



Nadi Town, Fiji

Korociri settlement

COMMUNITY-BASED VULNERABILITY ASSESSMENT AND ACTION PLAN



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House in Korociri settlement
UN-Habitat/Kamsin Raju

1 INTRODUCTION

The Korociri 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.

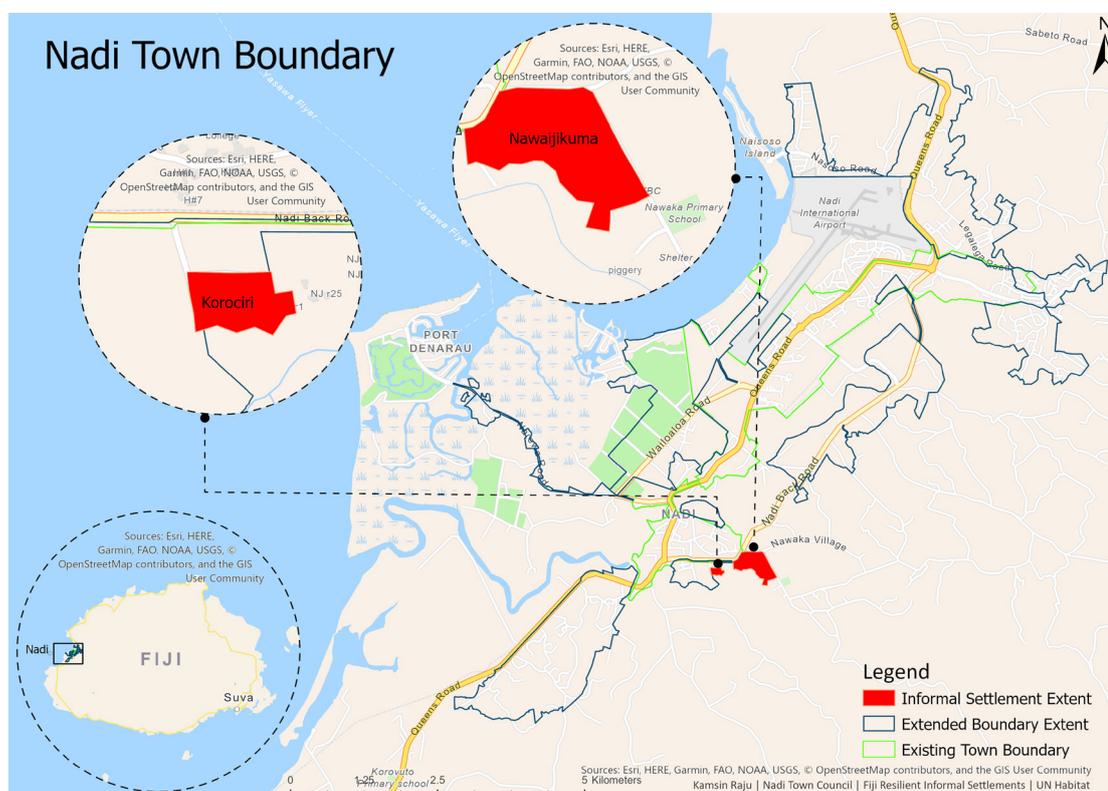
The high levels of physical, economic, social and environmental vulnerability in combination with poor levels of disaster preparedness and adaptive capacity often lead to high climate-related hazard impacts in informal settlements.

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 Nadi town, including Korociri¹



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 per cent of the total land area and are also the most populous areas nationally². Fiji's total population is 884,887 people, approximately 55.9 per cent 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 socio-economic 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.

Nadi Town is located in Ba Province, on the south-west coast of Viti Levu. It is Fiji's tourism hub due mainly to Nadi International Airport and Port Denarau. According to the latest Government census (2017), Nadi has a total population of 71,048 people⁹ over 1,200 hectares. The average of Nadi's population growth over the past decade is significantly higher than Fiji's average growth rate, at 5.32 percent per year¹⁰. However, the majority of this growth can be attributed to the expansion of urban boundaries¹¹.

