

# **Community Integrated Management Plan**

## **Falealili West**



## **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.

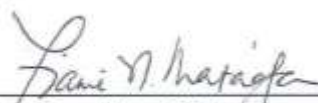
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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

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

## Participants in the Plan

The Community Integrated Management (CIM) Plan is a Partnership between the Government of Samoa and the villages within the plan. The Plan area starts from the ridge extending to the reef broadly covering four thematic areas; Infrastructure; Environment and Biological Resources; Livelihood and Food security; and 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 Constituency of Falealili West (Saleilua –Togitogiga / Iliili, Poutasi, Vaovai, Matautu, Tafatafa and Matavai, Malaemalu, Sapunaoa ma Piu, Satalo) District

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

### Date of Signing 15<sup>th</sup> June 2018

Representatives:	Signature
<b>Saleilua (Togitogiga / Iliili)</b>	
• Mata Ah Ching	
• Luatua Siiliga	
• Tuulau Mafulele Osa	
• Pa'u Ionatana Pamate	
• Mau Molipo Tafiti	
 <b>Poutasi Village</b>	
• Seuseu Aperaamo Faapale	
• Pouliotaua Meleisea	
• Vaataumai Tupu	

**Vaovai Village**

- Mapule'olo Feala Su'a
- Sogimalepuavai Tauiliili
- Losa Toai
- Matavai Vaifale Su'a
- Soi Faafetai Muese


**Matautu Village**

- Gautavai Vao'iva
- Tupuola Misi
- Pinofoaga Ieremia
- Siniva Ma'atusi
- Seupule Fanuafou Tiava'asu'e


**Tafatafa and Matavai Village**

- Falaila Fa'ausu Allen
- Mesepe Peterson
- Tapu Peterson
- Faletoa Nofo
- Leapaga Apinati


**Malaemalu Village**

- Talauega Fiafia Tulouna
- Ula'e Solia
- Peilua Ula
- Sinuanua Solia
- Muā'ava Ula Muā'ava


**Sapunaoa and Piu**

- Le'avasa Fa'alata
- Taloa Patea
- Tolomalii Filo
- Fa'agasea Asofitu Reupena
- Ma'aelopa Lotelika Tinoi

*Sapunaoa F.*  
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*Taloa Patea*  
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*Tolomalii Filo*  
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*Fa'agasea Asofitu Reupena*  
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*Ma'aelopa Lotelika Tinoi*  
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**Satalo Village**

- 'Alo'alo Talo'olema'agao F Afoa
- Tafa'i Soi
- Tafaomalo Siaosi
- Tafaomai Feusu Afoa
- Onofia Soi Mati

*'Alo'alo Talo'olema'agao F Afoa*  
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*Tafa'i Soi*  
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*Tafaomalo Siaosi*  
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*Tafaomai Feusu Afoa*  
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*Onofia Soi Mati*  
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The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of Falealili West (Saleilua –Togitogiga / Iliili, Poutasi, Vaovai, Matautu, Tafatafa and Matavai, Malaemalu, Sapunaoa ma Piu, Satalo) District as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

The Ministry of Natural Resources and Environment, as lead organization of Government, on behalf of the participating Government Ministries 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 2015.

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 Ulu Bismarck Crawley  
 Chief Executive Officer, MNRE



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## Acronyms

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

	Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan



## Glossary

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.

# 1. Introduction to the CIM Plan

## 1.1 The Strategic Vision

The District CIM Plan for Falealili West has been prepared under the Government of Samoa's Pilot Programme for Climate Resilience (PPCR) - Enhancing Climate Resilience for Coastal Resources and Communities Project. The CIM Plans is the primary means of implementing the CIM Strategy, which was formally approved by the Government of Samoa in February, 2001, and revised in August 2015, to provide Strategic direction for the management of government and community resources within the districts and villages.

The Strategy has as its central vision "Resilience – Communities and their resources are Resilient to Natural Hazards". 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, August 2015)*

## 1.2 The Aim of the CIM Plan

The aim of the CIM Plan is to help communities and government improve climate resilience by identifying actions and solutions for sustainable development.

The CIM Plan will enable communities and government service providers to:

1. Enhance awareness of hazard risks from the ridge to reef;
2. Improve climate resilience planning and development
3. Better adapt, respond and recover from natural disasters and other extreme events

## 1.3 The 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 to prepare 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.

## 2. Implementation Guidelines

### 2.1 Purpose of the Implementation Guidelines (IG)

The Implementation Guidelines describe the solutions proposed to increase the resilience of communities as identified in the CIM Plan consultation and site assessments. The solutions are presented under four broad themes; Infrastructure; Environment and Biological Resources; Livelihood and Food Security; and Governance Institution in the District/village. Implementation of solutions is considered to be the joint responsibility for both the villages and the government in partnership as follows.

The CIM Plan Solution Matrix, shows five columns each correlates to the solution identified:

- Column 1: Indicates the issues or problem identified during the CIM Plan consultation and site assessments
- Column 2: Solutions – these are the interventions/ solutions identified by the CIM Plan team and village community representatives. The government agency or village as indicated in Column-2 under each action will be the lead agency or village responsible for implementing the said solution;
- Column 3: “Other benefits”, where one solution indicated in Column 2, will provide benefits to other items;
- Column 4: Provides guidance on how the solution is to be implemented and noting the relevant government action plan, policy, code of ethics, regulation or act to follow by the responsible government agency or district/village during implementation of the solution;
- Column 5: Provides an overall summary of how the solution being implemented supports or achieve the objectives or goals set-forth in the relevant government sector plans and linking them up to the Strategy for the Development of Samoa.

It is therefore worth noting that climate change adaptation and mitigation actions or interventions identified in the CIM Plan solution demonstrates the national commitment to enhancing Samoa’s climate resilience portfolio.

