

Community Integrated Management Plan

Safata District – Upolu



Community nursery to support livelihood

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.

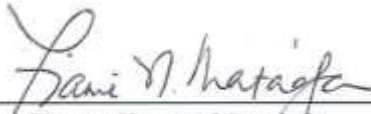
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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. Fiamē 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 Safata (Fausaga, Fusi, Lotofaga, Mulivai, Nuusuatia, Sa'anapu, Sataoa, Tafitoala and Vaie'e villages).

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

Date of Signing: 22 June 2018

Representative:	Signature:
Fausaga Village	
• Fuga Tupea	
• Lemusu Paulo	
• Nonufunai Alapati	
• Tauvasaiupolu Situa	
Fusi Village	
• Auseugaefa Francis	
• Faitaua Timani	
• Fafata Sega	
• Falefata Uilelea	
• Rosita S.	
Lotofaga Village	
• Lau Pepese	
• Lau Faataga	
• Lau Samuelu	
• Faima Iopu	
• Selina Tokolahi	

Mulivai Village

- Lulu Taia
- Palepa Toalepai
- Aua Olotu
- Loreta Alesana

Lulu Taia

Palepa Toalepai

Aua Olotu

Loreta Alesana

Nuusuatia Village

- Pofitu Saalea
- Faamatala Taoo
- Tupai Fiso
- Talosia Sini

Pofitu Saalea

Faamatala Taoo

Tupai Fiso

Talosia Sini

Sa'anapu Village

- Mautu Fou
- Laavi Segaa
- Vele Pauga
- Aila Lau
- Mama Ioapo

Mautu Fou

Laavi Segaa

Vele Pauga

Aila Lau

Mama Ioapo

Sataoa Village

- Vaimea Lopi
- Seve Nifo
- Lemafa Asafo Mamoe
- Lemafa Tanielu Pati
- Tagaloasa Fali Tagaloasa

Vaimea Lopi

Seve Nifo

Lemafa Asafo Mamoe

Lemafa Tanielu Pati

Tagaloasa Fali Tagaloasa

Tafitoala Village

- Fagalele Utai
- Avei Sione

Fagalele Utai

Avei Sione

- Fetu Saofai
- Afoauli Patolo Afoa
- Pese Vaiala Taisala







Vaie'e Village

- Lealaimuna Mapusaga
- Saolele Teo
- Malaesilia Lene
- Teo Pelema









The Government of Samoa adopts the Community Integrated Management Plan for the Safata District 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

Table of Contents

<i>Foreword</i>	2
<i>Participants in the Plan</i>	3
<i>Acronyms</i>	8
<i>Glossary</i>	9
1.Introduction to the CIM Plan	11
1.1 The Strategic Vision	11
1.2 The Aim of the CIM Plan	11
1.3 Structure of the Plan	11
2.Implementation Guidelines	12
2.1 Purpose of the Implementation Guidelines	12
2.2 Duration of the Plan	12
2.3 Financing of the Plan	12
3.Description of Safata District	14
3.1 Physical and Natural Resource Setting	14
3.2 Social and Economic Settings	15
3.3 Climate Risk and Resilience	15
4.Safata District Interventions	17
Safata District Map	22
4.1 Fausaga Village Interventions	23
Fausaga Village Map	27
4.2 Fusi Village Interventions	28
Fusi Village Map	33
4.3 Lotofaga Village Interventions	34
Lotofaga Village Map	39
4.4 Mulivai Village Interventions	40
Mulivai Village Map	46
4.5. Nu’usuatia Village Interventions	47
Nu’usuatia Village Map	52
4.6. Sa’anapu Village Interventions	53
Sa’anapu Village Map	58
4.7. Sataoa Village Interventions	59
Sataoa Village Map	64

4.8 Tafitoala Village Interventions.....65
 Tafitoala Village Map.....70

4.9 Vaie’e Village Interventions.....71
 Vaie’e Village Map.....76

Upolu AF Districts Overview Map of Coastal Inundation Zones.....77

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

“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	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
Food access:	Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all 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)
Food availability:	The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)
Stability:	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 insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security
Utilization:	Utilization of food through adequate diet, clean water, sanitation and health care 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
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 0-20mASL 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 the Safata 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 2015;
- 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-GEF SGP.
- **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 Safata District

3.1 Physical and Natural Resource Setting

The Faipule District of Safata is located on the south western side of the island of Upolu. It includes the villages of Sa'anapu, Sataoa, Lotofaga, Nu'usuatia, Vaie'e, Fusi, Fausaga, Tafitoala and Mulivai. The district is described as a wet climate. The coastal fringing areas are made up of alluvial soils formed from floods and sandy beaches (Dews, 2017).

The District is characterised by a broad plain ranging from two to four kilometres in width, sloping down to the coast from steep inland mountains. The District of Safata is dominated by plantations and mixed cropping with some area supporting cattle and small livestock. The coastal areas have extensive coral reefs, mangrove and wetlands and supports fishing villages that have convenient access to estuaries or beaches (Dews, 2017). A number of rivers and their tributaries cross the plain forming narrow incised river valleys then becoming slower meandering rivers at the coast. The main rivers include the Sataoa Stream, Leafe River, Matalipi River, Nu'usuatia River and the Tafitoala River.

Along the coast a series of sand-spits have formed from east to west enclosing wetland or estuarine areas. The largest of these takes in an area from Tafitoala to Vaie'e, where a break in the sand-spit creates an estuary open to the lagoon. This area is primarily an estuary with mangrove wetland encroaching around its edges. Other similar areas at Mulivai, Sataoa and Sa'anapu are predominantly enclosed mangrove wetlands with less open water. The Sa'anapu and Sataoa wetlands are designated as Mangrove Conservation Areas.

The coast-line of much of Safata is generally a soft, sandy coast. The lagoon varies from 500m in width at Tafitoala to 2.5km at Sa'anapu but there is a wide break in the reef opposite Lotofaga where the Leafe River enters the sea. Sand mining is allowed at designated sites and there are a couple of commercial concrete block operations using sand from the area especially at Sa'anapu and Lotofaga. The community has expressed concern over the commercial sand mining occurring in this district.

Aside from the Mangrove wetlands, plantation and agricultural areas dominate the area. Most of these are located inland from the Main South Coast Road. Replanting of native species such as tava, malili, cordia and asitua has begun at Nuusuatia to protect the village water supply but these efforts need to be up-scaled in order to be more effective. A number of invasive species were observed especially at previously cultivated lands and a very serious taro disease was found to be affecting many taro plantations in the district (Reti, 2017). Coconut plantations have replaced much of the district vegetation and what remains a highly disturbed secondary forest on steep upland areas. Some native species such as tava, tavai, maota and siapatua were spotted suggesting that these species may have comprised the primary vegetation in the district. The Safata district has lost much of its natural ecosystems due mainly to intensive agricultural development and wind damage. Little pockets of mangrove forests in Saanapu/Sataoa, Fausaga, Fusi and Vaiee are providing benefits to the residents and there is a desire by the villages to ensure the conservation of these areas. (Reti, 2017) Safata district was one of the districts that incurred damages during the 2009 tsunami but there has been some level of local adaptation since then. This includes coastal replanting in some areas of the district and the re-marking of "no-take zones" of the Safata Marine Protected Area. New seawalls were constructed in Sa'anapu and Tafitoala after the tsunami¹.

