Climate Adaptation and Protected Areas Initiative

Climate Risk Profile: Fiji

CAPA REPORT

March 2025

Project partners

IISD International Institute for Sustainable Development

Wildlife Conservation Society

WWF

Funded by

In partnership with Canada

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Climate Adaptation and Protected Areas (CAPA) Initiative

The Climate Adaptation and Protected Areas (CAPA) Initiative seeks to promote nature-based solutions (NbS) to strengthen climate resilience and protect biodiversity in and around protected areas and critical ecosystems. The CAPA Initiative, funded by Global Affairs Canada, will work with local communities, traditionally underrepresented groups, women's groups, and national and local authorities in Belize, Fiji, the Greater Virunga Landscape, and the Kavango–Zambezi Landscape to implement site-specific activities that respond to the risks, vulnerabilities, needs, and priorities of local communities and ecosystems, as identified through comprehensive assessments of the climate, gender, biodiversity, and conflict contexts. The CAPA Initiative is led by the International Institute for Sustainable Development (IISD), the Wildlife Conservation Society (WCS), and the World Wide Fund for Nature (WWF).

To learn more, visit https://www.iisd.org/capa.

If you'd like to reach out to us, please contact us at capa@iisd.org

Climate Risk Profile: Fiji

March 2025

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CAPA Initiative Project Partners

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Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Website: iisd.org
X: @IISD_news

Wildlife Conservation Society

The WCS is an international non-governmental organization committed to working with communities, governments, and other partners to safeguard biodiversity and natural resources through integrated land and seascape management underpinned by applied research. We run programs spanning the entire ocean and more than 3 million biologically critical square miles in nearly 60 countries. The CAPA Initiative is working with WCS Belize, WCS Fiji, and WCS Central.

Head Office

2300 Southern Boulevard
Bronx, New York
USA 10460

Website: wcs.org
X: @thewcs

World Wildlife Fund

WWF is an independent conservation organization with a global network in over 100 countries that collaborates with people at all levels to develop and deliver innovative solutions that protect wildlife and communities. Our mission is to stop the degradation of the planet's natural environment and to build a future in which people live in harmony with nature. The CAPA Initiative is working with WWF Uganda, WWF Zambia, WWF Africa, and WWF International.

Head Office

1250 24th Street, N.W.
Washington, DC
USA 20037

Website: worldwildlife.org
X: @world_wildlife

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1.0 About the Climate Risk Profile

The Climate Adaptation and Protected Areas (CAPA) Initiative seeks to promote natural solutions to strengthening climate resilience and protecting biodiversity in and around protected areas and critical ecosystems in Belize, Fiji, and the Greater Virunga and Kavango-Zambezi landscapes of Africa. As part of this 3-year project, the International Institute for Sustainable Development (IISD), in collaboration with conservation partners at the Wildlife Conservation Society (WCS) and the World Wide Fund for Nature, local communities, traditionally underrepresented groups, such as women and Indigenous Peoples, and national and local authorities are designing and implementing nature-based solutions (NbS) for adaptation in and around protected areas and critical landscapes in the Global South, and working to better integrate climate risks into the management of these spaces. This project is being undertaken with financial support from Global Affairs Canada.

Box 1. What are NbS for adaptation?

NbS for adaptation are actions to protect, conserve, restore, sustainably use, and manage natural ecosystems to strengthen the resilience of communities and ecosystems to the impacts of climate change (adapted from United Nations Environment Assembly, 2022). They involve assessing how climate change will affect ecosystems and people of all genders and social backgrounds and identifying how ecosystems can help to address these impacts on people.

As part of this project, the CAPA Initiative has developed a set of climate risk profiles for each landscape to illustrate the impacts of climate change, specifically within and around select protected areas in Belize, Fiji, and the Greater Virunga and Kavango-Zambezi landscapes of Africa. The climate risk assessments were undertaken across the four project sites and rely on information collected from participatory engagement processes with communities, complemented by desk-based or secondary research.

The outcomes and data collected through the climate risk assessments helped to underpin the choices of NbS for adaptation and inform the gender equality and social inclusion (GESI) strategies for each landscape. Each climate risk profile provides an overview of the landscape's climate context, observed and projected climate change impacts, and a set of recommended NbS for adaptation actions and measures to promote gender-responsive and socially inclusive climate adaptation.

2.0 Climate Context in Fiji

The Republic of Fiji is an archipelagic small island developing state situated in the South Pacific. Its geographical area is 18,272 km^2, encompassing over 332 islands. The total population is approximately 900,000, with most of its citizens living on the two largest islands, Viti Levu and Vanua Levu. These islands are mountainous and of volcanic origin. Approximately 90% of the population lives in coastal areas, more than half in urban areas, with the proportion of the country living in urban areas steadily increasing (Government of Fiji, 2018).