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. City population, Fiji. <http://www.citypopulation.de/Fiji.html>

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

Korociri settlement is located 1.5 km South-west of the center of Nadi Town (Figure 1), outside of the town boundary. Korociri settlement covers an area of approximately 20,400 square meters (2.04 hectares), and measures approximately 135 meters in length between its longest points and 185 meters in width. The settlement is located in a flood prone area along a creek.



House being built in Korociri settlement
UN-Habitat/Begoña Peiro

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

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 Korociri, 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.

Korociri settlement
UN-Habitat/Begoña Peiro



2 METHODOLOGY

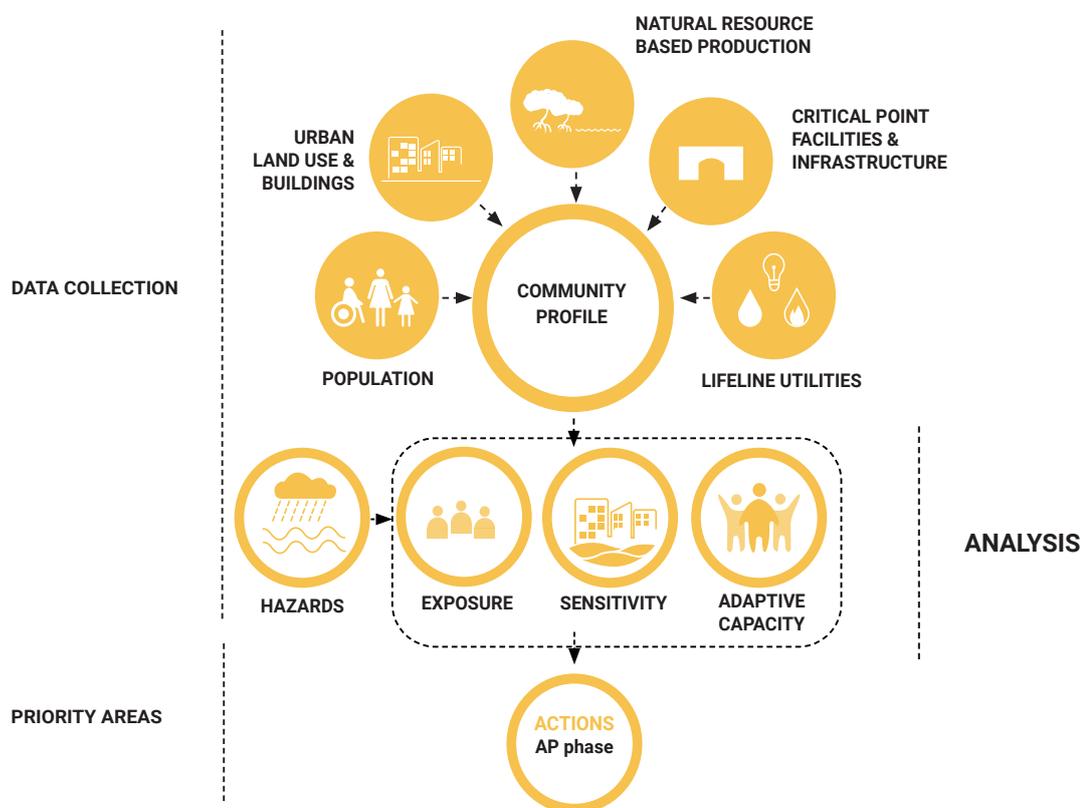
Several data gathering methods have been employed in order to collect both the primary and secondary data needed to conduct the analyses. The methodology is designed to support local and national governments in identifying current and future drivers of vulnerability and to identify priorities for climate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

DATA COLLECTION

<p>Primary data collection methods:</p> <ul style="list-style-type: none"> • Household survey (HHS)¹² • Site visits and participatory mapping • Key Informant Interviews (KII) • VRA workshop 	<p>Secondary data collection methods:</p> <ul style="list-style-type: none"> • Census • Reports on climate change projections • Spatial data available in GIS repositories
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Figure 2 Analytical Framework



12. 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 98 per cent of the households in Korociri settlement. A total of 63 households were identified in the settlement at the time when the HHS was carried out, and 62 of these were surveyed.