### 2.2 Funding options to support CIM Plan Implementation

Implementation of solutions that were identified from the CIM Plan consultations with each district communities will not be possible without the availability of funds. Like the previous CIM Plans infrastructural related solutions to protect government assets located in the coastal area are executed by the government through bi-lateral or multi-lateral donor funded projects. For example the NAPA (National Adaptation Programme of Action) project that supported the implementation of rock revetment or seawalls in most of the coastal villages, which is an outcome from the generation-1 CIM Plans were funded under multi-lateral donor. At the village level some villages were successful in sourcing small grants from existing mechanisms in country.

Similarly it is expected that funding support for the implementation of the updated revised CIM Plans during its 10 year lifespan, will be sourced from different development partners including the government of Samoa. All solutions and activities in the CIM Plans that have identified a government agency as the responsible agency for that particular action as outlined in the “Implementation Guideline Matrix” will take up the responsibility for these activities as part of their on-going workplan and priorities for each districts/villages. Funding of these activities will be sourced either from their local budget or multi-lateral donors such as UNDP, FAO, World Bank, ADB, and GEF to name a few, as well as bi-lateral donors like New Zealand, Australia, Japan, USA and China. Implementation of activities that are under the responsibilities of village communities will source support from small grants opportunities available from the following programs and agencies: CSSP, the UNDP-GEF SGP, Global Green Grant and Discretionary Funds from different Diplomatic Mission in country like New Zealand High Commission, Australia, Japan and China.

## 2.3 Duration of the Plan

The CIM Plan is reviewed every ten years. During the Plan period, the solutions implemented are monitored to ensure that they are effective in improving resilience. Some solutions are likely to take longer than the original five years for implementation.

The review of the Implementation Guidelines and the solutions proposed the following:

1. The CIM Plan full review will be undertaken every 10 years or decade;
2. Once implemented, the solutions will be monitored on a bi-annual basis for progress and updated every five years in accordance with the Strategy for the Development of Samoa;
3. Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators (KPI).

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## 3. Description of Falealili West District Environment

### 3.1 Physical and Natural Resource Setting

Falealii district is located on the south of Upolu Island and it's divided into two electoral constituencies of Falealili East and Falealili West. Falealili East is made up of 5 villages, namely Salesatele, Salani, Siuniu, Utulaelae, and Sapo'e, while Falealili West is made up of 11 villages, namely Togitogiga, Iliili, Saleilua, Poutasi, Vaovai, Matautu, Tafatafa, Matavai, Malaemalu, Piu, Sapunaoa, and Satalo. This CIM Plan provides an overview of the whole district with specific focus on the Falealili West villages in the matrix of solutions.

The marine environment comprises of a wide windward barrier reef. The large and widely extensive lagoon with deep blue holes and reef slopes extends from Saleilua village on the west to Lotofaga district on the east. With the coast being located on the south, it is fed by well oxygenated oceanic waters from the south pole, thus the area produces usually very good coral growth in the lagoons, reef crests and seaward slopes. This is evident with very rich and excellent coral growth in the existing fishery reserves from Saleilua, Poutasi, Vaovai and Matautu on the west. As one moves eastward, the impacts of the 2009 tsunami and the numerous estuaries and coastal herbaceous swamps along the coast seem to have affected the coral growth in areas from Sapunaoa to Sapo'e. Nevertheless, the wide and extensive lagoon ensures coral growth within the lagoon, the blue holes and the outer reef are recovering well, and assisted by the fishery reserves established by almost all villages in the district.

The higher than national average rainfall for the Falealili district lends itself to the many watershed areas, rivers and numerous wetlands along the coast of the district. Amongst the wetland are the extensive Vaovai mangrove forest, and Saleilua mangrove forest on the west and coastal herbaceous marshlands in Malaemalu, Satalo, Sapunaoa, and Salani on the east. All these wetlands have been affected by climate change and the 2009 tsunami. The mangrove forests have not only been damaged by natural events, where the size have reduced, while some of the old walking and canoeing routes do not exist anymore. For the marshlands, longshore drift and the tsunami have resulted in the build-up of sand along the mouth of the estuaries which have blocked the natural flow of freshwater into the sea. This has affected the existence of the wetlands as well as flooding inland along the streams. Additionally, the extensive land clearing and plantations inland has meant land-based pollution washed into the sea and settled in the inner lagoon has resulted in eutrophication seen by the prevalence of algae along the south coast.

Falealili being a high rainfall area of the country and with rich fertile soils, has over many years been a hub for commercial farming, extending from the old coconut plantations during the colonial era of the late 1800s, to the heydays of the taro export boom in the 1980's. This has resulted in the majority of the native vegetation in the lowland areas being stripped to what is now predominantly classified as mixed vegetation made up of coconut plantations, taro plantations, cattle farms, and fallow lands from previous plantations use. Almost all the villages in the district have access road that reach up above 400m, where forests continue to be cleared as families move further upland in search of fertile unused soil for plantations. The only area in the district where lowland rainforest vegetation is present is between Matautu and Tafatafa villages which is on crown and freehold land, and along Saleilua village from the National Park to Poutasi village. The O le Pupu-Pu'e National Park extends from ridge to reef protection is an important refugia and natural regeneration for the neighbouring areas

The upland forests above 500m is still classified although they were damaged by the cyclones of the 1990's where the vegetation is now mixed in with some exotic species such as tamaligi, pulu and faapasi which has seedlings that came to the area through wind dispersal.

As most of the district have moved inland and away from the beachfront area, coastal vegetation and littoral forest are commonly seen, and is likely to continue as more people move inland.



The invasive trees and shrubs are present around the village settlements as well as along the access roads throughout the district. **Faapasi** *Spathodea campanulate* (African tulip), Tamaligi trees *Albizia chinensis*, *Falcataria moluccana*, *Merremia peltata*, **pulu vao** *Funtumia elastica*; and **pulu mamoe** *Castilla elastica* are the common one's present. Myna birds and red-vented bulbuls were found in abundance in the district.