The Main South Coast Road forms part of Samoa's National Road Network and is kept in good condition, apart from some drainage issues as roads are damaged by heavy rains and inland flooding. The main road has already largely retreated from the coastline and a number of inland roads have been provided. Seven of these access roads² are part of Samoa's National Road Network and are maintained by the Land Transport Authority³. Water levels continue to rise in mangrove wetlands along the coast. Inadequate culverts and roadside drainage are contributing to inland flooding and storm water surges. Any development within the CEHZ or CFHZ should be controlled with structural and building level provisions to enhance resilience. A re-alignment of the Main South Coast Road at Fusi (Mulivai to Lotofaga) may need to be further investigated, as well as a review of catchment water flows along this road as a precursor to upgrading culverts and fords (Townsend, 2017).

¹ GoS. Post-tsunami Sept 2009-June 2011: report

² Fusi, Lotofaga, Nu'usuatia, Sa'anapu, Sataoa, Tafitoala and Vaie'e access roads

³ LTA. Samoa Infrastructure Asset Management Database

3.2 Social and Economic Settings

The Safata district currently has a population of 6,335; Sa'anapu 1,294⁴, Sataoa 1,360⁵, Lotofaga 745, Nu'usuatia 465, Vaie'e 565, Fusi 734, Fausaga 305, Tafitoala 474 and Mulivai 393. Of the total 6,335, total male is 3,273, and female is 3,062⁶.

The main South West Coast Road is considered an important part of the district's infrastructure. The main road extends inland in a southerly direction where it provides lifeline access to the District Hospital located at Fusi, as well as access to neighbouring districts; Siumu to the east and Lefaga and Falease'ela to the west. The district has several schools, churches, shops and some tourist facilities. Primary services such as power and telephone generally follow the main road. The use of mobile cellular phones has overtaken the need for telephone posts/lines however the District Hospital and Schools rely on landlines as their main form of communication. Power and telephone lines along the main road are outside the hazard zones from Sa'anapu village through to Lotofaga village.

Saanapu, Mulivai and Fausaga are the only villages in this district with reticulated water from SWA boreholes and intake. Two SWA boreholes are located in Saanapu-uta servicing Sa'anapu and neighbouring villages of Lefaga and Falease'ela District. Mulivai and Fausaga are serviced by SWA intakes located at Fausaga. The other six villages access water through the Independent Water Scheme. Supply of water is no longer an issue however, communities have complained about the high level of chlorine used in SWA reservoirs; a necessity to treat water supply due to contamination from cattle farms near the boreholes and intakes.

The District supports both primary schools; Fusi Primary School, Lotofaga Primary School, Mulivai Primary School, Sa'anapu Primary School, Sataoa Primary School, Tafitoala Primary School and Vaie'e Primary School, and a large secondary school; Safata College, a number of churches⁷ and a District Hospital. In addition, there are a number of retail shops, small markets and foodstalls throughout the area.

A survey⁸ conducted in 2017 of 25 districts in Savaii and Upolu recorded Safata as the second highest district with income earned from remittances. It gains only 2.9% from businesses even though a large number of local residents run small businesses such as commercial cooking, handicraft, floral arrangement and fabric printing. The products are sold at local and neighbouring district tourist facilities and resorts, or are carted to the markets and shops in Apia. Locals also enjoy employment opportunities at coastal resorts⁹ in Safata and the resorts and in neighbouring districts¹⁰. Other residents work in Apia, approximately 45 minutes' drive from Safata district. In all villages, the majority of residents are largely sustained by plantation work, cattle, piggery and poultry farms and fishing¹¹.

3.3 Climate Risk and Resilience

The use of LiDar mapping data, hydrologist and geomorphologist data and findings for this district has helped determine inland and coastal hazard zones and high risk areas for Safata District. The immediate risks for some areas of Safata are from coastal inundation, storm surges and fluvial hazards.

For the entire district there is about 12,160 hectares of land. About 140.8 hectare is in the Tsunami shore exclusion zone (Red zone). There are approximately 1137 buildings in the district with 97 buildings sitting in the shore exclusion zone. Of this 97, 88 buildings are in the high risk category being located in the coastal flooding, erosion and red zone areas. Women's Committee houses tend to be included in the buildings sitting in the high risk areas. Approximately 81% of the district is located in "safe" areas so the option of relocating buildings and assets away from the coast should be encouraged. 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. It is therefore recommended that a topographic and geomorphological assessment be carried out first if construction of any infrastructure is proposed within this buffer zone (Tokalauvere, 2018).

⁴ Saanapu Tai = 239; Saanapu Uta - 1,191

⁵ Sataoa Tai = 239; Sataoa Uta = 1,121

⁶ Samoa Bureau of Statistics, 2016 Preliminary Census

⁷ CCCS; Sa'anapu, CCCS, Methodist, AOG & LDS; Sataoa, CCCS, Methodist, LDS; Lotofaga, Methodist, LDS; Nu'usuatia, CCCS; Vaie'e, Methodist, Catholic, SDA, LDS, AOG; Fusi, CCCS, Methodist; Fausaga, CCCS, Catholic; Tafitoala, Catholic; Mulivai

⁸ MNRE (EWACC Project) Community Disaster and Climate Risk Management Household survey: final report 2017

⁹ Virgin Cove Resort; Sa'anapu, Mangrove Garden Restaurant and Accommodation; Sa'anapu, Sataoa Beach Fales; Sataoa,

¹⁰ S'Moana Surf Resort; Salamumu, Matareva Beach Fales; Lefaga, Return to Paradise Beach Resort; Lefaga, Coconuts Beach Resort; Maninoa Siumu, Sinalei Reef Resort; Siumu

¹¹ Village Profile of Upolu Island 2013, Ministry of Women, Community and Social Development

Evacuation shelters need to be located in areas that are not at risk from coastal hazard zones and fluvial hazards. The Lotofaga Primary, Sataoa Primary, Mulivai Primary, and Saanapu Primary schools are not located in any hazard zones and can therefore be utilised as evacuation shelters. However, all these schools need to be upgraded and retrofitted to be cyclone and flood proof. This district has villages that sit in and within floodplains, for example Mulivai, Lotofaga, Nu'usuatia have several fluvial hazard zones running from the back of the villages towards the shore. Inadequate or non-existent drainage exacerbates inland flooding during and after heavy rainfall (Tokalauvere, 2018).

The coastline in Safata is oriented to the south and is subject to the strong south-east trade and ocean swells. It is partially protected by a large lagoon. But it has openings in the fringe/barrier reefs and during extreme weather events the coast is exposed to extensive damages.¹² There are certain parts of the road in Nu'usuatia and Fusi/Fausaga that are rated as medium severity in the coastal hazard index¹³. There are also certain coastal areas of Safata eroding at a much faster rate due to human influence. Sand mining is a major contributor to such cause, and it is evident that it disrupts the coastal sediment flow. The major issue that the district experiences particularly during extreme events is inland flooding. This matter is exacerbated due to inadequate road structures and drainage systems. Storm water runoff from further upland is noticed to pond on streets and main road as culverts are either blocked or are not established within the area.