3 KOROCIRI SETTLEMENT

Residents in Korociri have no formal land tenure arrangements, limited access to electricity, poor sanitation and housing conditions, and limited access to risk-reducing infrastructure. The aforementioned issues hinder the abilities of informal settlers to cope and adapt to future risks.

The total population based on the household survey conducted in Korociri amounts to 399 people¹³, from which 190 are male and 209 are female. The total estimated population is 405 people¹⁴. In terms of age distribution, persons aged from 0 to 24 years old comprise almost half of the population (48 per cent). The youth age group (15-24) accounts for 11 per cent and 37 per cent of the population in the settlement is under 14 years old. There are three people aged over 75 in the settlement, and only two within the 70-74 age range. Approximately half of the households (53 per cent) reported having lived in the settlement less than 30 years. Although the size of a household in Korociri averages 6.1 persons, household sizes range from 2 to 17 people amongst those households surveyed.

¹³. The data is based on the information collected through the household survey, during which 63 out of 64 households were surveyed.

¹⁴. For those households that were not surveyed the average size of household is used.

56 Total number of houses

26.396 m² Total area within boundary

63 Total number of households

5.507 m² Residential buildings area

0 Uninhabited buildings

307 m² Civic buildings area

399 people living in the settlement

20.582 m² Open space area



Unpaved road in Korociri settlement
UN-Habitat/Begoña Peiro

4 CLIMATIC FEATURES, HAZARDS, PERCEPTIONS

4.1 CLIMATIC FEATURES AND HAZARDS

Fiji is generally considered to be an oceanic tropical marine climate¹⁵. There are two distinct seasons namely, a warm wet season from November to April and a cooler dry season from May to October¹⁶.

Regarding climate variability, the major features driving climate in Fiji are¹⁷:

- **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 country¹⁸.
- **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 a creek, the settlement's social, economic and natural systems are exposed to multiple hazards. Based on primary data collected, residents face key challenges due to a number of climate-related hazards, including cyclones, heavy rainfalls, river floods, flash floods, extreme heat, vector-borne diseases, and water-borne diseases



During FGDs, river flooding was noted as a critical issue by community representatives. The houses located in the low-lying area nearby the river were raised as being particularly vulnerable to floods, particularly during heavy rains as the river overflows. This directly impacts the structure of houses, damaging foundations, stilts, sanitation facilities and footpaths. According to community members, the water can reach approximately 0.7 meters when there is a combination of heavy rains and river overflowing, affecting the whole settlement. Participants also reported experiencing longer dry periods immediately after flood events.

Cyclones were highlighted as being highly problematic. TC Winston (2016) severely impacted all the houses in the settlement. Additionally, participants also mentioned that all households lost crops and livestock during this event. Community members also highlighted TC Evan (2012) as one of the major climate events that had impacted Korociri with almost all houses getting affected by floods. During this event, water reached approximately one meter and impacted all households.

15. 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

16. 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.

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

18. Ibid

5 CLIMATE CHANGE AND FUTURE RISKS

5.1 CLIMATE CHANGE PROJECTIONS¹⁹



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

Sea level rise is projected to increase across the region.



