

Community Integrated Management Plan

Gagaemauga 3 District - Savaii



Implementation Guidelines 2018

Foreword

It is with great pleasure that I present the new Community Integrated Management (CIM) Plans, formerly known as Coastal Infrastructure Management (CIM) Plans. The revised CIM Plans recognizes the change in approach since the first set of fifteen CIM Plans were developed from 2002-2003 under the World Bank funded Infrastructure Asset Management Project (IAMP), and from 2004-2007 for the remaining 26 districts, under the Samoa Infrastructure Asset Management (SIAM) Project.

With a broader geographic scope well beyond the coastal environment, the revised CIM Plans now cover all areas from the ridge-to-reef, and includes the thematic areas of not only infrastructure, but also the environment and biological resources, as well as livelihood sources and governance.

The CIM Strategy, from which the CIM Plans were derived from, was revised in August 2015 to reflect the new expanded approach and it emphasizes the whole of government approach for planning and implementation, taking into consideration an integrated ecosystem based adaptation approach and the ridge to reef concept. The timeframe for implementation and review has also expanded from five years to ten years as most of the solutions proposed in the CIM Plan may take several years to realize.

The CIM Plans is envisaged as the blueprint for climate change interventions across all development sectors – reflecting the programmatic approach to climate resilience adaptation taken by the Government of Samoa. The proposed interventions outlined in the CIM Plans are also linked to the Strategy for the Development of Samoa 2016/17 – 2019/20 and the relevant ministry sector plans.

We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

Ministry of Women Community and Social Development (MWCSD)
 Ministry of Works Transportation and Infrastructure (MWTI)
 Ministry of Natural Resources and Environment (MNRE)
 Ministry of Agriculture and Fisheries (MAF)
 Electric Power Corporation (EPC)
 Land Transport Authority (LTA)
 Samoa Water Authority (SWA)
 Ministry of Health (MOH)
 Ministry of Finance (MOF)

We acknowledge also our key international donor partners: the World Bank, the Pilot Program for Climate Resilience and Adaptation Fund, Adaptation Fund Project, through the UNDP, for the financial support that enabled the review and update of the CIM Plans.

Finally, I commend these CIM Plans to all relevant stakeholders from government ministries to districts and village communities and development partners to implement with the utmost urgency. It is assured that the implementation of the CIM Plans further enhance the resilience of Samoa to the impacts of climate change.

Thank you


 Hon. Fiame Naomi Mata'afa
 Minister of Natural Resources and Environment

Participants in the Plan

The CIM Plan is a Partnership between the Government of Samoa and the villages within the Plan area. The Plan area starts from the ridge extending to the reef broadly covering 4 sectors; Infrastructure; Natural Environment and Resources; Livelihood and Food security; and Village Governance. Both partners have responsibilities for issues and solutions and the Plan gives an integrated approach to the provision of services and improvement of resilience now and in the future.

This Plan incorporates the Faipule District of Gagaemauga 3 (Safa'i, Sato'alepai, Fagamalo, Lelepa, Avao and Salei'a and Vaipouli villages).

The village representatives participated in the preparation of this CIM Plan in partnership with the Government of Samoa.

Villages: **Date of Signing:** 15 June 2018

Representative:

Signature:

Safa'i Village

- Fuivelo Neemia
- Sufia Tino
- Pitova
- Seia Tino

Neemia
Tino
Pitova
Seia 15/6/18

Sato'alepai Village

- Maiava Veni Gaugautao
- Mauigoa Ueta Faasili
- Polutea Faletao
- Pipili Pili
- Pipili Pitone

Ueta Faasili
Polutea
P Pili
P Pitone

Fagamalo Village

- Seuamuli Fuai Poae
- Seuamuli Samuelu T
- Isaia Faaopopo
- Lepai Solomona
- Talalelagi Faamoetauloo

Fu - 15/6/2018
S. 15/6/2018
S. 15/6/2018
S. 15/06/2018
Sam. 15/6/2018

Lelepa Village

- Lealaiauloto Faaleliu
- Ulai Tu
- Maota Faamoe Pita
- Seela Aita

Koto - Faaliliu
~~_____~~
Maota. F. Pita.
Seela - Aita.

Avao Village

- Tiatia Foti
- Nofoi Selemaea
- Lealaiauloto Vili
- Letuu Tiatia Salevi
- Misileti Nafoi

_____ 15.6.18
_____ 15-6-18
_____ 15-06-18
_____ 15-6-2018.
_____ 15/06/2018.

Salei'a and Vaipouli Village

- Toa Maoluma
- Motoalii Fei
- Peki Toa
- Tusi Peseta
- Mailata Sakaio

TM 15/6-2018
_____ 15/6/2018
_____ 15/6/2018.
_____ 15/6/2018
_____ 15/6/18

The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Gagaemauga as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

The Ministry of Natural Resources and Environment, as lead organization of Government, on behalf of the participating Government Departments and Corporations, confirms the participation of the Government of Samoa in the preparation of this Community Integrated Management Plan and its adoption as a Management Plan for the implementation of the Community Integrated Management Strategy.



Ulu Bismarck Crawley
CHIEF EXECUTIVE OFFICER, MNRE

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Acronyms:

| | |
|--------------|---|
| ASCH | Areas Sensitive to Coastal Hazards |
| BCA | Benefit Cost Analysis |
| CBFMP | Community Based Fisheries Management Plan |
| CDCRM | Community Disaster & Climate Risk Management |
| CEP | Community Engagement Plan |
| CHZ | Coastal Hazard Zone |
| CEHZ | Coastal Erosion Hazard Zone |
| CFHZ | Coastal Flooding Hazard Zone |
| CIM | Community Integrated Management (Plan) or (Strategy) |
| CLHZ | Coastal Landslip Hazard Zone |
| COEP | Code of Environmental Practice |
| CSO | Civil Society Organization |
| CSSP | Civil Society Support Programme |
| DSP | District Sub Project |
| EbA | Ecosystem based Adaptation |
| ECCCR | Enhancing Coastal Community Climate Resilience |
| ECR | Enhancing Climate Resilience |
| EMP | Environmental Management Plan |
| EPC | Electric Power Corporation |
| ERN | Emergency Radio Network |
| HCSI | High Coastal Sensitive Index |
| IAS | Invasive Alien Species |
| KBA | Key Biodiversity Area |
| KPI | Key Performance Indicator |
| LTA | Land Transport Authority |
| LTO | Long Term Output |
| MAF | Ministry of Agriculture and Fisheries |
| MET Office | Meteorological Office |
| MoH | Ministry of Health |
| MNRE | Ministry of Natural Resources and Environment |
| MWCSD | Ministry of Women Community and Social Development |
| MWTI | Ministry of Work Transport and Infrastructure |
| NAP | National Action Programme |
| NBSAP | National Biodiversity Action Plan |
| NDMP | National Disaster Management Plan |
| NESP | National Environment Sector Plan |
| NISP | National Infrastructure Strategic Plan |
| NRW | Non-Revenue Water |
| PA - KO | Priority Area - Key Outcome |
| PUMA | Planning Urban Management Agency |
| PPCR | Pilot Programme Climate Resilience |
| R2R | Ridge to Reef |
| SIAM | Samoa Infrastructure Asset Management |
| SOE | State of Environment |
| SWA | Samoa Water Authority |
| UNDP-GEF SGP | United Nations Development Programme Global Environment Facility Small Grants Programme |
| WB | World Bank |
| WCR | West Coast Road |
| WMP | Watershed Management Plan |
| WSSP | Water Sanitation Sector Plan |

Glossary

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|-------------------------|---|
| “Do Minimum” Option | A Management option that involves continuing with the present maintenance and upgrading programme on and when required basis. |
| Emergency Management | To provide communities with skills, facilities and materials so that they may adapt, respond and recover more quickly in the event of emergencies. |
| Food Security | <p>Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life</p> <p>Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as these to fall commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources)</p> |
| Food availability | <p>The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)</p> <p><i>Stability:</i> To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g.an economic or climatic crisis) or cyclical events (e.g. seasonal food in security). The concept of stability can therefore refer to both the availability and access dimensions of food security</p> <p><i>Utilization:</i> Utilization of food through adequate diet, clean water, sanitation and healthcare to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security</p> |
| Hazard | A source of potential harm or a situation with a potential to cause loss. |
| Hazard Zones | <p>Defined areas which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to six hazard zones:</p> <p><i>ASCHs</i>(areas sensitive to coastal hazards);</p> <p><i>CEHZs</i>(coastal erosion hazard zones);</p> <p><i>CFHZs</i>(coastal flood hazard zones)and</p> <p><i>CLHZs</i> (coastal landslip hazard zones)</p> <p><i>CIHZ</i> (coastal inundation hazard zones)</p> <ul style="list-style-type: none"> - Coastal Inundation 0 to 15mASL – immediate coastal inundation hazard zone - Coastal Inundation 15 to 20mASL – 5-metre uncertainty buffer on the immediate coastal inundation hazard zone (due to potential LiDAR inaccuracies) - Coastal Inundation 20 to 50mASL – additional hazard zone for the purpose of assessing/planning the location of tsunami protection infrastructure beyond the 0-20mAmSL contour. Please note tsunami risk includes 0-20mASL, so tsunami hazard zones need to include the 0-15mASL and 15-20mASL polygons as well as the 20-50mASL polygon - Coastal Inundation 50 to 55mASL – 5-metre uncertainty buffer on the tsunami infrastructure hazard zone (due to potential LiDAR inaccuracies) <p><i>IFHZ</i> (immediate fluvial hazard zone) within the steep banks of the river gorges</p> <ul style="list-style-type: none"> - River bank encroachment control – 5m buffer on either side of river banks - Watershed management riparian zone – 20m buffer on either side of the river banks |
| Infrastructure | Built structures and networks which support the national, regional or local community |
| Lifeline infrastructure | Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events. |