Due to the variation in landscape and topography, soil types, aspect to prevailing winds and the extent of development that has altered the land formation within the district, it is difficult to predict, with any precision, impacts from climate change within any given livelihood activity at the local level. Resilience is supported by maximizing crop and livestock production while not impacting on the natural ecosystem and the environmental services derived from the ecosystem. There appears to be some low-lying areas along the coast that have been inundated with salt water. Some area of low lands has been altered to the extent some wetlands are indicating high levels of pollutants (Dews, 2017).

¹² Management Plan for TDA 2 South Upolu, Samoa Tourism Authority, 2015

¹³ Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

4. Safata District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Drainage systems require maintenance and upgrade in high risk areas of main South West Coast Road	<p>Assess and upgrade culverts on main South West Coast road especially at junctions with access roads (Vaie'e Access Road, Fusi Access Road, Nuusuatia Access Road, Lotofaga School Road, Sata Road, Sataoauta Road and Saanapu Access Road) 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: "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>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 Integrated Catchment Strategy and Flood Management Plan for Anoama'a East District</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>TSP2014-2019 Goal 2 KO 1</p>
Slope stabilization and road armouring to avoid landslips and erosions	<p>Implement slope stabilization at most vulnerable landslide area identified in the <i>Vulnerability Assessment of the Samoa Road Network</i></p> <p>Reduce sediment loads and loss of top soil by discouraging farming on steep slopes and keeping livestock in areas away from wetlands and watershed sites</p> <p>Government, Village and landowners to liaise and collaborate on processes needed to protect upland catchment area, riverbanks from land clearing and developments</p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Climate proof national road network</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from coastal erosion and landslides</p> <p>Maintain lifeline access for all of Anoama'a East</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Implement Safata District Integrated Catchment Strategy and Flood Management Plan in conjunction with Geomorphologist Drainage Infrastructure Database findings</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Anoama'a East district 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>CIM Strategy 2015</p> <p>Transport Sector Plan 2014-2019 Goal 2</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</p>

	<p>Responsibility: LTA/MWTI/ MNRE/ Villages</p>	<p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p>		
<p>Upgrade access/work roads</p>	<p>Assess and upgrade access/work roads (Vaie'e, Fusi, Nuusuatia, Lotofaga, Sata, Sataoauta and Saanapu access roads) and Mulivai ford to reduce inland flooding</p> <p>Upgrades 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/ Villages/Families</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 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>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Safata district</p>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
<p>Flood protection measures for fords and bridges</p>	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream</p> <p>Ensure river channel upstream is cleared and</p>	<p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from inland flooding</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs</p> <p>Implement Safata Integrated Catchment Strategy and Flood Management Plan in conjunction with</p>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation</p>

	<p>maintained regularly</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p>Responsibility: MWTI/ LTA/MNRE/ District/ Village</p>	<p>Reduce flooding of built up areas</p> <p>Safer villages, houses and roads</p>	<p>hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities</p> <p>Include in budget programming CBA, design and construction. Bridge and road designs to take account of forecast changes in local flooding from increased rainfall intensity</p> <p>Designation of the CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>Strategy, LTA</p>
Tafitoala/ Fausaga Hydroelectric Power Station	<p>Monitor health of rivers in district to ensure no oil leaks from power station enter watercourses and waterways</p>	<p>Reduce contamination of water supply</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Utilise DRM maps and Geomorphologist Drainage Infrastructure Database to inform location</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities</p>	<p>Energy Sector Plan</p> <p>PUMA Act</p>
Electricity supply	<p>Provide underground lines in the long term</p> <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>Maintain electricity supply at all times including natural disasters</p> <p>Avoid accidents from fallen electricity posts.</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p>	<p>EPC Strategic Plan</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 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</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 Integrated Catchment Strategy and 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>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>Draft NESP 2017-2021</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan(2016)</p> <p>Community Engagement Plan</p>

	<p>invasive animals to protect young trees</p> <p>Responsibility: MNRE/ SWA/MWCSD/ District /Village /CSSP</p>			
Mangrove Conservation Areas and Marine Protected Areas	<p>Undertake an assessment of tidal flow necessary to maintain a healthy natural environment</p> <p>Limit land clearance and developments adjacent to wetland areas</p> <p>Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Village to fence off domestic animals foraging in wetland areas</p> <p>Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</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>MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Va'a o Fonoti District</p> <p>Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district</p>	<p>Draft NESP 2017-2021</p> <p>Community Engagement Plan</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: 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>

Safata District Map

Safata 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 Fausaga Village Interventions

CIM Plan Solutions

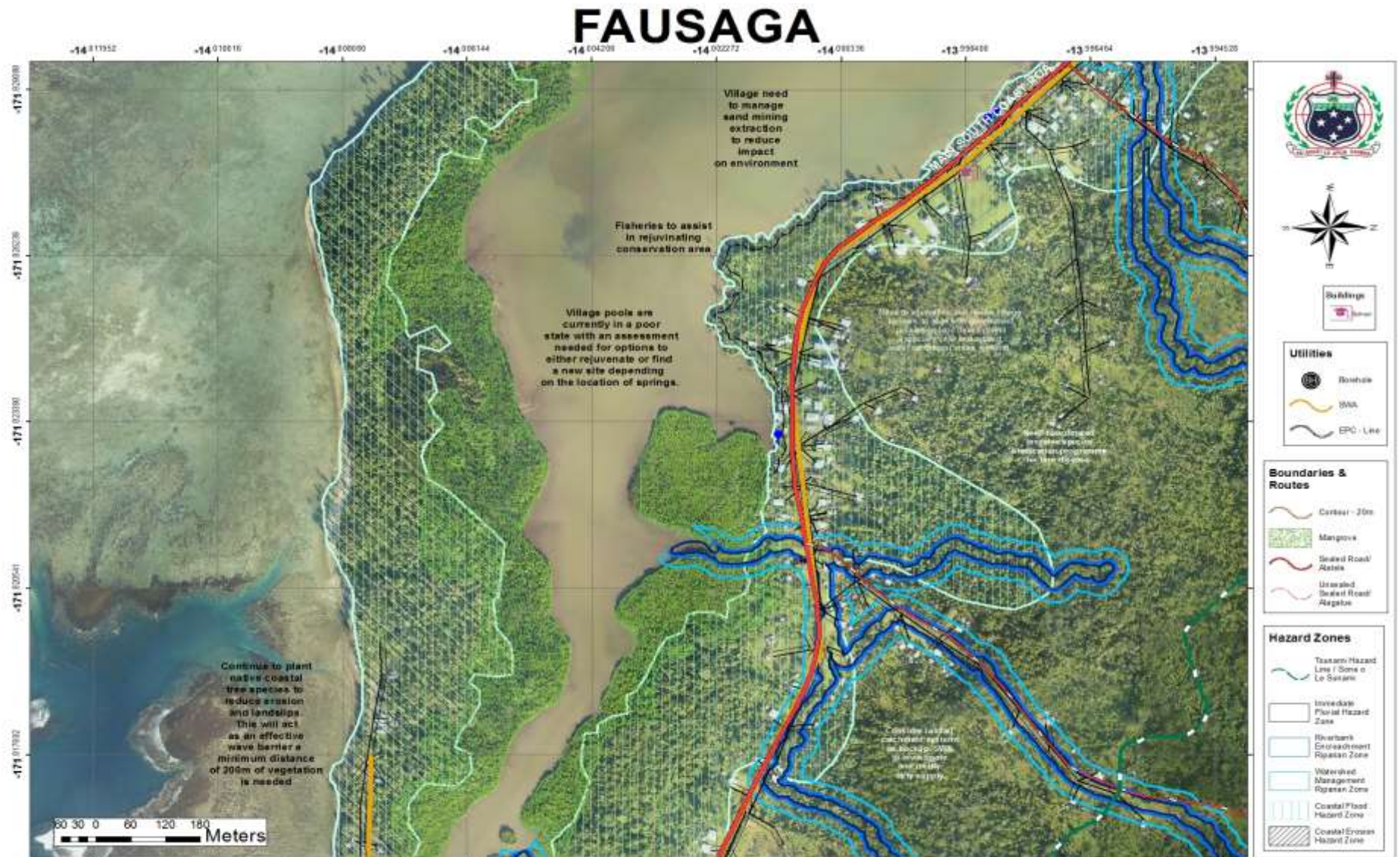
Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
<p>Village houses, village pool, churches and government assets located in high risk hazard zones</p>	<p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt appropriate mitigation measures</p> <p>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>Responsibility: Village / Families/MWTI/ MNRE/ MWCS</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>National Building Code</p>