2090



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



2090



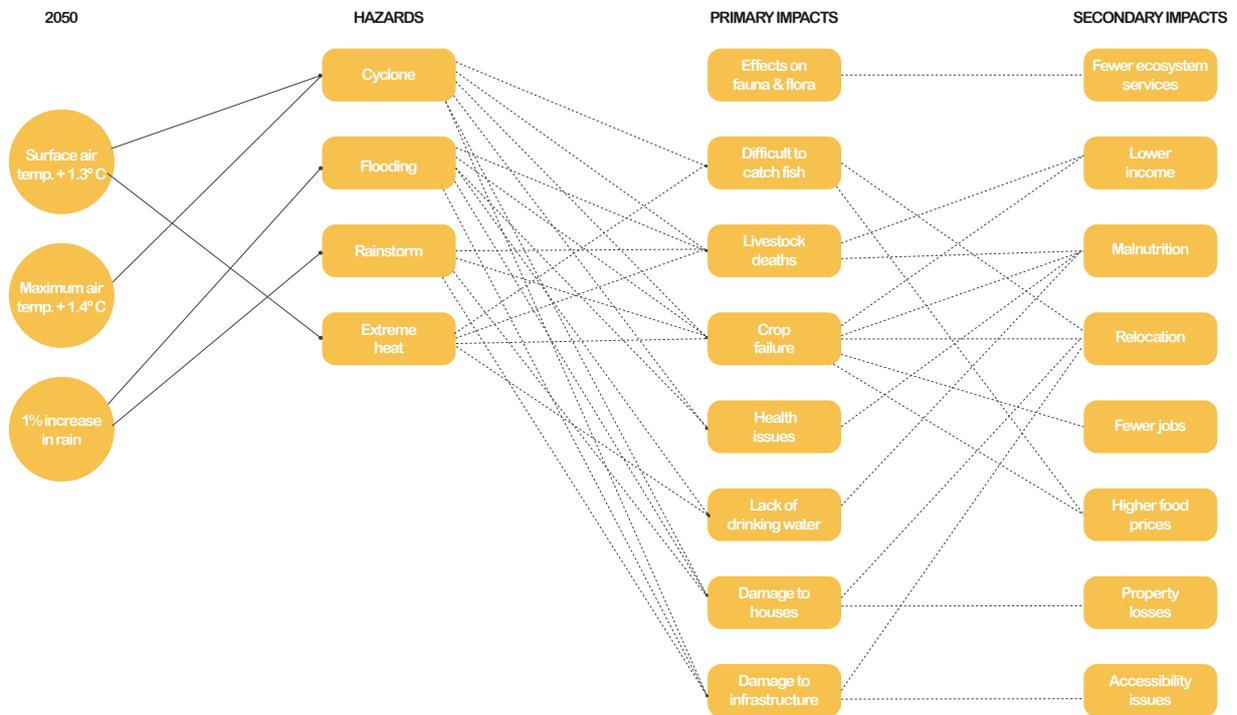
Landslides represent a significant risk that can increase in response to heavier rainfall.

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



Residents from Korociri experience regular flooding associated with heavy rainfalls and from the nearby river, which directly impacts their daily lives. Adelina explains how these events affect her community and the types of actions that she believes could be taken to address some of these issues.

Figure 3 Main hazards that affect Korociri settlement and primary and secondary impacts^{18,19}



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

21. 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.

”

Flooding has a huge impact in our community, causing many houses and the general environment to get destroyed. Many plants and trees get damaged and many houses become a mess with the mud that is left behind after flooding. When people get the news that there are high chances of flooding, our community rushes to get their cars to high ground, they try to place important belongings and valuable items at a higher place where it can be safe from the flood waters but when then most things are damaged due to leaking roofs and weak structures that are damaged easily. By the time the flood water starts increasing rapidly, people cannot leave their house and go to higher ground because the flood water drowns out the entire road access that the residents use.

When the flood water decreases, it leaves many houses covered in mud which is extremely difficult to clean. We often ask our elder children, mainly daughters, to stay home from work and school to help clean up the house or to take care of their younger siblings. It takes up to 5 or 6 days to clean the entire house and put things back to the way it was because the men go back to work so it

is left to us to tidy. Many houses get really destroyed and are in very bad condition so we also try to help out our neighbours and relatives clean and put their house back together.”

In response to environmental problems, we can do little things at home such as burning less, using less products that harm the environment, practicing recycling and just generally reducing waste. As a community we can plant more trees, have clean up campaigns every few months and we can practice sustainable farming. We can also educate our children on why we should protect the Earth and how they can contribute to reducing their carbon footprint too. We can learn and teach each other how to build safer homes that are higher than the flood water levels so that we don't get flooded every time and we can take care of our evacuation centres better so that they are habitable during times of disaster unlike during past events.

