

# **Community Integrated Management Plan**

## **Anoama'a East District – Upolu**



## **Implementation Guidelines 2018**

## Foreword

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

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

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

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

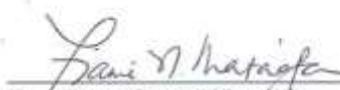
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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

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

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

Thank you

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

## Participants in the Plan

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

This Plan incorporates the Faipule District of Anoama'a East (Falefa, Falevao, Lalomauga, Lufilufi and Manunu/Sauniatu/Solaua 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

Representatives:

Signature:

### Falefa Village

- Fanualelei Purcell
- Fuaoletavai Maeu
- Faitamatau Eli
- Kasiano Alualu
- Peleti Salanoa

  
(FANUALELEI PURCELL)

  
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\_\_\_\_\_

  
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### Falevao Village

- Malaga Palale
- Tafililupetiamalie Tui
- Faasalafa Tafili Tui

  
(MALAGA PALALE)

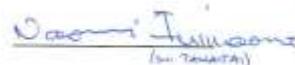
  
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(FAASALAFI TAFILI TUI)

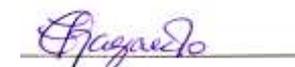
### Lalomauga Village

- Malofaiiolefaiva Lama
- Naomi Fuimaono
- Seugaalii Puaiai Gagaeolo
- Fetalai Gagaeolo

  
(MALOFAIOLEFAIVA LAMA)

  
(NAOMI FUIMAONO)

  
\_\_\_\_\_

  
\_\_\_\_\_

**Lufilufi Village**

- Mata'afa Peni
- Moemalo Fonoti
- Manuō Failautusi
- Tusa Finau
- Fa'amatuainu Letutusa

*Jeanitaifa*

*Moemalo*

*Manuō Failautusi*

*Tusa Finau*

*Fa'amatuainu*

**Manunu/Sauniatu/Solaua Village**

- Leifi Esekia
- Lumanai Moemoe
- Moegalupe Pea'e
- Ulisese Atualevao
- Tiaseu Toafa

*Leifi Esekia*

*Lumanai Moemoe*  
(Lumanai Moemoe)

*Moegalupe Pea'e*

*Ulisese Atualevao*

*Tiaseu Toafa*

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

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



**Ulu Bismarck Crawley**  
**CHIEF EXECUTIVE OFFICER, MNRE**

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## Acronyms

ASCH	Areas Sensitive to Coastal Hazards
BCA	Benefit Cost Analysis
CBFMP	Community Based Fisheries Management Plan
CC	Climate Change
CCA	Climate Change Adaptation
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
IG	Implementation Guideline
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
SOER	State of Environment Report
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

Coastal Hazard Zones	Defined areas landward of the coast 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 four coastal hazard zones: ASCHs (areas sensitive to coastal hazards); CEHZs (coastal erosion hazard zones); CFHZs (coastal flood hazard zones) and CLHZs (coastal landslip hazard zones).
“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.
Hazard	A source of potential harm or a situation with a potential to cause loss.
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 Guidelines	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).
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.
Livelihood	A livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life Food

availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

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).

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.

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.

## ***Introduction to the CIM Plan***

### **The Strategic Vision**

The District Community Integrated Management (CIM) Plan for Anoama'a East 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).***

### **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.

### **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.

## Implementation Guidelines

### 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.

### 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.

### 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 natural environmental effects
- development will improve resilience
- development will achieve speedy recovery
- development will reduce risk
- also identified as a priority in other Sector Plans or National Strategies

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

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

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

## 1. Description of Anoama'a East District

### Physical and Natural Resource Setting

The Faipule District of Anoama'a East is located at the north-eastern end of the island of Upolu. The average annual rainfall varies with Anoama'a East receiving above the national average for rainfall in this area (Dews, 2017). The district is characterized by a small headland on the coast which rises inland from the main road towards steep mountain peaks. It has some low lying areas with several slow moving streams forming numerous inland wetland areas. A number of small pockets of mangrove areas are scattered throughout the district, some are heavily degraded as a result of road construction, family gardens and being used as dumping grounds of household wastes. The coastal areas have extensive coral reefs, mangroves and wetlands. The Anoama'a east and west districts are characterised by a series of steep headlands with bays in between. The bays vary in length with the larger bays providing the setting for the villages of the Districts. The hilly and steep nature of the topography provides some protection for the natural vegetation although this also makes the villages highly vulnerable to flooding from upland rivers and streams. Short, fast flowing rivers and streams flow through most of the villages draining the steep catchments behind. The reef systems are mostly broken opposite the rivers and streams and from past volcanic activity that have left rocky outcrops offshore. Where there is a coral reef it is generally less than 500m offshore (Reti, 2017).

The five main villages of Anoama'a East are located both on the coast and inland. The villages of Lufilufi and Falefa are located by the coast, on both sides of the main East Coast Road. Manunu/Sauniatu/Solaua, Lalomauga and Falevao are located inland, away from the coast and main road. Manunu/Sauniatu/Solaua are mainly accessible through the Manunu Road via Saoluafata village in Anoamaa West district whilst Lalomauga and Falevao each have their own access roads<sup>1</sup>. The narrow flat coastal plateau has small areas of houses positioned close to the coastal main road but set back from the coastline. Inland from the coast the landscape is described as dominated by broad sloping ridges separated by deep gorges and wet climate. This landscape supports mixed farming and plantations. The soil type on the coastal plateau is at risk of salt intrusion from storm surges (Dews, 2017).

The coastline is mainly comprised of rocky shores with narrow strips of fine coral sand with several fresh water springs scattered along the coast. A large wetland area is also located in Lufilufi, which is important for the biodiversity of the area. This wetland increases the degree of flooding that impact on Lufilufi due to overflows from the wetland trying to find its way into the sea. The upland area of the district suffers from agricultural development and is facing new challenges resulting from the fast spreading merremia vine (Reti, 2017). There is a minor reef break in front of Lufilufi and the reef ends at the Falefa River mouth. These breaks influence tidal flows and sediment transport along the coast.

Two coastal revetment wall that extend approximately 1km along the coast in front of Lufilufi and approximately 500 metres in front of Falefa. These revetments provide protection to a number of village houses, churches, village pools and the culturally significant area of land on the coastal strip of Lufilufi. Erosion is evident behind the rocks, reducing the stability of the revetment. Away from the coast, the area is dominated by inland settlements, plantations and cattle farms. There has been some erosion along the river banks affecting land stability. Land-use practices such as deforestation, cattle farming and agriculture are increasing both the rate of erosion and the supply of sediment to the coast. These practices affect coastal processes including the incidence and degree of inland flooding in coastal areas, the rates of sediment accretion along the coast (occurring at Falefa) and the impact on the health of the lagoon and reef systems as fine sediments suffocate coral. They have a direct impact on the reef as the first line of defence from cyclone hazards and increase the susceptibility of coastal infrastructure to damage.

