



Lami town, Fiji

Wainivokai settlement

COMMUNITY-BASED VULNERABILITY ASSESSMENT AND ACTION PLAN



**Wainivokai Settlement (Fiji) Community-Based Vulnerability Assessment and Climate Action Plan
(Abridged Version)**

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Woman weaving in Wainivokai Settlement
UN-Habitat/Begoña Peiro

1 INTRODUCTION

The Wainivokai Settlement (Fiji) Community-Based Vulnerability Assessment (VA) and Climate Action Plan (CAP) has been developed under the Fiji Resilient Informal Settlements (FRIS) project financed by the Adaptation Fund. This document is an abridged version of a comprehensive report, finalized in 2020. FRIS works in 16 informal urban settlements that are highly vulnerable to climate change and disaster risks, in four urban areas as part of a project implemented by UN-Habitat and executed by the Ministry of Housing and Community Development and the Ministry of Local Government.

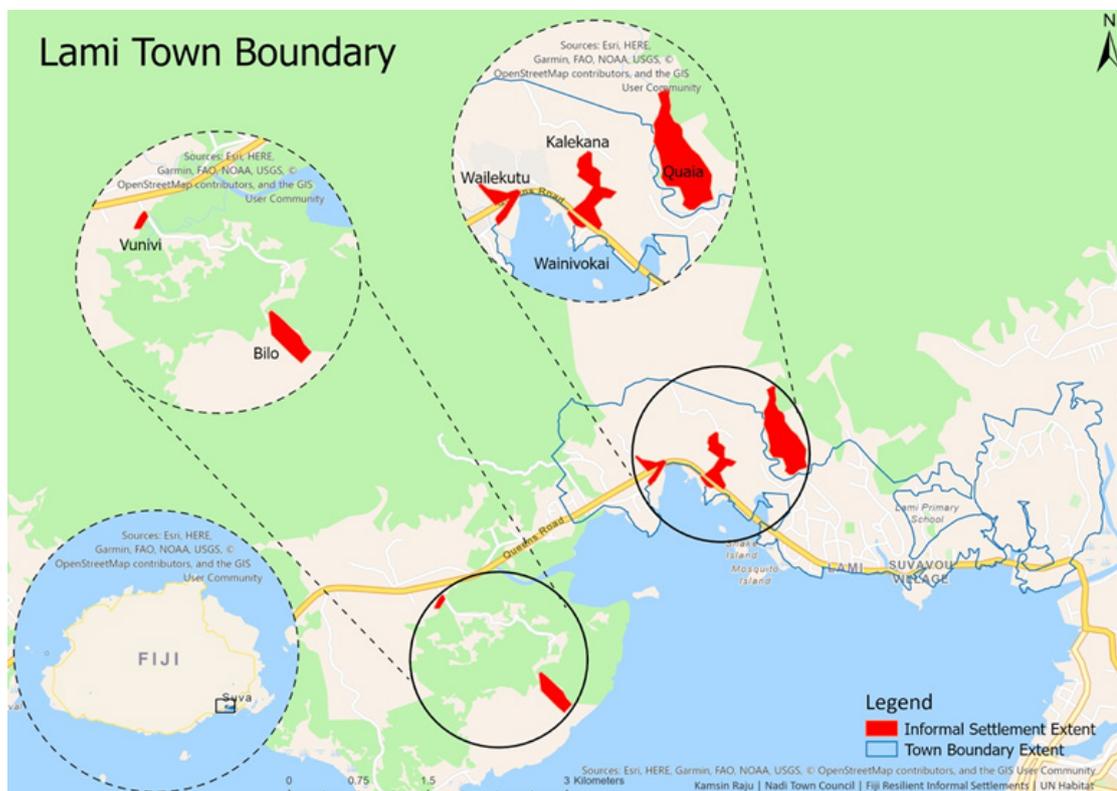
The high levels of physical, economic, social and environmental vulnerability in combination with poor levels of disaster preparedness and adaptive capacity often lead to high climate-related hazard impacts in informal settlements.

The VA and CAP guides the implementation of projects under component 3 of the FRIS project (Enhancing resilience of community level physical, natural and socio-economic assets and ecosystems).

The overall objective of the project is to increase the resilience of informal settlements communities in Fiji that are highly vulnerable to climate change and disaster risks. To achieve this, the project has four components:

1. Institutional strengthening for enhanced local climate response
2. Local (community/informal settlement) resilience strengthening
3. Enhancing resilience of community level physical, natural and socioeconomic assets and ecosystems
4. Awareness raising, knowledge management and communication.

Figure 1 Informal settlements that are part of the FRIS program in Lami Town, including Wainivokai¹



1. Prepared by: Kamsin Raju, Nadi Town Council

1.1 LOCATION AND PHYSICAL DETAILS

Fiji is located in the western South Pacific. It has a total of 322 islands located between 177°E–178°W and 16°S–20°S and a total land area of 18,333 square kilometers. Viti Levu and Vanua Levu are the two largest islands. These two islands form up to 87% of the total land area and are also the most populous areas nationally². Fiji's total population is 884,887 people, approximately 55.9 percent of whom reside in urban areas³.

Fiji is among the countries with the highest disaster risk, ranking number ten according to the World Risk Index (2018)⁴. Located in the Pacific Ocean's tropical cyclone belt, cyclones are the most frequent hazards to affect the country (with around two to three cyclones occurring every year)⁵. Additionally, the country has a high exposure to other environmental hazards, such as storm surge, severe storm, flooding, landslide, drought and extreme temperature, earthquake, and tsunami. The country is also vulnerable to rising sea levels, and more frequent and intense rainfall caused by climate change.

Although Fiji is recognized as being one of the most developed economies in the Pacific⁶, signs of socioeconomic inequality are rising, particularly with the expansion of informal settlements⁷. The 5-year and 20-year National Development Plan was prepared by the government in order to address development challenges. The plan's objectives include a doubling of the real gross domestic product (GDP) per capita by 2036 and to provide universal access to all services, including housing, electricity, clean and safe water and sanitation, high-quality education, and health care⁸. However, natural hazards and climate change represent a major obstacle to the achievement of these objectives.