Adelina, Korociri resident
[No real names are used in this report]

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)²².

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.

²². PACCSAP Program, (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.



6 VULNERABILITY

Korociri'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 efforts²³. 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 centers²⁴. Moreover, people with disabilities and especially women are at particular risk of domestic violence due to their intersecting vulnerabilities²⁵. 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.

Flood events and other hazards have impacts on residents' health, with large cumulative impacts on children who can be deprived of access to school. From 44, only eight children under 6 were reported as being involved in education. This means that members of families with children under 6 will have to assume the role of caretakers. Often, female members of the household take this role.

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

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

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



Participatory mapping
UN-Habitat/Sara Vargues

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 affected²⁶.

Korociri occupies an approximate total area of 20,400 square meters (2.04 hectares). Being located in a flood prone area, its social, economic and natural systems are exposed to multiple hazards. Figure 4 shows the key elements and main hazards identified by community members during participatory workshops.

Floods were highlighted as one of the main issues in the settlement. The area marked in yellow was identified as being flooded due to heavy precipitation, and FGD participants mentioned that flood levels reach 0.3 to 0.7 meters. The area marked in orange was marked as reaching levels of up to one meter.

Community members highlighted a perceived increase in surface runoff associated with heavy rainfalls that leads to flooding of certain areas which cause disruptions to their lives by affecting crops, accessibility across the settlement and saturation of poorly constructed sanitation systems. Moreover, the houses located in the low-lying area nearby the river were also identified as being highly impacted by floods.

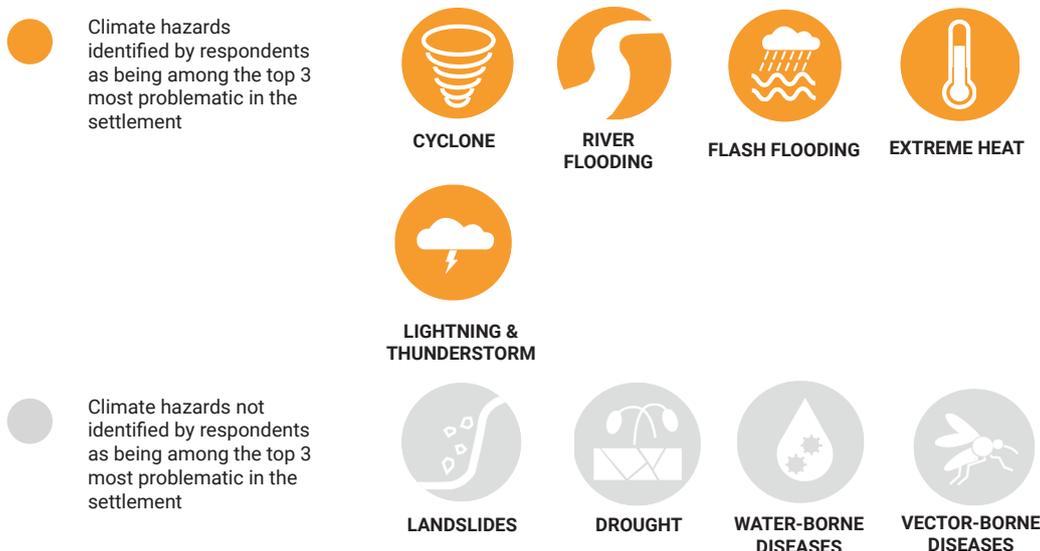
Figure 4 Hazard exposure map developed in participatory workshops



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

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 change²⁷.

(i) Population

Residents in Korociri do not have formal land tenure arrangements. According to the household survey, 60 per cent reported living in the settlement over 20 years. The dependency ratio in the settlement is 67 which is higher than the national dependency ratio of 54²⁸. Young dependents make 91 per cent of the total dependents, while elderly people (aged over 65) make the other 9 per cent.