### 3.2 Social and Economic Setting

The 2016 Census, recorded the total population for Falealili at 4,695 people, whereby Falealili West had a population of 3,348 people and the remaining 1347 covers Falealili East villages. The village of Poutasi is where all the main public services are located such as the district hospital, police station and secondary school. The nearest post office is in Malaemalu village. Most villages have a pre-school and primary school, as well as metered water with the exception of a few who have water under the Independent Water Scheme, such as part of Saleilua village. All villages have cash power electricity and communications are mostly from the mobile services such as Digicel and Bluesky.

Village developments are very much subsistence with a few families who own large plantations. Almost all families in each of the 16 villages own a plantation – includes common crops of taro, giant taro (taamu) bananas, coconut and cocoa. There are also families with cattle farms, poultry farms and everyone family has a piggery farms or own a couple of pig sty, since pigs are used a lot in faalavelave or family feast etc. Fishing is also the main livelihood for families that own fishing boats (alia). Apart from Tafatafa and Matavai village, that has families who runs beach fale small scale nature focus tourism, there are no major tourist resort development in the district. The district of Falealili is home to the first National Park in Samoa, the Le Pupue National Park and Togitogiga waterfalls. Transportation to Apia is either bus or private vehicles for those people in the district who work in town.

### 3.3 Climate Risk and Resilience

There is an urgent need for communities to understand the changes in Samoa's climate and future projection. A study has been completed in 2011 which summarizes changes in Samoa's climate at present and in the future, from 1990 -2030 up to 2090. The assessment showed that: Samoa's temperature will increase with very hot days; more extreme rainfall days expected; there would be a decrease in number of tropical cyclone but increase in intensity; sea level rise will continue and ocean acidification is increasing in Samoa's water threatening coral reef ecosystems and marine biodiversity.

The 2002 Falealili District CIM Plan mapped out all vulnerable areas along the coast and the lowland coastal areas identifying them as hazard zones given the exposure to natural disasters, climate change and extreme events causing flooding and erosion. There are changes in the catchment areas and land use hence the severe flooding downstream is caused by the concentrated flows from upland-catchment areas. As such the update of the CIM Plan considers a broader landscape hazards, climate risks and likely responses.

**Coastal Hazards and Risks:** The O Le Pupue headlands to the west of Saleilua village together with Nuusafee island both acts as groins (dykes) with respect to long-shore littoral drift process, and together with the southeasterly trade winds all contribute to the accumulation of thick sand deposits along the coastal zone of Falealili. The coastal zone also is where much of the debris or terrestrial materials from the many rivers and streams that runs from upland catchment area of Falealili down to the coast and fed into the sea. Some of these old river or stream channel have deeply dissected at the coast, as seen in a series of broken reefs (Fig 1). A potential hazard now and in the future the collapse in part of the seafloor to the south of Falealili due to high energy wave activity brought to the surface. As well, continuous sand mining between Saleilua and Tafatafa/Matavai could result

<sup>1</sup> Pacific-Australia Climate Change and Adaptation Planning Program Partners (2015) Current and Future Climate of Samoa, Government Australia and Government Samoa.

in the worst case scenario of coastal erosion for communities on the eastern part towards Utulaelae, and strong impact on coastal infrastructure or assets.

The southern part of Upolu island including Falealili district is vulnerable to tsunami now and the in the future. This is because the southern part of Upolu is opposite and close (up to 40km) to the Northern Terminus Zone, where the seafloor at this part of the Kermadec Tonga Trench can collapse at any time causing a tsunami (Fepuleai, 2017).

**Inland Hazards and Risks:** Rapid development inland of the Falealili district could speed up erosion and may generate landslide from high elevation areas that are heavily weathered with the jointed and fractured Salani rock formation. The main road infrastructures along the Falealili district in some areas that are exposed are threatened with landslide and rockfall activities in the future.

Overall, it is highly recommended that sand mining in the Falealili district should concentrate at river delta, like those at Matavaifagaloa River, Salani. As well, a removal of terrestrial materials along river deltas would reduce a high sedimentation rate. Replanting along the coast is important to help sustain marine habitats and mitigate coastal erosion and extend reef respectively. Reef extension would contribute to a natural breakwater and thus reduce high energy wave activity entering the coast. It is critical that continuous seismic monitoring of the Fagaloa-Falealili fault will provide valuable information about potential landslide and dormant volcanic activity.



**Figure 1** Evidence of terrestrial thick deposits along the coast and remnants of old river channels that goes right into the seafloor. **Photo credit** – Aleni Fepuleai, 2017

## 4. Falealili West District Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
South Coast Road including fords, bridges and the upgraded Salani	<p>Improved maintenance program of clearing sedimentation and debris from upstream locations and culverts</p> <p>Provide drainage and enlarge undersized culverts or bridges in areas where the road is blocking the natural overland flow path, for example at Poutasi where the District Hospital and Secondary School located</p> <p>Maintenance and management of upgrade fords and bridges</p> <p><b>Responsibility:</b> <b>LTA / MWTI / District</b></p>	<p>*Improved rate of recovery</p> <p>*Improved coastal protection</p> <p>*Reduced potential for flooding in coastal areas</p> <p>*Improved lifeline access</p> <p>*Safer village houses and roads</p> <p>*Improved sustainability of natural resources</p> <p>*Improved safety and resilience of residents in the coastal hazard zones</p>	<p>LTA and MWTI should provide the design and close monitoring of road infrastructure development following the guidelines below:</p> <p>Programme drainage in budget and work programme</p> <p>Prepare assessment of road drainage systems</p> <p>Prepare a local education programme on need for keeping drainage systems clean</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p> <p>Programme road safety activities into budget and work programme</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>
District / village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as Secondary School</p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Application of the National Building Code (Draft Sept 2016) and permit compliance</p> <p>PUMA Act 2004</p>	<p>CIM Strategy (2015)</p>