Environmental hazards have far reaching negative impacts across a number of sectors in Fiji, including agriculture, housing, transport infrastructure, basic service provision, tourism and primary industries, among other. The majority of the country's cities and towns are located on the coast and along rivers, particularly exposed to seaborne and riverine natural hazards, cyclones, storm surges, coastal and riverine erosion, landslides, floods and already occurring sea level rise due to climate change. Moreover, mangrove deforestation and coral reef extraction for urban development are reducing the mitigating benefits of mangroves and coral reefs in providing a barrier against storm surges and cyclones. Given the increasing trends in urbanization and concentration of development along the coast, costs related to natural hazard-induced disasters are expected to increase with time.

Wainivokai settlement is located 2.4 km west of the center of Lami Town, outside the town boundary. Lami has a total area of 680 hectares and a total population of 24,637 people⁹. As compared to the urban population growth in Fiji, Lami's urban population growth has been slower, with a 0.2 percent per year in the town area and a 1.4 percent in the peri-urban areas¹⁰.

2. Fiji's First National Communication under the UNFCCC, 2005; Fiji's Pacific Adaptation to Climate Change, 2009

3. Fiji Bureau of Statistics. (2017). Population and Housing Census: Administration Report.

4. Heintze, H., Kirch, L., Küppers, B., Mann, H., Mischo, F., Mucke, P., Pazdzierny, T., Prütz, R., Radtke, K., Strube, F., Weller, D. (2018). World Risk Report 2018. (p. 7). Retrieved from: <https://reliefweb.int/sites/reliefweb.int/files/resources/WorldRiskReport-2018.pdf>

5. NDMO. (n.d.). Tropical Cyclones – Action Guide. Retrieved from: http://www.ndmo.gov.fj/images/Hazards/Tropical_Cyclone.pdf

6. Asian Development Bank (ADB). (2019). Pacific Finance Sector Briefs – Fiji. Retrieved from: <https://www.adb.org/sites/default/files/publication/529841/pacific-finance-sector-fiji.pdf>

7. World Bank (WB). (2017). Systematic Country Diagnostic 2017. Republic of Fiji. Retrieved from: <http://documents.worldbank.org/curated/en/529271512123603244/pdf/116491-revised-PUBLIC-ACS.pdf>

8. Ministry of Economy Republic of Fiji. (2017). 5-Year & 20-Year National Development Plan. Transforming Fiji. Retrieved from: <https://www.fiji.gov.fj/getattachment/15b0ba03-825e-47f7-bf69-094ad33004dd/5-Year---20-Year-NATIONAL-DEVELOPMENT-PLAN.aspx>

9. Fiji Bureau of Statistics. (2017). Population and Housing Census: Administration Report.

10. Fiji Bureau of Statistics. (2017). Population and Housing Census: Administration Report.

1.2 PURPOSE OF THE COMMUNITY-BASED VULNERABILITY ASSESSMENT AND CLIMATE ACTION PLAN

The community-based VA and CAP aims to inform the wider planning processes at the town and national levels, by providing an in-depth assessment on settlement level vulnerability, in addition to providing recommendations for action. This document presents a summary of the report developed under the project for dissemination. The original report includes additional information and a more in-depth analysis.

The VA aims to understand the level of vulnerability of systems in Vuniivi, by following a multi-scale approach. The VA has the following sub-objectives:

1. Identify the underlying causes of vulnerability.
2. Understand the perceptions on climate change and disaster risk from the residents living in the settlement.
3. Analyse the spatial dimension of exposed assets.
4. Identify the sources of livelihoods that may be vulnerable to the impacts of climate change.

Based on the findings of the VA, a CAP was developed to identify and prioritize potential community-level interventions. This aims to identify and prioritize climate change adaptation options that will enhance the resilience of physical, natural and socio-economic assets and ecosystems at the community level.

Girls playing in the settlement
UN-Habitat/Begoña Peiro



2 METHODOLOGY

Several data gathering methods have been employed in order to collect both the primary and secondary data needed to conduct the analyses. The methodology is designed to support local and national governments in identifying current and future drivers of vulnerability and to identify priorities for climate change adaptation.

Community level data was collected around five key components: (i) **Population**; (ii) **Urban use**; (iii) **Natural resource-based production**, (iv) **Critical point facilities**; and (v) **Lifeline utilities**. The data collected from both primary and secondary sources provide information on climate hazards and variability and support three main analyses: (1) **Hazard exposure analysis**; (2) **Sensitivity analysis**; and (3) **Adaptive capacity analysis**.

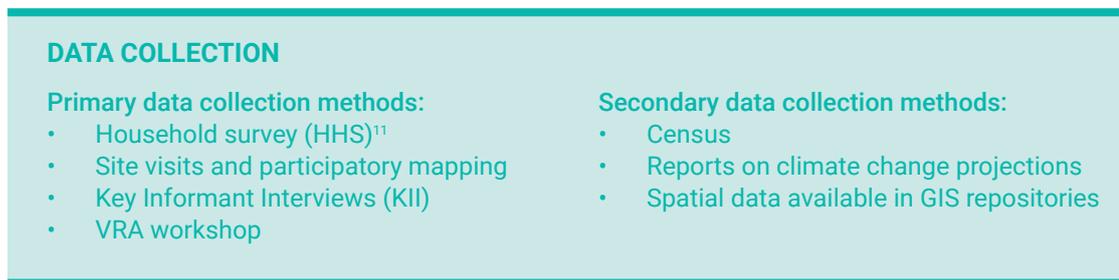
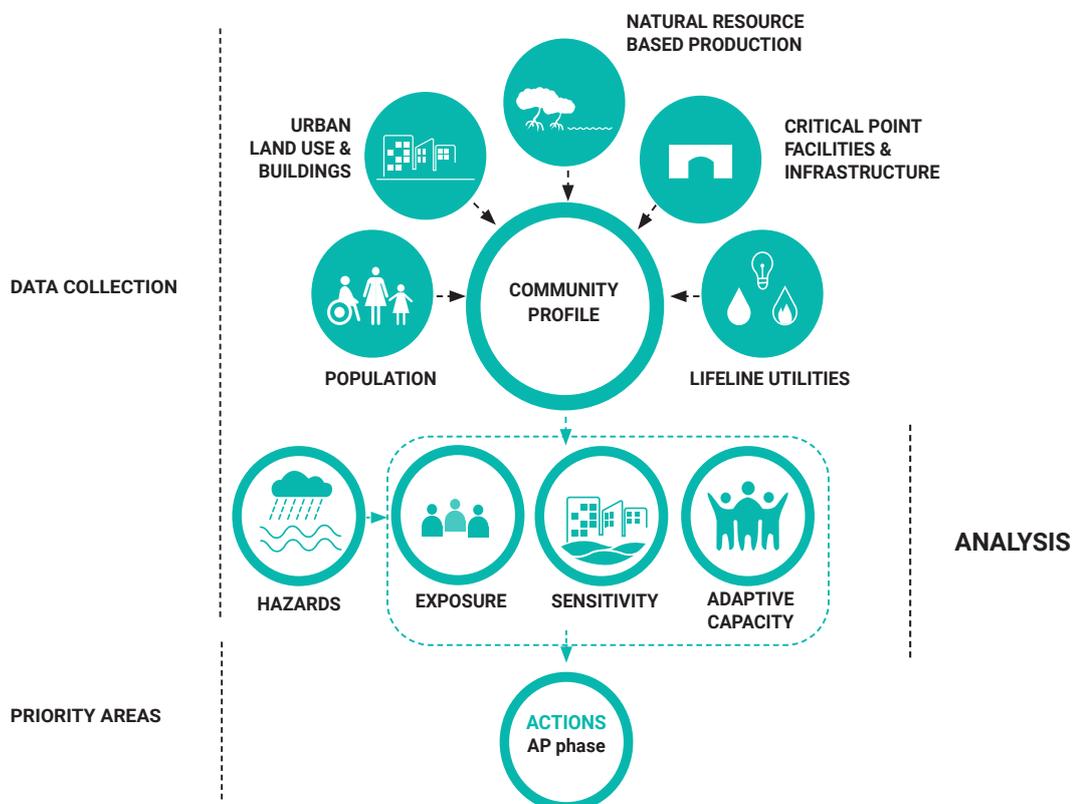


