



Lami town, Fiji

Qauia settlement

COMMUNITY-BASED VULNERABILITY ASSESSMENT AND CLIMATE ACTION PLAN



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

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Coordinators:

Bernhard Barth, Inga Korte.

Authors:

Begoña Peiró, Sara Vargues.

Contributors:

Kolora Qativi, Kamsin Raju, Geeta Singh, Sunishma Singh, Lydia Ogden.

Design and Layout:

Lydia Ogden, Marion Reinoso, Begoña Peiro

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Access road to Qauia Settlement
UN-Habitat/Begoña Peiro

1 INTRODUCTION

The Qaia 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.

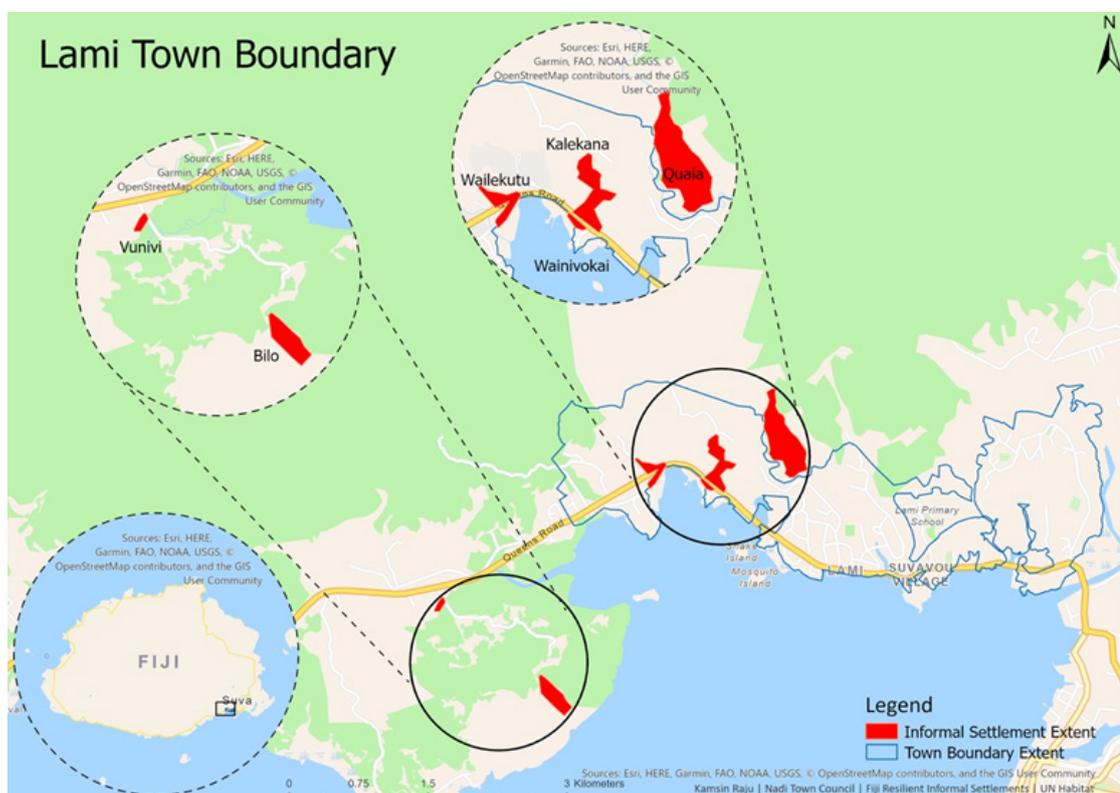
The high levels of physical, economic, social and environmental vulnerability in combination with poor levels of disaster preparedness and adaptive capacity often lead to high climate-related hazard impacts in informal settlements.

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 Qaia¹



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 per cent of whom reside in urban areas².

Fiji is among the countries with the highest disaster risk, ranking number ten according to the World Risk Index (2018)³. 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)⁴. 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 tsunamis. 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 Pacific⁵, signs of socioeconomic inequality are rising, particularly with the expansion of informal settlements⁶. 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 care⁷. 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.

