



Lautoka city, Fiji

Nasoata settlement

COMMUNITY-BASED VULNERABILITY ASSESSMENT AND ACTION PLAN



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

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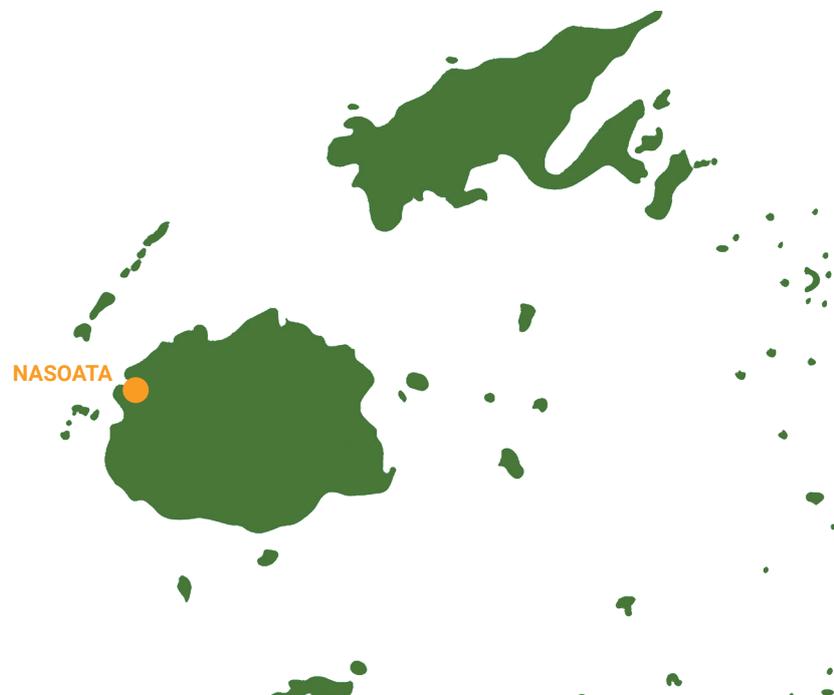
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1 INTRODUCTION

The Nasoata Settlement 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.

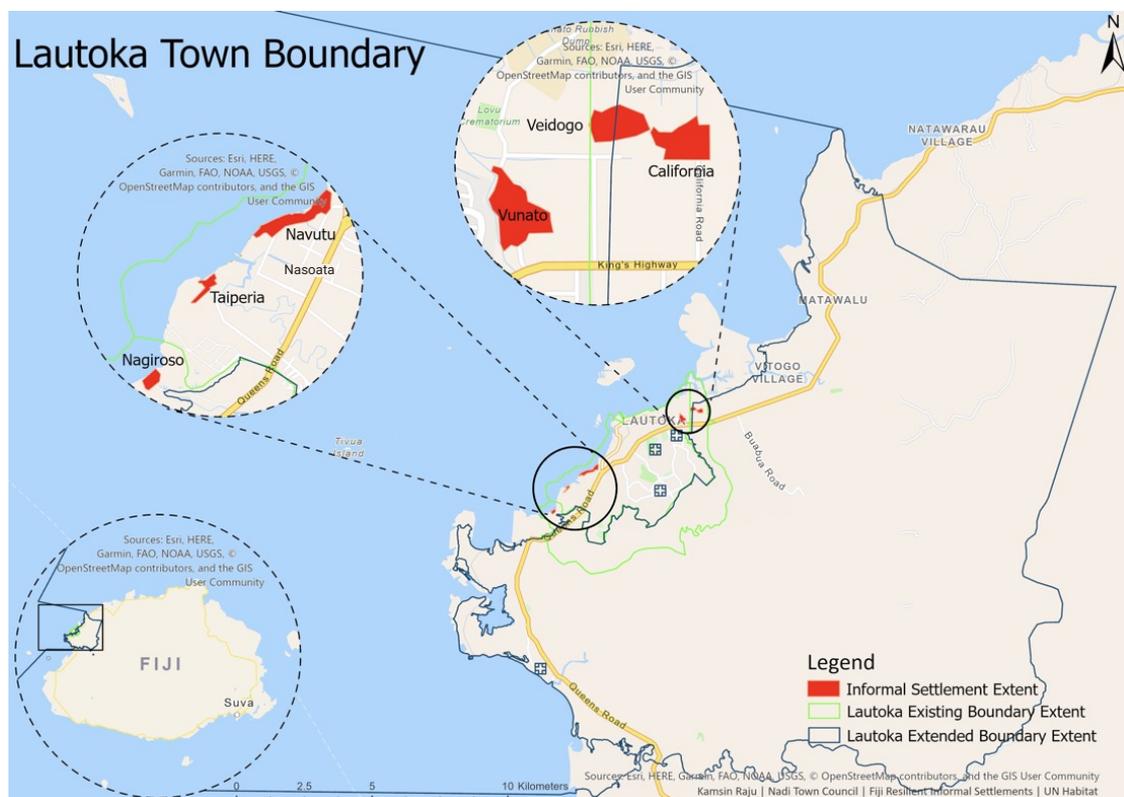
The overall objective of the project is to increase the resilience of informal settlements communities in Fiji that are highly vulnerable to climate change and disaster risks. To achieve this, the project has four components:

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.

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).

Figure 1 Informal settlements that are part of the FRIS program in Lautoka City, including Nasoata¹



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, increasingly severe cyclones, and more frequent and intense rainfall caused by climate change.

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.

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

Nasoata settlement is located approximately 3.8 km west of the center of Lautoka City, inside of the city boundary. Lautoka City is a coastal city located in the west coast of Viti Levu, at 24km north from Nadi Town. It has a total area of 3,200 hectares and a total population of 71,573⁹. As compared to urban population growth in Fiji, Lautoka's urban population growth has been exponentially higher, with a 3.2% per year. However, most of this growth can be attributed to the expansion of the city's boundaries¹⁰. Nasoata settlement covers an area of approximately 5 hectares. It measures approximately 500 meters in length between its longest points and 155 meters in width.

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

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

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

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

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

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

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

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

10. Fiji Bureau of Statistics (2018) 2017 Population and Housing Census, Release 1

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 Nasoata, 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.

Fishing boat during low tide
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.

DATA COLLECTION

Primary data collection methods:

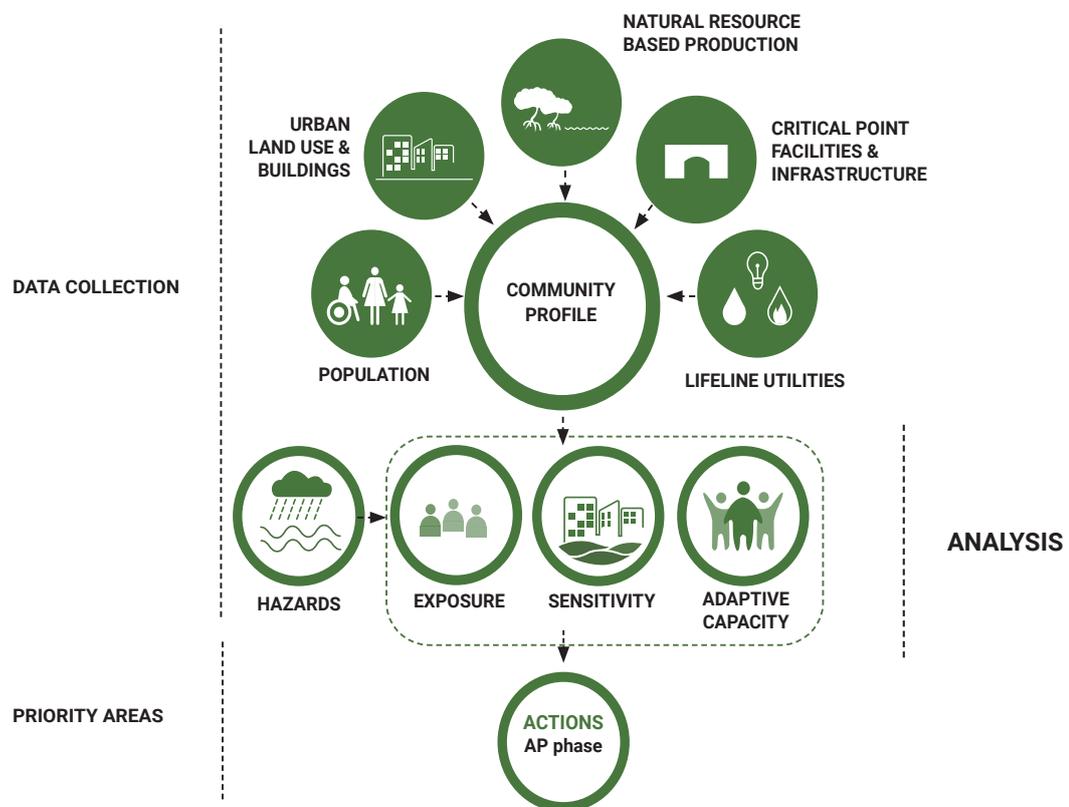
- Household survey (HHS)¹¹
- Site visits and participatory mapping
- Key Informant Interviews (KII)
- VRA workshop