Figure 2 Analytical Framework



11. The HHS provides predominantly quantitative data on the household unit, and the community unit once aggregated. The assessment makes a distinction between household and house. Household refers to the family unit living in a same dwelling, and house refers to the physical structure. When providing information regarding the HHS, the unit considered is the household. The household survey covered 100 per cent in Vuniivi settlement. Eleven households were identified at the time of the assessment, and all of them were surveyed.

3 WAINIVOKAI SETTLEMENT

Wainivokai settlement is located 2.4 km west of the center of Lami Town, outside of the town boundary. Wainivokai settlement covers approximately 0.7 hectares (7000 square meters) measures approximately 200 meters in length between its longest points and 70 meters in width. The total population surveyed in Wainivokai amounts to 82 people¹², from which 45 are male and 40 are female. The total estimated population is 99 people¹³. In terms of age distribution, persons aged from 0 to 24 years old represent a half of the settlement population (46 percent). The youth age group (15-24) accounts for 12 percent of the population. Based on the data collected, there are no people aged over 75 in the settlement, and only two within the 70-74 age range. Most households (70 percent) have been living in the settlement for over 50 years.

The community has an established community leader, who is chosen by community members. Among his roles are conveying meetings with community members and acting as the focal point for outside organizations and institutions. At the household level, all of the households in Wainivokai have an established head of household. Moreover, most of the households (70 per cent) have been living in the settlement for over 50 years.

¹². 20 out of 24 households were surveyed.

¹³. For those households that were not surveyed, the average household size is used.

26	Total number of houses	7.143 m²	Total area within boundary
24	Total number of households	3.126 m²	Residential buildings area
2	Uninhabited buildings	73 m²	Civic buildings area
99	estimated people living in the settlement	3.944 m²	Open space area



4 CLIMATIC FEATURES, HAZARDS, PERCEPTIONS

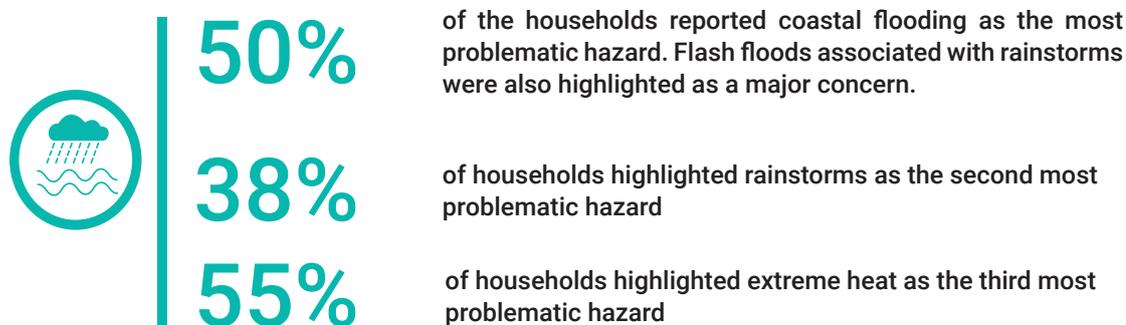
Fiji is generally considered to be an oceanic tropical marine climate¹⁴. There are two distinct seasons namely, a warm wet season from November to April and a cooler dry season from May to October¹⁵.

Regarding climate variability, the major features driving climate in Fiji are¹⁶:

- **The El Niño Southern Oscillation (ENSO) phenomenon**, which occurs every two to seven years, four years on average. It is the most important influence on inter-annual climate variations in the country. It strongly influences rainfall, temperature and tropical cyclones. Dry seasons during El Niño event tend to be drier and cooler, with droughts being associated to these periods. On the contrary, La Niña events are associated with floods, depressions and tropical cyclones.
- **The South Pacific Convergence Zone** strongly influences the seasonal cycle, which is most intense during the wet season and closer to the country¹⁷.
- **The trade winds** bring orographic rainfall to the eastern parts of the country. Around 70% of the national annual average rainfall occurred during the wet season (over the period from 1961 to 2010).

4.2 COMMUNITY PERCEPTIONS OF KEY IMPACTS

Being located along the coast next to a mangrove area, social, economic and natural systems in Wainivokai are exposed to multiple hazards. Based on primary data collected, residents face key challenges due to a number of climate-related hazards, including cyclones, floods, extreme heat, and vector-borne diseases.



Floods are among the hazards with the highest impacts in the country. Coastal flooding is one of the main issues affecting residents from Wainivokai regularly. The combination of Spring tide and heavy rainfalls is particularly problematic. During FGDs, coastal flooding was noted as a critical issue by community representatives, mainly to the houses located in the mangroves as the sea water often impacts its structure by damaging foundation, stilts and footpaths. Furthermore, community members highlighted a perceived increase in surface runoff associated with heavy rainfalls that leads to flooding of certain areas (Figure 37) which cause disruptions to their lives by affecting crops, accessibility across the settlement and saturation of poorly constructed sanitation systems.