| | |
|--------------------------|--|
| Secondary infrastructure | Infrastructure that contributes to the every-day development of the community. |
| Implementation Guideline | A document to guide land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defenses and works. |
| Issue | A specific concern regarding both cause and effect. |
| Land and Resource Use | The use of land and resources by the community for social, economic or other benefit (e.g. land use includes areas used for villages or crops, resource use includes activities such as sand mining, gravel extraction or fishing). |
| Livelihood | Livelihood refers to a person or group's "means of securing the necessities -food, water, shelter and clothing- of life". |
| Monitoring | Process of measuring the effectiveness or impacts of projects and works against predicted standards, levels or outcomes. |
| Resilience | The ability to be adaptive, responsive and quick to recover. |
| Community Resilience: | The ability for the community to be adaptive, responsive and quick to recover from the adverse effects of hazard. |
| Natural Resilience | The ability of natural systems to be adaptive, responsive and quick to recover from natural processes or hazards. |
| Risk | The chance of something happening that will have an impact on objectives. It is measured in terms of consequence and likelihood. In the Community Integrated Management Plan context it is the likelihood that infrastructure, environment and biological resources and agricultural and marine resources (food security) will be subject to inland and coastal hazards and the potential for loss of property, life or land due to natural processes. |
| Stakeholders | Those people and organizations who may affect, be affected by, or perceive themselves to be affected by, a decision or activity. The term stakeholder may also include interested parties. |
| Strategy | Direction or course of action to achieve a define division. |
| Susceptibility | The degree to which infrastructure at risk is likely to be damaged by coastal hazards and how easy/difficult, expensive/cheap it is to replace. In the context of the CIM Plan the term susceptibility is equivalent to the term vulnerability as the Samoan phrase for both susceptibility and vulnerability is the same. |
| Vision | A desired destiny |

1. Introduction to the CIM Plan

1.1 The Strategic Vision

The District Community Integrated Management (CIM) Plan for Gagaemauga3 District has been prepared as part of the Government of Samoa's Adaptation Fund - *Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project*. The CIM Plan is one of the primary means of implementing the CIM Strategy, which was formally approved by the Government of Samoa in February, 2001 and updated in 2015 as providing the Strategic direction for enhancing the resilience of community livelihoods, infrastructure, environment and natural resources using a holistic and integrated ridge-to-reef approach. The Strategy has as its central vision:

Resilience – Community Livelihoods, Infrastructure, Environment and Natural Resources
to Climate Change and Natural Disasters

The CIM Plan takes this vision and provides the practical tools with which the communities and the government, in partnership, can implement the Strategy. ***To be resilient is to be adaptive, responsive and quick to recover so that communities are environmentally, socially and economically sustainable (CIM Strategy, 2015).***

1.2 The Aim of the CIM Plan

The aim of the CIM Plan is to help communities and government improve resilience by identifying actions and solutions considered as best approach to issues identified. Not all the solutions may be actioned immediately but the plan will ensure that issues and options are identified for the long-term improvement in resilience of community livelihoods, infrastructure, and environment and resource systems.

The CIM Plan will:

1. Improve the community's awareness of all hazard risks from the ridge to the reef;
2. Enable the community as well as providers of services and physical, financial, and technical support in all climate prone sectors, to reduce inland and coastal hazard risks in villages;
3. Enable the community and government service providers of infrastructure services, livelihoods, environment and natural resources to better adapt, respond and recover from cyclones.

1.3 Structure of the Plan

The CIM Plan consists of two parts each serving a separate and distinct purpose.

- ***Plan Development***, which describes the process undertaken in preparing the CIM Plan in conjunction with representatives of the Communities involved, the Government and other stakeholders with interests in the Plan area.
- ***Implementation Guidelines***, which describes the Plans and Actions recommended as outcomes of the process, together with the partner responsible for implementing these outcomes. The participants of the CIM Plan preparation process are acknowledged in the Implementation Guidelines.

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines

The Implementation Guidelines describe the solutions proposed that will increase the resilience of the villages in the Plan area and the ways these solutions can be implemented. The solutions are presented for various livelihoods, infrastructure, environment and natural resources items that have moderate to low resilience. Where one solution will provide benefits to other items of livelihoods, infrastructure, environment and natural resources these “Other Benefits” are also noted. Implementation is considered to be the joint responsibility of both the villages and the government in partnership. The government is responsible for the provision of national and district “Public”, infrastructure and public goods and benefits derive from environmental services and natural resources, while villages are responsible for local and community infrastructure and livelihoods related actions. The responsibility for implementing the proposed actions is also defined. Solutions for both District and Village level issues related to livelihoods, infrastructure, environment and natural resources respectively, and the responsibility of both partners, should be considered together as they combine to provide for the integrated management of all community development initiatives.

The solutions for village level interventions related to livelihoods, infrastructure, environment and natural resources will usually be the responsibility of the Village Council and Families in the village to implement. Advice and resources may be available from the Government to assist the village in implementing these solutions. In most situations these solutions will also provide benefits to both village and district infrastructure and resources and environmental goods that are shared between villages. These solutions should be considered an integral part of strengthening community resilience at both levels.

2.2 Duration of the Plan

The CIM Plan is reviewed every 10 years but during the Plan period, the solutions implemented will be monitored on a five (5) yearly basis to ensure the proposed solutions are effective and are actually improving resilience. The 5 yearly monitoring of the new CIM Plan is aligned with the 5 year review of the key national planning and programming strategy for Samoa: the Strategy for the Development of Samoa (SDS). The new CIM Plan recognizes some solutions are likely to take longer than 5 years, whilst others may take up to 10 years to implement due to the complexity of planning process, funding and budgeting programming required to implement these solutions.

Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators.

2.3 Financing of the Plan

Implementation of best solutions is the collective effort of all identified responsible agencies, civil society organizations, donor partners and district and village communities themselves. Funding will be sourced through several mechanisms recognizing the Government of Samoa’s programmatic approach to tackling climate change impacts on its development progress. While every effort has been made to identify priority actions needed to build the resilience of Samoa and its communities, the Government also recognizes that not all actions identified can be financed at once. Implementation of best solutions will be undertaken strategically and over time in line with available funding and, if determined a priority CCA activity that will actually build the resilience of communities and Samoa as a whole. Criteria of determining priority CCA best solutions for financing are:

- proposed development is in general accordance with the objectives of the CIM Strategy;
- development is specifically recommended in the CIM Plan
- number of people that will benefit from the development, i.e. population benefit
- development will provide *life sustaining* support for communities
- minimum or neutral environmental effects
- development will improve resilience
- development will achieve speedy recovery
- development will reduce risk
- also identified as a priority in other Sector Plans or National Strategies

During the development of the new CIM Plans, the World Bank funded Pilot Programme for Climate Resilience Enhancing Climate Resilience for Coastal Resources and Communities (PPCR ECR) prepared two (2) key documents:

- **Community Engagement Plan (CEP)**-the guidelines provided in the CEP is an excellent capacity building tool that can be used by CSO's and village communities themselves to aid development of small grant proposals to existing small grant funding mechanisms like CSSP and the UNDP-GEFSGP
- **District Sub Project (DSP)** – the guidelines provided in the DSP targets single districts or multi-district projects with a large number of beneficiaries.

Noting Samoa's programmatic approach to CC and CCA, these key documents are fundamental in guiding development partners, implementing agencies and other stakeholders on the most effective way of resourcing and supporting climate change adaptation projects at the village and district levels. These village and district level CCA projects actually achieve the majority of key indicators in various Sector Plans, subsequently achieving key national indicators contained in the *Strategy for the Development of Samoa* (SDS).

3. Description of Gagaemauga 3 District

3.1 Physical and Natural Resource Setting

The Gagaemauga3 District is located on the northern most point of the island of Savaii between Gagaifomauga1 and Gagaemauga2 districts. The district is characterized by a low-lying coral sand beach, inland ridges and coastal plains with extensive wetland and estuary areas. The flat coastal plateau extends approximately 1km inland from the coastal shoreline. There are no coral reef systems in this district. The terrain is dominated by volcanic lava of recent age (Dews, 2016). The coastal areas are flat with a large expansion of alluvial sediments adjacent to the bay at Matavai. Inland from the coast the terrain rises into the mountain area through a series of different landforms (Dews, 2016). This district contains an open forest located on the northern shores near Fagamalo (Reti, 2017).

The seven villages of Safa'i, Sato'alepai, Fagamalo, Lelepa, Avao, Salei'a and Vaipouli are mainly located along the coast. Public buildings servicing all of Gagaemauga3 and nearby districts are located in Fagamalo: Police Station, ANZ Bank ATM and Samoa Post Office. The old hospital which was in Fagamalo has been relocated to Safotu. A new district hospital has opened at the old location of the Vaipouli College. The district secondary school 'Itu-o-Tane' is located in Avao/Vaipouli. Behind the EFKS church in Avao is a historic site where the bible was first translated into Samoan.