There are two main rivers in the district supplying reservoirs at Lalomauga and Sauniatu. These rivers begin in the mountains and carve a path through steep valleys meandering and levelling out as they reach the sea at Saoluafata and Falefa. The largest river, Falefa River passes through, or adjacent to, Falevao, Lalomauga and Manunu. This river flows all year round and during the rainy season causes severe flooding in the three villages. Lalomauga and Falevao have built a number of buildings, including school buildings close to its banks.

The coastal villages are also affected by the same river, but of most concern is the stormwater runoff due to lack of drainage directing overflow towards the sea. To prevent pollution of the village pool from flooding, the residents of Lufilufi have diverted stormwater runoff by installing a drainage channel alongside the pool. Wind damage by cyclones Ofa and Val in 1990 and 1991 respectively are still evident in high areas of Anoama'a East and the merremia vine has taken over most of the open areas (Reti, 2017).

<sup>1</sup> Lalomauga Road and Falevao-uta Road

## Social and Economic Setting

The Anoama'a East District currently has a population of 3,785. Total male 2,011, female 1,774. These figures exclude Saletele and Sauano<sup>2</sup> who are part of Anoama'a East if the electoral jurisdictions are used to calculate populations of this district.

The main East Coast Road and Le Mafa Pass are considered an important part of the district's infrastructure and is in good condition. The main road extends inland in a southerly direction at Falefa where it crosses Le Mafa Pass. The main road provides lifeline access to the District Hospital at Lufilufi as well as access to other neighbouring districts, villages, schools, churches, and shops. The main road through Lufilufi and Falefa is generally located outside the coastal hazard zones or at the inland edge of the coastal flood hazard zone. The falls at Falefa provide a scenic tourist attraction within the district.

Primary services such as power and telephone generally follow the main road. In some locations, particularly Falefa, the telephone poles are located in the drainage channel along the main road. In Lufilufi, telephone lines are extremely low (less than 2m). Power and telephone lines along the main road are outside the hazard zones. Consistent water supply is a concern for a number of villages especially communities that live away from existing pipelines. The District hospital for instance was recently forced to close due to inadequate water provision. Of the five villages, only Lufilufi has access to Samoa Water Authority reticulated water supply. The remaining four are serviced by the Independent Water Scheme with reservoirs located at Lalomauga and Manunu.

The district of Anoama'a East supports a large hydro electric scheme at Lalomauga that is supplied by a reservoir at Sauniatu. The river at Lalomauga is a major economic asset to the local community as a source of freshwater prawns, eels and fish. These are harvested for food and prawns are sold to hotels in Apia for income. The river is also a main source of hazard from inland flooding and erosion especially during cyclone season and periods of prolonged heavy rain (Reti, 2017).

Each village has an access or work road which provides access to primary schools, plantations as well as the district hospital. These access roads generally all connect to the main East Coast Road which runs through all the way to Apia. The access road to the hospital is narrow and in poor condition. Access roads to primary schools in both Lufilufi (seal extends 300m) and Falefa (seal extends 200m) have power and are sealed as far as the school. All other access roads within the district are unsealed and vary in condition. The access roads to the villages of Lalomauga, Manunu and Falevao are particularly poor and in need of improvement. The causeways and fords are impassable during heavy rain.

The cash economy of the District is a mixture of traditional work including fishing, plantations, cattle, piggery and poultry farming. In addition a large number of local residents are employed within Apia. Anoama'a East is recorded in the Community Disaster & Climate Risk Management survey as the second highest district<sup>3</sup> with its income source from salaries. The District supports a number of primary schools<sup>4</sup>, churches<sup>5</sup>, small shops and a District hospital.

## 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 Anoama'a East.

Land-use practices, such as deforestation, cattle farming and agriculture development are increasing both the rate of erosion and the supply of sedimentation to the coast (Reti, 2017). The lowland and upland forest areas of Anoama'a East and Anoama'a West are comprised mainly of disturbed secondary forests and the existence of inland settlements with their own agricultural development needs exacerbate the land clearing problem.

<sup>2</sup> Total female for Sauano and Saletele = 192; total male = 207

<sup>3</sup> Out of 25 districts surveyed from both Upolu and Savaii

<sup>4</sup> Falevao Primary School; Falevao, St Peters Pre-School (Catholic Mission), St Peters Primary School (Catholic Mission), Falefa Primary School; Falefa, Lalomauga Primary School; Lalomauga, Piula Theological Pre-School (Methodist Mission), Loimata Pre-school (Methodist Mission), Lufilufi Primary School; Lufilufi, Manunu Primary School; Manunu/Sauniatu/Solaua

<sup>5</sup> Falevao: CCCS, Falefa: CCCS, Catholic, AOG, LDS, Lalomauga: CCCS, Lufilufi: CCCS, Catholic, Methodist, LDS, Manunu/Sauniatu/Solaua: CCCS, LDS

Element at risk includes all human-made infrastructure and natural features, which consist of physical and non-physical infrastructures that face risks from natural disasters. Human-made physical infrastructures include houses, road networks, utilities networks, bridges, drainage networks and railways. Human-made non-physical elements consist of economic, cultural and political environments. Natural features that may be affected by natural disasters include beaches, river systems, swamps, vegetation and all fauna in these environments. Anoama'a East District has a total area of 4, 208 hectares. The watershed management riparian buffer covers 454 hectares, and there are 139 buildings in the district that are located in this fluvial zone. 54 buildings in the district are located both in the Coastal Flood Hazard Zone and Coastal Erosion Hazard Zone. 9 buildings sitting in the tsunami shore exclusive zone should consider relocation.

This district is prone to landslips exacerbated by inland flooding and storm water runoff. Some parts of the main East Coast Road lie extremely high hazard zones where there is a combination of the tsunami shore exclusive zone, CEHZ, CLHZ and IFHZ. Indiscriminate felling of the forest and trees further inland is exacerbating river overflows adding to flooding at lower areas of the district.