Other hazards highlighted as the most problematic include: rainstorms, river floods (in relation to the river that is located on the southwestern side of the settlement), extreme heat, vector-borne diseases and other (specifically referring to skin diseases that are caused by extreme heat).

14. Government of Fiji. (2019). National Climate Change Policy. Retrieved from: https://www.pacificclimatechange.net/sites/default/files/documents/National-Climate-Change-Policy-2018---2030_0.pdf

15. Pacific-Australia Climate Change Science and Adaptation Planning Program (PACCSAP). (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.

16. Government of Fiji. (2018). Climate Vulnerability Assessment – Making Fiji Climate Resilient.

17. Ibid



Houses along the coast
UN-Habitat/Begoña Peiro

5 CLIMATE CHANGE AND FUTURE RISKS

5.1 CLIMATE CHANGE PROJECTIONS¹⁸



2090

Extreme rainfall events are expected to increase, becoming more frequent and intense.



2090

The total number of storms is likely to decrease over time, however. The proportion of Category 4 and 5 tropical cyclones is likely to increase.



2090

Temperatures are expected to increase as well as temperature on extreme hot days.



2090

Mean sea level will continue to rise, with projected increases of 38–87 cm by 2090 under the RCP8.5



2090

Ocean acidification is expected to continue increasing, leading to coral reef bleaching and destruction.



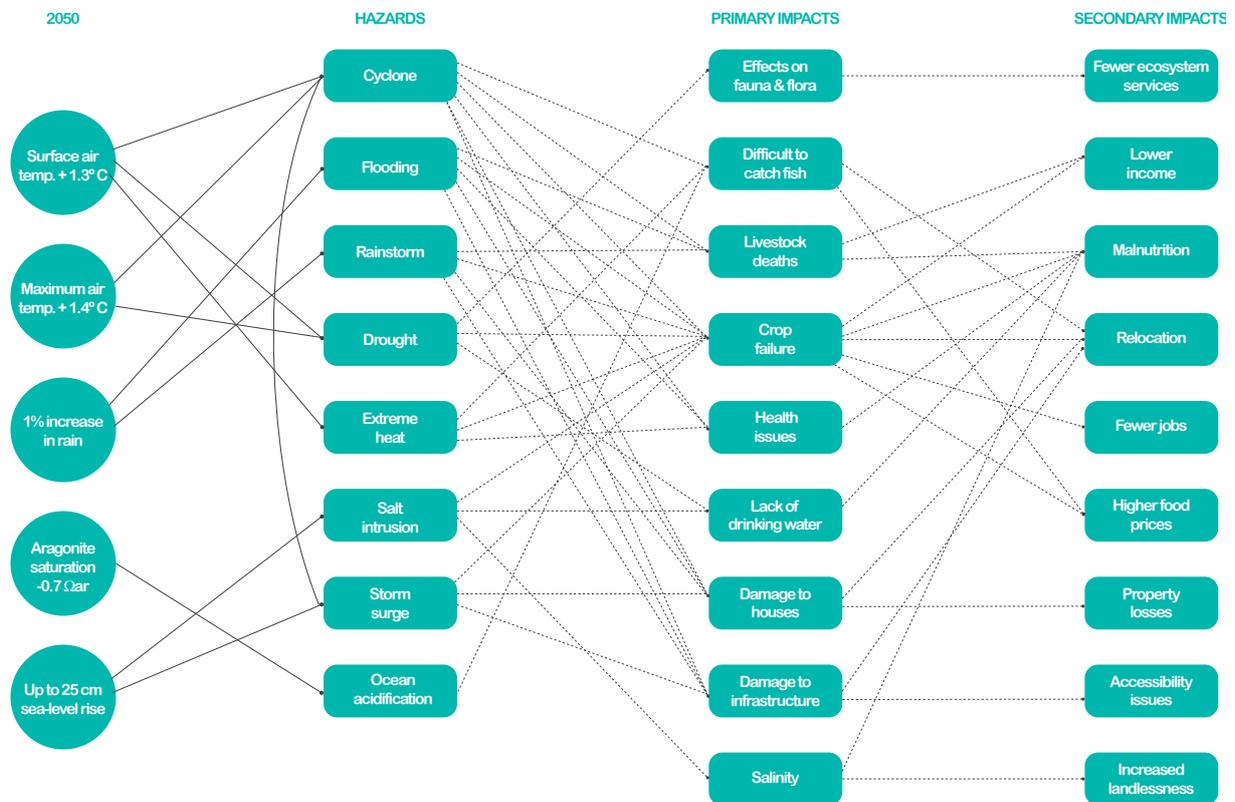
2090

Landslides represent a significant risk that can increase in response to heavier rainfall.

¹⁸. Based on: PACCSAP Program, (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.



Figure 3 shows the main hazards that affect Wainivokai settlement and primary and secondary impacts^{19, 20}



19. Climate projections based on: PACCSAP Program, (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.

20. Surface air temperatures in the Pacific are closely related to sea-surface temperatures (SST), so the projected changes to air temperature can be used as a guide to the expected changes to SST.



5.2 EXTREME CLIMATE EVENTS FUTURE RISK

The assessment carried out relies on existing sets of climate change projections that are available and were produced by the Pacific-Australia Climate Change Science Program (PACCSAP)²¹.

Cyclones:

Despite projections that tropical cyclogenesis will decrease, the intensity of cyclone events is expected to increase. Increase in strong winds is expected to result in damage to housing stock and critical infrastructure. Cyclones will impact livelihoods through damage to land and crops, livestock and by increasing difficulty in catching fish. Increased intensity of cyclones will impact on people's mobility and has the potential to displace vulnerable communities, both temporarily and permanently.

Extreme Temperatures:

Projected increase in temperature, in particular on extremely hot days, is expected to have significant impacts on local health. Higher temperatures lead to lower water availability during the dry season. Higher temperatures also increase the incidence of mosquitos, the risk of crop failure, and livestock health impacts. This has a socioeconomic impact on communities by reducing income reliability and increasing food insecurity due to increased food prices.

Rainfall:

Projections a wide range of change in annual rainfall, from increase to a decrease and with little change on the model average. Findings show that the effect of climate change on average rainfall may not be obvious in the short or medium term, due to natural variability, with year-to-year rainfall variability being generally larger than the projected change (except for models in the highest emission scenario by 2090).