There are 2 catchment areas within this district. One connects to the Muliolo Stream, which runs through a steep incised valley adjacent to Vaipouli. The stream joins the wetland area behind Avao and Salei'a discharging in two locations (see District Map). The second connects to streams that discharge into the Fagamalo and Satoalepai wetlands. Inadequate culverts under the Safa'i bridge is restricting the outflow of water from wetlands and contributing to inland flooding in Fagamalo and Satoalepai. An Independent Water Scheme reservoir is located close to where the new Vaipouli District Hospital is located. The reservoir is exposed to nearby agricultural developments but is the main source of water supply for the district, although along most inland access roads there is limited reticulated water supply. Most inland families rely on water tanks. The reticulated system has decaying and exposed pipes, which is contributing to contaminated and irregular water supply. SWA has one exploratory borehole in Fagamalo to assess the viability of groundwater for supply of water within the district.

The wetlands of Gagaemauga3 contain some of the indigenous species that are considered rare or extinct in other parts of Samoa. For example, the seasea tree (*syzygiumcorynocarpium*) whose fruits were traditionally used as leis and occasionally eaten, appear to be naturalised in this area along with other local species such as filimoto (*falcourtiarukam*), nonufi'afi'a (*syzygiummalaccense*), nonutogi (*morindacitrifolia*) and ifi (*inocarpusfagifer*). This wetland is within the cfhz but this should not deter any action by the village to set it aside as a protected area. At the lowland forests, tamaligi is dominant along with tinamoni, mosooi, tufaso and other lesser known species. Upland areas is dominated by tavai, fau, coconut plantations, tinamoni and some individual stands of exotic species such as mahogany and eucalyptus. Large leaf *merremia*, *mint weed* and cinnamon are rife in the lowland and upland areas. Wild pigs and myna birds are a threat to village plantations and gardens (reti, 2016).

There are two major reef breaks in the district at Safa'i and Fagamalo, 200m and 250m wide respectively (see District Map). Most of the Gagaemauga3 district is protected by seawalls. The reef ranges from 100m to 750m off shore. Sand mining occurred on the boundary of Sato'alepai and Fagamalo but has now been reduced due to heightened monitoring by the village council and government.

A 5m high revetment wall built in 2015 runs from Avao to Saleia forming a long (approx. 800 m) concrete wall behind the villages. There are no channels to allow wetland flood water to flow freely through the wall to the sea. The water is blocked at the eastern end of the wall by the Saleia work road near the bridge. This poses a real threat to the villages when the wetland is flooded and the wall is broken by the sheer weight of flood water. Stagnant water is believed to have contributed to the death of wetland vegetation especially at the eastern end of the district. Wetlands are valuable and productive ecosystems and the construction of the revetment at Gagaemauga3 deserves close monitoring (Reti, 2016).

The main north coast road is a critical lifeline access for the whole of Savaii but it sits very close in some places in this district, in the coastal erosion and flooding hazard zones. Away from the coast going inland along the four¹

¹Fagamalo access road which connects to Satoalepai is considered as 1 as it is called the Fagamalo Loop Road

access roads, residential houses, schools and agricultural activities are all in the mix. Access roads have been sealed since the 2007 CIM Plan however condition of roads are not up to national road standards. They are often flooded due to non-existent or inadequate drainage and culverts. Approximately 90% of the Safa'i village population has relocated inland along the local access road. Gagaemauga3 villages are located on both sides of the access roads except along the main sealed 8m wide Avao/Vaipouli access road which houses the new district hospital. This road also merges to the Lelepa village as well as a second access road and the water reservoir. Further inland, the clearance of land for plantations affects land stability and increases both the rate of erosion and the supply of sediment to the coast. Agricultural developments in this area are too close to the reservoir and needs to be monitored closely. These practices affect coastal processes including the incidence and degree of flooding in coastal areas.

3.2 Social and Economic Setting

The Gagaemauga3 District has a population of 1,695 persons including 823 females and 872 males². 263 in Satoalepai, 383 in Fagamalo, 279 in Lelepa, 279 in Avao, 226 in Safai, 221 in Salei'a and 44 in Vaipouli. There is a slight reduction of total population from the 2007³ CIM Plan with the majority moving overseas or to Apia for job opportunities. Development is mostly located in a linear manner on the southern side of the main road except in Safa'i where 90% of the village live along the work road and Vaipouli where the main road extends 1.5km inland.

The district has received several financial assistances from various donors, and government agencies programmes. Financial assistance varied from assistance for road upgrades, pool rehabilitation, tilapia restocking, establishment of community owned fish reserves, giant clam restocking, scenic attraction, protection and conservation of mangroves, water tanks, seawall construction to school renovations⁴.

From Fagamalo eastward to Safa'i, the wetland is a major site for tilapia farming by the villages on this side of the district. The district reports wetlands showing signs of the water being more saline, mangroves dying off, and different species of fish found in the enclosed area. The construction of the bridge at Safa'i is too low and narrow to allow water to flow freely. This part of the mangrove is extremely important for it provides an important economic opportunity for the district. According it conservation status will be a good investment for the future of this district (Reti, 2016).

Primary services such as water, power and telephone generally follow the main road. In the event of an emergency all services along the main road could be affected by a disaster. The new district hospital is now located at the old Vaipouli College and a doctor visits twice a week.

The cash economy of the District is dominated by traditional work. In all villages, the majority of residents are largely sustained by subsistence plantation and fishing. The District supports both a large primary school 'Laumoli' and large secondary school 'Itu-o-Tane'. In addition, there are a number of small shops and home occupations throughout the area. At Sato'alepai is the 'Swimming with Turtles', a popular tourist operation as well as the Le La Goto Resort at Fagamalo which provides job opportunities for the district and also draws on some supply of local produce from the villages.

The agricultural system is mixture of plantations, cattle and small livestock. The soils and rainfall are consistent with areas of high rainfall and pockets of drier environment. Household farming is a mixture of vegetables and fruit and small livestock. Cattle are grown inland in between the coconut plantation.

3.3 Climate Risk and Resilience

The district of Gagaemauga3 has a total area of 6,872 hectares. The area covering the 0-15m Coastal inundation Zone is 271.1hectares, which is 3.9% of the total area of the district. Of the 516 buildings in the district, 443 buildings are located within the 0-15m inundation zone. Most of the village boundaries of Saleia, Avao and Fagamalo are within the Tsunami Hazard Zone. The Watershed Management Riparian Zone is a 20m buffer on either side of the river banks. Healthy riparian areas are vital to the health of stream ecosystems and the entire watershed as well. Many of the threats to rivers and streams are directly related to physical changes to these areas and loss of vegetation (Tokalauvere, 2017).

² Samoa Bureau of Statistics: Census 2016 Preliminary Count.

³Recorded 1,640 using 2001 census count

⁴MWCSD, 2013. Village Profiles of Samoa, 2nded.

The wetland from Avao to Sale'ia is the site of a major revetment wall built to protect the villages of the district from flooding of the wetland. Behind the wetland are steep slopes some of which are already being cleared of forest vegetation. There are 2 catchment areas within this district. This puts the villages in a dangerous and risky situation during heavy rain as the chances of flooding increases. There are no channels built into the revetment wall to allow flood water to flow to the sea. This means the flood water could accumulate behind the wall posing a serious risk to the families living nearby should the wall burst due to heavy volume of flood water. Already there are signs of swamp vegetation die back on the seaward side of the wall and it is expected that this side of the wetland will eventually dry up with more trees dying. Wetlands are valuable and productive ecosystems and the construction of the revetment at Gagaemauga III deserves close monitoring (Reti, 2016).

Tree planting on steep slopes and hill sides are particularly important for the lowland areas of Gagaemauga3 where landslips appear to be a major problem (Reti, 2016). The Vulnerability Assessment of the Samoa Road Network (SMEC/LTA, 2016) ranked the Lano to Fagamalo north coast road as high in vulnerability using their physical assessment and social vulnerability index calculations. The Fagamalo to Sasina stretch of road is also high in vulnerability being within 5metres of the coastline in some areas. During extreme weather events and king tides, some parts of the road are impassable. All access road have been upgraded but the absence of culverts and drains has exacerbated local flooding and inundation, with water pooling where access roads intersect with the main coastal road.

The district of Gagaemauga3 is protected from inland flooding by an extensive revetment wall that runs from Fagamalo in the east to Saleia in the west. The revetment is built on the coastal side of the wetland that runs the full length of the district. There are no channels to allow wetland flood water to flow freely through the wall to the sea.

Due to most of the agriculture being away from the coast the impacts from storms, sea level rise and loss of marine diversity is low for this district. Impact from extended periods of dry conditions will impact household crops. Impacts from change in climatic conditions will result in an increase in forest fires being more likely. The management of surface water from the mountain areas will be important given the soil conditions and large area of volcanic rock. Varied rainfall will create conditions that will require farmers to diversify crops and management of pests (Dews, 2016).

Restoration of native forests species increases the resilience of the forest against droughts, invasive species, fires and cyclones. The forest provides valuable ecological services downstream along the catchment (Dews, 2016).