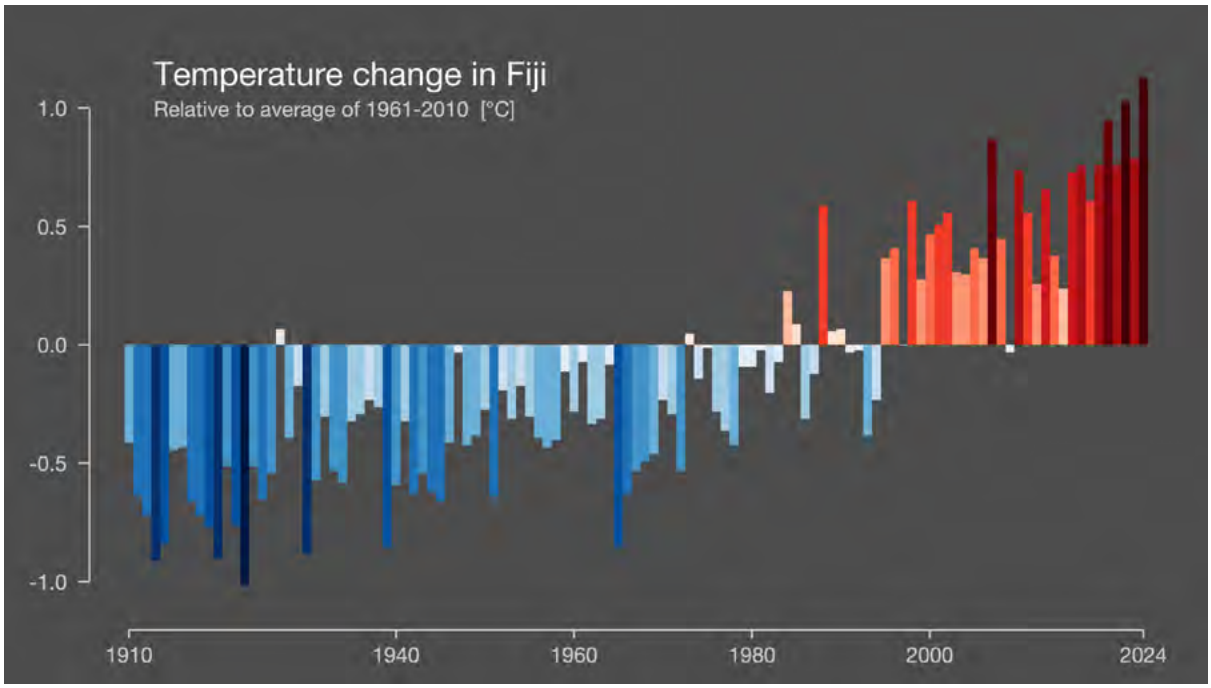
The climatology of the tropical marine environment of Fiji is driven by the South Pacific Convergence Zone. The specific location of this zone is influenced greatly by the El Niño Southern Oscillation and Interdecadal Pacific Oscillation conditions. The most important driver of year-to-year climate variations is the El Niño Southern Oscillation, which typically occurs every 2 to 7 years. In Fiji, it is characterized by reduced rainfall, increased incidence of drought, and an increased likelihood of cyclones (Government of Fiji, 2018; Pacific Community, 2016).

Fiji has two distinct seasons—a warm, wet season from November to April and a cooler, dry season from May to October. Daily temperatures are relatively stable year-round, fluctuating between 20–27°C, though coastal areas can see temperatures dip to 18°C (International Federation of Red Cross and Red Crescent Societies, 2021). Precipitation is much more variable; on average, the wet season sees 250–400 mm of rainfall per month, an increase from 80–150 mm per month in the dry season (World Bank Group, 2021). Rainfall varies geographically as well as seasonally due to the steep and rugged topography of many of the islands. The island of Viti Levu also experiences a spatial variation in precipitation, with its eastern side seeing much stronger precipitation than what falls in the west (World Bank Group, 2021).

2.1 Observed Climatic Changes in Fiji

There have been some clear changes in the climate of Fiji over recent years, most notably temperature increases and an increase in the severity of storms (Government of Fiji, 2017). Annual precipitation has also increased (World Bank Group, 2021). Fiji's temperatures have increased less than the global average, approximately 0.8-1.0°C throughout the 20th century (Commonwealth Scientific and Industrial Research Organisation [CSIRO] & Secretariat of the Pacific Regional Environment Programme [SPREP], 2021; World Bank Group, 2021). Nonetheless, the number of cool nights has decreased, and the number of warm days has increased since 1942 (Stimson & Ocean Policy Research Institute [OPRI], 2023). Sea levels have risen more than the global average, with a 6 mm increase per year since 1993 (Stimson & OPRI, 2023).

Figure 1. Temperature change in Fiji from 1910 to 2023



Source: Hawkins, n.d.

More severe extreme weather events have been observed in Fiji for decades, including more severe cyclones, droughts, and periods of excessive rainfall (Stimson & OPRI, 2023). Tropical Cyclone Winston, which hit the country in 2016, was the most powerful cyclone ever recorded in the Southern Hemisphere. It impacted over 540,000 people in Fiji, causing 44 fatalities and widespread damage and destruction. The estimated value of disaster effects on Fiji amounted to USD 900 million (Australian Aid, 2021) or 20% of the country's GDP. Impacts from cyclones include flooding and landslides that cause significant physical damage (Pacific Community, 2016). In addition, there are compounding social impacts, such as in April 2020 when Tropical Cyclone Harold damaged 2,000 homes and caused USD 22.6 million in agricultural and infrastructure damage while the country was responding to the early impacts of the COVID-19 pandemic (Mangubhai et al., 2021).

2.2 Future Climate Projections for Fiji

The climate of Fiji is expected to change in line with global projections. Temperatures will increase under all representative concentration pathway (RCP) models, with a 2.7°C average increase under RCP 8.5. However, since warming occurs less over ocean regions than over land, temperature increases in Fiji will be slightly lower than the global average (CSIRO & SPREP, 2021; World Bank Group, 2021). There will be an increase in extreme rain events, and tropical cyclones will increase in severity (but not frequency) (Australian Aid, 2021). Precipitation models are not consistent, with some showing larger increases and some showing little change in annual precipitation averages (CSIRO & SPREP, 2021). There is currently limited evidence of long-term climate change in total annual precipitation trends. Studies

suggest drier conditions on the sheltered side of Viti Levu, while the windward side will tend to be characterized by wetter conditions. In the same vein, recent studies found that the frequency and severity of extreme precipitation events and long periods of droughts in the Fiji Islands have been increasing (Fernández-Duque et al., 2024).