Qauia settlement is located in Lami, outside the town's boundary. Lami Town, along with Suva, Nausori, Navua and Nasinu, is part of the Greater Suva Area (GSA), which is the most densely populated region in Fiji with 62.1 per cent of the country's total urban population. Lami has a total area of 680 hectares and a total population of 24,637 people⁸. As compared to urban population growth in Fiji, Lami's urban population growth has been slower, with a 0.2 per cent per year in the town area and a 1.4 per cent in the peri-urban areas⁹. Lami Town and its surroundings have significant natural capital including mangrove forests, seagrass beds, coral reefs, river systems and upland forests. Qauia covers an area of approximately 26.7 hectares and measures approximately 820 meters in length (north-south). The width of the site varies from 80 to 450 meters.

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/TropicalCyclone.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>

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 Qauia, 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.



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**.

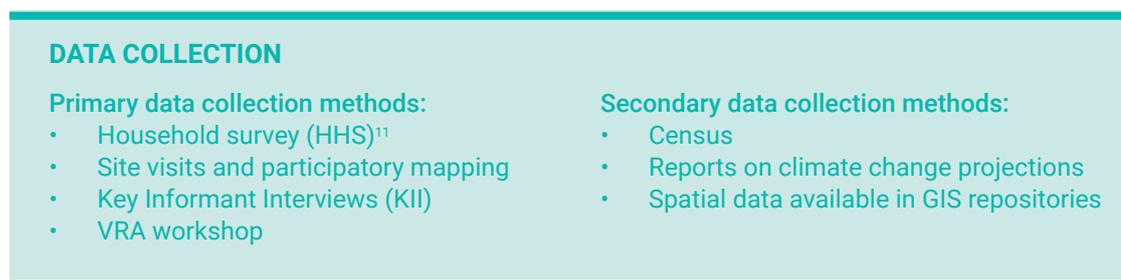
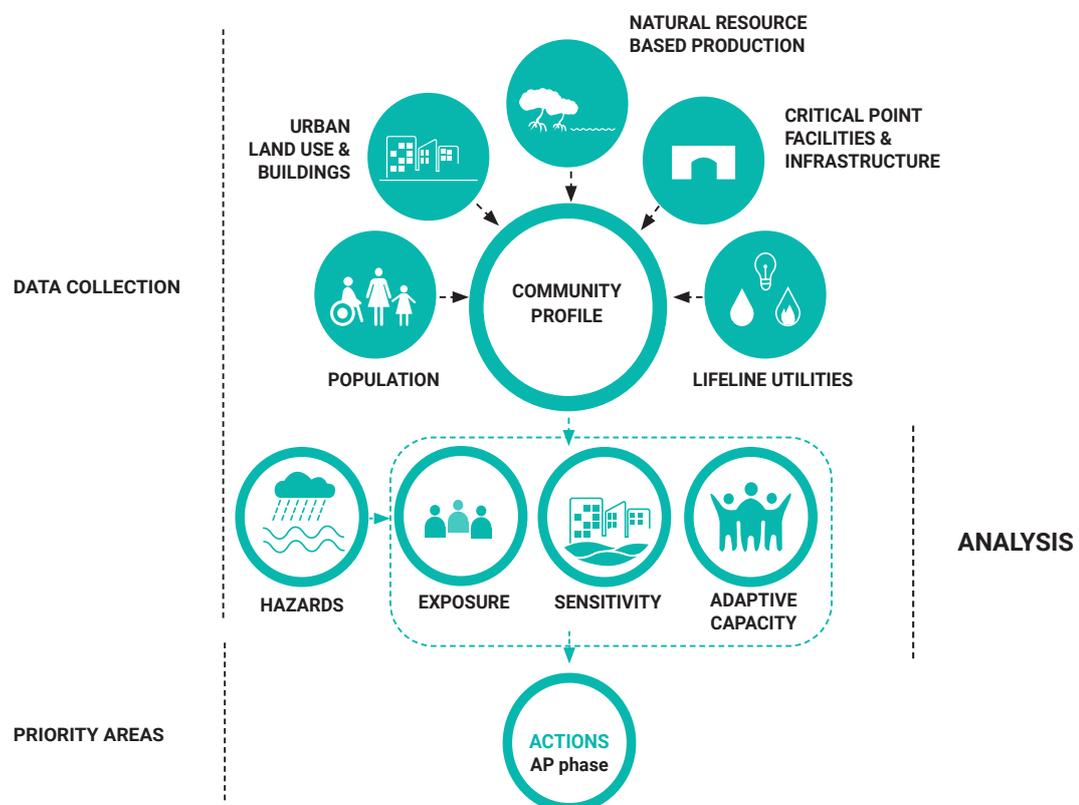


