94–101.
- Thomas, A; A. Baptiste; R. Martyr-Koller; P. Pringle and K. Rhiney 2020: Climate change and small island developing states. In: *Annual Review of Environment and Resources* 45:1, pp 1–27.
- Thomas, E. 2019: *Compacts of Free Association: 2023-2024 Renewal Negotiations: ICAAD*.
- Thomas, P. and Keen, M. (eds.) 2017: *Urban Development in the Pacific (The Development Bulletin, Canberra: Australian National*.
- Thomas R.; S. Gu’urau and C. Reid 2020: *Economic Development Indicators and Statistics 2020. Tuna Fisheries of the Western and Central Pacific Ocean 2020*. Honiara, Solomon Islands: Forum Fisheries Agency.
- Tuck, M. E.; P. S. Kench; M. R. Ford and G. Masselink 2019: Physical modelling of the response of reef islands to sea-level rise. In: *Geology* 47:9, pp 803–806.
- Tuima, S. 2021: *Report on statistical analysis of water and sanitation in rural Fiji: The Ministry of Rural and Maritime Development*.
- Tuvalu Fisheries Department 2021: *Annual Report 2020*. Funafuti, Tuvalu: Ministry of Fisheries and Trade.
- United Nations Children’s Fund 2015: *Child protection in emergencies. A toolkit for practitioners in Pacific Island Countries*. Suva, Fiji: United Nations Children’s Fund.
- United Nations Children’s Fund 2017: *Situation Analysis of Children in Tuvalu*. Suva, Fiji: UNICEF.
- United Nations Children’s Fund 2022a: *Tropical Cyclone Harold leaves destruction in its wake*. Retrieved 15 Sep 2022, from <https://www.unicef.org/stories/tropical-cyclone-harold-leaves-destruction-its-wake>.
- United Nations Children’s Fund 2022b: *Water, sanitation and hygiene*. Retrieved 18 Sep 2022, from <https://www.unicef.org/pacificislands/what-we-do/water-sanitation-hygiene>.
- United Nations Development Programme 2018: *Gender Assessment. FP015: Tuvalu Coastal Adaptation Project: United Nations Development Programme*.