Committee House	<p>in Poutasi and District Hospital</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p><b>Responsibility:</b> <b>Village/Families / MWTI/MWCSD</b></p>			
Water (Existing water from SWA has strong chlorine smell / taste)	<p>Assess and monitor the piped water network for Falealili:</p> <p>regulate the levels of chlorine in the water</p> <p>Conduct water quality testing for compliance</p> <p><b>Responsibility:</b> <b>SWA/MoH/village</b></p>	<p>Improve sanitation and hygiene</p> <p>Reduce number of sick people from poor drinking water</p> <p>Improve community resilience to proactively adapt</p>	<p>Samoa Water Authority Pipeline Work Program for FY17/18</p> <p>Environmental and Social Safeguard Policies apply - MoH Water Quality Standards</p> <p>SWA 10 Year Investment Plan (2016) to improve water supply network</p>	<p>Community Integrated Management Strategy, August 2015)</p> <p>Water and Sanitation Sector Plan 2016-2020</p>
<b>Environment &amp; Natural Resources</b>	<b>Best Solution</b>	<b>Other Benefits</b>	<b>Guidelines to assist Implementation</b>	<b>Relevant to Sector Plans</b>
Marine Environment needs protection and management	<p>Established a marine protected area that includes fish reserves, and mangrove, wetland rehabilitation:</p> <p>Implement an integrated coastal resource management program for the district covering all coastal communities</p> <p>Conduct community education and awareness program on the importance of marine ecosystems (coral reef, wetlands and mangroves)</p>	<p>Improve sustainable livelihood and food security</p> <p>Natural barriers and protection from storm surges</p> <p>Increase biodiversity</p> <p>Improve ecological resilience of marine ecosystems</p> <p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p>	<p>Maintenance of marine reserve and protected area requires community consent and government approval along with biological surveys.</p> <p>Fisheries Division to advice villages on the Community-based Fisheries Management Program (CBFMP) – Develop Village Fisheries Management Plans</p> <p>NBSAP 2015-2020</p> <p>Develop Management Plans for Marine Protected Area</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>

	<p>Strengthen existing village marine management plan with an over-arching district marine protected area management plan</p> <p><b>Responsibility:</b> <b>MAF / MNRE / District &amp; Villages</b></p>	Reduce loss of marine habitats		
<b>Livelihood &amp; Food Security</b>	<b>Best Solution</b>	<b>Other Benefits</b>	<b>Guidelines to assist Implementation</b>	<b>Link to Sector Plans</b>
Disturbed forests and plantation areas	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests :</p> <p>Promote and facilitate planting of root-crops ( 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>Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement Sustainable Land management practices</p>	Improve food security and healthy living and increase community resilience and adaptive response to climate change	<p>MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>Strengthen partnership with farming NGO’s such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity</p> <p>Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p>	Agriculture Sector Plan 2016-2020

	<p>Implement integrated pest management programmes</p> <p><b>Responsibility:</b>  <b>MAF/CSSP/</b>  <b>WIBDI/</b>  <b>Farmers</b>  <b>Association/</b>  <b>METI/ SBEC /</b>  <b>UNDP-GEF-</b>  <b>SGP/MNRE /</b>  <b>villages</b></p>		<p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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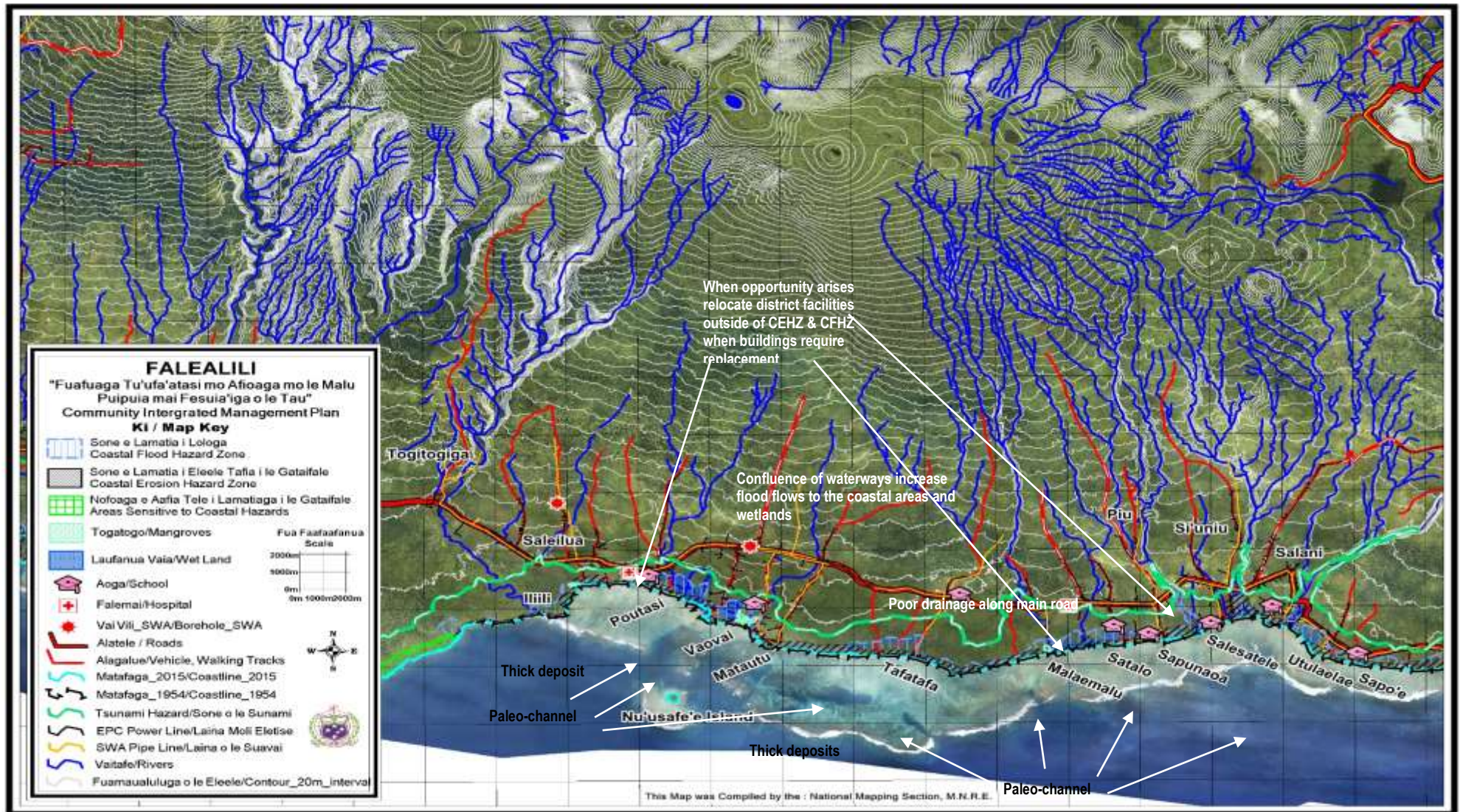
Governance	Solutions/ Issues	Implementation Guidelines	Comment
<p>District /Village By-laws</p>	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial</p> <p><b>Responsibility: Village / MWCS D</b></p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>