4. Gagaemauga 3 District Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|--|--|--|--|--|
| Main Road including seawalls, revetment wall and drains in CEHZ and CFHZ | <p>Promote and support village and district tree planting on coastal areas around existing seawalls to strengthen seawalls and reduce erosion using native species such as talie, fetau, toaetc that are known to have greater resilience to natural disasters and changing climate conditions. Depth and density of planting needs to be increased and a minimum vegetative distance of 200mm as an effective wave barrier distance</p> <p>Upgrade culverts under the bridges at Sato'alepai and Safa'i to ensure water flows freely in and out of the wetlands</p> <p>Install channels at the Saleia/ Vaipouli revetment wall to ensure water flows freely in and out of the wetlands</p> <p>Assess and upgrade the main road drainage system in particular at the Avao road ford and ensure that they are clear at all times to enable the flow of the river out to the sea</p> <p>Install advisory depth Markers and Advisory edge markers at all fords to warn vehicle and pedestrian traffic</p> <p>Implement seawall and slope stabilization west of Avao ford</p> <p>Upgrade culverts to drain stormwater into sea and in accordance with Vulnerability Assessment of the Samoa Road</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Climate proof national road network</p> <p>Improve preparedness and readiness responseto natural disasters</p> <p>Reduce impact from coastal erosion and inland flooding</p> <p>Maintain lifeline access for all of Savaii</p> <p>Safer villages, houses and roads</p> <p>Improve sustainability of natural resources</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Utilise Saleia/Vaipouli Relocation Strategy to guide long term planning of infrastructure relocation. Allow for 2.5km arterial as long term solution</p> <p>Prepare design and contract for upgrading and installing channels, culverts under the bridges and the ford</p> <p>Implement recommendations in the Vulnerability Assessment of the Samoa Road Network and Road Network Adaptation Strategy</p> <p>Include in budget programming design, and construction costs</p> <p>Develop/Update District/Village bylaws that include banning of sand mining and illegal rubbish dumping.</p> <p>Utilise Hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and design</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village drainage cleanup and awareness programmes</p> | <p>NESP 2017-2021</p> <p>Community Sector Plan</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>NISP2011</p> <p>Village Fono Act (Amendment Bill 2016)</p> <p>[Draft] Samoa Relocation Strategy 2016</p> |

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|---|--|--|--|--|
| | <p>Network recommendations</p> <p>Undertake safety audit of the Saleia/Vaipouli revetment wall and conduct regular inspections</p> <p>Investigate further main road relocation recommended in Saleia/Vaipouli Relocation Strategy</p> <p>Responsibility: LTA/MW TI/MNRE/ MWCS D/ Village</p> | | | |
| <p>Access to reservoir and water supply, quality and network to be improved</p> | <p>Continue regular maintenance at the reservoir and dig out the dirt that is filling up the reservoir</p> <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ MWCS D/ MNRE / District/ Village/ CSSP</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Community Sector Plan</p> |
| <p>Electricity supply</p> | <p>Provide underground lines in the long term</p> | <p>Maintain electricity supply at all times including</p> | <p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p> | <p>EPC Strategic Plan</p> <p>NISP</p> |

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| | <p>Install and connect power supply for inland residents</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Install streetlights along the roads where needed for community safety</p> <p>Install and connect to solar power supply if made available</p> <p>Families to limit building and developments near electricity posts</p> <p>Responsibility: EPC/MWTI/ Village/Families</p> | <p>natural disasters</p> <p>Avoid accidents from fallen electricity posts.</p> | | |
| <p>Village houses, Churches, School and private residences located in high risk hazard zones</p> | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> | <p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p> | <p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> | <p>CIM Strategy 2015</p> <p>[Draft] Samoa Relocation Strategy 2016</p> |

| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementations | Relevant Sector Plans, National Strategies/Policies |
|---|---|--|---|---|
| <p>Wetland restoration and protection</p> | <p><i>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</i></p> <p>Adopt agro-forestry and community tree farming practices instead of clear felling as is practiced at present</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Continue ban of destructive fishing practices including sand mining and introduce village ban on rubbish dumping in wetland and coastal areas</p> <p>Fence domestic animals to reduce contamination in wetlands</p> <p>Conduct regular inspections of the swamp/wetland vegetation at Saleia/Vaipouli near and around revetment wall to monitor health of vegetation</p> <p>Construct drain from wetlands to the sea underneath the main road to allow the free flow of water in and out of wetlands and reduce flooding impacts on village houses</p> <p><i>Responsibility: MNRE/ Village/MWCS D</i></p> | <p>Protect coastline against normal wave action</p> <p>Maintains natural ecosystem connectivity</p> <p>Reduce inland & wetland flooding</p> <p>Improve health and sanitation</p> <p>Reduce overland flooding from river channels</p> | <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats (coastal lowland area) and planting materials for villages that need them</p> <p>Develop/Update District/Village bylaws that include banning of sand mining and illegal rubbish dumping.</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes</p> | <p>NESP2017-2021</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> <p>Village Fono Act (Amendment Bill 2016)</p> <p>Vaipouli Watershed Management Plan</p> |

| <p>Unsustainable sand mining (commercial and domestic)</p> | <p>Identify alternative sustainable sources of sand/rocks for domestic use</p> <p>Research the impacts of sand mining</p> <p>Village consultation on sand mining policy and regulation</p> <p>Village and government to collaborate closely on designated areas for sand/rock mining</p> <p>Raise awareness and support of sustainable land use practices</p> <p>Responsibility: MNRE/Village/Families</p> | <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Safer villages, houses and roads</p> <p>Reduce impact from coastal erosion</p> <p>Economic benefit for village from sustainable sand mining activities</p> | <p>MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks</p> <p>Undertake assessments of identified sites</p> <p>Undertake consultation with villages affected by proposed sand/rock mining</p> <p>Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of CIM Plan activities</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Draft Soil Resource Management Bill</p> |
|---|---|---|---|---|
| <p>Livelihood and Food Security</p> | <p>Best Solutions</p> | <p>Benefits</p> | <p>Guideline to assist with the implementation</p> | <p>Relevant Sector Plans, National Strategies & Policies</p> |
| <p>Pest management; invasive species (african snails and worms affecting vegetable gardens)</p> | <p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate resilient native species</p> <p>Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken</p> <p>Conduct education and awareness programmes on the impacts of invasive species</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water</p> | <p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</p> | <p>Develop an integrated land management plan for Gagaemauga 3 district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to raise awareness of farmers on impacts to water flows from poor livestock management</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p> <p>MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly</p> <p>Village to manage pig/cattle population (compounds, in particular around water</p> | <p>Agriculture Sector Plan 2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p> |

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| | <p>sources</p> <p>Conduct pilot site trials for climate ready plant varieties</p> <p>District to fence domestic animals</p> <p>Responsibility: Villages /District/ MNRE/MAF/ SROS</p> | | <p>supplies)</p> <p>Training for farmers on pests management particularly affecting fruit trees and crops</p> | |
| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Strengthen the governance of natural resources and land use through Bylaws | <p>Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p>Responsibility: MWCS D /Village</p> | <p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p> | <p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> |

| Non-CR issues raised during consultations | Proposed Solution | Comments |
|--|--|--|
| <p>Safety barriers/fence for Itu o Tane secondary school</p> <p>Responsibility: MESC/ Village</p> | <p>Construct safety barrier & associated signage opposite Itu o Tane senior secondary school to protect school children and vehicles from nearby cliff</p> | <p>Not a CR issue but included for MESC and Village to consider and seek funding/budget requirements if considered a priority in national planning processes</p> |
| <p>Resident doctor for the new district hospital</p> <p>Responsibility: NHS/ Village</p> | <p>District to discuss with NHS (note shortage of doctors is a nationwide issue- not just for this particular district)</p> | <p>Not a CR issue. May be considered under a District/Village Disaster Management Plan. DMO has already completed survey for district but Disaster Management Plan yet to be developed</p> |

Gagaemauga 3 District Map

Gagaemauga III District



Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa
 Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project



4.1 Safa'i Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|--|--|---|---|--|
| <p>Village houses, school, church and other village assets in high risk hazard zones</p> | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Design infrastructure appropriately to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Government and Village to liaise and collaborate on processes needed to protect riverbanks and coastline from land clearing and developments</p> | <p>Minimise expenditure on damaged properties and personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Safer villages, houses and roads</p> | <p>Planning provisions to be guided by the PUMA Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise updated hazard maps and Geomorphologist Drainage Infrastructure Database to inform policy development and possible relocation of assets</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> | <p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p> <p>National Building Code</p> |

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| | Responsibility: Village / Families/MWTI/ MNRE/ MWCSO | | | |
| Access/work roads require maintenance and upgrade to facilitate relocation inland | <p>Assess and upgrade Safa'i access road to service 90% of residents already living inland</p> <p>Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Include in budget programming CBA, design and construction</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> <p>Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p> |
| Sato'alepai and Safa'i bridges: inadequate culverts causing inland flooding & rising sea levels within wetland area | <p>Upgrade culverts under the bridges at Sato'alepai and Safa'i to ensure water flows freely in and out of the wetlands</p> <p>Assess and upgrade the main road drainage system and ensure that</p> | <p>Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> | <p>Use existing information for guidance but not limited to: "Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> |