## 2. Anoama'a East District Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Slope stabilization and road armouring to avoid landslips and erosions in most high risk hazard zones	<p>Implement slope stabilization or 'forced collapse' under controlled conditions at most vulnerable landslide areas of Anoama'a East as identified in the <i>Vulnerability Assessment of the Samoa Road Network</i> report</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><b>Responsibility:</b> <b>LTA/MWTI/ MNRE/ Villages</b></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 Upolu</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties, public and private assets</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Implement Anoama'a East District Integrated Catchment Strategy and Flood Management Plan in conjunction with Geomorphologist Drainage Infrastructure Database findings</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>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Anoama'a East district</p> <p>Include in budget programming CBA, design and construction</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>Transport Sector Plan 2014-2019 Goal 2</p> <p>NISP 2011 (KESO 5 D&amp;E)</p>
Flood protection measures for fords and bridges	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream of Lalomauga, Falefa and Manunu</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Construct levees to reduce flooding along</p>	<p>Minimise expenditure on damaged properties &amp; 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>Maintain lifeline access for all of Upolu</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 Anoama'a East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings</p> <p>Utilise environmental and social safeguards including EIAs in screening and</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>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><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>		<p>designing infrastructure facilities</p> <p>Include in budget programming CBA, design and construction. Bridge and road designs to take account of forecast changes in sea level rise and 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>Drainage systems require maintenance and upgrade in high risk areas of main East Coast Road</p>	<p>Assess and upgrade culverts and cross drainage on main East Coast Road especially at junctions of access/work roads within the district- 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><b>Responsibility: LTA /MWTI/MWCSD /Village/ Families</b></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 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>
<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>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of</p>	<p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p>	<p>CIM Strategy 2015</p> <p>Water and Sanitation</p>

	<p>Procure rainwater harvesting systems for vulnerable families and for identified evacuation shelters as a short term solution</p> <p><b>Responsibility: SWA/ MWCS/ MNRE / District/ Village/ CSSP</b></p>	<p>recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p>	<p>Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform designs</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p>	<p>Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Community Sector Plan</p>
<p>Coastline protection: Lufilufi and Falefa seawalls</p>	<p>Assess and strengthen part of seawalls in <b>most high risk areas</b> to reduce vulnerability of road and other critical village assets in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</p> <p>Clear debris from existing culverts near seawalls to enable free outflow of storm water and streams</p> <p>Research the impacts of sand mining</p> <p>Village consultation on sand mining policy and regulation</p> <p>Enforce environmental social safeguards where reclamations, sand mining, extraction or other major coastal works are proposed. Government and village to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: LTA/ Village /MNRE/MWTI</b></p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Reduce impact from coastal erosion</p> <p>Safer villages, houses and roads</p> <p>Minimise expenditure on damaged properties &amp; personal assets</p>	<p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Draft Soil Resource Management Bill</p>

<p>Evacuation Shelter and a connected escape route needed for emergency preparedness and response</p>	<p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Develop a Village Climate Disaster Management Plan (VCDMP)</p> <p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p><i>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</i></p>	<p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p>	<p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p> <p>NISP 2011 KESO 5</p>
<p>Village houses, church and government assets in extremely high risk hazard zones</p>	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for</p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>

	<p>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>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>		<p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Restoration and conservation of upland forest	<p>Re-stock existing nursery with appropriate trees</p> <p>Protect ridge-top habitats and forests from indiscriminate cultivate and other developments</p> <p>Replant native forestry species of the upland forests to restore resilience and ecological function</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</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>Protects and enhance local species diversity</p> <p>Sustains ecosystem services and functions</p> <p>Reduced risk of slips and erosion</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>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>Utilise PD3 to inform location for planting/ re-planting</p>	<p>Community Engagement Plan</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	<b>Responsibility: MNRE/ /MWCSO/ District /Village/CSSP</b>			
Protection of catchment areas	<p>Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p> <p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility: MNRE/ /SWA/District/Village/ CSSP/GEF-SGP</b></p>	<p>Reduced risk of slips and erosion</p> <p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Anoama'a East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p> <p>Utilise PD3 to inform location for planting/ re-planting</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p> <p>Restoration Operational Plan 2016-2020</p>
Flood protection measures (soft solution to support flood protection measures for infrastructure)	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility: MNRE/ Villages</b></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>Implement Anoama'a East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
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</p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from</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</p>	<p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational</p>

	<p>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><b>Responsibility: MNRE/MAF/Villages</b></p>	<p>coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>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>Plan 2016-2020</p> <p>Forestry Management Act 2011</p>
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
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>Obtain necessary permits required by law before developments take place</p> <p><b>Responsibility: MWCSO /MNRE /Village</b></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>

<b>Non-CR issues raised during consultations</b>	<b>Proposed Solution</b>	<b>Comments</b>
District Hospital at Lufilufi: need doctor to visit more than once a week Responsibility: MOH /District	MOH to assess and review based on national needs and priorities in Health Sector Plan	Not a CR issue however can be a CR issue if hospital is identified as a evacuation shelter and/or a first response emergency facility during extreme weather events
Upgrade access road to EPC power station/house at Lalomauga Responsibility: EPC /District/Village	District and Village mayor to collaborate with appropriate authorities to upgrade access road	Not a CR issue but upgrading of access road to the EPC power station will ensure a reliable and secure power system

# Anoama'a East District Map

## ANOAMA'A EAST 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

### 3. Falefa Village Interventions

#### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Flood protection measures for riverbanks, bridges and fords	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream of Falefa</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>	<p>Minimise expenditure on damaged properties and 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 during the planning phase</p> <p>Implement Anoama’a East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to identify specific location and condition of current drainage / infrastructure requiring maintenance and upgrade works</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 sea level rise and 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>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>
Village houses, schools, churches and government assets in extremely high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</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>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning</p>	<p>CIM Strategy 2015</p> <p>National Building Code</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>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>		controls and restrictions	
<p>Access/work roads require maintenance and upgrade as it exacerbates flooding onto main East Coast Road</p>	<p>Assess and upgrade access/work roads as potential escape routes</p> <p>Construct roadside drainage ditches where needed</p> <p>Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: LTA/ MWTI/ MNRE/ Villages/Families</b></p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>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 Anoama’a East district</p>	<p>National Disaster Management Plan 2017-2021</p> <p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
<p>Evacuation Shelter and a connected escape route needed for emergency preparedness and response</p>	<p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Develop a Village Climate Disaster Management Plan (VCDMP)</p>	<p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p>	<p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p>

	<p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable building exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p><b>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</b></p>			
<p>Drainage systems to be improved in high risk areas</p>	<p>Continue to assess and upgrade culverts on main and access roads in district to facilitate the overland flow of storm water and reduce flooding - in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</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>Village to conduct regular drainage and waterway clearance behind homes</p> <p>Government to regulate developments and illegal rubbish dumping near</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</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 Anoama'a East 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 for Anoama'a East district</p> <p>Develop and register District/Village bylaws to include</p>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>