<p>Upgrade village roads and drainages to reduce stormwater runoff and inland flooding</p>	<p>Upgrades 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: MWTI/ MNRE/ Villages /Families</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 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>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Safata district</p>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
<p>Natural Resources and Environment</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>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 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>

<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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: MoF-CSSP/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 to inform location and design</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>Community Engagement Plan</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 plants</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>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</p>	<p>Develop an integrated land management plan for Anoama'a East 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>Agriculture Sector Plan 2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

	<p>Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources</p> <p>District to fence domestic animals</p> <p>Responsibility: Villages/District/MNRE/MAF/SROS</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>	
Governance	Best Solutions	Other Benefits	Implementation Guideline	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: 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>

Fausaga Village Map



4.2 Fusi Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, women's committee house, 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>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>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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>

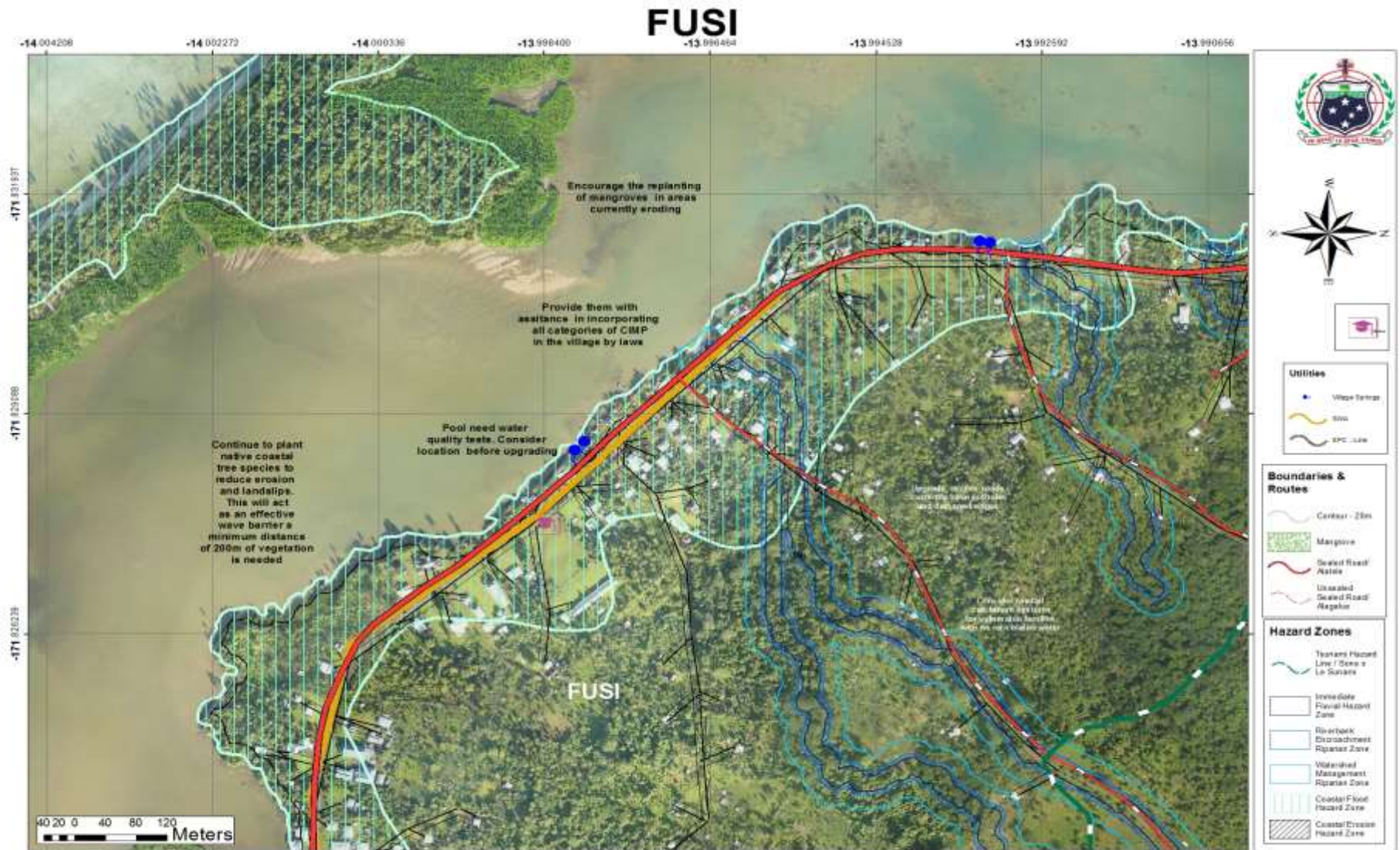
<p>Upgrade new inland access/work roads to facilitate relocation of houses away from hazard zones</p>	<p>Assess and upgrade Fusi Access Road as potential escape route and to encourage relocation away from hazard zones</p> <p>Upgrade to include adequate sized culverts to facilitate the overland flow of 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</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 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>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</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</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>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</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>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>Reduce impact from inland flooding</p>	<p>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>	
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 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>
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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>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>CIM Strategy 2015</p> <p>Community Engagement Plan</p>

	Responsibility: CSSP/NGOs/MNRE/Villages		Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities	
Marine resources depletion	<p>Assess feasibility of creating a marine reserve for village as backup, alternative food supply</p> <p>Village to restock marine reserve with suitable species</p> <p>Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction</p> <p>Research improved inshore fishery resources that are resilient to climate change</p> <p>Village to provide fencing for domestic animals to prevent waste contaminating marine reserve</p> <p>Responsibility: MNRE /MAF/ Village /CSSP/ UNDP-GEF SGP</p>	<p>Protects and enhance local species diversity</p> <p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</p>	<p>MAF and MNRE DEC and CC to provide technical assistance and backstopping in the assessment and establishment of a marine reserve for village</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>Village to seek funding to establish marine reserve</p> <p>MAF to raise awareness of farmers on impacts to water flows from poor livestock management</p>	<p>Draft NESP 2016-2020</p> <p>Community Engagement Plan</p> <p>Agriculture Sector Plan 2016-2021</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 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>