Figure 2: Analytical Framework



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 90 per cent of the households in Qauia settlement. A total of 329 households were identified in the settlement at the time when the HHS was carried out, and 296 of these were surveyed.

3 QAUIA SETTLEMENT

Qauia is approximately one kilometer north of Queen's Road and is accessed via Nasevu Street. It is situated in a low-lying floodplain, bound by Lami River on its western side and a hillside escarpment on its eastern side. The Lami River is approximately 9.5 kilometers in length, has two major tributaries and discharges to Laucala Bay. The total area of the catchment is approximately 21.54 square kilometers. River erosion is visible in different areas, as most of the banks are composed of soft soil and logs have also been found blocking the flow of the waterway¹². There is a quarry located at the northern side of the settlement which has been operational for several years.

Qauia is among the 44 informal settlements that are being upgraded by the Ministry of Housing and Community Development as part of their Informal Settlement Upgrade and Formalization Programme (ISUP), currently in the preparatory stage. This is an in-situ capital program that targets informal settlers, which aims to offer them long-term land tenure through 99-year leases and fully serviced and subdivided lots.

¹². Arcadis (2017), Flood Resilience Shelter Mission.

332 Total number of houses	267.000 m ²	Total area within boundary
329 Total number of households	52.861 m ²	Residential buildings area
3 Uninhabited buildings	863 m ²	Civic buildings area
1,749 estimated people living in the settlement	213.276 m ²	Open space area





ACCESS BRIDGE



FLOOD DEBRIS



BRIDGE OVERTOPPED DURING FLOODS



HOUSE CONDITIONS



FOOTPATH

4 CLIMATIC FEATURES, HAZARDS, PERCEPTIONS

4.1 CLIMATIC FEATURES AND HAZARDS

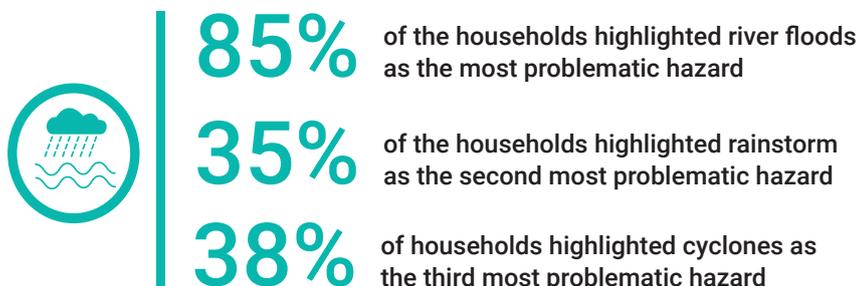
Fiji is generally considered to be an oceanic tropical marine climate¹³. There are two distinct seasons namely, a warm wet season from November to April and a cooler dry season from May to October¹⁴.

Regarding climate variability, the major features driving climate in Fiji are¹⁵:

- **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 country¹⁶.
- **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

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.



13. 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

14. 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.

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

16. Ibid

KEY FINDINGS:

Qaia residents reported being impacted in different ways by the recurrence of climate hazards:



River floods was ranked by many households as the most problematic hazard being faced. Three major events were mentioned during FGDs: floods in 1987, floods in 2014 and floods in 2016. The floods from 1987 were reported as being the most severe and affecting all the houses in the settlement except those that are located on an elevated area. FGD participants mentioned that residents had to move by boat. During the flood from 2014, the river burst its banks due to intense rainfalls. During the flood in 2016, the concrete bridge was overtopped, and low-lying areas were flooded. FGD participants mentioned that the construction of the quarry has led to changes in the river's watercourse, pushing it further away from the settlement. Furthermore, residents highlighted that floods are more severe during high tide. The houses located near the river are affected up to twice or thrice a month by floods.