3.0 Observed Climate Hazards and Impacts in Fiji

Fiji faces several climate hazards that pose serious threats to its population, environmental integrity and socio-economic development. The main climate hazards experienced are tropical cyclones, storm surges, droughts, and flooding events. Table 1 outlines climate hazards that have been observed across the country, as well as associated risks.

Table 1. Overview of climate hazards and their associated risks in Fiji

Climate Hazard	Climate Impacts
 Changes in rainfall patterns	• Changes in rainfall impact planning, flowering patterns, vegetative growth, and harvesting patterns, which may affect productivity. • Heavy, concentrated rainfall can lead to waterlogging and a higher risk of certain plant diseases. • Increase of erosion and the loss of much of the country's topsoil. • Runoff may smother reefs due to higher levels of sediment, preventing sunlight from reaching coral reefs. • Increased risk of flooding, erosion, and landslides, alongside the decreased availability of fresh water, has negative impacts on human well-being.
 Increasing temperatures and drought	• Agricultural productivity will be impacted, particularly for those crops—taro, sweet potato, yam, and sugar—that are sensitive to drought. • An increase in pests and crop diseases will impact both substance agriculture and livestock. • Heat stress further strains the livestock sector and production of livestock feed.
 Sea level rise and storm surges	• Land area available for agriculture may be reduced, particularly near the coast, due to saltwater intrusion. • Fisheries and aquaculture operations could be impacted and forced to relocate. • Increased exposure to wave action may lead to the retreat of mangroves and increase coastal erosion.
 Increase in sea surface temperatures	• Further coral bleaching, leading to the loss of fish habitat and reef biodiversity in general, including migration and spawning of fish, directly impacting fishers and fisheries. • Seaweed aquaculture—an important local livelihood—could also be impacted.

Climate Hazard	Climate Impacts
Ocean acidification	• Reduced health and productivity of aquatic invertebrates, impacting aquaculture and fisheries operations. • Reduced areas suitable for seaweed aquaculture and likely decreases in the survival of aquaculture species such as ornamental products, oyster spat, and sea cucumbers.
Increased severity of storms and cyclones	• Flooding, storm surges, droughts, and landslides causing loss of lives and livelihoods, • Substantial economic and ecological losses from damage or destruction of ecological environments, critical infrastructure, and housing.

Source: Government of Fiji, 2018; Green Climate Fund, 2020; Pacific Community, 2016.

Fiji ranked 103 out of 191 countries by the 2025 INFORM Risk Index (European Commission, 2025; see Table 2). This ranking has worsened compared to 2019 and is driven by the country's high exposure to cyclones and tsunamis, as well as coastal flooding. Disaster risk in Fiji is increased due to its levels of social vulnerability and coping capacity.

Table 2. Selected indicators from the INFORM 2025 Index for Risk Management for Fiji

Inform Risk Index	Fiji
Overall risk level (0–10)	3.1
Rank (1-191)	103
Vulnerability (0–10)	3.7
Coastal flood (0–10)	7.1
Tropical cyclone (0–10)	6.9
Drought (0–10)	2.8
Tsunami (0–10)	7.1
Projected conflict probability (0–10)	0
Current conflict intensity (0–10)	0
Gender inequality index	4.4

Source: European Commission, 2025.

4.0 Fiji's Climate Adaptation Policy Context

Fiji is the 87th most vulnerable country out of 181 countries on the Notre Dame Global Adaptation Index, yet despite facing dire current and future climate conditions, it is making progress on climate change adaptation and ranks 66th when it comes to adaptation readiness.

The Government of Fiji launched its first national adaptation plan (NAP) in 2018. It is an overarching plan for addressing national adaptation needs and outlines 160 adaptation measures across 10 priority sectors to address these challenges and adapt to climate change. It provides public, private, and civil society stakeholders and development partners a list of prioritized adaptation needs across various sectors. Part of the NAP's mandate is to ensure vertical and horizontal integration of climate risks through interlinking adaptation efforts across multiple levels of governance, stakeholder groups, and economic sectors. National consultations for an updated NAP began in 2024, with drafting planned to begin in early 2025 as part of the Fiji Government's commitment to ensure that adaptation interventions evolve holistically with changing climate impacts.

In 2021, Fiji's Parliament passed the National Climate Change Act, providing a legal framework for the country's climate change responses. The launch of the Act marked a significant shift in the *modus operandi* of the previous administration, changing the national focus from mitigation projects to initiatives that enhance resilience and increase the adaptive capacity of vulnerable communities. The Act provides the legal backing to ensure the government's long-term commitment to implementing the NAP's goals. This change was further exemplified by the Fiji Government through the launch of its Planned Relocation Guidelines.

In its updated nationally determined contribution from 2020, the Fijian government emphasized reducing the country's vulnerability to climate change and raising awareness about the need for climate change mitigation and adapting through targeted communication plans. Further, the government strongly underscored the need for "equity, justice, inclusion, transparency, and accountability in all climate actions" in the updated nationally determined contribution (p. 18).