Fusi Village Map



4.3 Lotofaga Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Drainage systems to be improved in high risk areas especially at junction of South West Coast Road and Lotofaga Access Road exacerbating inland flooding and storm water surges	<p>Continue to assess and upgrade culverts on main and 'access' roads in district and widen culverts 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>Introduce culverts in wetland areas to improve tidal flow and fish passage in the wetland area</p> <p>Implement regular drainage inspection and maintenance</p> <p>Government to regulate developments and illegal rubbish dumping near and around waterways and drainage</p> <p>Responsibility: LTA/MWTI/MNRE/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>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design</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>Develop Integrated Catchment Strategy and Flood Management Plan for Safata District</p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Utilise environmental and social safeguards including 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>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</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</p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal</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>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management</p>

	<p>barrier, a minimum distance of 200m of vegetation is needed</p> <p>Responsibility: MNRE Villages</p>	<p>erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>Act 2011</p>
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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>Sand/rock extraction (domestic): coastline, rivers and riverbanks</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>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 taro plantations)</p>	<p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of</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</p>	<p>AgricultureSectorPlan2 016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National</p>

	<p>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>community livelihood and food security</p>	<p>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>Invasive Species Action Plan (NISAP)</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 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>



Lotofaga Village Map

LOTOFAGA



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 Mulivai Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, 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 appropriate permits and consent</p> <p>Responsibility: Village / Families /MWTI/ MNRE</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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>Upgrade inland access/ work roads to facilitate relocation of houses away from hazard zones</p>	<p>Assess and upgrade access roads 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 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>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</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</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>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</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>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>Reduce impact from inland flooding</p>	<p>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>	
Electricity supply	<p>Provide underground lines in the long term</p> <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>Maintain electricity supply at all times including natural disasters</p> <p>Avoid accidents from fallen electricity posts</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p>	EPC Strategic Plan
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans National Strategies & Policies
Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)	<p>Village pool is 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>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>CIM Strategy 2015</p> <p>Community Engagement Plan</p>

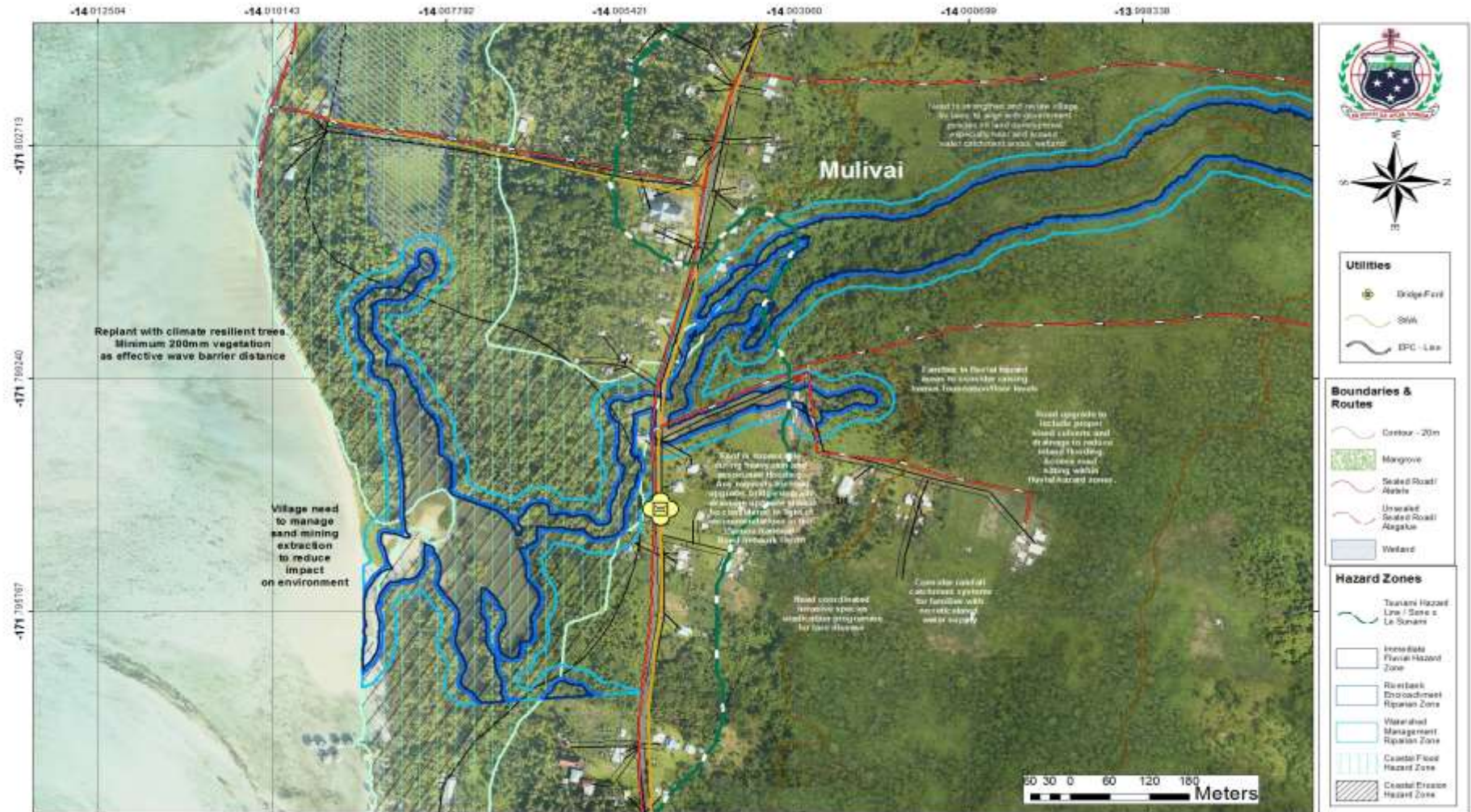
	Responsibility: CSSP/NGOs/MNRE/Villages		Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities	
Mangrove Conservation Areas and nearshore marine resources	<p>Research new species found in mangrove area</p> <p>Undertake an assessment of tidal flow necessary to maintain a healthy natural environment</p> <p>Limit land clearance and developments adjacent to wetland areas</p> <p>Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Village to fence off domestic animals foraging in wetland areas</p> <p>Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</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>MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Safata District</p> <p>Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district</p>	<p>Draft NESP 2017-2021</p> <p>Community Engagement Plan</p>
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Pest management; invasive species (african snails, crown-of-thorns, and worms affecting plantations and vegetable gardens)	<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>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</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 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</p>	<p>AgricultureSectorPlan2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</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>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>	
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 Nuu 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
Cattle farm and pigs sties Responsibility: SWA/Village/ Landowner	Village council and landowners to resolve	Not a CR issue however, due to unfenced cattle and pigs damaging the environment there is concern with contamination of nearby waterways and subsequent overflow into mangrove area