	<p>and around waterways and drainage connecting to East Coast Road</p> <p><b>Responsibility: LTA/ MWTI/MNRE/MWCSD /Village/ Families</b></p>	private assets	maintenance of drainages and illegal rubbish dumping into waterways	
Reticulated water supply, quality and network to be improved	<p>Extend the water supply to families inland with no access to water</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Village of Faleapuna and Falefa to support SWA water rationing programmes during times of drought</p> <p>Villagers of Faleapuna and Falefa to support SWA efforts at protection and conservation of boreholes in district</p> <p><b>Responsibility: SWA/ MNRE / District/ Village/ CSSP</b></p>	<p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p>	<p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings for planning purposes</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of village programmes and responsibilities</p>	<p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Village Fono Act(Amendment Bill 2016)</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><b>Responsibility: EPC/ MWTI/ Village/Families</b></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> <p>NISP</p>

<p>Coastline protection: seawall upgrade and maintenance</p>	<p>Assess and strengthen part of seawall in relevant area <b>only</b> to reduce vulnerability of road and other critical assets in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</p> <p>Clear debris from existing culverts near seawalls and waterways to enable free outflow of storm water and streams into sea</p> <p>Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: MNRE/ Village /Families/ CSSP/ MWTI/LTA</b></p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Reduce impact from coastal erosion</p> <p>Safer villages, houses and roads</p> <p>Minimise expenditure on damaged properties &amp; personal assets</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 for Anoama'a East district</p> <p>Develop and register Village bylaws to include banning of sand mining and illegal rubbish dumping in waterways and drains</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village replanting and clean up programmes</p>	<p>CIM Strategy 2015</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
<p><b>Natural Resources and Environment</b></p>	<p><b>Best Solutions</b></p>	<p><b>Benefits</b></p>	<p><b>Guideline to assist with the Implementation</b></p>	<p><b>Relevant Sector Plans National Strategies &amp; Policies</b></p>
<p>Wetland area conservation</p>	<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>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 Anoama'a East 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>

	<b>Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI</b>			
Flood protection measures (soft solution to support flood protection measures for infrastructure)	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility: MNRE/ Villages</b></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>Implement Anoama’a East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
<b>Livelihood and Food Security</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Pest management; invasive plants and animals	<p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate resilient native species</p> <p>Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken</p> <p>Conduct education and awareness programmes on the impacts of invasive species</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Build the capacity of farmers to manage stray animals (pigs, cattle) that</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>Village to manage pig/cattle population (compounds, in particular around water supplies)</p> <p>Training for farmers on pests management particularly affecting</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>are contaminating water sources</p> <p>Conduct pilot site trials for climate ready plant varieties</p> <p>District to fence domestic animals</p> <p><b>Responsibility: Villages/District/MNRE/MAF/SROS</b></p>		fruit trees and crops	
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
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><b>Responsibility: MWCSO /Village</b></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>



Upgrade access road to village plantation



Village alternative water source

# Falefa Village Map

## FALEFA VILLAGE



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. Falevao Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, schools, churches and government assets in extremely high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones</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>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>
Drainage systems to be improved in high risk areas	<p>Assess and upgrade culverts on most vulnerable parts of the local road especially at junctions with main East Coast Road (Falevao Uta Road and Falevao 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><b>Responsibility: LTA/ MWTI/MWCS D /Village / Families</b></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>Minimise 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</p>	<p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>

			<p>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>Primary School; River armouring to avoid landslips and erosions behind school</p>	<p>Implement slope stabilization at most vulnerable landslide area <b>identified in study</b> and Anoama'a East Integrated Catchment Strategy and Flood Management Plan</p> <p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream of Primary School</p> <p>Construct levees to reduce flooding along estuaries</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>	<p>Minimise expenditure on damaged properties &amp; 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 during the planning phase</p> <p>Implement Anoama'a East Integrated Catchment Strategy and Flood Management Plan in conjunction with 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</p>	<p>CIM Strategy 2015</p> <p>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Draft NESP 2017-2021</p> <p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p>

			<p>construction</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>	
<p>Upgrade work road to reservoir</p>	<p>Village to upgrade and maintain road to ensure improved access to reservoir</p> <p>Construct roadside drainage ditches where needed</p> <p><b>Responsibility: Village/ CSSP/MWTI/MNRE</b></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>Village to seek financial assistance</p> <p>Village to seek engineering /technical advice prior to any road upgrade</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Anoama’a East District</p> <p>Include in budget programming CBA, design and construction. Road design standard to take account of forecast changes in 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>Develop and register District/Village bylaws to include maintenance of</p>	<p>CIM Strategy 2015</p> <p>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Engagement Plan</p>

			drainages and illegal rubbish dumping into waterways	
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><b>Responsibility: EPC/ MWTI/ Village/Families</b></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> <p>NISP</p>
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Illegal rubbish dumping at old quarry	<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>Introduce ban on illegal rubbish dumping in district especially around fluvial hazard zones</p> <p>Conduct campaign for public awareness of district ban and establish a “neighbourhood watch” agreement with district to monitor and report on illegal dumping activities</p> <p>Government, district and villages to monitor, report and apply penalty on offenders</p> <p><b>Responsibility: MNRE/ District/ Village</b></p>	<p>Improve health and sanitation</p> <p>Reduce leachate into environment and water supply</p> <p>Reduce contaminant from overland flooding entering sea</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>Utilise Waste Management Act/Legislation to guide process of effecting the ‘polluter pays’ principle</p> <p>Develop and register District/Village bylaws to include penalizing illegal rubbish dumping in district lands</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>National Waste Management Policy</p> <p>Draft NESP 2017-2021</p> <p>Village Fono Act(Amendment Bill 2016)</p>

<p>Flood protection measures (soft solution to support flood protection measures for infrastructure)</p>	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility: MNRE/ Villages</b></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>Implement Anoama’a East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
<p>Water supply from Independent Water Scheme (IWS)/ village reservoir dirty: affected by flooding and unsustainable land practices</p>	<p>Village and relevant authorities to conduct water quality tests on a regular basis</p> <p>Introduce ban on illegal rubbish dumping in district especially around fluvial hazard zones</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate agricultural developments around the upland forest area</p> <p>Limit land clearance and agricultural development around intake and boreholes</p> <p><b>Responsibility: IWS/ MNRE/ SWA/MWCSD/ District/ Village</b></p>	<p>Improve health and sanitation</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 and register District/Village bylaws to include regulating developments around rivers, streams and water catchment</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Anoama’a East district</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>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>Community Sector Plan</p>
<p><b>Livelihood and Food Security</b></p>	<p><b>Best Solutions</b></p>	<p><b>Benefits</b></p>	<p><b>Guideline to assist with the Implementation</b></p>	<p><b>Relevant Sector Plans, National Strategies &amp; Policies</b></p>
<p>Pest management; invasive plants and animals affecting taro plantations, vegetable gardens and other crops</p>	<p>Implement an eradication programme to eradicate, contain or exclude invasive 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>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</p>	<p>Agriculture Sector Plan 2016-2021</p> <p>Samoa’s National Invasive Species Action Plan (NISAP)</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><b>Responsibility: Villages/District/MNRE/MAF/SROS</b></p>		<p>area</p> <p>MAF to raise awareness of farmers on impacts to water flows from poor livestock management</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>Training for farmers on pests management particularly affecting fruit trees and crops</p>	
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Strengthen the governance of natural resources and land use through Bylaws	<p>Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility: MWCSO /Village</b></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>