The Fiji National Climate Finance Strategy was developed by the government in 2022. The Strategy outlined training and awareness programs *inter alia* in water, waste, and agriculture to empower communities to manage their climate risks. The Strategy also explicitly outlined project pipelines and priority sectors (energy and agriculture) that required climate finance investment that would contribute to increasing the resiliency of Fiji's aging infrastructure.

5.0 Climate Change Impacts on CAPA Target Communities and Ecosystems in Fiji

Protected areas are a critical approach to conserve biodiversity, maintain ecosystem functionality and the provision of the services they provide to people and communities, in the form of livelihoods, food security, health, spiritual and cultural identity. In addition, well connected ecosystems such as forests, freshwater and marine protected areas provide habitat for many species and refuge from climate and natural disasters. If protected areas are well-designed and managed and function as a connected network, they can greatly improve the functionality and health of ecosystems, provide economic and social benefits to communities and halt biodiversity loss. An increasing number of marine and terrestrial protected areas "have been established through conservation agreements or payments for ecosystem services schemes in Fiji, providing win-win solutions for people and nature" (WCS Fiji, n.d.).

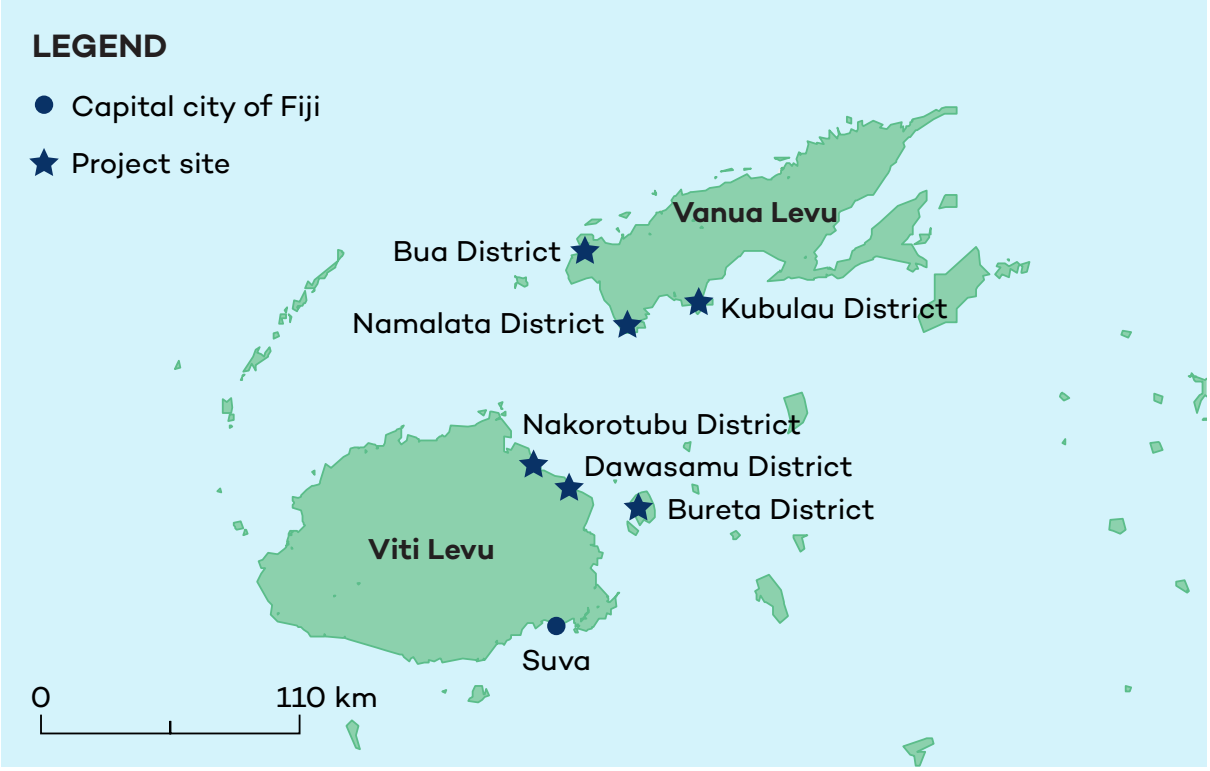
Many protected areas in Fiji are designated by "Indigenous communities with customary land-sea rights through traditional management systems such as tabus. The majority of tabus in Fiji are temporary for fixed periods of time extending from 3 months to 10 years" (WCS Fiji, n.d.). However, Namena Marine Reserve and Vatu-i-Ra Conservation Park—Fiji's largest protected areas—are permanent.

The CAPA Initiative is working with local communities that live within and around protected areas to design and implement NbS for adaptation that respond to climate change and biodiversity impacts in Fiji. The comprehensive climate risk assessment was undertaken in 20 communities across six districts in terrestrial and marine sites: Kubulau, Nakorotubu, Dawasamu, Namalata, Bua, and Bureta.

Nakorotubu, Bua and Bureta are home to locally managed marine areas within the Vatu-i-Ra Seascape, and activities focus on improving regulation and monitoring of customary fishing grounds to improve coral reef protection and reduce fishing pressure. Kubulau district hosts the Kubulau Forest Conservation Area, which encompasses one of the last native rainforests on Fiji's second largest island, Vanua Levu. At least 98% of the Kubulau Forest Conservation Area is primary undisturbed habitat that the Ministry of Forests has described as part of the few remaining untouched forests in Fiji. Activities in the terrestrial areas focus on integrated watershed management, landscape restoration, biodiversity conservation, and sustainable agricultural practices.