(ii) Urban Land Use & buildings

The town council is responsible for ensuring that buildings are compliant with the building code. However, often, compliance is not checked in informal settlements. There are residential buildings, a church and an evacuation center which has not been completed. Most of the houses are one storey high and are located on relatively flat terrain.

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

77%

of the houses have been built before the year 2000

100%

of houses have metal roofs. 52% were ranked as being in below average conditions.

80%

of houses are built with metal exterior walls, 8% of wood and 12% of concrete blocks.

11%

of the houses are built on wooden stilts.

72%

of the stilts are over 2 meters high.

The building identified by the community as an evacuation center that was initially meant to accommodate new facilities (i.e., kitchen, sanitation facilities, showers and storages) to support the existing church building. However, it has not yet been completed and only its sanitation facilities are being used by the community on a daily basis. During the FGDs, participants mentioned that the building should not only be completed but also extended. According to them, the population of Korociri has increased considerably over the last six years and the existing footprint is no longer suitable for the entire community. Hence, both church and evacuation center are needed to accommodate residents during disaster events.

(iii) Natural Resource-based Production

Residents in Korociri do not largely depend on natural resources for food and livelihoods. As mentioned, a relatively small proportion (29 per cent) of households grow crops. According to community representative, low productivity levels are either related to the lack of land available and to the quality of the soil which gets regularly flooded. According to participants, after climate events, all crops have to be replanted. Dependency on fishing is also quite low, with 11 per cent of the households reporting to fish frequently. The main types of fish available referred by the community are duna, malea and tilapia. Coral bleaching and ocean acidification represent a threat to the availability of fish. Furthermore, the proportion of households relying on livestock for livelihoods is also low, with 10 per cent of households rearing livestock.

(iv) Critical Point Facilities & Infrastructure

Korociri is located next to Nadi's Back Road which connects to the settlement through Korociri Road which is unpaved for all of its length. Residents have made several footpaths that allow them to access their houses, although most of these are unpaved. Accessibility was highlighted as a positive aspect of Korociri by 97 per cent of the surveyed households. However, mobility across the settlement could be challenging, particularly during flash floods events where roads and footpaths get regularly damaged.

There is a building which has not been completed which was meant to be used as an evacuation center by the community. The existing church was built in 2013 and is used both for religious purposes and as an evacuation center given that the other building has not been completed. According to the community members, it should be structurally improved. Its roof is built in metal and is in good conditions (based on a five-point scale from poor to excellent). The exterior walls are built in wood and were ranked as being in average conditions.

The building identified by the community as an evacuation center that was initially meant to accommodate new facilities (i.e., kitchen, sanitation facilities, showers and storages) to support the existing church building. However, it has not yet been completed and only its sanitation facilities are being used by the community on a daily basis. During the FGDs, participants mentioned that the building should not only be completed but also extended. According to them, the population of Korociri has increased considerably over the last six years and the existing footprint is no longer suitable for the entire community. Hence, both church and evacuation center are needed to accommodate residents in times of disasters. Its roof is built with metal sheets and it was ranked as being in average conditions. The exterior walls are built in wood and were ranked as being in fair conditions.

(v) Lifeline Utilities

The settlement has access to services provided by several entities in Fiji (e.g., water, electricity, etc.). All the households in the settlement reported having access to water supply provided by the Fiji Water Authority (FWA), either piped into their dwelling or into their yard. Sensitivities related to drinking water access are mainly linked to the conditions of the water supply network, given that pipes are

often exposed, which can lead to damages and leaks. 98 per cent of the households reported having access to electricity. However, there is a lack of access to clean and modern fuels and technologies for cooking.

With regards to sanitation, all the households reported having access to a facility. 37 per cent of the households are sharing these facilities with members from other households. Like the rest of the settlements within and in the periphery of Nadi Town, Korociri does not have access to sewerage infrastructure. Frequent flash flooding often causes excreta to rise back up and overflow (particularly in those cases where there are pit latrines), failing to hygienically separate human excreta from human contact, and heightening the risk for water contamination and water-borne diseases. Another

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' adaptation. In this report the unit considered for the analysis is the household³⁰.