# Falevao Village Map

## FALEVAO VILLAGE



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

## 5. Lalomauga Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, schools, churches and government assets in extremely high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones</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>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>
River armouring to avoid landslips and erosions behind school	<p>Implement slope stabilization at most vulnerable landslide area <b>identified in study</b> and Anoama’a East Integrated Catchment Strategy and Flood Management Plan</p> <p>Upgrade waterways</p> <p>Upgrade or repair riverine embankment protection work upstream</p> <p>Relocate outside of high risk hazard zones when building/infrastructure requires replacement</p> <p>Investments within the hazard zones to adopt</p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Maintains natural ecosystem connectivity</p> <p>Reduce impact from coastal erosion</p> <p>Safer villages, houses and roads</p> <p>Minimise expenditure on damaged properties &amp;</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey of embankment and watercourse at Anoama’a East</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Anoama’a East District. MNRE to develop zonation strategy for safe areas</p>	<p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p>

	<p>appropriate mitigation measures</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>	<p>personal assets</p>	<p>Include in budget programming design, construction costs</p> <p>Develop and register District/Village bylaws to include banning of sand mining and illegal rubbish dumping in waterways and drains</p>	
<p>Upgrade access/work road to reservoir</p>	<p>Assess and upgrade access/work roads and implement where relevant</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>Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: LTA/ MWTI/ MNRE/ Villages/Families</b></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>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>CIM Strategy 2015</p> <p>Community Sector Plan</p>
<p>Evacuation Shelter and a connected escape route needed for emergency preparedness and response</p>	<p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Conduct evacuation shelter assessment and mark on CIM Plan hazard maps</p> <p>Develop a Village Climate Disaster Management Plan (VCDMP)</p> <p>Conduct trainings for People With Disabilities (PWDs) on</p>	<p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p>	<p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p> <p>NISP 2011 KESO 5</p>

	<p>emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p><b>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</b></p>			
<p>Replace ford with proper bridge and maintain hanging bridge</p>	<p>Upgrade ford to a proper bridge</p> <p>Upgrade or repair riverine embankment protection work upstream</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 main ford in village</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></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>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations during the planning phase</p> <p>Implement Anoama’a East Integrated Catchment Strategy and Flood Management Plan in conjunction with 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 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>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>Steel walkway: upgrade needed</p>	<p>Strengthen and upgrade steel walkway(hanging bridge) as alternative lifeline access during flooding, heavy rain and extreme events</p> <p><b>Responsibility: Village /DMO/ Families</b></p>	<p>Safer villages, houses and roads</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Utilise 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>Design and construction to take account of forecast changes in local flooding from increased rainfall intensity</p>	<p>CIM Strategy 2015</p> <p>Community Sector Plan</p> <p>National Disaster Management Plan 2017-2021</p>
<p>Improve water supply: construct new reservoir away from hazard zones</p>	<p>Village to seek funding and technical assistance to guide design</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Regulate developments around catchment area and boreholes in district</p> <p>District to support SWA efforts at exploratory boreholes in district</p> <p><b>Responsibility: SWA/ MWCS/ MNRE / District/ Village / CSSP</b></p>	<p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p> <p>Reduce impact from inland flooding</p>	<p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and design</p>	<p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>Community Engagement Plan</p>
<p><b>Natural Resources and Environment</b></p>	<p><b>Best Solutions</b></p>	<p><b>Benefits</b></p>	<p><b>Guideline to assist with the Implementation</b></p>	<p><b>Relevant Sector Plans, National Strategies &amp; Policies</b></p>
<p>Flood protection measures (soft solution to support flood protection measures for infrastructure)</p>	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</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>Implement Integrated Watershed/Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	<b>Responsibility: MNRE/ Villages</b>			
Restoration and conservation of upland forest	<p>Protect ridge-top habitats and forests from indiscriminate cultivate and other developments</p> <p>Replant native forestry species of the upland forests to restore resilience and ecological function</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</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><b>Responsibility: MNRE/ /MWCSO/ District /Village/CSSP</b></p>	<p>Protects and enhance local species diversity</p> <p>Sustains ecosystem services and functions</p> <p>Reduced risk of slips and erosion</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 Watershed/Catchment Strategy and Flood Management Plan for Anoama'a East District</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>Community Engagement Plan</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
Protection of catchment areas	<p>Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p> <p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility: MNRE/ /SWA/District/Village/ CSSP/</b></p>	<p>Reduced risk of slips and erosion</p> <p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Anoama'a East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p> <p>Restoration Operational Plan 2016-2020</p>