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| | <p>they are clear at all times to enable the flow of the river out to the sea</p> <p>Upgrade culverts to drain stormwater into sea</p> <p>Responsibility: LTA/ MWTI/MNRE/ Village</p> | <p>Encourages coastal families to relocate inland</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p> | <p><i>Code of Environmental Practice (2007)</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> | |
| <p>Reticulated water supply, quality and network to be improved</p> | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Community Sector Plan</p> |

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| | <p>Responsibility: SWA/ MWCSPP/ MNRE / District/ Village/ CSSP</p> | | | |
| <p>Coastline protection: upgrade seawalls at most high risk hazard zones</p> | <p>Assess and strengthen part of seawalls in relevant areas to reduce vulnerability of road and other critical village assets in accordance with Vulnerability Assessment of the Samoa Road Network recommendations</p> <p>Clear debris from existing culverts near seawalls to enable free outflow of storm water and streams</p> <p>Research the impacts of sand mining</p> <p>Village consultation on sand mining policy and regulation</p> <p>Enforce environmental social safeguards where reclamations, sand mining, extraction or other major coastal works are proposed. Government and village to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: MNRE/ Village /Families/MWTI</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Maintains natural ecosystem connectivity</p> <p>Reduce impact from coastal erosion</p> <p>Safer villages, houses and roads</p> <p>Minimise expenditure on damaged properties & personal assets</p> | <p>Develop and register Gagaemauga 3 District /Village bylaws to strengthen maintenance and regular inspections of seawalls</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village inspections and maintenance of seawalls</p> | <p>CIM Strategy 2015</p> <p>Community Engagement Plan</p> <p>Draft Soil Resource Management Bill</p> |

| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
|--|---|--|--|--|
| Strengthen the governance of natural resources and land use through Bylaws | <p>Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nuu to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p>Responsibility: MWCSO /Village</p> | <p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p> | <p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> |

| Non-CR issues raised during consultations | Proposed Solution | Comments |
|---|--|---|
| Re-level school rugby field to avoid water ponding from inland flooding | <p>Village to seek financial assistance from relevant grant facility</p> <p>Responsibility: Village</p> | Not a CR issue. Field is affected mainly by flooding from no/inadequate drainage of access road. This can be alleviated once road has been upgraded (with proper sized culverts/drainage) |



Village assets in the vicinity of the river channel



Bridge on main North Coast Road thought to be limiting outflow of wetland into sea

Safa'i Village Ma

Safa'i Village



4.2 Sato'alepai Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|--|--|---|---|--|
| Village houses, school, church and other village assets in immediate fluvial hazard zone | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Design infrastructure appropriately to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Government and Village to liaise and collaborate on processes needed to protect riverbanks and coastline from land</p> | <p>Minimise expenditure on damaged properties and personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Safer villages, houses and roads</p> | <p>Planning provisions to be guided by the PUMA Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise updated hazard maps and Geomorphologist Drainage Infrastructure Database to inform policy development and possible relocation of assets</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> | <p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p> <p>National Building Code</p> |

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|--|---|--|---|---|
| | clearing and developments Responsibility: Village / Families/MWTI/ MNRE/ MWCS D | | | |
| Upgrade access/ (Satoalepai Access Rd that connects to Fagamalo Loop Rd) work roads to facilitate relocation of houses away from the CEHZ and CFHZ and access Tourist Site (Swimming with Turtles) and village pools | <p>Assess and upgrade as potential escape route and to encourage relocation away from hazard zones</p> <p>Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Include in budget programming CBA, design and construction</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> <p>Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of village cleanup and awareness programmes</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> <p>Community Engagement Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p> |

| | | | | |
|--|---|---|--|--|
| <p>Reticulated water supply, quality and network to be improved</p> | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ MWCSPP/ MNRE / District/ Village/ CSSP</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Community Sector Plan</p> |
| <p>Sato'alepai and Safa'i bridges: inadequate culverts causing inland flooding & rising sea levels within wetland area</p> | <p>Upgrade culverts under the bridges at Sato'alepai and Safa'i to ensure water flows freely in and out of the wetlands</p> <p>Assess and upgrade the main road drainage system and ensure that they are clear at all times to enable the flow of the river out to the sea</p> <p>Upgrade culverts to drain stormwater into sea</p> <p>Responsibility: LTA/ MWTI/MNRE/ MWCSPP/ Village</p> | <p>Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Minimises national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design</p> <p>Use existing information for guidance but not limited to: "Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa Code of Environmental Practice (2007)"</p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Utilise environmental and social safeguards including</p> | <p>CIM Strategy 2015</p> <p>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> |

| | | | <p>EIAs in screening and designing built environment infrastructure projects</p> <p>Include in budget programming CBA, design and construction</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> | |
|--|---|--|---|---|
| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| <p>4 Village pools located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p> | <p>Village pools are currently in a poor state with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs.</p> <p>Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works)</p> <p>Responsibility: CSSP/NGOs/MNRE/Villages</p> | <p>Increase adaptation during drought periods</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> | <p>Utilise Hazard Maps and Geomorphologist findings for planning purposes</p> <p>MNRE Water & Sanitation to conduct water testing and analysis of village pool prior to any intervention</p> <p>Update Village bylaws to include managing and maintaining village natural resources</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>Community Engagement Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p> |
| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| <p>Strengthen the governance of natural resources and land use through bylaws</p> | <p>Update and/or develop bylaws to manage the use of natural resources and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> | <p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> | <p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> |

| | | | | |
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| | <p>Facilitate continuous awareness raising programs with the villages</p> <p>Responsibility: MWCSO /Village</p> | <p>Improve accountability and enabling environment of communities</p> | | |
|--|--|---|--|--|



Sato'alepai Village Map



4.3 Fagamalo Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|---|--|---|---|---|
| Village houses, churches and road in high risk hazard zones | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the</p> | <p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Improve recovery to create more resilient villages</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> | <p>National Building Code</p> <p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> |

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|---|--|---|---|--|
| | <p>appropriate permits and consent</p> <p>Responsibility: Village / Families /MWTI/ MNRE</p> | | | |
| <p>Drainage systems require maintenance and upgrade in high risk areas of main North Coast Road where it joins Fagamalo Loop Road</p> | <p>Assess and upgrade culverts on main road especially at junctions with access roads (Fagamalo Loop Road) in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</p> <p>Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding</p> <p>Implement regular drainage inspection and maintenance</p> <p>Responsibility: LTA /MWTI/MWCSD /Village/ Families</p> | <p>Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimises national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Use existing information for guidance but not limited to: <i>"Vulnerability Assessment of the Samoa Road Network (2017)"</i>; <i>"Review of National Road Standards in Samoa (2016)"</i>; <i>"Samoa Code of Environmental Practice (2007)"</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> |
| <p>Evacuation Shelter and a connected escape route needed for emergency preparedness and response</p> | <p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Conduct evacuation shelter assessment and mark on CIM Plan hazard maps</p> <p>Develop a Village Climate Disaster Management Plan</p> | <p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p> | <p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p> | <p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p> |

| | | | | |
|---|--|--|---|--|
| | <p>(VCDMP)</p> <p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</p> | | | |
| <p>Reticulated water supply, quality and network to be improved</p> | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Vaipouli Watershed Management Plan</p> <p>Community Sector Plan</p> |

| | <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ IWS/MWCSD/ MNRE / District/ Village/ CSSP</p> | | <p>inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | |
|---|---|---|--|--|
| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Soft coastal protection measures needed for most vulnerable areas | <p>Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Responsibility: MNRE/ MAF/Villages</p> | <p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p> | <p>Develop an integrated land management plan for Safata district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p> | <p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p> |
| Establish marine protected area: Giant clams/ oysters | <p>Continue ban of destructive fishing practices including sand mining</p> <p>Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for subsistence living</p> <p>Encourage the expansion/ maintenance of the Samoan Customary User Rights System as an area-based catch share program</p> | <p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p> <p>Increase diversity of marine species and coral reef ecosystem</p> <p>Reduce coral bleaching</p> | <p>Develop/Update District/Village bylaws to include establishment, governance and management of marine protected area</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes</p> <p>Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> <p>MAF to provide trainings and awareness on suitable</p> | <p>Community Sector Plan</p> <p>Community-Based Fisheries Management Plan</p> <p>Agriculture Sector Plan 2016-2021</p> <p>Village Fono Act (Amendment Bill 2016)</p> |