Moreover, community representatives mentioned that they have perceived an increase frequency and intensity of extreme precipitation during the last ten years. Floods associated with heavy rainfall is a common issue based on the feedback provided by its residents. The lack of a continuous drainage network leads to some areas being particularly affected, such as the lower side of the settlement.

Cyclones also pose a major challenge to residents in Qauia. TC Winston, which made a landfall in Viti Levu on the 20th of February 2016, was highlighted as being the most damaging, impacting the community in several ways. Based on the information provided by community members, floods reached the Methodist Church. Among the impacts mentioned were damage to property (especially roof structures), damage to crops and livestock. Furthermore, they also mentioned that there was one fatality (one person drowned). The community also referred to TC Harold which took place on the 8th of April 2020.



Woman washing clothes in the river
UN-Habitat/Begoña Peiro

5 CLIMATE CHANGE AND FUTURE RISKS

5.1 CLIMATE CHANGE PROJECTIONS¹⁷

- 

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.
- 

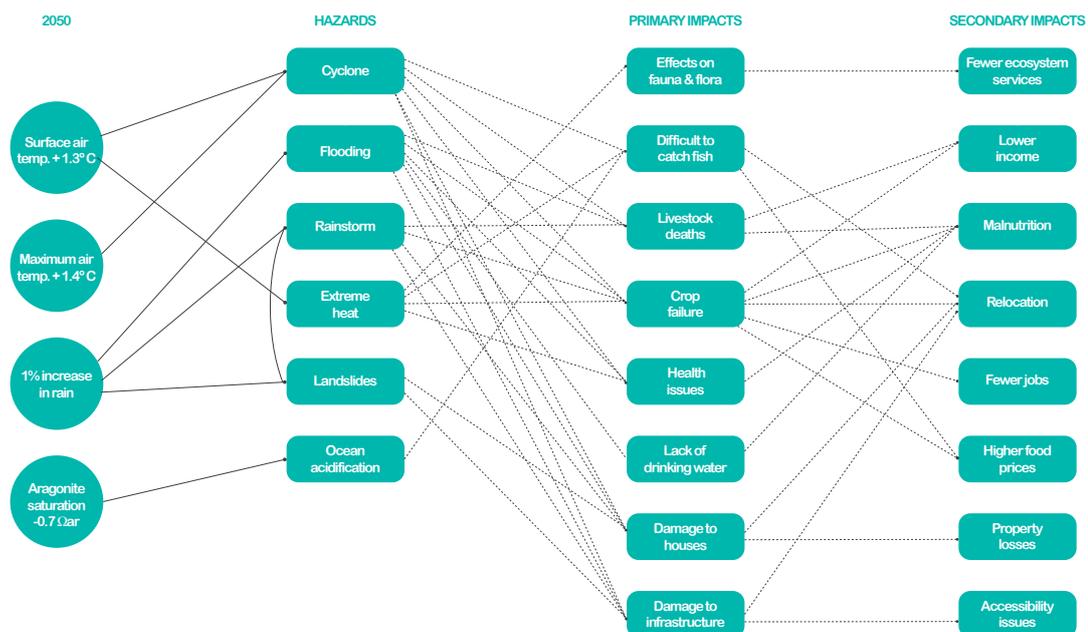
2090 Temperatures are expected to increase as well as temperature on extreme hot days.
- 

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.

Figure 3 shows the main hazards that affect Qaia settlement and primary and secondary impacts that were reported by community members during participatory workshops^{18,19}



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

18. Ibid

19. 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)²⁰.

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.

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



6 VULNERABILITY

Qauia'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 efforts²¹. 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 centers²². Moreover, people with disabilities and especially women are at particular risk of domestic violence due to their intersecting vulnerabilities²³.

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.