5.1 Description of CAPA Target Communities

Figure 2. Map of CAPA project sites in Fiji



Source: Authors.

Kubulau District

Kubulau District is situated on the southeast side of the province of Bua on Vanua Levu and consists of 10 villages. Of these, five villages and one settlement are CAPA project sites: Waisa, Natokalau, Nasasaivua, Kiobo, Navatu, and Nabalabalawa settlements. The district's population of 529 is made up of 250 women (47%) and 279 men (54%). Seven communities are considered coastal, while the other three are located inland. Land is used for subsistence farming; crops harvested are either sold in the local community or brought to markets for sale. Marine resources, such as crabs, fish, and seaweed, are extracted for daily consumption as well as other livelihood options.

Dawasamu District

Dawasamu District is situated on the northeast coast of the Tailevu province on Viti Levu and consists of six villages, four of which (Nasinu, Nataleira, Delakado, and Natadradaveare) are CAPA project sites. The population of these four sites is 554: 254 women (46%) and 300 men (54%). The terrestrial ecosystem includes grasslands, forest, mangrove swamps, and fresh water. Although most communities are located near coastal areas, the main source of income is farming. The marine ecosystem is greatly affected by ongoing gravel extraction in the

Delakado River. This has led to the release of more sediment along the coastline, contributing to murky waters and diminished marine resources. Land is utilized for planting crops, such as cassava, duruka (Saccaharum edule), plantain, yaqona, and dalo, as well as for animal grazing. The main source of livelihood is subsistence farming and fishing.

Nakorotubu District

Vanua o Nakorotubu is one of the four main districts in Ra Province in the northeast of Viti Levu. There are seven communities in Nakorotubu District that are included as CAPA project sites: Nayavuira, Nasau, Veidrala, Saioko, Nabukadra, Nayavutoka, and Nadogoloa. The population of these villages is 662: 279 women (42%) and 383 men (58%). The villages are located along the coast, but their land boundaries extend to the inlands where community members practise farming and livestock grazing. The communities are mainly subsistence farmers and fishers. These communities' terrestrial landscape is mainly "talāsiga" soils and cliffs, which means arable land is limited. Their main livelihood activities include farming and small businesses, along with some fishing and formal employment.

Namalata District

Namalata District is located on the northeastern region of Tailevu province on Viti Levu. The villages of Veinuqa, Naitutu, and Davetalevu are three of the sites included under the CAPA project. The three communities have an average population of 509: 244 women (48%) and 265 men (52%). The communities are terrestrial, with mostly forest and freshwater ecosystems but no protected areas around them. Their main livelihood activities include farming, formal employment, small business, and government social welfare. Minor sources of livelihood include fishing, pensions, and remittances. Their farming yields include cassava, dalo, yaqona, plantains, and cabbage with ota and rourou along the riverbanks. The freshwater catch includes prawns, fish, and mussels.

Bua District

There are seven villages in Bua District, one of the nine districts in Bua Province: Bua, Dalomo, Tiliva, Tacilevu, Waitabu, Koroinasolo, and Nawailevu. The villagers sustain themselves through farming, fishing, and employment at the two sawmills. The district encompasses 19.59 km^2 of locally managed marine areas. Bua District has extensive mangroves, mudflats, and various reef types that provide essential habitats for marine life, including corals, fish, and other invertebrates, while offering shoreline protection. Deep lagoons dominate the qoliqoli area, with smaller sections of mangroves and mudflats inshore. There are seven existing locally managed marine areas within their qoliqoli.

The WCS, in collaboration with the communities of Bua District, developed a ridge-to-reef management model using the Ecosystem-Based Management tool to help communities sustainably manage their natural resources.

Bureta District

Bureta is one of four districts on Ovalau island (Fiji's sixth largest island) and is made up of four villages that are located along the Southeast coast of Ovalau Island. The four villages include Naiviteitei, Tai, Nasaga, and Navuloa. The villages make a living from farming and fishing, and a few villagers are employed by the Pacific Fishing Company in Levuka town. Bureta is also home to the largest locally managed marine area (Ovalau), which covers a total area of 5.64 km^2.

5.2 Observed Climate Change Hazards, Impacts, and Risks Across Communities

The most direct impacts of climate change and its hazards on the communities of Fiji are those that arise from an increase in extreme weather events like cyclones, heavy rain events with subsequent flooding, and prolonged droughts. The destruction of built infrastructure, such as homes, schools, hospitals, roads, electrical grids, and access to economic activities, has significantly impacted communities' livelihoods, food security, and general well-being. Sea level rise, rising ocean surface temperatures, and ocean acidification are increasingly impacting fish populations, marine biodiversity, and the productivity of the aquaculture industry, having long-term impacts on any sectors that rely on marine environments (Government of Fiji, 2018). The degradation of marine ecosystems may also impact tourism in Fiji, putting that major employment sector at particular risk (International Federation of Red Cross and Red Crescent Societies, 2021). Economic losses due to disasters or the long-term impacts of climate change are inevitable, but so to are the impacts to community well-being. Displacement due to disasters or relocation due to coastal erosion are sources of psychological stress and instability within households and communities (Government of Fiji, 2017).