- United Nations News 2015: Vanuatu: UN finds ‘extensive’ loss of agriculture; full scale of damage still to be revealed. United Nations News.
- United Nations Office for the Coordination of Humanitarian Affairs 2014: Solomon Islands: Worst flooding in history. Retrieved 18 Sep 2022, from <https://www.unocha.org/story/solomon-islands-worst-flooding-history>.
- United Nations University Institute for Environment and Human Security 2017: Pacific Islanders Faced with Climate-Induced Migration. Retrieved 18 Sep 2022, from <https://ehs.unu.edu/blog/articles/pacific-islanders-faced-with-climate-induced-migration.html>.
- United Nations Women 2013: Climate Change, Disasters and Gender Based Violence in the Pacific. Suva, Fiji: United Nations Women.
- United Nations Women 2015: Why is Climate Change a Gender Issue? Suva, Fiji: United Nations Women.
- US Department of State 2019: Kiribati (19-719) – Treaty on the Delimitation of Maritime Boundaries. Retrieved from <https://www.state.gov/wp-content/uploads/2019/10/19-719-Kiribati-Maritime-Boundary-Treaty.pdf>.
- van der Geest, K.; M. Burkett; J. Fitzpatrick; M. Stege and B. Wheeler 2019a: Marshallese Migration: The Role of Climate Change and Ecosystem Services. Policy Brief of the Marshall Islands Climate and Migration Project. University of Hawai‘i at Mānoa: Pacific Islands Climate Adaptation Science Center.
- van der Geest, K.; M. Burkett; J. Fitzpatrick; M. Stege and B. Wheeler 2019b: Marshallese perspectives on migration in the context of climate change (Migration, Environment and Climate Change: Policy Brief Series, ISSN 2410-4930: International Organisation for Migration.
- van der Geest, K. and M. Burkett, J. Fitzpatrick, M. Stege and B. Wheeler 2019c: Marshallese migration: The role of climate change and ecosystem services. Summary for policymakers: University of Hawai‘i at Mānoa.
- Vermeij, M. J.A.; M. L. Dailer and C. M. Smith 2011: Crustose coralline algae can suppress macroalgal growth and recruitment on Hawaiian coral reefs. In: *Marine Ecology Progress Series* 422, pp 1–7.
- Voigt-Graf, C. and Y. Kanemasu 2019: Labour Mobility in Pacific Island Countries. Suva, Fiji: International Labour Organisation for Pacific Island Countries.
- Voigt-Graf, C. and Kagan S. 2017: Migration and Labour Mobility from Kiribati (Development Policy Centre Discussion Paper, No. 56: Australia National University.
- Wairiu, M.; M. Lal and V. Iese 2012: Climate Change Implications for Crop Production in Pacific Islands Region, Food Production - Approaches, Challenges and Tasks.
- Waiti, D. and R. Lorrenij 2018: Sustainable management of deep sea mineral activities: a case study of the development of national regulatory frameworks for the Republic of the Marshall Islands. In: *Marine Policy* 95, pp 388–393.
- Webb, A. P. and P. S. Kench 2010: The dynamic response of reef islands to sea-level rise: Evidence from multi-decadal analysis of island change in the Central Pacific. In: *Global and Planetary Change* 72:3, pp 234–246.
- Webster, P. J.; G. J. Holland; J. A. Curry and H-R Chang 2005: Changes in tropical cyclone number, duration, and intensity in a warming environment. In: *Science* 309:5742, pp 1844–1846.
- Weerasinghe, S. 2014: Planned relocation, disaster and climate change: Consolidating good practices and preparing for the future. Sanremo, Italy: UNHCR.
- Wewerinke-Singh, M. und E. Hamman (eds.) 2020: Environmental law and governance in the Pacific. Abingdon, Oxon, New York, NY: Routledge.
- Widlansky, M. J.; H. Annamalai; S. B. Gingerich; Curt D. Storlazzi; J. J. Marra; K. I. Hodges; B. Choy and A. Kitoh 2019: Tropical Cyclone Projections: Changing Climate Threats for Pacific Island Defense Installations. In: *Weather, Climate, and Society* 11:1, pp 3–15.
- Willie, R.; T. Henning und S. Mannakkara (eds.) 2021: Adapting to climate change through the strengthening of asset management practices in Kiribati: Examples from the water sector. University of Auckland.
- Wilson, C. n.d. : Land and Conflict in the Pacific Region. Land Management and Conflict Minimisation Sub-Project 1.1 Report. Suva, Fiji: The Pacific Islands Forum Secretariat.
- Wilson, C. 2017: As climate threats grow, Solomon Islands hunts “evergreen” solutions. In: Thomson Reuters Foundation, 23 Oct 2017.
- Wilson, N.; O. Mansoor; D. Lush and T. Kiedrzyński 2005: Modeling the impact of pandemic influenza on Pacific Islands. In: *Emerging infectious diseases* 11:2, pp 347–349.
- Wilson, W. 2020: Demanding the future: Navigating the Pacific’s youth bulge. With half the region’s population aged under 23, the Pacific’s ‘youth bulge’ will affect every area of development in the region in the coming decades: Lowry Institute.