Secondary data collection methods:

- Census
- Reports on climate change projections
- Spatial data available in GIS repositories

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 82 per cent of the households in Nasoata settlement. 68 households were surveyed, out of a total of 83 households that were identified in the settlement at the time when the HHS was carried out.

3 NASOATA SETTLEMENT

Being situated inside of Lautoka’s city boundary, Nasoata is under the jurisdiction of Lautoka City Council. The community has an established community leader who is chosen by community members. Among his roles are conveying meetings with community members and acting as the focal point for outside organizations and institutions. Nasoata settlement is located on State land.

The total surveyed population amounts to 355 people, from which 183 are male and 172 are female¹². The total population in Nasoata is estimated at 433 people¹³. In terms of age distribution, persons aged from 0 to 24 years old represent more than half (54%) of the total population. The youth age group (15-24) accounts 20% of the total population and 34% of the population in the settlement is under 14 years old. There is a total of three people aged over 75, and another three within the 70-74 age range. 38% of the surveyed households reported having lived over 50 years in the settlement and 10% less than a year. The average size of household in Nasoata is 5.2 persons, however this ranges from 1 to 11 people amongst those households surveyed.

¹². 18 out of 20 households were surveyed.

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

85	Total number of houses	48.420 m ²	Total area within boundary
83	Total number of households	6.126 m ²	Residential buildings area
4	Uninhabited buildings	20 m ²	Civic buildings area
433	estimated people living in the settlement	42.274 m ²	Open space area



Child in the mangroves
UN-Habitat/ Begina Peiro

”

I moved to Nasowata settlement in search for employment and I believe that it was the best decision I've ever made. The only term that spirals up in my mind is 'sea-level rise'. Coastal erosion has been an issue that we all face in the community and have been enduring it for a very long time. When cyclone or storm surge hits, it has a total different impact as chunk of land immediately eroded. This is definitely a concern because we have to think of our future generation's security. This settlement has become home for many lives, and we are all working together in keeping our home safe from climate change impacts. I know that there is no cure to climate change but adapting towards it will give a little hope in securing our home.

At this very moment, we use tyres as the settlement seawall in lessening coastline erosion, but I do believe that mangroves can prevent coastal erosion. I search for young propagules that is matured enough to be transplanted, I also take propagules that are found floating close to the coastline and nurse them till it is suitable enough to be transplanted by the coastline. I do believe this could be a natural method in preventing coastal erosion and most importantly, keep our home save by adapting to the new changes. It can act as a barrier in lessening the wave impact towards the coastline. I have a great support from my family as well as the community, especially youths. Nowadays they take the initiative in mangrove planting for a safer future.