Table 3. Observed climate change impacts and risks across communities in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts

Reported climate hazards and impacts	Consequences on people and ecosystems
Prolonged drought and dry season	• The long dry season is leading to infertile and dry land. Decreased soil fertility has resulted in decreased yields and bitter and acidic crops. • Drier seasons have caused the drying up of the drinking water sources and other freshwater bodies. • Prolonged dry weather causes withering of plants, giving rise to new plant diseases and bushfires. • Spring water provides an alternative water source, which is also affected during drought, and some spring water can only be accessed during low tide; otherwise, the groundwater is infiltrated with seawater. • The long dry season causes water contamination and makes communities have to travel further to get water. • During low tide, community members must move their boats for docking.

Reported climate hazards and impacts	Consequences on people and ecosystems
 Shifting and changing seasons	• Changes in the flowering and fruiting of tree crops; mangoes, for example, are no longer fruiting.
 Cyclones and frequent flooding	• Cyclones impact human settlements located in coastal areas and floodplains, impacting housing structures. • Climate-related events like cyclones have led to injuries and deaths. • Villages or houses located at hilltops are affected by strong winds during cyclone season. They are not cyclone proof. • Frequent flooding is a threat to communities' infrastructure, health and livelihoods. In some communities, bridges are poorly built and easily damaged due to flooding, impacting accessibility to villages. • Certain areas in some villages are more prone to landslides and water runoff. • Heavy rains and landslides have impacted community docks and boats. High sedimentation caused by upstream topsoil runoff is leading to infiltration of foliage and sediments into the drinking water supply, affecting water quality and clogging water pipes. • Excessive rainfall is affecting the germination cycles of native fruiting trees. • Access to education and health care facilities is impacted during storms and cyclones as roads become inaccessible. • Following disasters, there are increases in water-borne and skin diseases, with children commonly affected. • Water disruptions and the presence of improper drainage and water infrastructure will further contribute to water-borne and skin diseases.
 Crop and plant infestation of insects	• An increase in insects feeding on crops affects the yield and, in some cases, causes diseases in plants, with a direct impact on food security. • Continued use of pesticides will cause insects to build resilience to chemicals. • Indigenous forests have disappeared due to the unprecedented growth of African tulip and mahogany.
 Soil erosion and sedimentation	• High sedimentation caused by upstream topsoil runoff affects soil fertility. • The washing away of soil into the water source affects drinking water quality and clogs up water pipes. • Increased sedimentation along the coastal area leads to eutrophication in rivers and streams, resulting in habitat loss and a decline in the health of coral reefs, affecting the productivity and fertility of aquatic ecosystems.

Reported climate hazards and impacts	Consequences on people and ecosystems
 Warming ocean temperatures	• Increasing sea temperatures are leading to declining coral reef health (coral bleaching), negatively impacting fish size and numbers, crustaceans, and other marine invertebrates. • Community members now need to travel further out for extended periods of time to find food that was previously caught close to shore. • The size of seafood has significantly decreased, which can be attributed to changes linked to increased fishing pressure that severely limits the spawning and maturation periods of fish. These risks are likely going to increase in the future.
 Coastal erosion	• Coastal erosion decreases village boundaries and increases vulnerability to storm surges and saltwater intrusion. • Sea level rise and increased storm surges (king and high tides) on the coastline will lead to the extension of the highwater mark and flooded homes, causing the need for relocation of houses. • Increased sedimentation of the coastal environment destroys seagrass beds, which are an important habitat for sea cucumber and other invertebrates. • There will be a loss of habitable and arable land and contamination of freshwater. • Erosion causes declines in marine delicacies (nama, kaikoso, etc.). • It also impacts the health of coral reef ecosystems and causes a decline in the fish population.
 Shifting species and habitats	• Mangrove crab and other crustaceans are now found further away from where they were previously.

Source: Community consultations undertaken by WCS Fiji in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts in Fiji.

5.3 Observed Non-Climatic Drivers Across Communities

The integrated climate risk assessment identified several non-climatic drivers across the communities that contribute to the overall vulnerability to climate change and lower adaptive capacity:

- **forest deforestation:** Forests have become thinner due to farming and unnecessary cutting to make more arable farmland.
- **waste:** Disposing rubbish in the estuaries has decreased the number of fish coming upstream.

- **improper infrastructure:** Some infrastructure, such as bridges constructed near villages, has a negative impact on ecosystems. Some water drainage and water supply infrastructure is old.
- **water management:** Certain villages continue to experience extreme flooding due to upstream activities, including but not limited to intensive monocropping leading to the removal of buttress trees, river gravel extraction, and intensive logging resulting in riverbeds becoming shallow due to sedimentation.
- **unsustainable fishing practices:** This includes types of fishing nets used, water toxicants, and improper rubbish disposal that lead to decreased freshwater catch.
- **unsustainable land management practices:** This includes reclamation of mangrove swamps, burning forests to clear farming sites, overgrazing, clearing of land near riverbanks, and use of chemical pesticides and fertilizers that negatively impact terrestrial and coastal ecosystem services.
- **human activities:** This includes washing of clothes and use of excavators near water courses, which are impacting streams shared by multiple communities.

5.4 Climate Change Impacts on Women and Marginalized Groups Across CAPA Communities in Fiji

In Fiji, structural gender inequality is a driver of women's high degree of vulnerability to the impacts of climate change. In addition to coping with disasters and responding to climate change, many women in Fiji face additional challenges, such as access to resources, income, education, and health care (Asian Development Bank [ADB], 2022, Government of Fiji, 2017). For example, following Tropical Cyclone Winston, women in Fiji experienced an escalation of gender-based violence within temporary shelters and affected communities, as well as increased impoverishment during the recovery and reconstruction phases (Fiji Women's Rights Movement, 2018).