Recurrent disaster events as well as slow-onset emergencies have impacts on residents' health, with large cumulative impacts on children who can be deprived of access to school. Although all of the individuals aged 6 to 16 (corresponding to the age ranges between education years 1-12, compulsory in the country) in Qauia have been reported as being involved in education programs, children under 6 have limited access to early childhood facilities, as these are located outside of the settlement. 11 out of the total of 187 children under six in Qauia 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.

The COVID-19 pandemic impacted residents in Qauia settlement in multiple ways, as expressed by community representatives. Observing rules such as isolating and distancing was challenging, as houses are often not only built closely but also count with a large number of people living in the same house, share sanitation facilities with other households, etc. Moreover, many residents expressed concerns about how they were losing their jobs and working reduced hours, as the pandemic unfolded. This also resulted in increased household expenses due to children being more at home. Women representatives said that they sometimes had to go without lunch and were worried about where their next meal would come from. They also mentioned it was hard to supervise children all day and get them to do their school work.

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

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

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

6.2 EXPOSURE

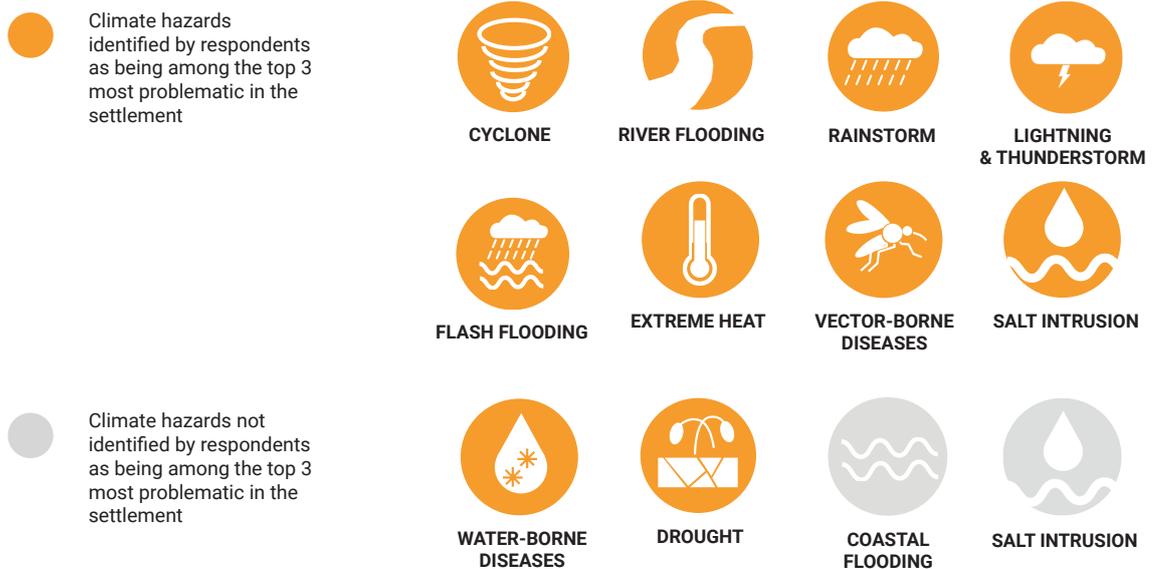


Exposure is defined as the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected²⁴.

Being located in a low-lying floodplain bound by the Lami River and a hillside escarpment, its social, economic and natural systems are exposed to multiple hazards. Figure 3 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 shows a map that was developed with community representatives during FGDs and transect walks. As already mentioned, community representatives identified three major flood events that took place in 1987, 2014, and 2016. The map shows the areas that were affected and those that didn't get flooded.