Other CIM Plan Issues Identified	Comment
<p>Access Road – identified by LTA pipeline for Falealili District the reconstruction of Village Access / Plantation Road</p> <ul style="list-style-type: none"> <li>➤ Saleilua/Togitogiga; Length 600m Estimated Cost: SAT\$216,000.00</li> <li>➤ Vaovai (Vaivaia); Length 240m Estimated Cost: SAT\$86,000.00</li> <li>➤ Matautu; Length 680m Estimated Cost: SAT \$ 244,800.00</li> <li>➤ Malaemalu; Length 580m Estimated Cost: SAT\$ 208,800.00</li> <li>➤ Satalo; Length 700m Estimated Cost: SAT\$ 252,000.00</li> <li>➤ Sapunao &amp; Piu; Length 400m Estimated Cost: SAT\$ 144,000.00</li> <li>➤ Tafatafa &amp; Matavai; Length 1146m Estimated Cost SAT\$412,560.00</li> <li>➤ Tafatafa-uta; Length 615m Estimated Cost; SAT\$ 221,400.00</li> <li>➤ Utulaelae; Length 630m Estimated Cost: SAT\$ 226,800.00</li> </ul> <p><b>Responsibility: LTA / MWTI / District &amp; Villages</b></p>	<p>During the CIM Plan consultation, the implementing agencies including LTA were requested to provide the CIM Team with their list of pipeline work in the PPCR-ECR districts. LTA submitted their list of pipeline work for the district of Falealili which included 9 access / plantation roads for the villages within Falealili West.</p> <p>Most of the village access roads listed by LTA were also part of the CIM Plan site assessments because they were requested by the communities.</p>



<p>Seawall – some villages made specific request for seawall</p> <p>Saleilua/Iliili – seawall need to protect village from coastal erosion</p> <p>Matautu – village request a seawall on the oceanfront where the community pool is located to protect village from storm surges and strong waves. Estimated length is 400m and 3m height.</p> <p>Vaovai seawall extension from existing boundary with Poutasi (approximately 150m length) and reason for request to complete the seawall is the increase level of coastal erosion.</p> <p><b>Responsibility: LTA / MWTI / villages</b></p>	<p>The PPCR-ECR project does not prioritize solutions suggesting seawall unless it is a critical case whereby improved resilience of the coastal ecosystem is dependent on the seawall.</p> <p>Noted from the Civil Engineering assessment that the request for seawalls from the communities would be relevant more to LTA in terms of providing cost.</p> <p>Saleilua village asked for seawall because of the increase level of coastal erosion along the beachfront from Iliili to Saleilua and much of these erosion is not due to climate change but human induced activities like sand mining. Also everyone has moved inland after the tsunami 2009 and therefore not a priority to build a seawall but maybe strong emphasis on coastal replanting and limiting sand mining activities.</p> <p>As well, based on site observation the Matautu seawall is very costly and careful consideration prior to a decision to build one given the impact on the natural environment and community pool. Similarly the Vaovai request for the seawall is not a high priority based on site assessment there are no residents along this area that would need protection from sea level rise as well it important to factor in adverse impacts of building a seawall on the mangrove ecosystem.</p>
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# Falealili West District Map





## 4.1 Saleilua (Togitogiga and Ilili) Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Implementation Guidelines	Link to Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones  Investments within the hazard zone adopt appropriate mitigation measures such as:  Raise building foundations at a level that takes into account the CFHZ in the vicinity  <b>Responsibility:</b> <b>Village/Families / MWTI/MWCS D</b>	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Application of National Building Code 2002  PUMA Act 2004	Application of the National Building Code (Draft Sept 2016) and permit compliance  CIM Strategy (2015)
Water (Independent Water Scheme)	Upgrade and improve infrastructure for the existing piped water network and reservoir under IWS located inland of Togitogiga  Recommend water tank storage in Saleilua village to extend the IWS to families on the other side of the road without water. (CASP supporting this work under PPCR-ECR small project)  <b>Responsibility:</b> <b>MWCS D-IWS /CASP/ village</b>	Improve access to clean water	MWCS D – IWSA should provide guidance and advice to village on routine maintenance work for management of independent water scheme	Community Development Plan 2016-2021
Water (Existing water from SWA has strong chlorine smell / taste)	Assess and monitor the water network for Saleilua families receiving water:  regulate the levels of chlorine in the water  Conduct water quality testing for compliance	Improve sanitation and hygiene  Reduce number of sick people from poor drinking water  Improve community resilience to proactively adapt	Samoa Water Authority Pipeline Work Program for FY17/18  Environmental and Social Safeguard Policies apply - MoH Water Quality Standards  SWA 10 Year	Community Integrated Management Strategy, August 2015)  Water and Sanitation Sector Plan 2016-2020  SWA 10 Year Investment Plan (2016) to improve