The frequency and intensity of extreme rainfall events are projected to increase. This is expected to damage crops and cause livestock deaths. Food security will increase due to crop loss. Despite increased water availability, rainwater is difficult to capture without proper infrastructure, and flooding is likely. Flooding will cause accessibility issues and damage housing stock.

21. PACCSAP Program, (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.

Urban farming can enable sustainable livelihoods, particularly in areas such as Wainivokai Settlement in Lami. The settlement has been transforming every piece of unbuilt land into an urban garden. Prior to the COVID-19 pandemic, many residents worked in cement and food factories in Lami Town. However, with the pandemic, many lost their jobs. This resulted in many families becoming more dependent on the land and the sea for food. Family members spent most of their time working on the farms during lockdown during April and May in 2020. Mr. Samuela who is part of a youth group in Wainivokai says that this has benefitted the youths of the settlement in many ways, including learning valuable skills.



6 VULNERABILITY

Wainivokai's vulnerability was assessed through three lenses:



6.1 VULNERABLE GROUPS: WOMEN, YOUTH, ELDERLY, PEOPLE WITH DISABILITIES

Gender inequality in Fiji is a key driver of vulnerability to climate change with several studies demonstrating that women and girls are highly vulnerable to the impacts of climate-related disasters. The increase of Gender Based Violence (GBV) and violence against children after disasters has been widely documented by humanitarian agencies coordinating emergency response efforts²². Evidence indicated that violence against children increased after TC Winston as a result of heightened stress and vulnerability from caregivers. Incidents of sexual violence were also reported after the two tropical cyclones hit the Western division of Fiji in 2012 by women living in relief centers²³. Moreover, people with disabilities and especially women are at particular risk of domestic violence due to their intersecting vulnerabilities²⁴.

Additionally, unequal participation in governance and political processes also limits women's ability to influence important processes and decision-making in areas relevant to climate and disaster risk management. Due to these social norms, the full potential of women to contribute to increasing the capacity of their communities to manage climate and disaster risk is often not reached.

In Wailekutu, all individuals aged 6 to 16 (corresponding to the age ranges between education years 1-12, compulsory in the country) have been reported as being involved in education programs. However, none of the children under 6 were reported as attending kindergarden.

22. UN Women. (2014). *Climate change, Disaster and Gender-Based Violence in the Pacific*.

23. UN Women. (2013). *The 2012 Fiji Floods: Gender Sensitivity in Disaster Management*.

24. Government of The Republic of Fiji (GoF). (2017). *Climate Vulnerability Assessment*. Washington, D.C.: The World Bank Group.





Houses in Wainivokai settlement
UN-Habitat/Begoña Peiro



Wainivokai settlement
UN-Habitat/Begoña Peiro

6.2 EXPOSURE



Exposure is defined as the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected²⁵.

Wainivokai occupies an approximate total area of 7,143 square meters. Being located along the coast next to a mangrove area, Wainivokai's social, economic and natural systems are exposed to multiple hazards. During the participatory workshop, community-members identified key locations, infrastructure and assets. Participants schematically demarcated the areas that are exposed to the main climate-related hazards that affect their community and discussed key impacts (see Figure 3).

Participants said that they believe that cyclones have increased in intensity (higher categories of intensity) and in frequency. The cyclones identified as having particularly affected their community in the past are Winston (2016), TC Sarai (2019), and TC Harold (2020). TC Winston was highlighted as the cyclone with the largest impacts, damaging roofs, toilets and causing tree incidents. Based on the information provided, storm surge during cyclones has caused flooding in the past. In order to adapt to this situation, 90 percent of the households are built on stilts. During TC Harold, water only flowed inside one house, which is located on the western side of the settlement. Although cyclones have caused property damage in the past, no casualties were reported.

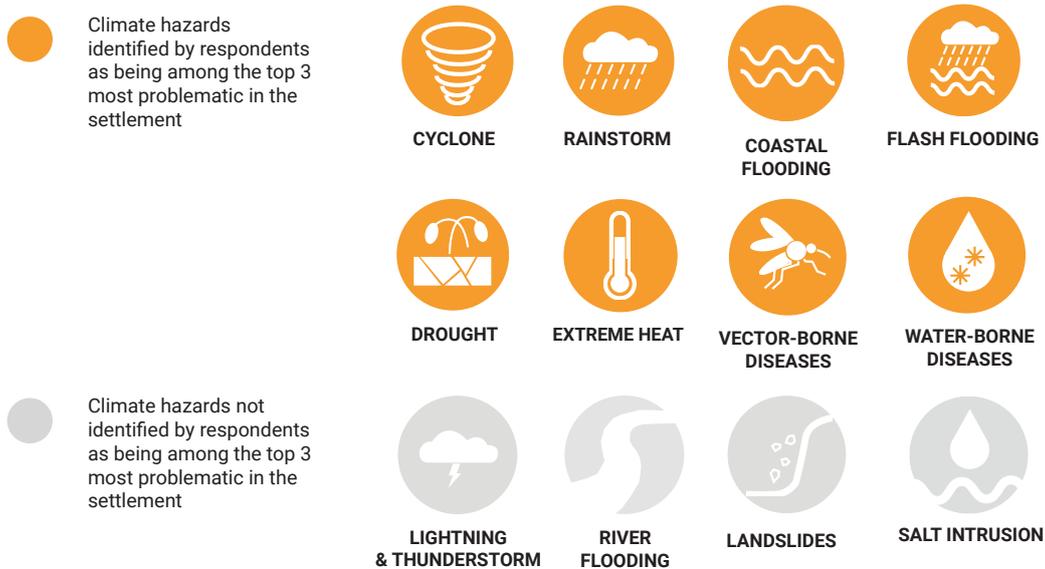
Figure 3 Hazard exposure map developed in participatory workshops



25. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland

Figure 4 shows the hazards that were highlighted by respondents as being amongst the three most problematic hazards for their household. While these are the hazards that residents perceive as being problematic based on their experiences, it does not mean that other hazards do not pose risks in the settlement.

Figure 4 The most problematic hazards identified by respondents in the settlement



6.3 SENSITIVITY



Sensitivity is defined as the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change²⁶.

(i) Population

All residents of Wainivokai can be considered informal settlers, as they do not have formal land tenure arrangements. Perceived land security regarding land tenure is low. 70 percent of the surveyed households reported having lived in the settlement for over 50 years. The dependency ratio in the settlement is 57, slightly higher than the national average of 54²⁷. Young dependents make up 84 percent of the total dependents, whilst elderly people (aged over 65) make up the remaining 16 percent. There is a large proportion of children under 4 years old (17 percent of the total population). 33 percent young people (aged 15-24) in the settlement are neither in employment, education or training.