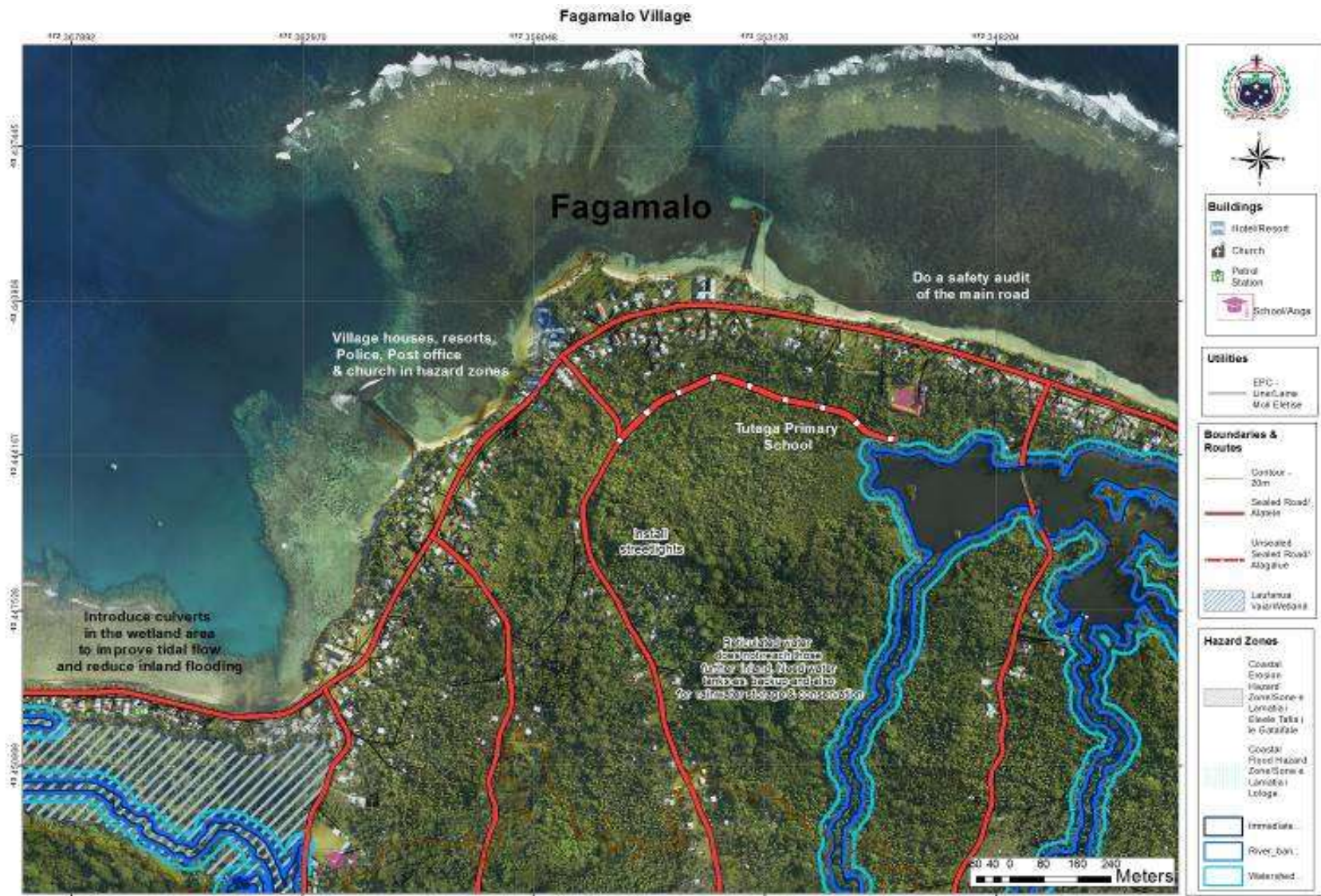
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|---|--|---|--|---|
| | Responsibility: Village / Families/ MAF | | <p>marine species to suit the prolonged impacts of climate change</p> <p>MAF and DEC to provide technical advice and resources to initiate programme</p> <p>Village to undertake and manage marine reserve to sustain programme</p> | |
| Livelihood and Food Security | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Replanting forest, cocoa and coconut farms | <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p> <p>Village to identify lands and forest areas for replanting</p> <p>MAF to identify suitable plant/tree species for replanting in identified lands</p> <p>Responsibility: MAF /villages</p> | <p>Improve health, village hygiene and cleanliness</p> <p>Increase recovery and resilience of village</p> <p>Improve preparedness and readiness response to natural disasters</p> | <p>CROP Division of MAF to provide trainings and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons</p> <p>MAF to provide technical advice and planting material for village and families as a trial</p> | <p>Agriculture Sector Plan 2016-2021</p> <p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> |
| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Strengthen the governance of natural resources and land use through bylaw | <p>Update and/or develop bylaws to manage the use of natural resources and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nuu to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising</p> | <p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve</p> | <p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> |

| | | | | |
|--|--|---|--|--|
| | <p>programs with the villages</p> <p>Responsibility: MWCSO /Village</p> | <p>accountability and enabling environment of communities</p> | | |
|--|--|---|--|--|

| Non-CR issues raised during consultations | Proposed Solution | Comments |
|---|--|---|
| <p>Safety of school children, families in Fagamalo, Gagaemauga III district and general public</p> <p>Responsibility: Village /LTA</p> | <p>Install Road humps in front of Tutaga Primary School and along straight stretch of road between Satoalepai and Fagamalo. Road in North Coast Rd national road network</p> | <p>Not a CR issue- relevant under recommendations of PRIF Transport Sector MTEF Development & Road Safety Assessment Project (via MWTI)</p> |
| <p>Market/Stall to sell local produce</p> <p>Responsibility: Village/ MAF/SBEC/ WIBDI</p> | <p>Village to work with SBEC or WIBDI on establishment of a village-based market to sell fruit/agricultural products</p> | <p>Indirectly related to CR issue (livelihood)</p> |



Fagamalo Village Map



Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa
 Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

4.4 Lelepa Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|---|--|---|---|--|
| <p>Village Houses, church and all infrastructure in the CEHZ and CFHZ</p> | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> | <p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Improve recovery to create more resilient villages</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> | <p>National Building Code</p> <p>CIM Strategy 2015</p> |

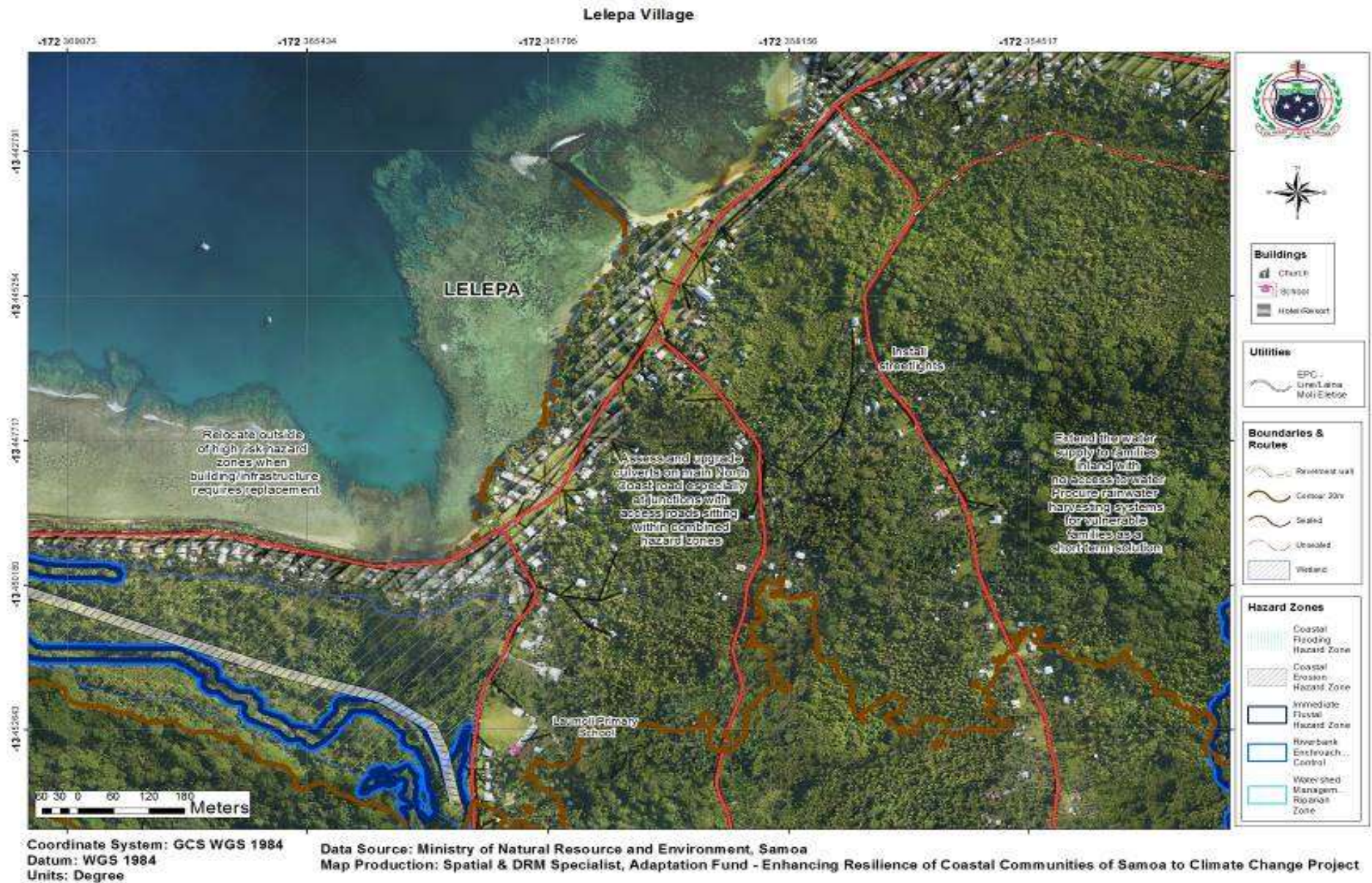
| | Responsibility: Village / Families /MWTI/ MNRE | | | |
|---|--|---|--|--|
| Drainage systems require maintenance and upgrade in high risk areas of main North Coast Road | <p>Assess and upgrade culverts on main North Coast road especially at junctions with access roads sitting within combined hazard zones in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</p> <p>Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding</p> <p>Implement regular drainage inspection and maintenance</p> <p>Responsibility: LTA /MWTI/MWCSD /Village/ Families</p> | <p>Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimises national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Use existing information for guidance but not limited to: <i>“Vulnerability Assessment of the Samoa Road Network (2017)”</i>; <i>“Review of National Road Standards in Samoa (2016)”</i>; <i>“Samoa Code of Environmental Practice (2007)”</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> |
| Upgrade access/work roads to facilitate relocation of houses away from the CEHZ and CFHZ and to village pool (Sogi) | <p>Assess access roads for upgrading</p> <p>Any approved upgrade to include widening, construction of drains</p> <p>Village to conduct regular drainage clearance (grass & rubbish dumped into drainage) and ensure drains are clear at all times</p> <p>Responsibility: LTA/ MWTI/MNRE/ Village/ Families/District/ MWCSD</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Safer villages, houses and roads</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> | <p>Draft NESP 2017-2021</p> <p>CIM Strategy 2015</p> <p>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> |