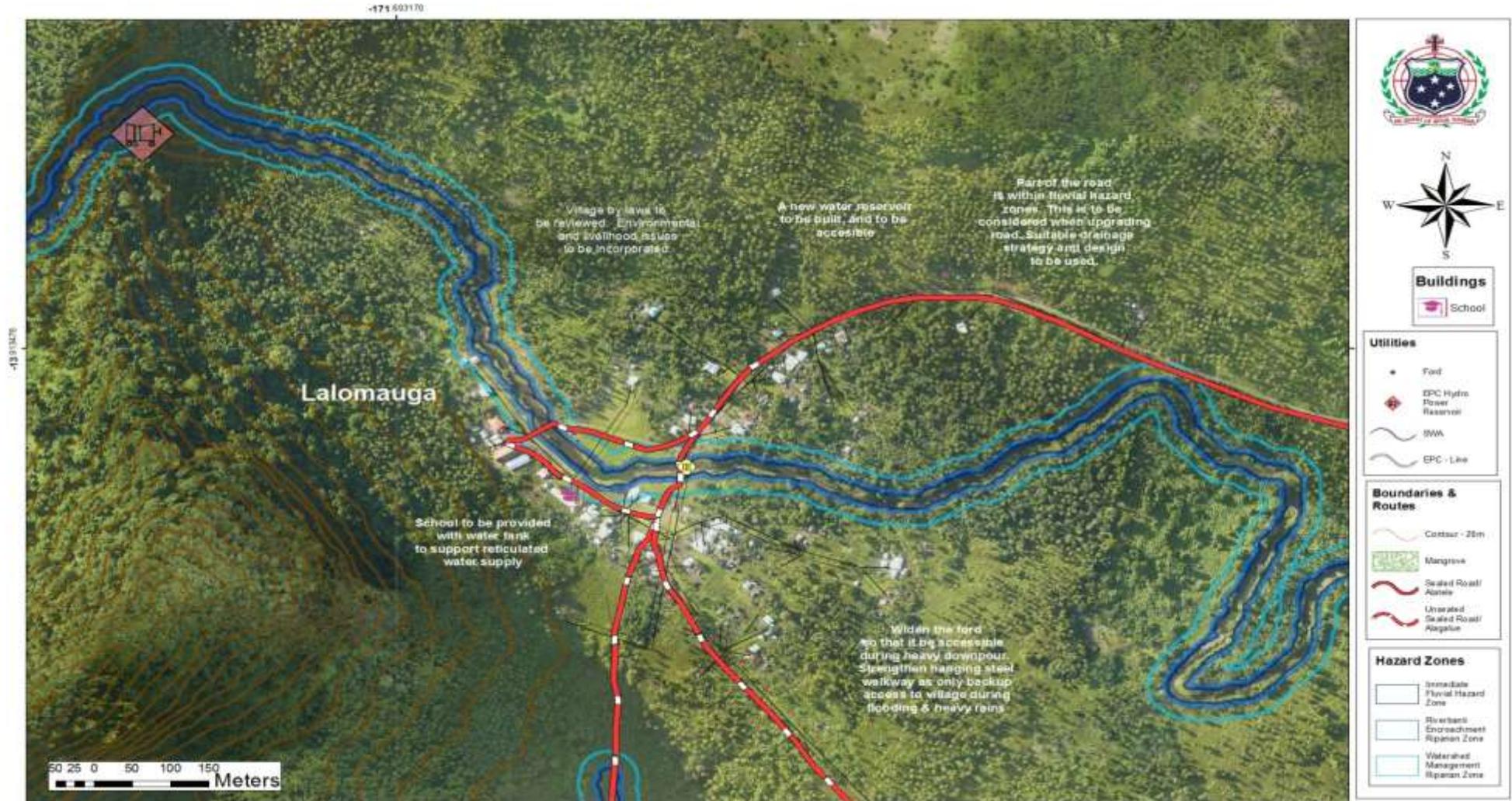
Governance	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
Strengthen the governance of natural resources and land use through Bylaws	<p>Update and/or develop bylaws to manage the use of natural resources, and to control land use 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><b>Responsibility: MWCSO /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>

Non-CR issues raised during consultations	Proposed Solution	Comments
<p>Cut down trees close to power lines</p> <p>Responsibility: EPC/ Village</p>	EPC and village to liaise directly on best solution	Not a CR issue but indirectly related to infrastructure concerns on resilience of communities during extreme events



# Lalomauga Village Map

# LALOMAUGA VILLAGE



## 6. Lufilufi Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, church and government assets in extremely high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</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>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>
Lufilufi Access road requires maintenance and upgrade as it exacerbates flooding onto main East Coast Road	<p>Assess and upgrade access roads to village primary school and plantations and provide with adequate sized culverts to facilitate the overland flow of storm water and reduce flooding onto main roads and neighboring villages</p> <p>Construct roadside drainage ditches where needed</p> <p>Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff</p> <p>Village to regulate developments near and around road shoulders of all access</p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone</p>	<p>National Disaster Management Plan 2017-2021</p> <p>CIM Strategy 2015</p> <p>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>

	<p>roads</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: LTA/ MWTI/ MNRE/ Villages/Families</b></p>	<p>damaged properties and public assets</p>	<p>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 Anoama'a East district</p>	
<p>Evacuation Shelter and a connected escape route needed for emergency preparedness and response</p>	<p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Develop a Village Climate Disaster Management Plan (VCDMP)</p> <p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p><b>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</b></p>	<p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Enforcement of National Building Code 2017</p> <p>Utilise hazard maps and Geomorphologist findings to inform location and designs</p>	<p>National Disaster Management Plan 2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p> <p>NISP 2011 KESO 5</p>
<p>Water supply, quality and network to be improved</p>	<p>Village to upgrade and maintain reservoir to cater for additional families who have moved further inland</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term</p>	<p>Increase adaptation during drought periods</p> <p>Improve infrastructure resilience and</p>	<p>Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p> <p>Implement SWA</p>	<p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan (2016)</p> <p>Community Engagement</p>

	<p>solution</p> <p>Village to support SWA water rationing programmes during times of drought</p> <p>V to support SWA efforts at exploratory boreholes in district</p> <p>District and village to fence reservoir to protect from contamination</p> <p><b>Responsibility: MWCS D/SWA/ MNRE / District/Village/ CSSP</b></p>	<p>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>(2016) 10year investment plant to improve water supply network to support all inland families without access to drinking water</p> <p>Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems</p> <p>Utilise hazard maps and Geomorphologist findings to inform design</p>	<p>Plan</p>
Electricity supply	<p>Install streetlights along the roads where needed for community safety</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Provide underground lines in the long term</p> <p>Install and connect to solar power supply if made available</p> <p><b>Responsibility: EPC /MWTI/ Villages</b></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>
<b>Natural resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies and Policies</b>
Sand/rock extraction (domestic): coastline, rivers and riverbanks	<p>Identify alternative sustainable sources of sand 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><b>Responsibility: MNRE/ Village/Families</b></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</p>	<p>Draft Soil Resource Management Bill</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 and worms affecting vegetable gardens)</p>	<p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>Replant with climate resilient native species</p> <p>Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken</p> <p>Conduct education and awareness programmes on the impacts of invasive species</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources</p> <p>Conduct pilot site trials for climate ready plant varieties</p> <p>District to fence domestic animals</p> <p><b>Responsibility: Villages /District/ MNRE/MAF/ SROS</b></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>Village to manage pig/cattle population (compounds, in particular around water supplies)</p> <p>Training for farmers on pests management particularly affecting fruit trees and crops</p>	<p>Agriculture Sector Plan 2016-2021</p> <p>Draft NESP 2017-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