Mulivai Village Map

MULIVAI



4.5. Nu'usuatia Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, 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 appropriate permits and consent</p> <p>Responsibility: Village / Families /MWTI/ MNRE</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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>Extension of existing road to ridge as escape route and to encourage relocation of houses away from hazard zones</p>	<p>Assess whether proposed road will encroach into catchment and wetland areas</p> <p>Assess and upgrade approved access roads to include adequate sized culverts to facilitate the overland flow of storm water and reduce flooding onto main roads and neighbouring families and villages</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>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</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 design</p> <p>Include in budget programming CBA, design and construction. Road design standard to take account of forecast changes in sea level rise and 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 District/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>National Disaster Management Plan 2017-2021</p> <p>Community Sector Plan</p>
<p>Flood protection measures; IWS reservoir: blocked with silt</p>	<p>Village to upgrade reservoir</p> <p>Clear sand deposition and ensure river channel is cleared and maintained regularly</p> <p>Upgrade or repair riverine embankment protection work upstream</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Conduct riparian</p>	<p>Minimise expenditure on damaged properties & personal assets</p> <p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Safer villages, houses and roads</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs</p> <p>Implement Safata Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and design</p> <p>Utilise environmental and social safeguards including EIAs in screening and</p>	<p>CIM Strategy 2015</p> <p>Community Sector Plan</p>

	<p>replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p>Responsibility: MWTI/ LTA/MNRE/ District/ Village</p>		<p>designing infrastructure facilities</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p> <p>Designation of the CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Wetland areas threatened by developments, stormwater runoff and inland flooding	<p>Undertake an assessment of tidal flow necessary to maintain a healthy natural environment</p> <p>Limit land clearance and developments adjacent to wetland areas</p> <p>Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Village to fence off domestic animals foraging in wetland areas</p> <p>Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</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>MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Safata District</p> <p>Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district</p>	<p>Draft NESP 2017-2021</p> <p>Community Engagement Plan</p>
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Pest management; invasive species (african snails, myna birds, and worms affecting taro plantations)	<p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate resilient native species</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and</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>AgricultureSectorPlan2 016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa’s National Invasive Species Action</p>

<p>and vegetable gardens)</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>food security</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>Plan (NISAP)</p>
<p>Governance</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>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 Nuu to monitor the use of and impact on natural</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</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>resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p>Responsibility: MWCSO /Village</p>	<p>quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>		
--	---	---	--	--

4.6. Sa'anapu Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses and other assets 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 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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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 South West Coast Road where it joins existing access road	<p>Assess and upgrade culverts on main South Coast road especially at junctions with access roads (Saanapu Uta 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 Integrated Catchment Strategy and Flood Management Plan for Safata District</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p>
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Effluent and wastewater management systems	<p>Introduce ban on latrines established in and around fluvial hazard zones</p> <p>Families in fluvial hazard zones to install proper septic waste disposal systems</p> <p>Families to fence domestic animals</p> <p>Implement village awareness and cleanup programme to reduce illegal rubbish dumping</p> <p>Implement district/village</p>	<p>Increase adaptation during extreme weather events</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</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>Review wastewater strategy/ legislation to include role of Village/District bylaws</p> <p>Develop/Update and register District/Village bylaws to include regulating developments and latrines around</p>	National Waste Management Strategy

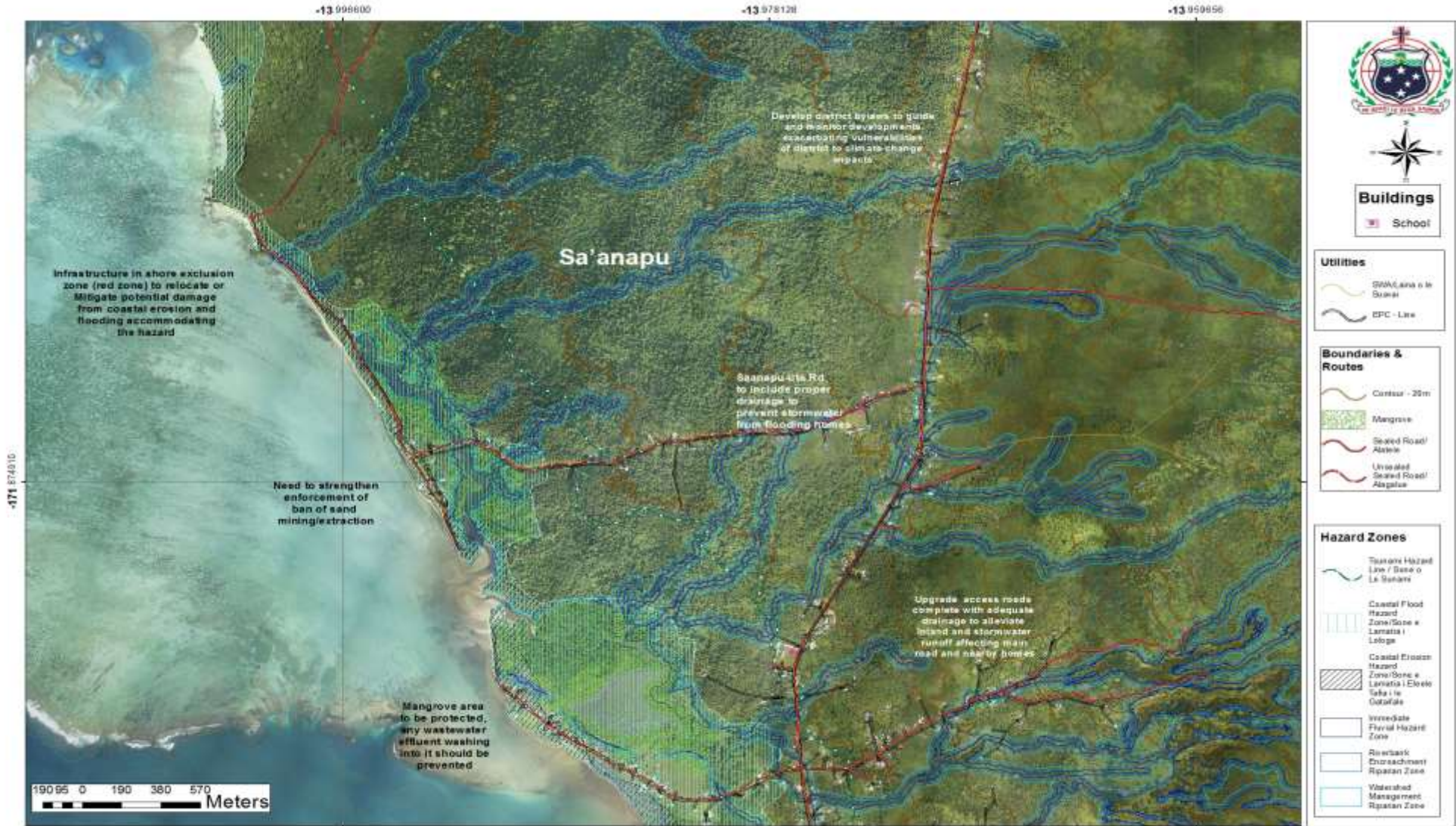
	<p>drainage cleanup and awareness programme</p> <p>Produce posters and village signs for public awareness</p> <p>Responsibility: MNRE/ MWCSO/ District/ Village</p>		<p>catchment areas and areas susceptible to flooding</p> <p>Utilise Hazard maps and Geomorphologist findings to inform location</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management</p>	
<p>Illegal rubbish dumping in riverbanks, watercourses and roadsides within fluvial hazard zones</p>	<p>Implement village awareness and cleanup programme to reduce illegal rubbish dumping</p> <p>Implement district/village drainage cleanup and awareness programme</p> <p>Produce posters and village signs for public awareness</p> <p>Responsibility: MNRE/ MWCSO/ District/ Village</p>	<p>Increase adaptation during extreme weather events</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</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>Review wastewater strategy/ legislation to include role of Village/District bylaws</p> <p>Utilise Hazard maps and Geomorphologist findings to inform location</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management</p>	<p>National Waste Management Strategy</p>
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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>Community Engagement Plan</p>