Climate change is expected to have a significant impact on women's roles in food production, whether through subsistence farming or crop cultivation for income, as it alters the types of crops that can be grown and their suitable locations; it impacts modern agricultural practices as well as crop variability and productivity; it raises concerns about the sustainability of water supplies; and it prompts the migration of disease vectors like malarial mosquitoes and crop pests to newly warmer regions (ADB, 2022; IPCC, 2014).

Shifts in coastal marine fisheries and diminished availability of fish stocks, compounded by climate change, are affecting women, men, and underrepresented groups in different ways. Women heavily depend on fisheries for their livelihoods and their families' food security, as they are significantly involved in subsistence fishing and tend to fish in shallow-water reefs, lagoons, or estuaries for small fish and seafood for subsistence or income generation. In rivers and estuaries, women fish for freshwater prawns, freshwater eels, goby, and crabs (ADB, 2022, p. 14). Although women in Fiji are greatly involved in the fisheries sector, they are either absent or inadequately represented in planning and management decision making in the fisheries sector (Thomas et al., 2020). Projections indicate a potential 50% decline in coastal fishery harvest by 2100 in the Pacific (IPCC, 2014). These repercussions will manifest more

gradually compared to extreme weather events and necessitate more enduring adaptation strategies in Fiji (CARE & Live&Learn, 2016; UN Women, 2020).

The integrated climate risk assessment revealed that vulnerability within communities is not equally shared, with women and girls experiencing higher levels of vulnerability to the impacts of climate change in terms of their livelihoods and well-being. Table 4 outlines the climate change impacts on gender and marginalized groups across CAPA communities.

Table 4. Observed climate change impacts on gender and marginalized groups across communities in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta District

Group	Description
Women	• The majority of women are not involved in decision making regarding natural resources, and while their opinions or concerns are brought up during village council meetings, they are rarely acknowledged. • Due to their participation in vulnerable sectors (agriculture, fisheries), women are particularly susceptible to climate shocks and are at an increased risk of impoverishment. • Women do most of the (typically unpaid) inshore work in subsistence fisheries. Due to declining fish population and size, women tend to travel longer distances along the coast to fish, spending extended periods away from home. • Frequent droughts are impacting water availability, forcing women to walk to nearby streams, creeks, and springs to collect drinking water and wash clothes. • Salt inundation around village boundaries forces women to go further inland to plant local vegetables for sale or have their vegetable plantations for home consumption. • Water contamination poses significant health risks for women, who rely on clean water for daily household chores. • Disasters also impact women disproportionately; after Tropical Cyclone Winston, gender-based violence escalated and women experienced more impacts from the economic downturn than men during the recovery and reconstruction phases (Fiji Women's Rights Movement, 2018).
The elderly	• Heatwaves and increased temperatures can lead to heat stroke, heat stress, heat exhaustion, and dehydration, with the elderly being most sensitive (Filho et al., 2019). • The elderly are more likely to be injured or die due to climate hazards; however, during extreme weather events, elderly people are being supported by the village and assisted to move to higher grounds.

Group	Description
People with disabilities	• Early warning systems may not be designed for people living with different types of disabilities, and they may not have access to these systems. Likewise, evacuation plans may not be designed with certain disabilities in mind (Government of Fiji, 2017). • People with disabilities are more likely to die or be injured due to natural hazards (Government of Fiji, 2017). • People with disabilities are less likely to be included in planning and decision making (Government of Fiji, 2017).
Youth and children	• Young people are part of the working age group in most communities. They assist in every type of labour and in community development. • They often lack knowledge with regard to the effects of climate change and mitigation methods that would improve their landscapes in the future. • Youth in rural communities are resorting to the use of tabu (protected) areas for resources and fishing, highlighting their vulnerability to environmental and resource constraints. • They are often left out of community decision making. • After displacement from climate hazards, children face higher risks due to the greater likelihood that women and children will live in informal housing arrangements until housing is rebuilt (Government of Fiji, 2017).

Source: Community consultations undertaken by WCS Fiji in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts in Fiji.

6.0 Recommended Nature-Based Solutions for Adaptation Options

As communities and ecosystems in Fiji continue to face the impacts of climate change, implementing effective adaptation strategies is essential. Based on CAPA's climate risk assessment, this section presents identified adaptation options to further enhance climate resilience. These options focus on NbS for adaptation—actions to protect, conserve, restore, sustainably use, and manage natural ecosystems—to strengthen the resilience of communities and ecosystems to the impacts of climate change. To most effectively address climate change, these actions should be seen as part of a broader climate adaptation strategy and implemented alongside other adaptation and mitigation efforts.

Based on findings from CAPA's comprehensive climate risk assessment and developed in collaboration with local communities, the following NbS for adaptation measures would benefit ecosystems and communities in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts:

Table 5. Recommended NbS for adaptation options across communities in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta District

Reported climate hazards and impacts	Recommended NbS for adaptation options
Prolonged drought and dry season	• Improved land management practices, such as the integration of trees and shrubs into crop and animal systems (agroforestry). • Planting of native trees along water sources. • Provide capacity building and awareness around sustainable farming practices and consider the reintroduction of traditional farming practices (note: traditional farming practices must also be adapted to future climate scenarios). • Shift toward planting of drought-tolerant and drought-resilient crops e.g., dalo ni tana and yams (tivoli ni rotuma).
Shifting and changing seasons	• Expand the planting fast-growing root crops (such as sweet potatoes).