	<b>Responsibility:</b> <i>SWA/MoH/village</i>		Investment Plan (2016) to improve water supply network	water supply network
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**Other Solutions Considered or Further Issues Raised**

<b>Infrastructure</b>	<b>Solutions/ Issues</b>	<b>Comment</b>
Seawall	Build seawall on the coastal area from Iliili to the rest of Saleilua coastal area to protect coastal area from erosion.  <b>Responsibility:</b> <i>MWTI/ MNRE / village</i>	Saleilua village asked for seawall because of the increase level of coastal erosion along the beachfront from Iliili to Saleilua and much of these erosion is not due to climate change but human induced activities like sand mining. Also everyone has moved inland after the tsunami 2009 and therefore not a priority to build a seawall but maybe strong emphasis on coastal replanting and limiting sand mining activities.
Coastal spring Safulutu	Village request the rehabilitation of the coastal spring currently being inundated by seawater.  <b>Responsibility:</b> <i>MNRE / village</i>	The site assessment during the CIM Plan noted that this coastal pool no longer exist as it has been buried by sand and highly inundated. This has no climate resilience outcome and a poor investment.
Access Road - Road to Primary School - Road to some residential places and plantation	Village request to re-seal the road going inland to the Primary School as it has deteriorated due to heavy rain and storm water run-off.  Village request to seal the remaining access road to some of the families inland and plantations that has not been sealed as most access roads in the village have completed tar sealed. LTA identified the road based on following specification: Length: 600 m Estimated Cost: SAT\$ 216,000.00  <b>Responsibility:</b> <i>LTA / village / MWTI</i>	The road to the Primary School needs re-sealing and maintenance work by LTA but is not a high priority in terms of climate resilience.  The second road has solid ground and it is not a high priority as there are not many families residing along this road except for plantations. Also most of Saleilua village houses are along the main road which is far from the coastal hazard zone.

<b>Environment &amp; Biological Resources</b>	<b>Best Solutions Proposed</b>	<b>Other Benefits</b>	<b>Implementation Guidelines</b>	<b>Link to Sector Plans</b>
Marine / Fisheries Reserve	Expand existing fishery reserves Implement coral gardening  Conduct training on village based monitoring programs for marine areas	Reduce impact of land-based pollution  Reduce impact of coral bleaching  Improve resilience of coral reef ecosystem to combat climate change	MAF-Fisheries division to provide advice following existing guidelines:  Community-based Management Fishery Plan  NBSAP 2015-2020	Agriculture Sector Plan 2016-2020  Draft NESP 2017-2021

	<p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area</p> <p><b>Responsibility: MAF / Village</b></p>	Reduce loss of marine habitats	Update village Fisheries Management Plan	
Forest Loss (loss of indigenous forest due to cyclone damages and land clearance)	<p>Replanting of native tree species in open fallow lands</p> <p>Rehabilitate fallow land and degraded area</p> <p>Implementation of replanting program for village of native tree species</p> <p>Support conservation programs in the management of the Le Pupue National Park and Togitogiga Waterfalls</p> <p><b>Responsibility: MNRE / village</b></p>	Reverse land degradation	<p>MNRE-Forestry Division to provide advice to community on reforestation / restoration program by providing tree seedlings for planting.</p> <p>2016-2020 National Forestry Plan</p> <p>NBSAP 2015-2020 NAP – Sustainable Land Management Plan 2015-2019</p> <p>NBSAP 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Two million Tree planting Strategy 2015-2020</p> <p>Forestry Management Act 2011</p>	Draft NESP 2017-2021

<p>Invasive species</p>	<p>Implement control or eradication programs to remove or managed invasive weeds and plants commonly found in open fallow land such as: Cordia tree species, peanut weed (vao pinati), African tulip (faapisi) and merremia peltata (fue lautetele)</p> <p>Conduct awareness and education community programs on the adverse impact of invasive alien species (terrestrial or marine environment)</p> <p><b>Responsibility:</b> <b>MNRE / village</b></p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>Draft NESP 2017-2021</p>
<p>Water catchment</p>	<p>Protect catchment area and discourage agricultural expansion to high elevation of 600m asl.</p> <p>Conduct Consultations and awareness programmes with communities on proposed catchment area</p> <p>Water Resources Division (WRD) to conduct assessment of the watershed area status for the Togitogiga catchment area</p>	<p>Restoration of native forests species increases the resilience against climate change impacts by improving the biodiversity, reducing the risk of forest fires, providing land stabilization, reducing erosion, reducing land slips and maintaining water quality</p> <p>Contribute to the 2 million tree planting</p>	<p>MNRE-DEC, WRD and Forestry Division to provide advice such as:</p> <p>Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting</p> <p>Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project</p> <p>NBSAP 2015-2020</p> <p>National Forestry Plan 2016-2020</p> <p>National Water Strategy Plan 2007-2017</p>	<p>Draft NESP 2017-2021</p> <p>Water and Sanitation Sector Plan 2016-2020</p>



	<p>WRD to continue monitoring the status of the catchment area and implement reforestation program for maintenance of healthy watershed ecosystem</p> <p>Water Quality Testing</p> <p><b>Responsibility:</b> <b>MNRE /MOH/ village</b></p>			
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Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant to Sector Plans
Disturbed forests and plantation areas / invasive pests	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</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 Sustainable land management practices.</p> <p>Implement integrated pest management programme</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>CROP Division of MAF to provide trainings and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons.</p>	<p>Agriculture Sector Plan 2016-2020</p>

	<p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p><b>Responsibility:</b> <b>MAF/</b> <b>MNRE/villages</b></p>			
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<b>Village Governance</b>	<b>Best Solutions and Other Solutions Proposed</b>	<b>Implementation Guidelines</b>	<b>Comments</b>
District /Village By-laws	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial</p> <p><b>Responsibility: Village /</b> <b>MWCS D</b></p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>