<p>Wetland/ Mangrove areas threatened by developments, stormwater runoff and inland flooding</p>	<p>Undertake an assessment of tidal flow necessary to maintain a healthy natural environment</p> <p>Limit land clearance and developments adjacent to wetland areas</p> <p>Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Village to fence off domestic animals foraging in wetland areas Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</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>MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Safata District</p> <p>Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district</p>	<p>Draft NESP 2017-2021</p> <p>Community Engagement Plan</p>
<p>Governance</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>Strengthen the governance of natural resources and land use through bylaw</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>Facilitate continuous awareness raising programs with the villages 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
Streetlights not working <i>Responsibility: Village /Families/EPC</i>	Village families to report problem directly to EPC.	Not a CR issue. This issue was recorded by EPC staff during consultations

Sa'anapu Village Map

SA'ANAPU



4.7. Sataoa Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
<p>Village houses, pre- school, church, road etc and beach fales in 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>Responsibility: Village / Families /MWTI/ MNRE</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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>Drainage systems require maintenance and upgrade in high risk areas of main South West Coast Road where it joins Sataoa Access road</p>	<p>Assess and upgrade culverts on main South West Coast road especially at junctions with access roads (Sataoa 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 Integrated Catchment Strategy and Flood Management Plan for Safata District</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p>
<p>Upgrade Sataoa Access Road to encourage relocation away from hazard zones and to reduce stormwater runoff</p>	<p>Assess and upgrade approved access roads to include adequate sized culverts to facilitate the overland flow of storm water and reduce flooding onto main roads and neighbouring families and villages</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>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</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design</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 District/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>National Disaster Management Plan 2017-2021</p> <p>Community Sector Plan</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</p>	public assets		
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Deforestation for agricultural developments, cattle farms etc has exacerbated flooding from catchment area into village and eventually into mangrove 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>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>Government, district and villages to monitor, report and apply penalty on offenders</p> <p>Continue ban of destructive fishing practices including sand mining and introduce village ban on rubbish</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 Integrated Catchment Strategy and 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>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>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	<p>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>			
<p>Wetland/ Mangrove areas threatened by developments, stormwater runoff and inland flooding</p>	<p>Undertake an assessment of tidal flow necessary to maintain a healthy natural environment</p> <p>Limit land clearance and developments adjacent to wetland areas</p> <p>Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p>Village to fence off domestic animals foraging in wetland areas</p> <p>Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</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>MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Safata District</p> <p>Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district</p>	<p>Draft NESP 2017-2021</p> <p>Community Engagement Plan</p>
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
<p>Pest management; invasive species (african snails, myna birds, and worms affecting taro plantations and 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</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</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 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>Agriculture Sector Plan 2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

	<p>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>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>	
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 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>

Sataoa Village Map

SATAOA



4.8 Tafitoala 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>Responsibility: Village / Families /MWTI/ MNRE</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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>Upgrade access road to facilitate relocation and as potential escape routes</p>	<p>Assess Tafitoala Road, Tafitoala Primary and Tafitoala Access Roads and upgrade approved access roads to include adequate sized culverts to facilitate the overland flow of storm water and reduce flooding onto main roads and neighbouring families and villages</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>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</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 design</p> <p>Include in budget programming CBA, design and construction. Road design standard to take account of forecast changes in sea level rise and 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 District/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>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</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</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</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>

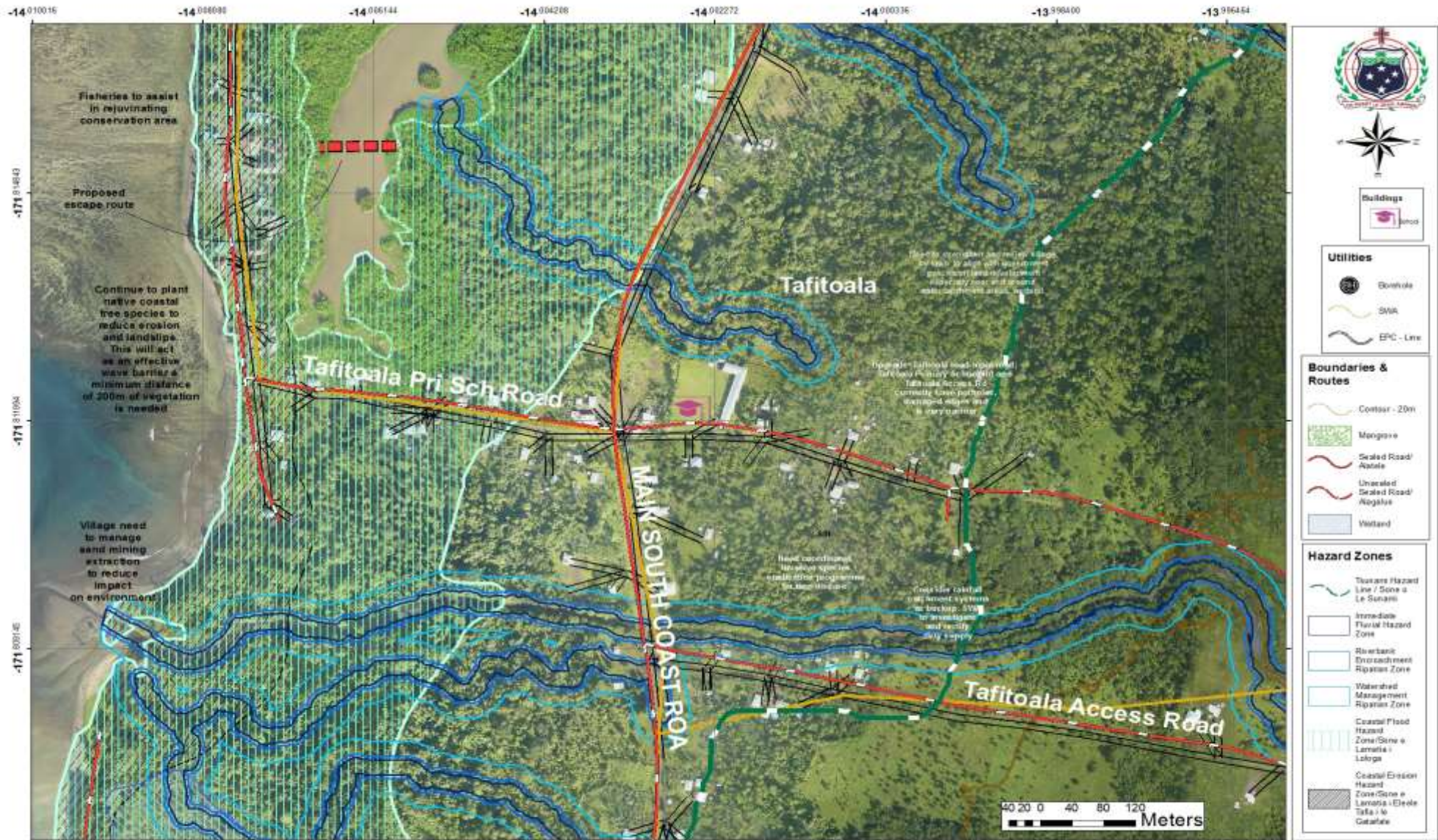
	<p>boreholes in district</p> <p>District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas</p> <p>Responsibility: SWA/ IWS/MWCSD/ MNRE / District/ Village/ CSSP</p>		<p>Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings 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
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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>Community Engagement Plan</p>
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
<p>Pest management; invasive species (african snails, myna birds, and worms affecting taro plantations and 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</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</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 raise awareness of farmers on impacts to water flows from poor livestock management</p> <p>MAF to assist in</p>	<p>AgricultureSectorPlan2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