Jone, Nasoata resident

[No real names are used in this report]



Aerial view of Jone's house during high tide
Photograph taken by the University of the South



4 CLIMATIC FEATURES, HAZARDS, PERCEPTIONS

4.1 CLIMATIC FEATURES AND HAZARDS

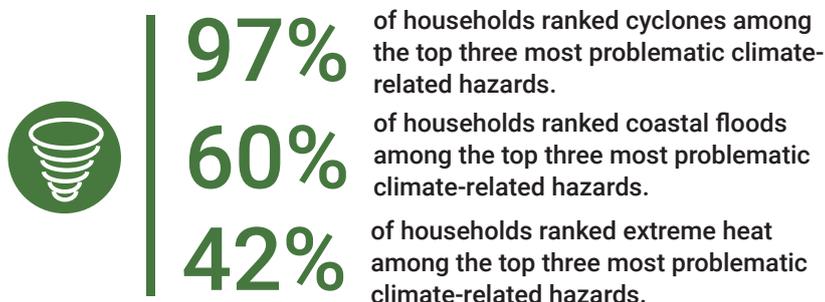
Fiji is generally considered to be an oceanic tropical marine climate¹⁴. There are two distinct seasons namely, a warm wet season from November to April and a cooler dry season from May to October¹⁵.

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

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

4.2 COMMUNITY PERCEPTIONS OF KEY IMPACTS

Based on primary data collected, residents face key challenges due to a number of climate-related hazards, including cyclones, heavy rainfall, floods, extreme heat, and vector-borne diseases.



Tropical cyclones are considered among the most severe extreme events to affect Fiji, with increasing occurrences in the past four decades¹⁸. In the validation workshop, participants mentioned that, based on their perceptions, tropical cyclones are becoming less frequent but more intense. Community members highlighted TC Evan (2012), TC Winston (2016) and TC Harold (2020) as major climate events that have impacted Nasoata. Participants mentioned that TC Winston was the most severe cyclone, damaging approximately 80 per cent of the houses, the tires that are placed along the coast and property such as study materials. The settlement was also affected by flooding related to the storm surge. Among the impacts of TC Evan were flooding, damage to houses and sanitation facilities. During TC Harold, one house was completely destroyed and 44 were partly damaged due to floods. During TC Harold residents from Nasoata went to the evacuation center (Natabua Primary School). During all three events, Nasoata was affected by flooding and settlements were damaged.

Floods in Nasoata are generally linked to storm surges and the combination of high tide and heavy rainfall. During TC Winston, flood levels reached up to a meter based on the information provided by residents. Associated impacts include flooding, damage to housing structures, impacts on mobility, etc.

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

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

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

17. Ibid

18. Government of Fiji. (2019). National Climate Change Policy.

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

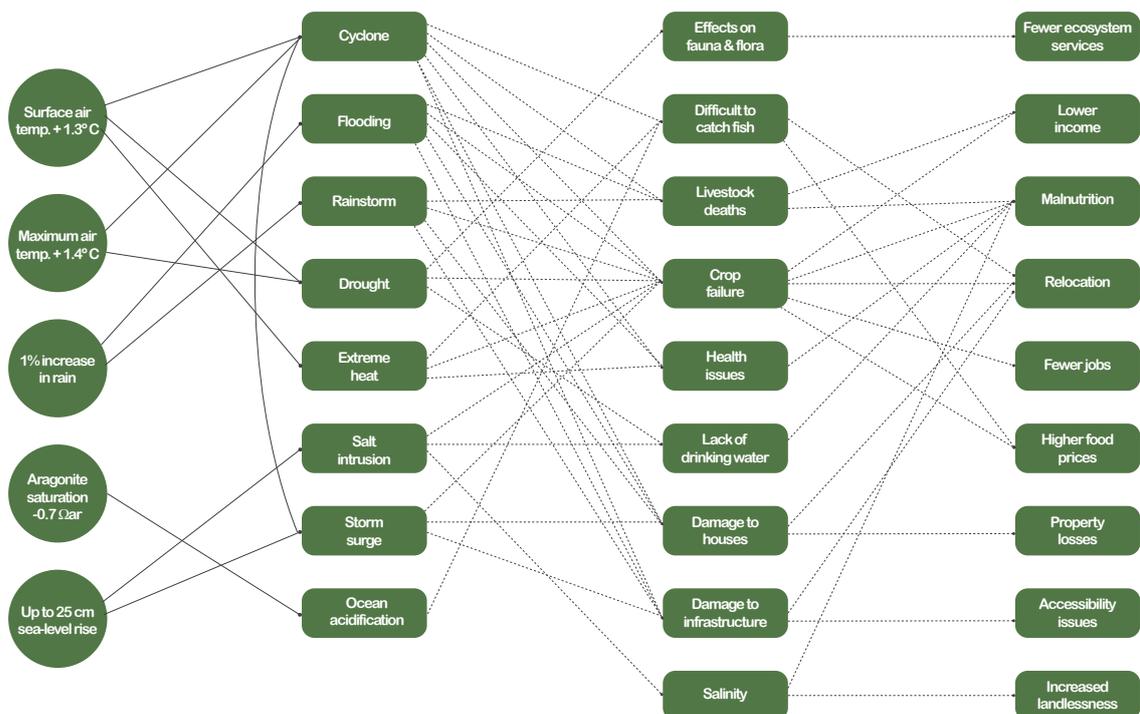
Mean sea level will continue to rise, with projected increases of 38–87 cm by 2090 under the RCP8.5