(ii) Urban Land Use

The town council is responsible for ensuring that buildings are compliant with the building code. However, often, compliance is not checked in informal settlements. In terms of informal land use, most of the settlement is residential, with only one building as the exception (a church). Based on the HHS, 50 percent of houses were constructed after 2010, and 40 percent were constructed between 1981 and 2010 (the rest could not be dated). Given the low durability of the structures of the houses and building materials, this could indicate that despite living in the settlement for many years, families have had to rebuild their houses. All houses in the settlement are one storey high and mostly located on relatively flat terrain. Most houses are on stilts (except two houses), 85 percent of which are made of wood, the rest are concrete. 56 percent of houses are less than

26. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland

27. World Bank. (2019). Retrieved from: <https://data.worldbank.org/indicator/SP.POP.DPND?locations=FJ>

half a meter off the ground. 22 percent have stilts between 0.5 and 1 meter high and the remaining 22 percent are between 1 and 1.5 meters. The condition of wooden stilts is in most of the cases very poor. The combination of humidity variations (being partly under the groundwater level and partly exposed above the ground level), the variation of the water level due to tidal flooding, lack of adequate treatment of the wood have led in many cases to pathologies of different sorts.

(iii) Natural Resource-based Production

Wainivokai Residents depend on natural resources for food and livelihoods, as well as for protection. Mangroves not only provide coastal protection from waves and storm surges and prevent coastal erosion but are also an important source of food and wood. Despite being located along the coast, dependency on fishing is not as high as in other settlements. However, there are still a number of households that reported fishing frequently (39 percent), mostly for subsistence. During FGDs, participants mentioned that they have perceived a decrease in the availability of fish. Impacts associated with coral bleaching are expected to lead to loss of fish habitat. Participants also mentioned that there has been an increase in pollution and amount of waste washed up the shore. The importance of reducing the amount of plastic being used and the importance of maintaining mangroves healthy and not cutting them was also highlighted by participants during the FGDs.

There is a lower level of dependency on crops (as compared to other settlements), which is likely related to the lack of land available. Moreover, the limited land there is affected by coastal floods. The main subsistence crops include taro and cassava. Climate change impacts on root crops are expected to be lower as compared to grain crops. Expected impacts on cassava crops on the short term (2030) are insignificant to low, and those on taro crops are low to moderate²⁸. Other climate-related impacts that are expected to increase, and that could present a risk to taro crops, is the increase in pest incidences due to increased temperatures.

(iv) Critical Point Facilities & Infrastructure

Wainivokai is located along Queen's Road, adjacent to the coast. Accessibility was highlighted as a positive aspect of life in Wainivokai by 60 percent of households, who referred to the settlement's location close to nearby amenities. Accessibility across the settlement is challenging. There is a reasonable gradient on between the low and high sides of the settlement. Most houses are located on the lower ground along the mangroves. Footpaths have been constructed by residents with various materials (e.g. concrete, gravel), but are in poor conditions. Footpaths located on the lower side of the settlement are in the worst condition.



Site visit
UN-Habitat/Begoña Peiro

28. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland

(v) Lifeline Utilities

All the households in the settlement reported having access to water supply provided by the Fiji Water Authority (FWA). 95 percent of respondents reported the quality to be good. Issues with access to safe drinking water are mainly linked to the poor levels of water supply infrastructure. Pipes are often exposed, leading to damages and leaks.

Like the other settlements in the periphery of Lami Town, Wainivokai does not have access to sewerage infrastructure. 60 percent of households share sanitation facilities. 35 percent of households have basic sanitation facilities, characterised by pour/flush toilets connected to a pit latrine, ventilated improved pit latrine/ composting toilet. 5 percent of households practice open defecation. The poor sanitation conditions are particularly concerning given that frequent coastal and flash flooding causes excreta to rise back up and overflow, heightening the risk of water contamination and water-borne disease spread. Moreover, many septic tanks are poorly constructed and some discharge directly into the ocean.

All households reported disposing of their household waste into bins provided by the town council. However, rubbish can still be found spread across the settlement. Community representatives reported that waste is regularly washed up on the coast and dragged by heavy rains from higher areas. 80 percent of households have access to electricity. Power cuts are frequent and can last up to several weeks after a cyclone. 'Fuel-stacking' is a common issue in all households. This is generally formed by a combination of either kerosene or gas with fuelwood.



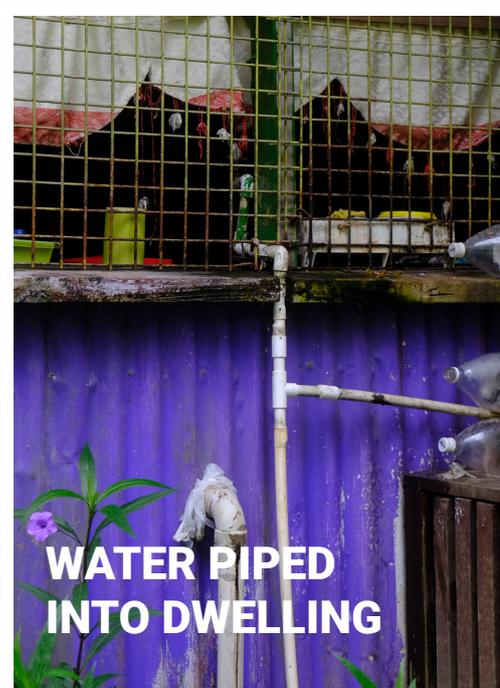
WATER PIPES & DRAIN



SANITATION



MANGROVE AREA



WATER PIPED INTO DWELLING

6.4 ADAPTIVE CAPACITY



Adaptive capacity is the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences²⁹.

Three different levels of adaptive capacity are analysed:

- (i) **Independent Capacity,**
- (ii) **Collective Capacity,**
- (iii) **Institutional Capacity.**

(i) Independent Capacity

Independent capacity is how individuals or families are able to respond and adapt to climate hazards without assistance from the larger community or local government. Also referred to as 'autonomous' adaptation³⁰. In this report the unit considered for the analysis is the household.

The limited financial resources at the household level combined with the low access to financial assistance and social protection services indicate that the level of economic wealth and financial capital at the household level is low in Wainivokai.