	<p>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>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>	
--	---	--	--	--

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 bylaw</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 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>

Tafitoala Village Map

TAFITOALA



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

4.9 Vaie'e 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 village pool are all in 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>Responsibility: Village / Families /MWTI/ MNRE</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>Develop an Integrated Catchment and Flood Management Strategy for Safata District. MNRE to develop zonation strategy for safe areas</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>Upgrade access road to facilitate relocation and as potential escape routes</p>	<p>Assess Vaie'e access road and upgrade where necessary. Upgrade to include adequate sized culverts to facilitate the overland flow of storm water and reduce flooding onto main roads and neighbouring families and villages</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>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</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 design</p> <p>Include in budget programming CBA, design and construction. Road design standard to take account of forecast changes in sea level rise and 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 District/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>TSP 2014-2019 Goal 2 KO 1</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</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</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</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>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>Geomorphologist findings to 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
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is 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>
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
<p>Pest management; invasive species (african snails, myna birds, and worms affecting taro plantations and 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</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</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 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</p>	<p>AgricultureSectorPlan2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

	<p>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>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>	
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 bylaw</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>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>

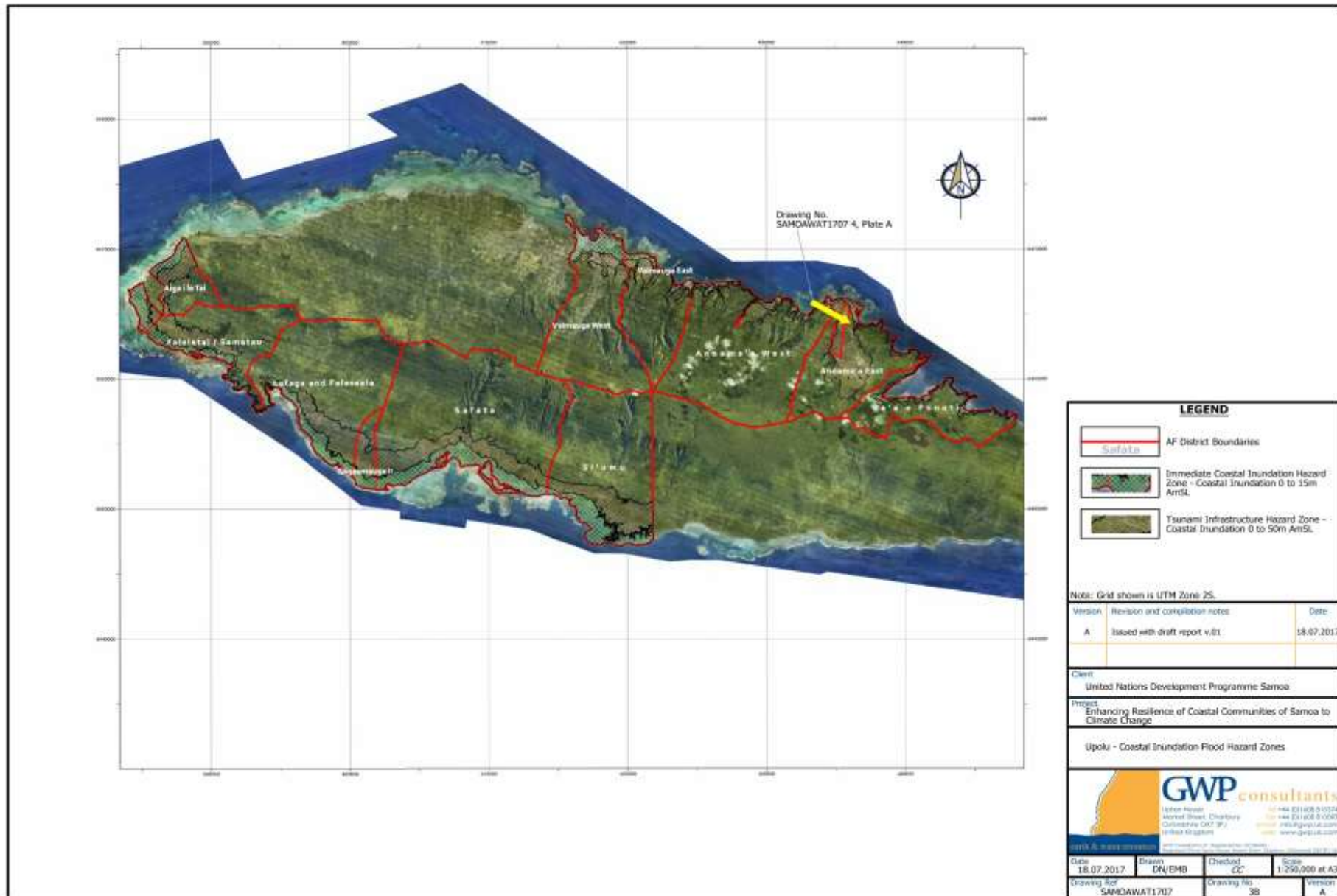
Non-CR issues raised during consultations	Proposed Solution	Comments
South Coast Road; Sight distance on Main Road Responsibility: LTA /MWTI	LTA and MWTI to assess and recommend best remedial action to ensure safety of vehicles and pedestrians	Not a CR issue. Safety concern on speeding traffic with road alignment reducing sight distance (25kph limit area)
District Hospital Responsibility: MOH/District/Village	MOH and District/Village to discuss relocation of hospital from hazard zone (Fusi) where it is currently situated	There are land issues involved so this has to be dealt with first at village/landowner level

Vaie'e Village Map

VAIE'E



Upolu AF Districts Overview Map of Coastal Inundation Zones



LEGEND

- AF District Boundaries
- Immediate Coastal Inundation Hazard Zone - Coastal Inundation 0 to 15m AMSL
- Tsunami Infrastructure Hazard Zone - Coastal Inundation 0 to 50m AMSL

Note: Grid shown is UTM Zone 25.

Version	Revision and completion notes	Date
A	Issued with draft report v.01.	18.07.2017

Client
United Nations Development Programme Samoa

Project
Enhancing Resilience of Coastal Communities of Samoa to Climate Change

Upolu - Coastal Inundation Flood Hazard Zones

GWP consultants
 Lynton House
 Market Street, Chichester
 West Sussex PO19 1SE, UK
 Tel: +44 (0)1243 830374
 Fax: +44 (0)1243 830383
 Email: info@gwp.co.uk
 Web: www.gwp.co.uk

Date 18.07.2017	Drawn DN/EMB	Checked CC	Scale 1:250,000 at A3
Drawing No. SAMOAWAT1707	Drawing No. 38	Version A	