2090

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

Figure 3 shows the main hazards that affect Nasoata settlement and primary and secondary impacts that were reported by community members during participatory workshops^{20 21}



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

20. Ibid

22. 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)²³.

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.

²³. PACCSAP Program, (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports.

Aerial view of Nasoata
Photograph taken by the University of the South



6 VULNERABILITY

Nasoata'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 efforts²⁴. 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 centres²⁵. Moreover, people with disabilities and especially women are at particular risk of domestic violence due to their intersecting vulnerabilities²⁶. Additionally, unequal participation in governance and political processes also limits women's ability to influence important processes and decision-making in areas relevant to climate and disaster risk management. Due to these social norms, the full potential of women to contribute to increasing the capacity of their communities to manage climate and disaster risk is often not reached.

In Nasoata, all individuals aged 6-16 have been reported being involved in education programmes. However, children under the age of 6 have limited access to early childhood facilities, as these are located outside the settlement. This means that members of families with children under 6 often must assume the role of caretakers. Female members of the household take this role in most of the cases.

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

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

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



Mangroves
UN-Habitat/Begoña Peiro

6.2 EXPOSURE



Sensitivity is defined as the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change²⁷.

Nasoata occupies an approximate total area of 5 hectares and is located next to a mangrove area along the coast. Its social, economic and natural systems are exposed to multiple hazards. The map below shows the key elements and main hazards identified by community members during participatory workshops (see Figure 3).

Coastal flooding is associated with high tide and heavy rainfalls as well as storm surge during cyclones (e.g., TC Winston). The area marked in orange was identified as being flooded during Spring Tide and heavy precipitation, reaching flood levels of up to approximately 0.6 meters. The area marked in yellow can also be affected by this type of events, but water levels are lower (up to approximately 0.3 meters). During cyclones, storm surge can also lead to coastal flooding reaching even higher levels

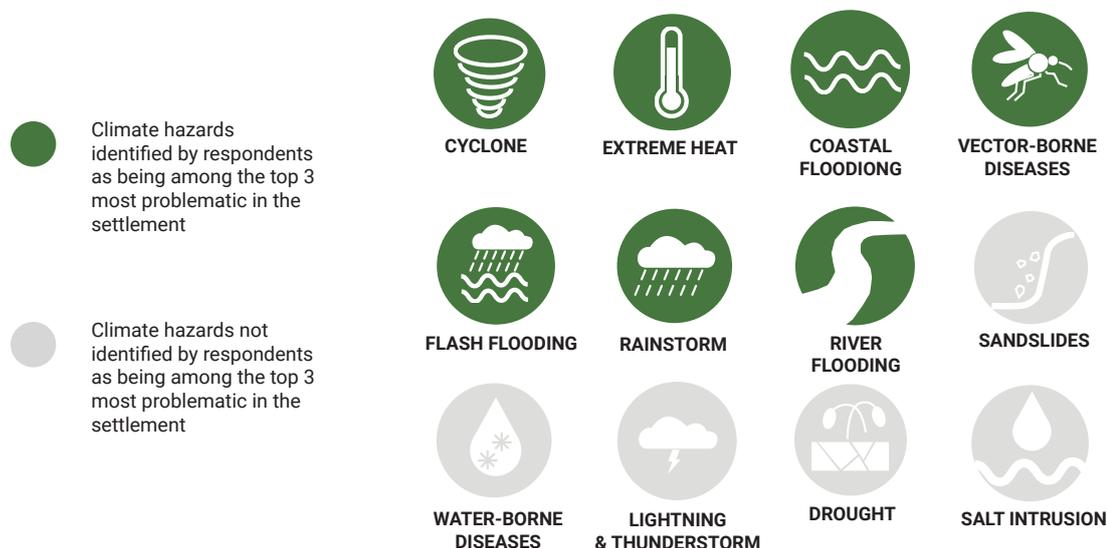
Figure 3 Hazard exposure map developed in participatory workshops