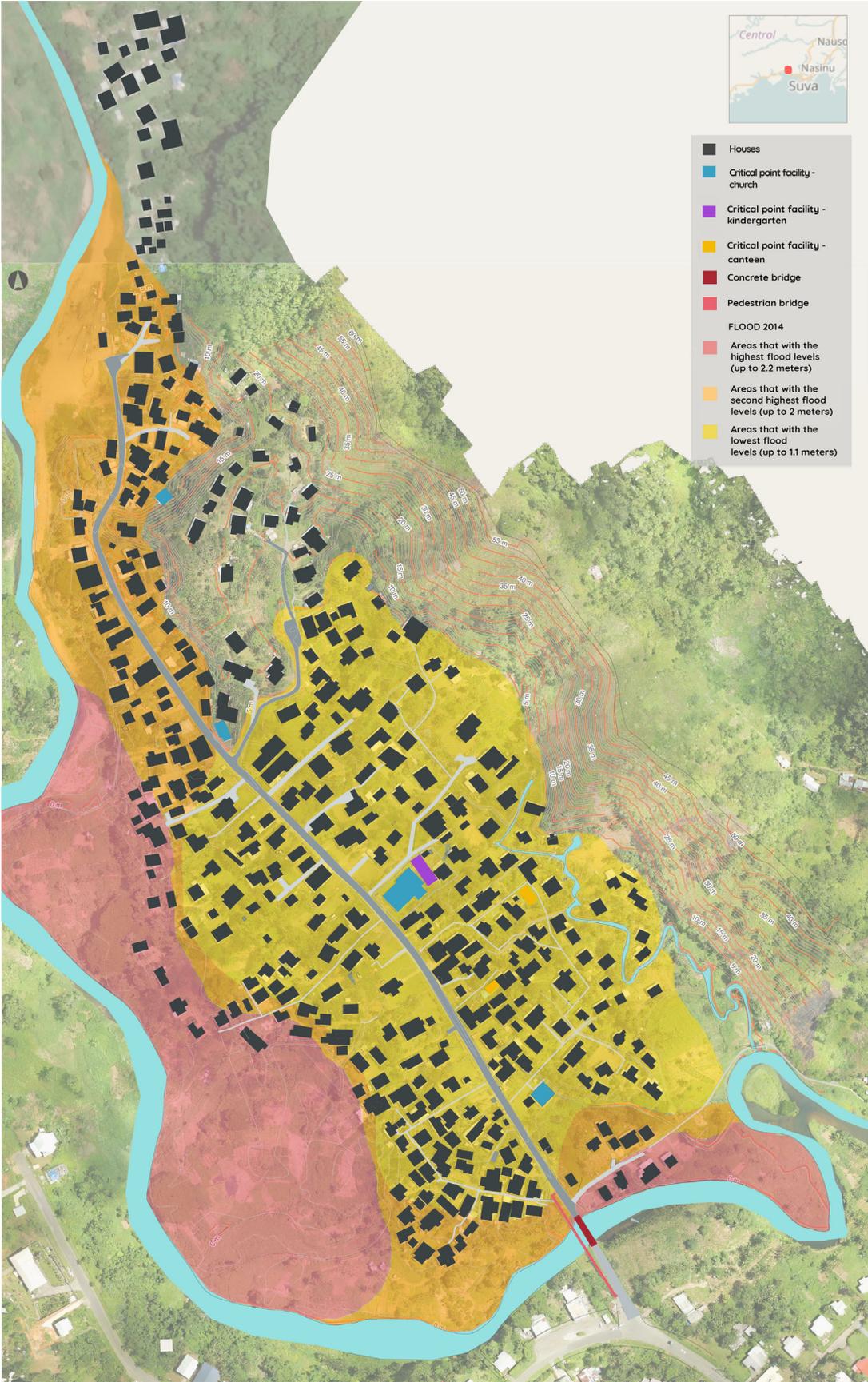
Figure 3 The most problematic hazards identified by respondents in the settlement



²⁴. 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 Hazard exposure map developed in participatory workshops and transect walks



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 change²⁵.

(i) Population

The dependency ratio in the settlement is 45.5, which is below the national ratio which is 54x. Young dependents make 94 per cent of the total dependents, while elderly people (aged over 65) make the other 6 per cent. There is a large proportion of children aged under 4 (10 per cent). There are 16 people with disabilities living in Qauia based on the information collected through the household survey. Regarding household income, 80 per cent of the households reported their main household income comes from wages, while the remaining households earn their income by selling products such as fish, crops, handicrafts, etc. (2 per cent), through their own business (7 per cent), and from remittances (1 per cent). 6 per cent said that they don't have any income, and 1 per cent could not respond.