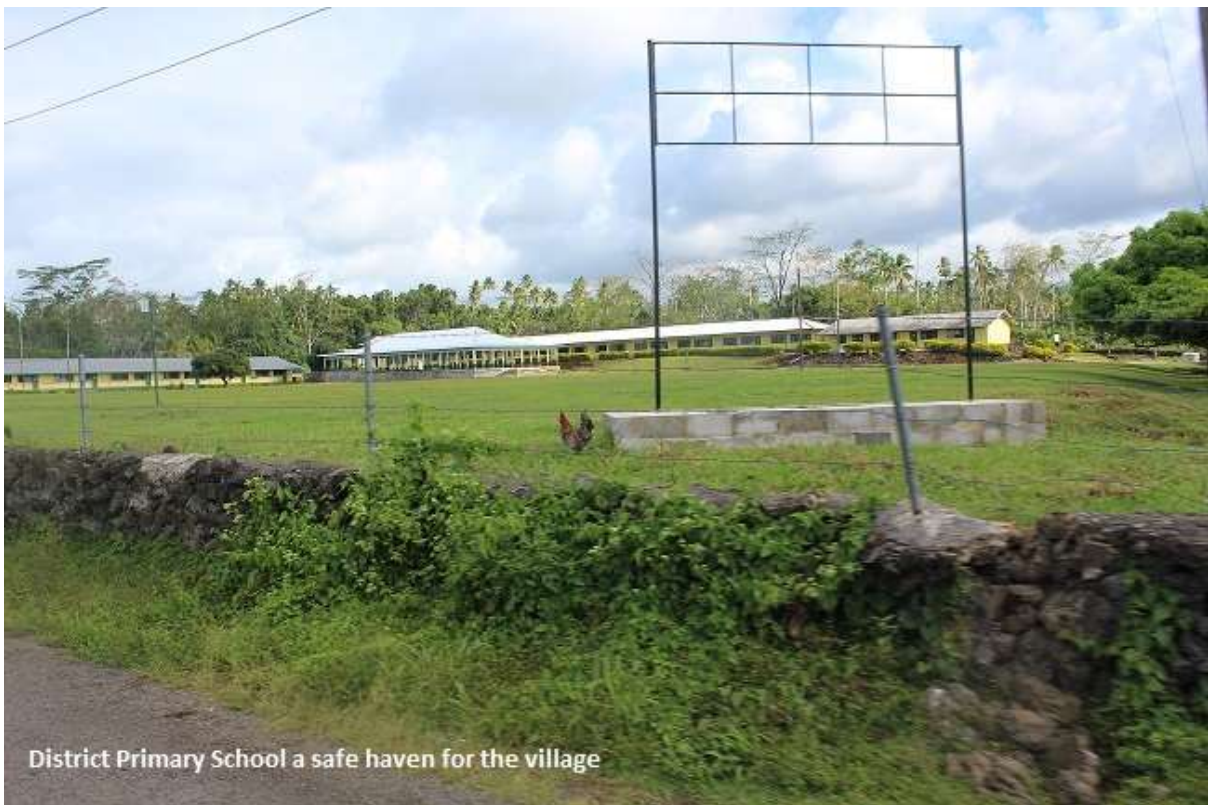
| | | | | |
|--|---|--|--|--|
| | | Minimise national disaster recovery expenditure on damaged properties and public assets | Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Gagaemauga 3 district | |
| Reticulated water supply, quality and network to be improved | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ MWCSPP/ MNRE / District/ Village/ CSSP</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Community Sector Plan</p> |
| Evacuation shelter (Laumoli Primary School) | <p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Conduct evacuation shelter assessment and mark on CIM Plan hazard maps</p> <p>Develop a Village Climate Disaster Management</p> | <p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p> | <p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p> | <p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p> |

| | <p>Plan (VCDMP)</p> <p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</p> | | | |
|--|---|---|--|---|
| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| <p>Soft coastal protection measures needed for most vulnerable areas</p> | <p>Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Responsibility: MNRE Villages</p> | <p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p> | <p>Develop an integrated land management plan for Gagaemauga 3 district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p> | <p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p> |

| Non-CR issues raised during consultations | Proposed Solution | Comments |
|--|---|---|
| Farming equipment and tools (e.g. wheelbarrows, rakes etc) to assist with their plantations <i>Responsibility: MAF/Villages</i> | Supply / introduction of mechanization/ labor saving devices. Increase availability and access to agricultural skills | Indirectly related to CR issue (livelihood) |

Lelepa Village Map





4.5 Avao Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|--|--|--|---|--|
| Upgrade inland access/ work road to reduce inland flooding and to facilitate relocation of houses away from hazard zones | <p>Assess and upgrade Avao Access Road potential escape route and to encourage relocation away from hazard zones</p> <p>Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Include in budget programming CBA, design and construction</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> <p>Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of village cleanup and awareness programmes</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p> |

| | | | | |
|---|--|---|--|--|
| <p>Reticulated water supply, quality and network to be improved</p> | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ IWS/MWCSD/ MNRE / District/ Village/ CSSP</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Community Sector Plan</p> |
| <p>Village houses, churches and road in high risk hazard zones</p> | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard</p> | <p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Improve recovery to create more resilient villages</p> <p>Improve preparedness and readiness response to natural disasters</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> | <p>National Building Code</p> <p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> |

| | | | | |
|--|---|--|--|---|
| | <p>zones; for example, raise floor levels of houses in flood prone areas</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: Village / Families /MWTI/ MNRE</p> | <p>Safer villages, houses and roads</p> | | |
| <p>Evacuation shelter (Laumoli Primary School and Itu o Tane Secondary School)</p> | <p>Retrofit school to DMO standards if approved as an evacuation shelter</p> <p>Identify or build a cyclone-proof house outside the hazard zones as an Evacuation shelter for village during cyclones</p> <p>Where no suitable houses exist, build village emergency shelter(s) to accommodate population in hazard zone during natural disasters</p> <p>Responsibility: MESC/ DMO/MWTI/Village</p> | <p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Develop Village Climate Disaster Management Plan in line with CDCRM findings</p> <p>Enforcement of National Building Code Requirements for all public buildings</p> <p>Utilise Hazard Maps and Geomorphologist findings to inform location and design</p> | <p>National Disaster Management Plan 2017-2021</p> <p>Education Sector Plan</p> <p>National Building Code</p> |

| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
|--|--|---|---|--|
| <p>Soft coastal protection measures needed for most vulnerable areas</p> | <p>Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Responsibility: MNRE/MAF/Villages</p> | <p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p> | <p>Develop an integrated land management plan for Gagaemauga 3 district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p> | <p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p> |
| <p>Establish marine protected area: Giant clams/ oysters</p> | <p>Continue ban of destructive fishing practices including sand mining</p> <p>Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for subsistence living</p> <p>Encourage the expansion/ maintenance of the Samoan Customary User Rights System as an area-based catch share program</p> <p>Responsibility: Village / Families/ MAF</p> | <p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p> <p>Increase diversity of marine species and coral reef ecosystem</p> <p>Reduce coral bleaching</p> | <p>Develop/Update District/Village bylaws to include establishment, governance and management of marine protected area</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes</p> <p>Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p> <p>MAF to provide trainings and awareness on suitable marine species to suit the prolonged impacts of climate change</p> <p>MAF and DEC to provide technical advice and resources to initiate programme</p> <p>Village to undertake and manage marine reserve to sustain programme</p> | <p>Community Sector Plan</p> <p>Community-Based Fisheries Management Plan</p> <p>Agriculture Sector Plan 2016-2021</p> <p>Village Fono Act (Amendment Bill 2016)</p> |

| Livelihood and Food Security | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
|--|--|---|--|---|
| Pest management : invasive plants | <p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate resilient native species</p> <p>Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken</p> <p>Conduct education and awareness programmes on the impacts of invasive species</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources</p> <p>Conduct pilot site trials for climate ready plant varieties</p> <p>District to fence domestic animals</p> <p>Responsibility: Villages/District/ MNRE/MAF/ SROS</p> | <p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</p> | <p>Develop an integrated land management plan for Gagaemauga 3 district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to raise awareness of farmers on impacts to water flows from poor livestock management</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p> <p>MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly</p> <p>Village to manage pig/cattle population (compounds, in particular around water supplies)</p> <p>Training for farmers on pests management particularly affecting fruit trees and crops</p> | <p>Agriculture Sector Plan 2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p> |
| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Strengthen the governance of natural resources and land use through Bylaws | Update and/or develop bylaws to manage the use of natural resources, and to control land use | Strengthen implementation of all national sector plans | Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and | Village Fono Act (Amendment Bill 2016) Community Sector |

| | | | | |
|--|---|--|--|---|
| | <p>impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nuu to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><i>Responsibility: MWCSO /Village</i></p> | <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p> | <p>food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Plan</p> <p>Community Development Plan 2016-2021</p> |
|--|---|--|--|---|