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

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 change²⁸.

(i) Population

The dependency rate in the settlement is 59.2, which is above the national dependency rate of 54²⁹. Young dependents make 92 per cent of the total dependents, while elderly people (aged over 65) make the other 8 per cent (Figure 50). Although all of the individuals aged 6 to 16 (corresponding to the age ranges between education years 1-12, compulsory in the country) have been reported as being involved in education programs, children under 6 have limited access to early childhood facilities, as these are located outside of the settlement. Nine children who are 5 years old were reported as being involved in education, the rest of the children under 6 do not attend early childhood development centers. This means that members of families with children under 6 often assume the role of caretakers. Often, female members of the household take this role. The ratio of young people (aged between 15 to 24) who are neither in employment nor in education and training is 38 per cent in the settlement. There are four people with disabilities living in Nasoata according to the information collected through the household survey.

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

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

(ii) Urban Land Use & Buildings

80% of houses in Nasoata are ranked as average or below in condition

96% of houses in Nasoata have metal exterior walls

43% of houses have roofs ranked as below average in condition

38% of houses in Nasoata were built after 2010



Town councils are responsible for checking the conditions of buildings and their compliance with the building code. However, compliance is not checked in informal settlements.

Only 13% of settlements has been built before 1970 and 38% dates from 2010 or after. All houses in the settlement are one story high with most of them located on a flat terrain. All of them have been constructed with light materials (e.g. metal, wood, etc.). 96% of the households are built with metal exterior walls, and the remaining 4% in wood. 16% were rated as being in a poor condition, 25% as fair and 39% as average. Regarding roof conditions, 43% of the roofs were ranked as being in below average conditions and another 32% were ranked as being in average conditions.

75% of the houses in the settlement have been built on stilts. Most of the houses built with stilts are made of wood (72%) and the rest are in concrete. 88% of the houses are less than half a meter high, and the rest between 0.5 and 1 meter.



(iii) Natural Resource-based Production

Residents in Nasoata rely on natural resources for food and livelihoods, as well as for protection. Mangroves not only provide coastal protection from waves and storm surges and prevent coastal erosion but are also an important source of food and wood.

59 per cent of the households in Nasoata grows crops. Impacts caused by droughts, floods and cyclones were also identified as major aspects affecting their crops and livestock. Dependency on fishing and livestock are lower than on crops, but still relatively high, with 57 per cent of households reporting fishing frequently. Coral bleaching and ocean acidification represent a threat to the availability of fish and would exacerbate the pressure on availability of fishing stock and other marine products. The proportion of households relying on livestock for food is smaller, with 54 per cent of households rearing livestock. Cyclones and floods were mentioned as the key hazards affecting livestock.

(iv) Critical Point Facilities & Infrastructure

Nasoata is located along the coast next to J.P. Bailey Road, a paved road that leads to the adjacent industries. No issues relating to climate hazards were reported regarding the access road. However, within the settlement boundaries, there are no paved roads or footpaths which complicates walking through the settlement after heavy rainfall. Residents from Nasoata have dug drains and built wooden platforms to cross these. The platforms are mostly inadequate.

Coastal erosion and coastal flooding are among the most critical issues being faced in Nasoata. Residents have tried to build a "sea wall" with tires. However, these are often pushed away during storms and not providing adequate protection nor preventing coastal erosion.

(v) Lifeline Utilities

All households reported having access to piped water supply. However, pipes are often exposed, which can lead to damages and leaks.