(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 in the settlement, five churches and a kindergarden. Two of the churches are used as evacuation centers during disaster events. 96 per cent of the buildings in Qauia are one storey high and 97 per cent are located on relatively flat terrain. All houses have been constructed with light materials (e.g. metal, wood etc.), which are often reused and already in poor conditions when the houses are assembled.

(iii) Natural Resource-based Production

Residents in Taiperia rely on natural resources for food and livelihoods, as well as for protection. 35 per cent of the surveyed households indicated that they grow crops, mainly for subsistence purposes (89 per cent). Community representatives mentioned that during major flood events, they have to replant most of their crops, as many of these are located in the riverbank. Some high intensity cyclones such as TC Winston were also reported as having impacts on their crops, while other cyclones such as TC Harold did not have major impacts.

Only 2 per cent of the households mentioned that they rear livestock (e.g., chicken, pigs, ducks), which is mostly for subsistence purposes (75 per cent). Based on the results from the FGDs, residents from Qauia have perceived a decrease in catching trends, and while years ago they could catch four to five bundles, now they cannot even catch one. They also mentioned water pollution in the river among one of the key issues. Lastly, despite being located along the river and relatively close from the ocean (approximately 1 kilometer), only 3 per cent of the households said that they fish, mostly for subsistence (80 per cent).

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

70%

of houses in Qauia were built after 1990.

100%

of houses have metal roofs. 74% are in poor conditions, 26% were ranked as fair.

74%

of houses are built with metal exterior walls, and the remaining 26% are wood.

74%

Most houses are on stilts, 74% of which are made of wood, the rest are concrete.

61%

of the stilts are less than 1m off the ground.

(iv) Critical Point Facilities & Infrastructure

The location of Qauia settlement near Lami Town, and its accessibility was highlighted as one of the most positive aspects by respondents from the HHS. However, many issues have been reported in relation to settlement access. Although the concrete ford bridge is meant to provide access to vehicles, it is often used by pedestrians. The pedestrian bridge has staircases at both ends (Figure 75), making accessibility to people with disabilities or the elderly difficult. Its poor conditions have often been reported by community members, including damages to the wooden planks that pave it. This led to concerns for children's safety. Although this issue has been partly addressed, as already mentioned, through a community-led initiative, no structural improvements have been made.

Having a single access, Qauia has been cut off during flood events. Based on information collected during FGDs, overtopping of the road bridge is a recurring issue. The pedestrian bridge is higher than the road bridge and has also been affected in the past. As mentioned by community representatives, there have been events during which the flood level reached the underside of the pedestrian bridge. Among the issues highlighted by FGD participants were that residents cannot leave the settlement, which means that they cannot critical point facilities such as the health center in Lami or the Lami town Council. The culvert walls from the concrete ford bridge reduce the cross-sectional flow area by approximately 40 per cent, contributing to the creation of blockages.

During disaster events, residents from Qauia may go to evacuation centers in Lami. However, the fact that the settlement is cut off during flood events, makes it often very difficult for them to evacuate. Although two of the churches (Assemblies of God Church and Methodist Church) have been used as an evacuation center in past events, its conditions and location do not make it a suitable place for people to seek shelter.

(v) Lifeline Utilities

The settlement has access to services provided by several entities in Fiji (e.g., water, electricity, etc.). 96 per cent of the surveyed households in the settlement reported having access to water supply provided by the Fiji Water Authority (FWA). Water is piped into the dwelling (92 per cent) and in the rest of the cases into the yard (4 per cent). With regards to sanitation, all the households except two reported having access to a facility. 5 per cent of the households are sharing these facilities with other neighbors. With regards to wastewater, there is no network present in Lami town. Most sanitation facilities are either connected to a septic tank or a pit.

There are several drains built in Qauia, mainly along the settlement road. There are some drains along the road that have been formally built. However, in other areas of the settlement, drains are mostly dug by residents and these are discontinuous (not part of a larger network). Existing water channels and drains take the water to the Lami River. Stagnant water is a common issue that can be observed in the drainage channels. This indicates that drains have not been adequately graded to induce water flow and that there is no maintenance. Furthermore, rubbish can often be found in the drainages, which can lead to blockages.