**Saleilua Primary School located inland ideal building for Village Safe Haven**



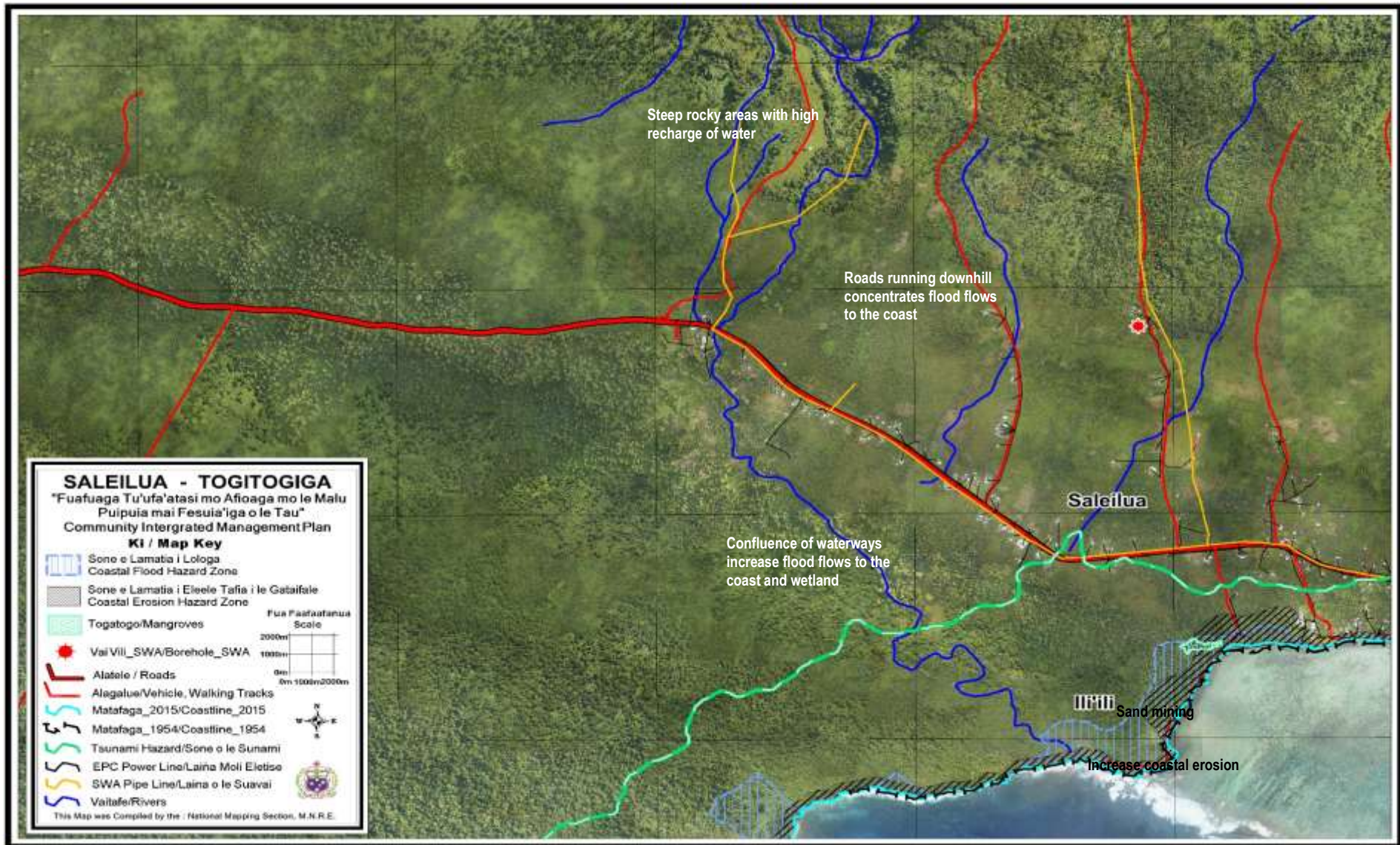
**Example of multi-cropping farming in Saleilua - taro plantation mixed with coconut plantation**



**Ford crossing between Saleilua village and sub-village Ili'ili on the coast inundated with saltwater intrusion, highly eroded and electricity line runs a high risk of wires crossing over the sea.**



# Saleilua Village Map



## 4.2 Poutasi Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Implementation Guidelines	Link to Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones  Investments within the hazard zone adopt appropriate mitigation measures such as:  Raise building foundations at a level that takes into account the CFHZ in the vicinity  <b>Responsibility: Village/Families / MWTI/MWCSO</b>	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Application of the National Building Code (2016) and permit compliance  PUMA Act 2004	CIM Strategy (2015)
Electricity Supply	Install and connect power supply for inland residents  Install streetlights along the roads where needed for community safety.  Relocate overhead lines to a more resilient location when being replaced  <b>Responsibility: EPC / MWTI / Villages</b>	Maintain electricity supply at all times including during natural disasters.  Avoid accidents from fallen electricity posts.	Monitor distribution networks to avoid overloading poles and contributing to line failures  EPC to installed electricity lines to reach families residing inland and streetlights  Consider energy efficiency developments for communities using renewable energy guided by existing framework –  Development of a Renewable Energy and Energy Efficiency Framework, 2016	Samoa Energy Sector Plan 2017-2022
Water (Existing water from SWA has strong chlorine smell / taste)	Assess and monitor the piped water network for Poutasi and regulate the levels of chlorine in the water	Improve sanitation and hygiene  Reduce number of sick people from poor drinking water	Samoa Water Authority Pipeline Work Program for FY17/18  Environmental and Social Safeguard Policies apply - MoH	Community Integrated Management Strategy, August 2015)  Water and Sanitation Sector Plan 2016-2020