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 Korociri.

The Department of Social Welfare, under the Ministry of Women, Children and Poverty Alleviation (MWCPA) 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.

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.

35%

households reported that at least one member had access to the free bus fare program.

3%

households mentioned having access to the social pension scheme

2%

household reported access to the food voucher program, and 12% to the poverty benefit scheme.

63%

households reported not having access to any social protection programs.

With regards to disaster preparedness, most of the households reported having access to early warning systems (EWS). 55 households (87 per cent) mentioned access through SMS alerts, 60 households through the radio and 43 households (68 per cent) through community notification systems. 61 households (97 per cent) responded that they have an evacuation plan, but only three households mentioned being connected to a formal DRR network. One household reported not having access to any of the systems mentioned above.

(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.

Information on the collective capacity at the settlement level was collected from workshops organized with community members and through the household survey. Their financial capital at the community-level is low, as there are no collective savings groups or systems in place. Each individual household relies on their own resources to address impacts, and as already mentioned above, these are limited.

The level of awareness and existing mechanisms of early warning systems, evacuation routes and disaster management committees in the settlement are higher in comparison to other informal settlements that are part of the FRIS project. Individual households reported having access to early warning systems (either through radio or SMS), and a high number of households reported being connected to a formal DRR network and having a formal evacuation plan. Korociri has an evacuation center inside the community, however, its construction is not yet completed. During the FGDs, participants explained that despite not being finished, this building is being used by community members. According to them, the evacuation should be completed and improved as it is not well dimensioned for the current number of people living in the settlement.

There are community leadership structures in place community (e.g. established community leader, community groups, etc.) that have been effective following past disaster events and all community mentioned being well connected to various sources of information. Furthermore, there is a community committee in place which is responsible for carrying out activities such as the organization of regular meetings to discuss community matters, garbage collection campaigns, etc. These systems present opportunities that can be tapped on in order to strengthen other aspects at the community-level such as stronger mechanisms for disaster preparedness, response and climate change adaptation.

(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.

³¹. UN-Habitat, 2014. Planning for Climate Change.

³². Ibid

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. 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 Korociri 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.



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 Plan (NAP)³⁴ 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 support and technical feasibility. This work forms the basis for the selection of options that will be implemented as

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

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		
Construction of an adequate stormwater drainage network	 	1
Localized interventions to improve the building conditions of those structures that are identified as being in the worst conditions	 	3
Construction of an evacuation center (extension and completion of the existing building)	 	2
Improved sanitation facilities (resilient to floods)	 	4
Urban farming		5
Construction of adequate footpaths across the community	 	6
Rainwater harvesting tanks	 	7
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	 	3
Training on financial literacy and social protection programs	 	1
Community involvement in elimination of larval habitats (through clean up campaigns and awareness raising)	 	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, drainages and rainwater harvesting.
- Establishing groups for the maintenance of the urban farm.

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	3	3	8
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	3	8
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 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
Urban farming area					
Trainings and awareness raising on sustainable and climate-resilient agriculture techniques and crops	 	3	2	3	8
Critical point facilities					
Construction of adequate footpaths across the community	 	2	3	3	8
Completion (and potential extension) of the existing evacuation center	 	2	3	3	8
Lifeline utilities					
Improved access to piped water supply	  	1	3	2	6

	Interventions in physical, natural and social assets	These actions were identified as part of the long-list of adaptive measures, and were short-listed for further prioritization.
	Trainings and awareness raising activities	
	Activities that support the project implementation	

OPTIONS	SDG CO-BENEFITS	EASE OF IMPLEMENTATION	URGENCY	COST	TOTAL
Lifeline utilities					
Rainwater harvesting tanks	  	2	3	3	8
Construction of an adequate drainage network	 	2	3	3	8
Improved sanitation facilities	  	2	3	3	8

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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