The Department of Social Welfare, under the Ministry of Women, Children and Poverty Alleviation (MWCOPA) is the lead agency for social assistance in Fiji and administers the core social protection programs, which are: the Poverty Benefit Scheme (PBS), Care and Protection Allowance (CPA), and Social Pension Scheme (SPS), Food Voucher Program and the Free Bus Fare Program.

45 percent of households reported having no access to any social programs. 45 per cent of the households reported that at least one member in the household had access to the free bus fare program. Only one household reported at least one household member having access to the food voucher program. Similarly, only one household reported having access to the social pension scheme. Three households mentioned having access to the poverty benefit scheme.

Most respondents reported having access to information on climate change, either through technology (including radio, television, etc.) (90 percent), or through social media (70 percent). With regards to disaster preparedness, most households reported having access to early warning systems (EWS). 80 percent of households reported receiving SMS alerts. 70 percent reported receiving early warning through community notification systems. 50 percent of households reported having an evacuation plan, but only 10 percent mentioned being connected to a formal DRR network.

When asked about the types of post-disaster assistance that the household had received in the past, 50 per cent of the households reported not having received any kind of aid in the past. 15 per cent mentioned having received money, 10 percent received food items, water and assistance or construction materials for shelter, and a first aid kit.

²⁹. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland

³⁰. UN-Habitat, 2014. Planning for Climate Change

(ii) Collective Capacity

Collective capacity is how well are communities, neighbourhoods or other groups able to respond and adapt to climate hazards without assistance from government or other agencies and institutions³¹.

Households reported using the LTA Fiji Cooperative as an evacuation centre during extreme climate events. Participants also reported using the Wainivokai church as an evacuation centre, however they also expressed concerns about the condition of the roof. There is a lack of financial capital at the community-level, as there are no collective savings groups or systems in place. Despite individual households reporting having access to early warning systems (either through radio or SMS), the community is not connected to a formal DRR network nor has a formal evacuation plan.

Material resources, infrastructure and access to services are very limited in the settlement. Houses are often built by household members and there is a lack of skills in climate resilient building techniques amongst community members. According to the household surveys, the main concern regarding disaster impacts is related to the damage and loss of property. Retrofitting and improving the housing stock would greatly benefit community members by minimising property losses.

There are community leadership structures in place community (e.g. established community leader) that have been effective following past disaster events. However, during FGDs, participants mentioned that in Wainivokai, people tend to organize and respond to their needs individually as household units, rather than through community organizations. Strengthening community structures that can carry out activities such as the organization of regular meetings to discuss community matters, small fund-raising activities, etc. could benefit residents.

³¹. Ibid



(iii) Institutional Capacity

Institutional capacity is how well an established government is able to, or would be able to, respond and adapt to climate hazards (e.g. organizational systems, policies, regulations, human resources, technological resources)³².

Fiji's 5 –Year and 20-Year National Development plans lay out the country's development agenda in realizing the Sustainable Development Goals and Nationally Determined Contribution under the Paris Agreement.

Fiji's National Climate Change Policy (NCCP) further articulates Fiji's priorities in reducing present and future climate risks in alignment to the National Development Plans. These Plans envisage 9.3 billion FJD expenditure on climate change adaptations over the next two decades. Despite this, financial capital remains lower than the identified needs.

The NCCP recognizes the important roles local government entities play in delivering the policy's objectives and in providing coordination at the community-level. At the moment, councils do not have a budget dedicated to the implementation of climate adaptation activities but may access funds through specific projects (e.g., mangrove conservation projects in Lami Town Council). The NAP is meant to provide mechanisms and arrangements that will allow to progress local government facilitation, promoting bottom-up approaches at district and community levels.

The National Disaster Management Office carries out activities such as community awareness programs and disaster management trainings. However, informal settlements are often left out of formal systems, networks and programs. For example, activities such as the community awareness programs have been carried out in villages, but not in informal settlements up to the date. Given that informal settlements such as Wainivokai are often located in highly exposed areas, combined with a high level of sensitivity, the introduction of awareness raising programs and improved disaster preparedness are a priority.

³². Ibid



7 CLIMATE ACTION PLAN

The main purpose of the CAP is to empower communities to identify community-level interventions that will strengthen their resilience to climate change while driving development. On the one hand, the prioritized actions resulting from this process will lead to the selection of projects that are financially supported by the FRIS project. On the other hand, the CAP aims to support national and local government decision-making, particularly in relation to upgrading of informal settlements and their enhanced integration into the urban system.

Several community workshops held with local stakeholders (including vulnerable groups such as women, youth, the elderly, and people with disabilities) helped to identify key vulnerabilities, climate risks and identify adaptation options and priorities. Integrating quantitative datasets and community perceptions during the VA phase allow for critical consideration of both community and scientific understanding of climate variability and change.

7.1 CLIMATE RESILIENCE & THE SUSTAINABLE DEVELOPMENT GOALS

As stated in the National Climate Change Policy, vulnerability to climate change in Fiji has the potential to derail and undermine progress against each of the SDGs³³. Building climate resilience is critical to the implementation of the SDGs. However, existing development deficits exacerbate communities' vulnerability to climate change. As such, the action plan prioritizes a holistic approach through actions that build climate resilience alongside sustainable development co-benefits.

7.2 ALIGNMENT TO FIJI'S NATIONAL PLAN

Fiji's National Adaptation Plan³⁴ (NAP) is aligned to international processes such as the SDGs of the 2030 Agenda, the Paris Agreement of the UNFCCC and the Sendai Framework for Disaster Risk Reduction. It contains 160 adaptation measures that are to be prioritized over the five-year period of the NAP, organized across a total of 10 components (five systems components and five sectoral components). The actions included in this report are aligned and respond to the aforementioned focus areas.

OPTION IDENTIFICATION & PRIORITIZATION

During the workshops, key climate-hazards were discussed, linking the options to these hazards and related impacts. Integrating quantitative datasets and community perceptions during the VA phase allow for critical consideration of both community and scientific understanding of climate variability and change. Similarly, the option identification process considered both community inputs, that allowed the team to capture local and traditional knowledge, and technical inputs from experts. The options identified were derived from the findings of the VA and prioritized based on a multi-criteria assessment (i.e. link to hazards, SDG co-benefits, ease of implementation, urgency and cost).