Avao Village Map





4.6 Salei'a and Vaipouli Village Interventions

CIM Plan Solutions

| Infrastructure | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant National, Sector Plans and Strategies |
|---|--|---|---|---|
| Village houses, , church, store, government assets, tourism development and a pool in CEHZ and CFHZ | <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p>Enforce social safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> | <p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from coastal erosion and flooding accommodating the hazard</p> <p>Improve recovery to create more resilient villages</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> | <p>National Building Code</p> <p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> |

| | | | | |
|---|--|--|---|--|
| | Responsibility: Village / Families /MWTI/ MNRE | | | |
| Upgrade access/ work roads (Vaipouli Rd) to facilitate relocation of houses away from the CEHZ and CFHZ and to access reservoir | <p>Assess and upgrade Vaipouli Road as potential escape route and to encourage relocation away from hazard zones</p> <p>Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p> | <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an Integrated Flood Management Plan for Safata District. MNRE to develop zonation strategy for safe areas</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Include in budget programming CBA, design and construction. Road design standard to take account of forecast increased rainfall intensity</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> <p>Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of village cleanup and awareness programmes</p> | <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p> |
| Reticulated water supply, quality and network to be improved | <p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> | <p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> | <p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016) 10 year investment plan to</p> | <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community</p> |

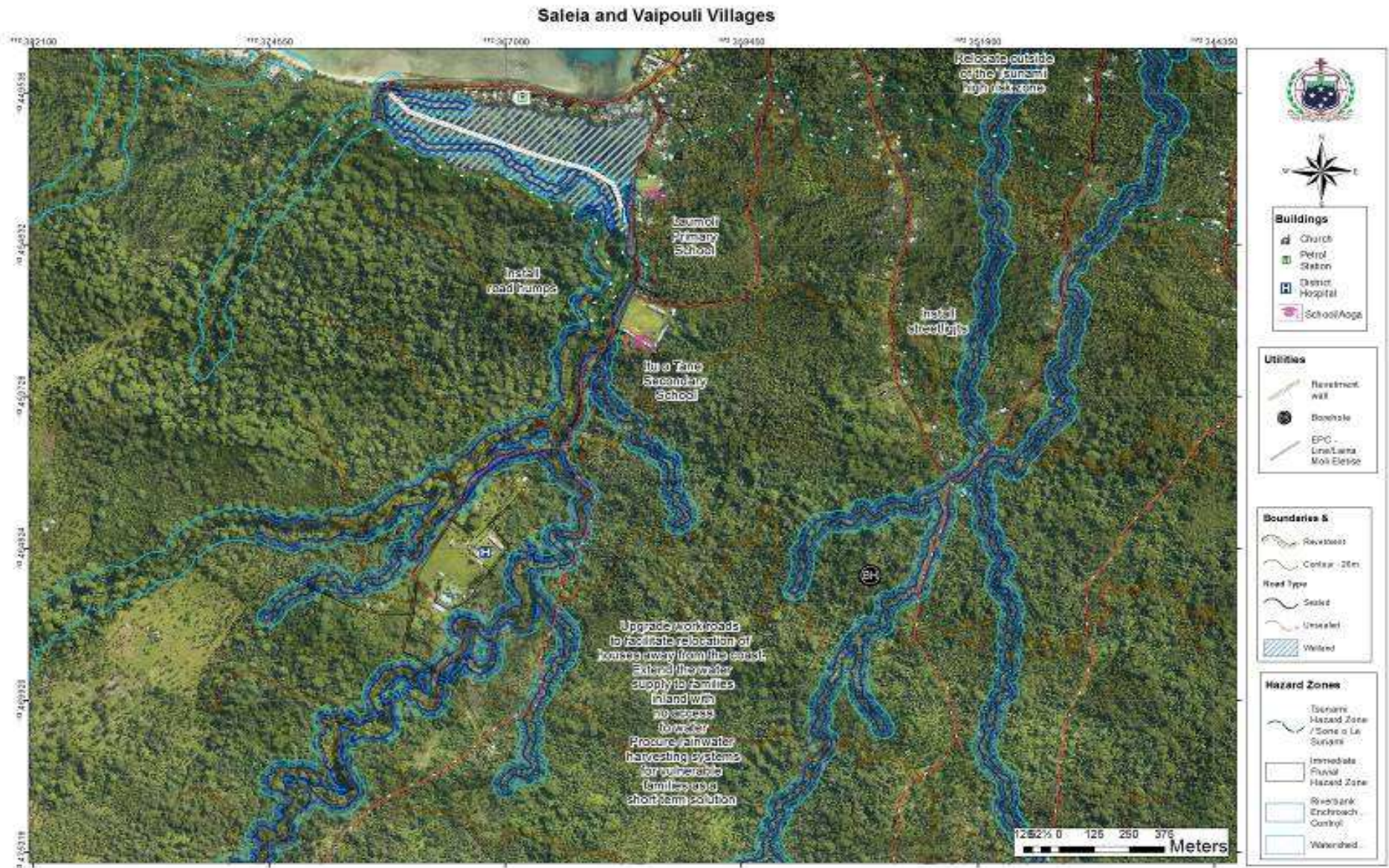
| | | | | |
|--|--|---|--|--|
| | <p>Procure rainwater harvesting systems for identified evacuation shelter(s)</p> <p>District and village to support SWA water rationing programmes during times of drought</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ MWCS/ MNRE / District/ Village/ CSSP</p> | <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> | <p>improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p> | <p>Engagement Plan</p> <p>Community Sector Plan</p> |
| <p>Upgrade seawall to national standards</p> | <p>Implement seawall and slope stabilization west of Avao ford to reduce flooding and storm surges onto Vaipouli Roads</p> <p>Investigate further main road relocation recommended in Saleia/ Vaipouli Relocation Strategy</p> <p>Responsibility: LTA/ MWTI / MNRE/ MWCS/ Village</p> | <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and inland flooding</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p> | <p>Utilise Saleia/Vaipouli Relocation Strategy to guide long term planning of infrastructure relocation. Allow for 2.5km arterial as long term solution</p> <p>Develop Village Hazard Zone Relocation Maps for long term planning of infrastructure relocation</p> <p>Include in budget programming design, and construction costs</p> <p>Undertake safety audit of the Saleia/Vaipouli revetment wall and implement its recommendations</p> <p>Utilise Hazard Maps and Geomorphologist findings to inform location and design</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village drainage cleanup and awareness programmes</p> | <p>Community Sector Plan</p> <p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Village Fono Act (Amendment Bill 2016)</p> <p>[Draft] Samoa Relocation Strategy 2016</p> |

| Natural Resources and Environment | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
|--|---|--|---|--|
| District Upland Forest and Catchment Areas | <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p> <p>Adopt agro-forestry and community tree farming practices instead of clear felling as is practiced at present</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Regulate developments around catchment area, SWA intake and boreholes in district</p> <p>Limit land clearance and agricultural development around SWA intake and boreholes</p> <p>Conduct campaign for public awareness and establish a “neighbourhood watch” agreement with district to monitor and report on illegal deforestation</p> <p>District/village to help promote the development of the agroforestry sector by encouraging relevant land use practice and where possible resolve any associated land disputes</p> <p>District to support SWA efforts at exploratory intakes and boreholes in district</p> <p>Continue ban of</p> | <p>Protects and enhance local species diversity</p> <p>Sustains ecosystem services and functions</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> | <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation in district lands</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of district/village forestry programmes</p> | <p>Forestry for Sustainable Development Policy</p> <p>Draft NESP 2017-2021</p> <p>Village Fono Act(Amendment Bill 2016)</p> <p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan(2016)</p> <p>Community Engagement Plan</p> |

| | | | | |
|--|--|--|--|--|
| | <p>destructive fishing practices including sand mining and introduce village ban on rubbish dumping in waterways and watercourses (immediate fluvial hazard zones)</p> <p>Fence domestic and invasive animals to protect young trees</p> <p>Responsibility: MNRE/ SWA/MWCSD/ District /Village /CSSP</p> | | | |
| Governance | Best Solutions | Benefits | Guideline to assist with the implementation | Relevant Sector Plans, National Strategies & Policies |
| Strengthen the governance of natural resources and land use through Bylaws | <p>Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p>Responsibility: MWCSD /Village</p> | <p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p> | <p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p> | <p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p> |

| Non-CR issues raised during consultations | Proposed Solution | Comments |
|--|--|--|
| Safety of travelling public and school children | Install Road humps at road junction (North Central Coast Rd: 3 corner at Avao turning into Vaipouli Road) and in front of Itu o Tane College | Not a CR issue- relevant under recommendations of PRIF Transport Sector MTEF Development & Road Safety Assessment Project (via MWTI) |

Salei'a and Vaipouli Village Map



Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa
 Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project



4.7 Savaii AF Districts Overview Map of Coastal Inundation Zones