<p>Food security</p>	<p>Promote and facilitate planting of rootcrops ( i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods</p> <p>Promote agro- forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Encourage organic farming and mixed planting system to promote ecological stability and soil protection</p> <p><b>Responsibility: MAF/ MNRE/village</b></p>	<p>Improve health through access to clean water and waste management</p> <p>Improve recovery to create more resilient villages</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum</p> <p>MAF to provide trainings, awareness raising and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting</p> <p>MAF to provide trainings and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MAF to provide technical advice, seedlings and planting material for village and families as a trial</p> <p>Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting</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</p>	<p>Agriculture Sector Plan 2016-2021</p> <p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p>
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Governance	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant Sector Plans, National Strategies & Policies
<p>Strengthen the governance of natural resources and land use through Bylaws</p>	<p>Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility: MWCS D /Village</b></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>



# Lufilufi Village Map

## LUFILUFI VILLAGE



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

## 7. Manunu/Sauniatu/Solaua Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the Implementation	Relevant National, Sector Plans and Strategies
Access/work roads require maintenance and upgrade (4km)	<p>Assess and upgrade Manunu Road (via Saoluafata village) Upgrade existing ford at Manunu into a proper bridge to improve access during flooding and extreme events.</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><b>Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP</b></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 Anoama'a East 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 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 Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes</p>	<p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p> <p>Community Engagement Plan</p> <p>Village Fono Act (Amendment Bill 2016)</p>
Upgrade and extend water supply (reservoir) Independent Water Scheme (IWS)/ village reservoir	<p>Upgrade village reservoir to an accepted drinking water quality</p> <p>Village and relevant authorities to conduct water quality tests on a</p>	<p>Improve health and sanitation</p> <p>Reduce contaminant from overland flooding entering sea</p> <p>Reduce</p>	<p>Develop Integrated Catchment Strategy and Flood Management Plan for Anoama'a East district. MNRE to develop zonation strategy for safe areas</p> <p>Develop an integrated land management plan with the</p>	<p>CIM Strategy 2015</p> <p>Water and Sanitation Sector Plan</p> <p>SWA 10 Year Investment Plan</p>

	<p>regular basis</p> <p>Build a fence around the reservoir and a roof to protect reservoir from contamination (illegal rubbish dumping)</p> <p>Procure rainwater harvesting systems for vulnerable families as a short term solution</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate agricultural developments around the upland forest area</p> <p>Investigate installing a water pump to improve water pressure</p> <p><b>Responsibility: SWA/ IWS/MWCSD/District/ Village/ CSSP</b></p>	<p>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>aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</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>Utilise Sui o Nu’u monthly meetings to monitor progress of village programmes and responsibilities</p> <p>Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes</p>	<p>(2016)</p> <p>Community Engagement Plan</p> <p>Health Sector Plan</p> <p>Village Fono Act(Amendment Bill 2016)</p>
<p>Slope stabilization</p>	<p>Implement slope stabilization at most vulnerable landslide area at Manunu – upland of Anoama’a East district as part of Anoama’a East District Integrated Catchment Strategy and Flood Management Plan</p> <p>Reduce sediment loads and loss of top soil by discouraging building and 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>Improve preparedness and readiness response to natural disasters</p> <p>Reduce impact from erosion and landslides</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 and Implement Anoama’a East Integrated Catchment Strategy and Flood Management</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Anoama’a East district</p> <p>Include in budget programming CBA, design and construction</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>Draft NESP 2017-2021</p>

	<b>Responsibility: MWTI /MNRE/ Villages</b>			
Drainage in front of Primary school: requires upgrade and maintenance	<p>Village to install ditch/ drainage to divert flooding from storm surges and floodwaters and to increase regulation of water flow and reduce flooding onto village road and homes</p> <p>Consider building school building foundations at a level that takes into account site flooding when replacement is required</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: Village / Families/CSSP</b></p>	<p>Minimise expenditure on damaged properties &amp; personal assets</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>Village to seek funding to implement drainage</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</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>CIM Strategy 2015</p> <p>Community Sector Plan</p>
Causeway and access road to Manunu	<p>Village to upgrade causeway</p> <p>Village to upgrade access road and resolve any land issues involved</p> <p><b>Responsibility: Village/ CSSP</b></p>	<p>Minimise expenditure on damaged properties &amp; 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>Village to seek funding to upgrade ford and access road</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities</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>NISP 2011 KESO 5</p> <p>TSP 2014-2019 Goal 2 KO 1</p>
<b>Livelihood and Food Security</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Organic Vegetable farming to promote ecological stability and soil protection	Promote and facilitate planting of rootcrops ( i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and</p>	<p>MAF to provide trainings, awareness raising and support in supply of nursery trees, technology and infrastructure</p> <p>MAF to provide trainings</p>	<p>Agriculture Sector Plan 2016-2021</p> <p>Community Engagement Plan</p> <p>Draft NESP 2017-</p>