7.3 PRIORITIZED SHORTLISTED ACTIONS

During the participatory workshops, potential adaptation options were co-designed and discussed. Some examples include improved sanitation facilities that are resilient to floods, and rainwater harvesting tanks to ensure continuous access to water. Based on the long-list of adaptive measures (see Annex A), a short-list was prepared and prioritized. Below is the table that includes the short-listed options and the results from the community ranking. These were also assessed against the following criteria: acceptability, community

³³. Ministry of Economy, Republic of Fiji, (2019). National Climate Change Policy 2018-2030.

³⁴. Government of the Republic of Fiji, (2018). Republic of Fiji. National Adaptation Plan. A pathway towards climate resilience. Retrieved from: https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan_Fiji.pdf

support and technical feasibility. This work forms the basis for the selection of options that will be implemented as part of the FRIS project. However, it must be noted that the fact that the options have been shortlisted does not mean that all of them will be implemented. The next steps of the project include further developing the priority actions for their implementation. This will be done in a participatory manner and will involve technical experts (e.g., engineers, architects, etc.), representatives from the Ministry of Housing and Community Development as well as from the local government with support from UN-Habitat.

PRIORITIZED OPTIONS	SDG CO-BENEFITS	COMMUNITY RANKING
Interventions in physical, natural and social assets		
Coastal protection	 	1
Construction of adequate footpaths across the community	 	2
Improved sanitation facilities (resilient to floods)	 	3
Storage units for livelihood materials	 	4
Trainings and awareness raising		
Training on waste management following a participatory approach that identifies opportunities linked to livelihoods	  	5
Trainings on safe construction for hazard proof shelters for low-income residents	 	2
WASH trainings that target adults and children	 	4
Disaster preparedness and response related activities	 	1
Training on financial literacy and social protection programs	 	7
Establish youth community groups and increase their skills and capacity		3
Training on livelihoods linked to sustainable agricultural practices	 	6

The following activities were identified and shortlisted, aiming to supported the project implementation:

- Reinforce existing governance structures at the community-level to ensure project ownership.
- Establish youth community groups and promote their participation in awareness raising and project implementation activities that can increase their skills and capacity.
- Engagement through design process of the retrofitting actions, following a participatory approach.
- Awareness raising and trainings on maintenance requirements of sanitation facilities.

ANNEX

Long list of climate change adaptation options

- Interventions in physical, natural and social assets
- Trainings and awareness raising activities
- Activities that support the project implementation

These actions were identified as part of the long-list of adaptive measures, and were short-listed for further prioritization.

OPTIONS	SDG CO-BENEFITS	EASE OF IMPLEMENTATION	URGENCY	COST	TOTAL
Population key area					
Community involvement in elimination of larval habitats (through clean up campaigns and awareness raising)	 	2	2	3	7
WASH trainings that target adults and children	  	2	3	3	8
Awareness raising campaigns that promote more sustainable options to solid waste management	 	2	3	2	7
Training on waste management following a participatory approach that identifies opportunities linked to livelihood options	  	2	3	3	8
Trainings on safe construction for low-income residents	 	2	3	3	8
Incorporating informal settlement areas to be covered by relevant authorities (including compliance with building codes)	  	1	2	1	4
Development of catalogue of hazard proof options for low-income residents that takes into consideration local and affordable materials that are available	 	2	2	3	7
Low-cost retrofitting to strengthen existing household structures, especially roofs	 	1	3	1	4
Identify financial support options and promote informal settlements upgrading and regularization of land tenure	 	1	3	2	6
Localized interventions to improve the housing conditions of those structures that are identified as being in the worst conditions	  	2	3	2	7
Set up disaster management committees to discuss disaster preparedness and response regularly	 	3	3	3	9
Plan and define evacuation routes	 	3	3	3	9
Link community level early warning system to formal networks, city-wide disaster response communications technologies and procedures.	 	3	3	3	9
Evacuation drills	 	3	3	3	9
Reinforce existing governance structures at the community-level to ensure project ownership as the process progresses	 	3	3	3	9

- Interventions in physical, natural and social assets
- Trainings and awareness raising activities
- Activities that support the project implementation

These actions were identified as part of the long-list of adaptive measures, and were short-listed for further prioritization.

OPTIONS	SDG CO-BENEFITS	EASE OF IMPLEMENTATION	URGENCY	COST	TOTAL
Population key area					
Strengthen existing youth community groups and promote their participation project activities	 	3	3	3	9
Diffusion of assessment results to provide insights on the findings and promote further action		3	3	3	9
Urban land use					
Strengthening community engagement and participation in resilience planning processes	 	3	2	3	8
Formalization of land tenure, land subdivision and upgrading		1	2	1	4
Natural resource-based production					
Awareness raising and clean up campaigns to prevent ecosystem degradation	  	3	2	3	8
Provide alternative low-cost cooking technologies that will reduce the dependency on mangrove firewood	 	2	2	2	6
Provide adequate waste management options, as waste is currently being dumped by the community in the nearby surroundings	 	3	2	3	8
Trainings and awareness raising on sustainable fishing techniques and climate change impacts	  	2	2	3	7
Trainings and awareness raising on sustainable and climate-resilient agriculture techniques and crops	 	2	2	3	7
Critical point facilities					
Coastal protection	 	2	3	2	7
Construction of adequate footpaths across the community	 	2	3	3	8
Storage units for livelihood materials	 	2	3	3	8
Lifeline utilities					
Improved access to piped water supply	  	1	3	2	6

- Interventions in physical, natural and social assets
- Trainings and awareness raising activities
- Activities that support the project implementation

These actions were identified as part of the long-list of adaptive measures, and were short-listed for further prioritization.

OPTIONS	SDG CO-BENEFITS	EASE OF IMPLEMENTATION	URGENCY	COST	TOTAL
Lifeline utilities					
Construction of an adequate drainage network	 	2	2	3	7
Rainwater harvesting tanks	  	2	2	3	7

The table below shows the criteria and scores used for the prioritization.

Criteria	3	2	1
Urgency	3 = High (action is directly linked to the most pressing issues identified through the VRA)	2 = Medium (action is somewhat linked to the most pressing issues identified through the VRA)	1 = Low (action is derived from the VRA, but not among the highest priorities identified)
Ease of implementation	3 = High (action can be implemented within the project's timeframe and can be implemented without external support)	2 = Medium (action can be implemented within the project's timeframe but would require some external support)	1 = Low (action cannot be implemented within the project's timeframe and would require significant support)
Cost	3 = High (action can be fully covered by the project's funding)	2 = Medium (action can be mostly covered by the project's funding but would require some external funding)	1 = Low (action requires significant external funding)



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