- Wolf, F.; W. L. Filho; P. Singh; N. Scherle; D. Reiser; J. Telesford; I. B. Miljković; P. H. Havea; C. Li; D. Surroop and M. Kovaleva 2021: Influences of Climate Change on Tourism Development in Small Pacific Island States. In: *Sustainability* 13:8, p 4223.
- Woolford, G. 2009: Social Protection for Migrants from the Pacific Islands in Australia and New Zealand (Social Protection Discussion Papers, 0912: The World Bank.
- World Bank n.a.: Agricultural land (% of land area) - Pacific island small states. Retrieved 18 Sep 2022, from <https://data.worldbank.org/indicator/AG.LND.AGRI.ZS?locations=S2>.
- World Bank 2009: Reducing the risk of disasters and climate variability in the Pacific Islands. Republic of Kiribati country assessment. Washington, D.C.: World Bank Group.
- World Bank 2010: Poverty Headcount Ratio at National Poverty Lines (% of population). Retrieved from <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=TV>.
- World Bank 2013: Acting on Climate Change & Disaster Risk for the Pacific: World Bank Group.
- World Bank 2017: Pacific Possible. Long-term economic opportunities and challenges for Pacific Island Countries: World Bank Group.
- World Bank 2019: Environmental and Social Management Framework (ESMF) for the Samoa Agriculture and fisheries Productivity and Marketing Project: World Bank.
- World Bank 2021a: Adapting to rising sealevels in Marshall Islands: World Bank Group.
- World Bank 2021b: Reskilling and Labour Migration Vital to the Pacific's Economic Recovery. In: World Bank Group, 2021, p 2.
- World Bank 2021c: Climate Risk Country Profile. Marshall Islands: World Bank Group.
- World Bank 2021d: Reducing the risk of disasters and climate variability in the Pacific Islands. Republic of the Marshall Islands Country Assessment: World Bank Group.
- World Bank 2022: Summary Climate Change Knowledge Portal Kiribati. Retrieved 01 Sep 2022, from <https://climateknowledgeportal.worldbank.org/country/kiribati>.
- World Bank and KNOMAD 2022: A War in a Pandemic. Implications of the Ukraine crisis and COVID-19 on global governance of migration and remittance flows: World Bank Group.
- World Bank and the Asian Development Bank 2021: Climate Risk Country Profile. Kiribati: World Bank Group and the Asian Development Bank.
- World Food Programme 2018: Food security in vulnerable islands. Regional Food Security Atlas of the Pacific. Suva, Fiji: Secretariat of the Pacific Community; World Food Programme.
- World Meteorological Organization 2021: Climate change increases threats in South West Pacific.
- Xuande, F. and G. Yuting 2021: An Analysis of the Tuna Diplomacy between Pacific Island Countries and EU -Take Kiribati as an example. In: *E3S Web of Conferences* 251, p 1071.
- Zaneveld, J. R.; D. E. Burkepile; A. A. Shantz; C. E. Pritchard; R. McMinds; J. P. Payet; R. Welsh; A. M. Correa; N. P. Lemoine; S. Rosales; C. Fuchs; J. A. Maynard and R. V. Thurber 2016: Overfishing and nutrient pollution interact with temperature to disrupt coral reefs down to microbial scales. In: *Nature communications* 7:1, p 11833.
- Zann 1991: The effects of the Crown-of-Thorns starfish (*Acanthaster planci*) on Samoan reefs.
- Ziegler, M.; G. Quéré; J-F. Ghi; G. Iwankow; V. Barbe; E. Boissin; P. Wincker; S. Planes and C. R. Voolstra 2018: Status of coral reefs of Upolu (Independent State of Samoa) in the South West Pacific and recommendations to promote resilience and recovery of coastal ecosystems. In: *Marine pollution bulletin* 129:1, pp 392–398.









**United Nations Development Programme  
(UNDP) Pacific Office in Fiji**

Level 2, Kadavu House, 414 Victoria Parade  
Private Mail Bag, Suva, Fiji

Tel: +679 331 2500

Fax: +679 330 1718

Email: [registry.fj@undp.org](mailto:registry.fj@undp.org)

Web: [www.undp.org/pacific](http://www.undp.org/pacific)

© UNDP 2023



**PACIFIC ISLANDS FORUM**

**Pacific Islands Forum Secretariat**

Ratu Sukuna Road,  
Private Mail Bag, Suva, Fiji

Tel: +679 331 2600

Email: [info@forumsec.org](mailto:info@forumsec.org)

Web: [www.forumsec.org](http://www.forumsec.org)

© PIFS 2023