Reported climate hazards and impacts	Recommended NbS for adaptation options
 Cyclones and frequent flooding	• Identify areas for land rehabilitation and enhanced ecosystem buffers. • Conserve existing trees and plant more trees, specifically breadfruits and beach almond trees (tavola) since they can withstand heat and drought much longer than other staple crops. • Set up a village-level natural resources committee (if non-existent). • Increase awareness about the impacts on flooding from illegal gravel extraction.
 Crop and plant infestation of insects	• Biological pest control. • Provide capacity building and awareness around sustainable farming practices.
 Soil erosion and sedimentation	• Planting of indigenous hardwood and fruiting trees (Tahitian chestnut) along the riverbanks. • Provide capacity building and increase awareness around soil conservation. • Sediment or silt socks (While not directly an NbS, this would provide protection of waterways and enhance their ecosystem services and should be considered in combination with NbS). • Encourage the movement of farming operations away from riverbanks. • Plant vetiver grass along riverbanks for increased stabilization. • Revegetate upstream deforested areas.
 Warming ocean temperatures	• Increase awareness and knowledge around the need for sustainable fishing practices. • Ban the use of undersized nets to refrain from the catching of undersized fish/crabs, etc. • Provide “fish warden enforcement” training and enhance patrolling of protected and tabu areas. • Plant super coral or corals with higher temperature thresholds.
 Coastal erosion	• Plant vetiver and mangroves on coastlines. • Install natural seawalls. • Protect and restore existing wetlands. • Preserve mangrove habitat and plant new mangroves. • Relocate houses that are on low-lying areas subject to regular flooding and erosion. • Biodigesters to minimize waste and deforestation in communities.

Source: Community consultations undertaken by WCS Fiji in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts in Fiji.

7.0 Recommended Measures to Advance Gender-Responsive and Socially Inclusive Adaptation

Not everyone can participate equally in the design and implementation of climate adaptation strategies and initiatives. For example, women and youth at the community level are significantly underrepresented and often lack confidence in their abilities to influence climate and biodiversity-related planning and decision making due to limited knowledge on conservation and environmental issues.

To ensure that climate adaptation initiatives in Fiji are effective, inclusive, and sustainable, deliberate effort must be made to adopt a gender-responsive and socially inclusive approach to their design and implementation. Such an approach can help facilitate the fair and equitable distribution of benefits and improve the adaptive capacity of communities. This section highlights key considerations for climate adaptation initiatives across the target communities in Fiji (see Table 6), drawing on lessons learned and insights from the integrated climate risk assessment.

These considerations are categorized into three pillars representing the CAPA Initiative's areas of focus for addressing gender and social barriers to promote GESI in NbS for adaptation outcomes among CAPA communities. These pillars were selected based on recent studies that revealed these areas to be the most salient to achieving equitable outcomes in NbS for adaptation (Caswell & Jang, 2024; Dazé & Terton, 2021).

In Fiji, during the integrated climate risk assessment, community dialogues (talanoa) were incorporated into the methodology to raise awareness. These dialogues highlighted gender equity, disability, and social inclusion in NbS for adaptation in 20 communities as well as gender-related gaps in conservation and adaptation needs and capacities. The dialogues were also used to help suggest gender-responsive NbS for adaptation interventions within the target communities.

Table 6. Recommended measures to advance gender-responsive and socially inclusive adaptation across target communities in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta District

Key Pillars	Recommended measures to advance gender-responsive and socially inclusive adaptation
Recognizing conservation and adaptation needs and capacities	• Support climate-resilient alternative income options to reduce fishing pressure on locally managed marine areas in Vatu-i-Ra Seascape and that support women-led enterprises (e.g., mud crab fisheries and Kuta grass weaving). • Organize peer learning for youth, women, and men to share knowledge and best practices and experiences on effective gender-responsive and conflict-sensitive NbS for adaptation. • Ensure the full and active participation of men, women, and youth in the community-led participatory approach to review and agree on strengthened fisheries rules for the relevant customary fishing grounds. • Formation of community patrol management committee with at least 30% participation of women or youth and capacity building on safety. • Ensure participation of women and youth in the monitoring patrols and boat master and fish warden training. • Gender-inclusive and socially inclusive fisheries management training.
Gender-equitable participation and influence in adaptation decision-making processes	• Conduct community awareness and training sessions to ensure meaningful participation and representation of youth, men, and women. • Community-led patrols by fish wardens that include women and youth to safeguard conservation areas and ensure compliance with fisheries rules. Capacity building focused on livelihood options (e.g., backyard gardening and food processing alternatives), with a focus on empowering women. • The farmer field school climate-smart agriculture training will be provided to community members. Recognizing the crucial role that women play in food production within communities, these gender-responsive farmer field school demonstrations will empower women to access training on growing vegetables and root crops, contributing to livelihood sustainability. Women and youth will be engaged in revegetation activities. • The capacity building, training, and activities will be conducted at times and locations that are convenient for women, given their time constraints.

Key Pillars	Recommended measures to advance gender-responsive and socially inclusive adaptation
Closing institutional gender gaps in adaptation policy and practices	• Conduct awareness training to communities and local leaders on GESI and the importance and value of gender-responsive and socially inclusive approaches in conservation and NbS for adaptation. • Incorporate key messages of GESI in NbS and GESI analysis findings into the outreach (e.g., animations) and promotional materials.

Source: Community consultations undertaken by WCS Fiji in Kubulau, Dawasamu, Nakorotubu, Namalata, Bua, and Bureta Districts in Fiji.

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