SECONDARY ROAD



DRAINS



CULVERT



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 consequences²⁶.

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 household²⁷.

There is limited financial resources available at the household level. The average income is low and access to financial assistance and social protection services is low. 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.

With regards to disaster preparedness, most of the households reported having access to early warning systems (EWS). 240 households (81 per cent) mentioned access through SMS alerts, 252 households through the radio (85 per cent) and 12 households (4 per cent) through community notification systems. Based on the results from the HHS, none of the households have an evacuation plan or are connected to a formal DRR network, and five households reported not having any sort of access to early warning systems.

The survey collected data related to the access to information on climate change and disasters. Most respondents indicated that they have access to information on climate change, either through technology (including radio, television, etc.) (273 households), or through social media (147 households). None of the households mentioned having been involved in trainings and 16 households said that they do not have any access to information on climate change and disasters.

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

37%

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

8%

households mentioned having access to the social pension scheme

2%

household reported access to the food voucher program, and 1 household to the poverty benefit scheme

64%

households reported not having access to any social protection programs

(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 institutions²⁸.

Information on the collective capacity at the settlement level was collected from workshops organized with community members and through the household survey. Information obtained during FGDs shows that there is a history of projects being implemented in the settlement as well as in resource mobilization. At the time when the workshop was organized, the community had raised funds in order to repair the footbridge. Furthermore, the youth group has been involved in the execution of the works. These include repairing the wooden planks and painting the structure.

There is a lack of awareness and robust mechanisms of early warning systems, evacuation routes and disaster management committees in the settlement. 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 and does not have a formal evacuation plan. During FGDs, participants mentioned that measures such as using ropes to provide additional support to roofs, closing the shutters, storing food, etc. are taken before cyclones by individual households. Furthermore, they mentioned there are two trained nurses in the community.

Material resources, infrastructure and access to services are very limited in the settlement. With only one access road leading to the settlement, transportation may easily be disrupted during an extreme event. Based on information collected, there are two churches being used as evacuation centers. There are evacuation centers in Lami Town that the residents from Qauia (i.e., Marist Convent Primary School and Parist Church) but as mentioned there are times during which they are cut off. The Methodist Church and the Assemblies of God Church have been used as evacuation centers in some occasions.

As mentioned, there are community leadership structures in place community (e.g. established community leader, community groups, etc.) that have been effective following past disaster events. These structures are functioning, and carry out activities such as the organization of regular meetings to discuss community matters, small fund-raising activities, 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.

²⁸. 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)²⁹.

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 Qauia 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.

²⁹. Ibid



LAMI RIVER



PEDESTRIAN BRIDGE



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

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 SDGs³⁰. 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 Plan³¹ (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 support and technical feasibility. This work forms the basis for the selection of options that

³⁰. Ministry of Economy, Republic of Fiji, (2019). National Climate Change Policy 2018-2030.

³¹. 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

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		
Construction of an evacuation center	 	1
Localized artworks and riverbank erosion protection	 	2
Internal drainage channels	 	3
Improved sanitation facilities (resilient to floods)	 	4
Construction of adequate footpaths across the community	 	5
Footbridge replacement	 	6
Trainings and awareness raising		
First aid and emergency response training	 	1
Trainings on safe construction for hazard proof shelters for low-income residents	 	6
WASH trainings that target adults and children	 	3
Disaster preparedness and response related activities	 	4
Training on financial literacy and social protection programs	 	2
Training on waste management and clean-up campaign	  	5
Training on reproductive and sexual health		7

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 and drainages.

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	2	3	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					
Construction of adequate footpaths across the community	 	1	2	2	5
Construction of adequate footpaths across the community	 	2	3	2	7
Localized artworks and riverbank erosion protection	 	2	3	3	8
Construction of an 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					
Internal drainage channels	 	2	3	3	8
Rainwater harvesting tanks	  	2	2	3	7
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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