Nasoata is not connected to the Lautoka City sewerage network. 4% of the sanitation facilities in Nasoata fall under the category unimproved. The area where sewer pipes outlet directly to the coast is not covered during low tide, posing health risks, especially to children playing in this area. There is heightening the risk for water contamination and water-borne diseases during flood events.

Despite having access to rubbish collection, not all households reported disposing household waste into the bins provided. This does not only pose health risks, but also environmental and safety issues. Large amounts of garbage may be found in the mangroves located next to the settlement.

All the households except two mentioned having access to the electricity supply network. . A large proportion of households relying on fuelwood and kerosene, and gas to a lesser degree as they lack access to clean and modern fuels and technologies for cooking. "Fuel-stacking" is a common issue that has been identified in all the households.



Tire "sea wall"
UN-Habitat/ Begoña Peiro

46%

of respondents share sanitation facilities with another household

78%

of respondents rate the quality of piped water as average, while only 21% rated the water quality as good.

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 consequences³⁰.

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 household³¹.

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 Nasoata.

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.

35%

of households reported not having access to the abovementioned social protection programs

22%

of households reported not having access to information on climate change or disasters

98%

of households reported accessing information on climate change and disasters through technology

³⁰. 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

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



(ii) Collective Capacity

Collective capacity is how well are communities, neighbourhoods or other groups able to respond and adapt to climate hazards without assistance from government or other agencies and institutions³².

There is a lack of financial capital at the community-level. There are no savings systems in place.

Households in Nasoata have a high level of access to disaster preparedness. Most reported having access to EWS through radio (98%), SMS (88%) and/or community notification systems (80%). Most respondents have an evacuation plan (79%) or are connected to a formal DRR network (78%). Respondents said that there is enough space in the evacuation center (Natabua Primary School) and that they bring their own provisions. Community leadership structures are in place and that have proven to be effective following past disaster events.

The main concern regarding disaster impacts indicated by community members is the loss of property.

(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)³³.

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.

³². UN-Habitat, 2014. Planning for Climate Change

³³. Ibid





WASTE IN MANGROVES



LACK OF ADEQUATE DRAINAGE



POOR SANITATION FACILITIES



COMMUNITY MEASURES AGAINST COASTAL EROSION



HOUSING STOCK CONDITIONS



COOKING FACILITIES

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 SDGs³⁴. 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 Plan³⁵ (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 follow-

³⁴. Ministry of Economy, Republic of Fiji, (2019). National Climate Change Policy 2018-2030.

³⁵. 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

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

PRIORITIZED OPTIONS	SDG CO-BENEFITS	COMMUNITY RANKING	EASE OF IMPLEMENTATION	URGENCY	COST
Interventions in physical, natural and social assets					
Construction of an adequate stormwater drainage network	 	1	2	3	3
Construction of adequate footpaths across the community and for specific houses	 	2	2	3	3
Rainwater harvesting tanks	 	3	2	3	3
Improved sanitation facilities (resilient to floods)	 	4	2	3	3
Localized interventions to improve the building conditions of those structures that are identified as being in the worst conditions	 	5	2	3	3
Trainings and awareness raising					
Community involvement in elimination of larval habitats (through clean up campaigns and awareness raising)	 	1	2	3	3
WASH trainings that target adults and children	 	2	2	3	3
Disaster preparedness and response related activities	 	3	3	3	3
Trainings on safe construction for hazard proof shelters for low-income residents	 	4	2	3	3
Training on waste management following a participatory approach that identifies opportunities linked to livelihoods	  	5	2	3	3
Training on financial literacy and social protection programs	 	6	3	3	3

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.

These activities would be implemented in conjunction with those shortlisted under "physical, natural and social assets".

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, but were short-listed.
- 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
 - Activities that support the project implementation
 - These actions were identified as part of the long-list of adaptive measures, but were short-listed.
- 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 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					
Improvement of road conditions	 	1	2	2	5
Improved footpaths	 	2	3	3	8
Lifeline utilities					
Rainwater harvesting tanks (as a complementary measure to piped water supply)	  	2	3	3	8
Construction of an adequate drainage network	 	2	3	3	8
Improved sanitation facilities (resilient to floods)	  	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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