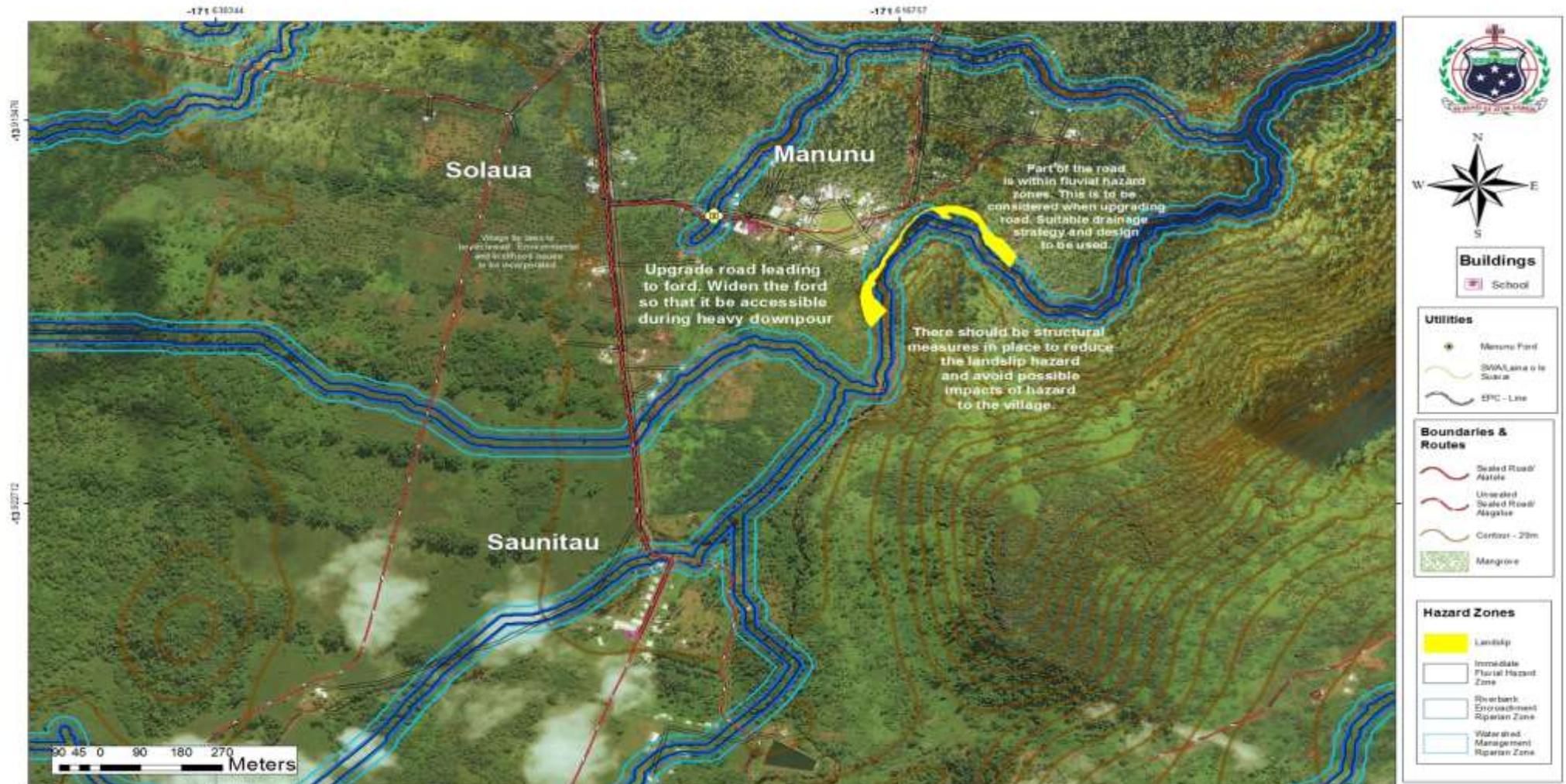
	<p>Promote agro- forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Conduct pilot site trials for climate ready plant varieties</p> <p><b>Responsibility: MAF/MNRE/villages/CSSP</b></p>	<p>food security</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</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>2021</p> <p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Forestry Management Act 2011</p>
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the Implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
<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><b>Responsibility: MWCSO /Village</b></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
Rubbish bins and access to TV/Radio <b>Responsibility: Village/STA</b>	Village to work together with STA on beautification of villages to support/supply rubbish bins	Not a direct CR issue but can be considered indirect as bins could actually reduce illegal rubbish dumping into rivers, fords and valley behind village homes



# Manunu/Sauniatu/Solaua Village Map

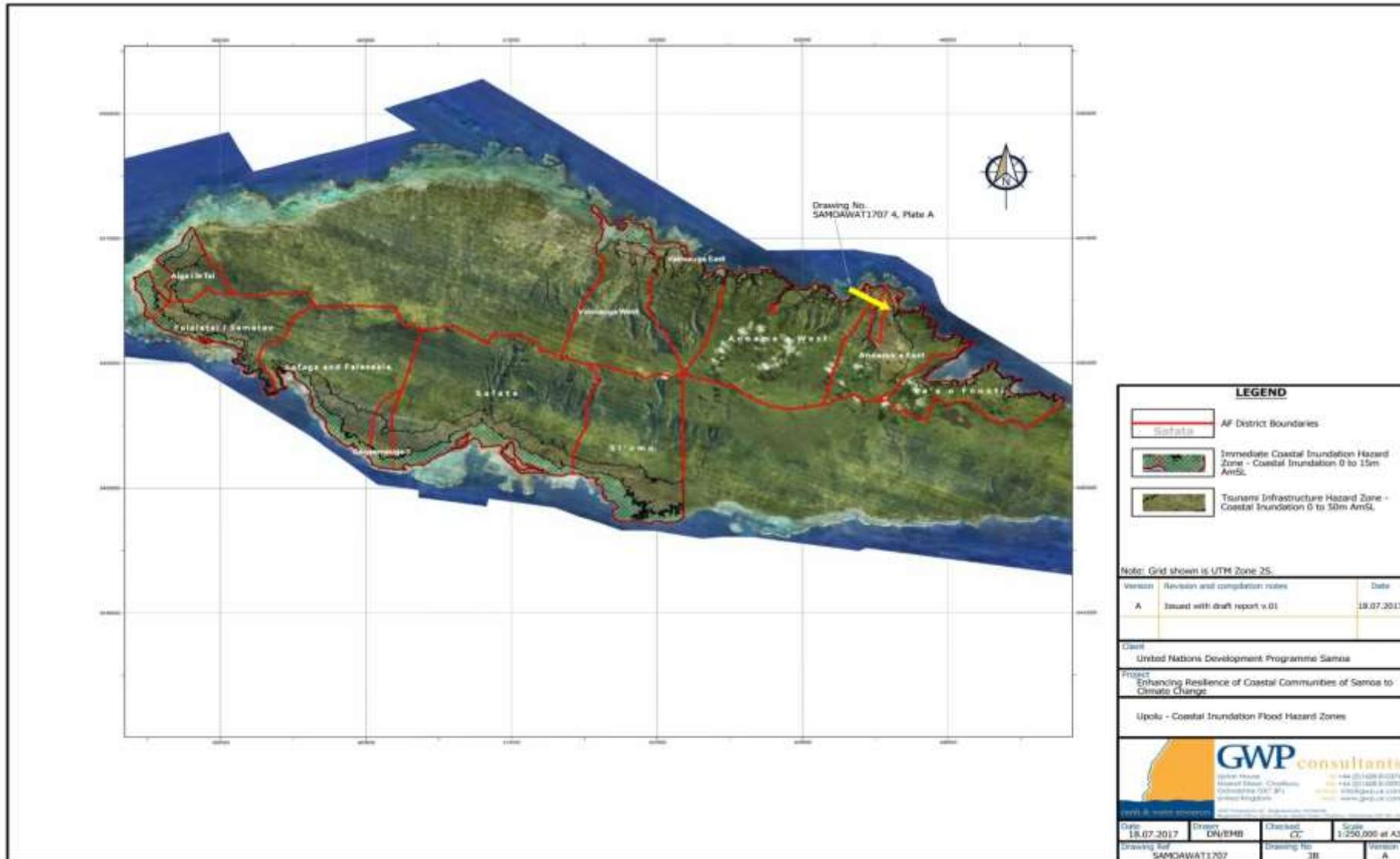
## MANUNU, SAUNITAU, SOLAUA VILLAGES



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

# 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

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