	<p>Conduct water quality testing for compliance</p> <p><b>Responsibility:</b> <i>SWA/MoH/village</i></p>	<p>Improve community resilience to proactively adapt</p>	<p>Water Quality Standards</p> <p>SWA 10 Year Investment Plan (2016) to improve water supply network</p>	
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### Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Seawall	<p>Request to extend the existing seawall and use large boulders as current structure has loose rocks. In addition if the current seawall can be shifted or move away from residential areas.</p> <p><b>Responsibility:</b> <i>LTA / MWTI / Village</i></p>	<p>Building a seawall as requested will not achieve climate resilience objective. There is a potential adverse impact of the seawall on the wetland area and this can be an issue.</p>
Footbridge	<p>Village request to build a footbridge (timber) to connect the pedestrian crossing. To enable easy crossing for Poutasi residence and the neighboring village Vaovai.</p> <p><b>Responsibility:</b> <i>LTA / MWTI / village</i></p>	<p>In photo 1 and 2 below there was an original access path through the mangrove which no longer exist at the present site. It was noted in the 2002 CIM Plan that this crossing through the swamp restrict water movement.</p> <p>From the CIM Plan Team site assessment this will not have contribute to climate resilience actions. Given the profile of the wetland and neighboring lands it is inefficient to supply any form of pedestrian bridge at this location. The bridge regardless of the height would be affected by storm surges, fluvial flooding events.</p>
Vai o Fiso community pool	<p>Request to upgrade the pool such as canopy and cementing/hardening around weak sections.</p> <p><b>Responsibility:</b> <i>LTA / MWTI / CSSP / UNDP-GEF SGP/ village</i></p>	<p>The pool is a cultural heritage asset. The CIM Plan team recommended using it as an alternative source of water supply when there is water shortage. Upgrading community pool can be supported under small sub-projects.</p>

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine / Fisheries Reserve	<p>Expand existing fishery reserves</p> <p>Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement all activities under the village Fisheries Management Plan</p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>



	<p>Implement program to remove crown of thorns from inshore area</p> <p><b>Responsibility: MAF / Village</b></p>			
Invasive species	<p>Implement control or eradication programs to remove or managed invasive weeds and plants commonly found in open fallow land such as: Cordia tree species, peanut weed (vao pinati), African tulip (faapisi) and merremmia peltata (fue lautetele)</p> <p>Conduct awareness and education community programs on the adverse impact of invasive alien species (terrestrial or marine environment)</p> <p><b>Responsibility: MNRE / village</b></p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>National Environment Sector Plan 2017-2021</p>

Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant to Sector Plans
Disturbed forests and plantation areas / invasive pests	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops ( i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p>	<p>Agriculture Sector Plan 2016-2020</p>

	<p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p><b>Responsibility: MAF MNRE /villages</b></p>		<p>Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
<p>Aquaculture tilapia farm</p>	<p>Implement climate smart aquaculture tilapia farm</p> <p><b>Responsibility: MAF / village</b></p>	<p>Increase food security</p>	<p>MAF-Fisheries to provide guidance to the community on developing a tilapia farm:</p> <p>Environmental Social Safeguard policy</p> <p>Community-based Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p>

Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
District /Village By-laws	Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial  <b>Responsibility: Village / MWCS D</b>	MWCS D to provide assistance to district /village in developing by-laws  Community Development 2016-2021	Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.
Clean-up of culverts along south coast Poutasi	Regular maintenance of existing culvert such as: Clean-up of debris and silt accumulated near the mouth of the culverts and blocking or slowing the flow of water into the sea  Improve water circulation and reduce flooding during heavy rain  <b>Responsibility: Village</b>	Community work should be guided by the following programs:  Programme drainage in budget and work programme  Prepare assessment of road drainage systems  National Infrastructure Strategic Plan (NISP) 2011  Prepare a local education programme on need for keeping culverts clear of debris and silt	Relevant to achieving objectives under the following sector plans.  Community Integrated Management Strategy, August 2015  Community Development 2016-2021  Transport Sector Plan 2014-2019



Access path through mangrove swamp restricting water movement, photo from 2002 CIM Plan (Photo 1)



This is the same site with the original footbridge 2002 Photo 1. Current Photo-2 2017, shows a wide channel and the rock crossing has been washed out. Timber



# Poutasi Village Map



### 4.3 Vaovai Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant to Sector Plans
<p>Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House</p>	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as:</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p><b>Responsibility: Village/Families / MWTI/MWCS</b></p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Application of the National Building Code (2016) and permit compliance</p> <p>PUMA Act 2004</p>	<p>CIM Strategy (2015)</p>
<p>Access road</p>	<p>Reconstruction and sealing of the only village access/plantation road and to families residing along this road: Costing was in LTA list of pipeline roads for Falealili Length: 240m Estimated Cost: SAT\$ 86,400.00</p> <p><b>Responsibility: LTA / MWTI / village</b></p>	<p>Improve rate of recovery</p> <p>Increase number of families relocate to higher grounds</p>	<p>Construction of access roads should be guided by the following:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work programme</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>

<p>Community pool (located around mangrove area)</p> <ol style="list-style-type: none"> <li>1. Matamanu pool</li> <li>2. Fuivai pool</li> <li>3. Matapuna pool</li> <li>4. Matavai pool</li> </ol>	<p>Continue maintenance and cleaning of community pool for use as back-up water supply during extreme events</p> <p>Water quality testing and upgrading</p> <p><b>Responsibility:</b> <b>Village / CSSP / MNRE / UNDP-GEF SGP</b></p>	<p>Back-up source of alternative water supply</p>	<p>Village pool maintenance should be guided by National Beautification program</p>	<p>Community Development Plan 2016-2021</p> <p>Water and Sanitation Sector Plan 2016-2020</p>
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### Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
seawall	<p>Village request for extension of seawall to boundary with Poutasi village about 150m due to coastal erosion</p> <p><b>Responsibility: LTA / MWTI / Village</b></p>	<p>From CIM Plan site assessment it was noted the area for extension include the mangrove ecosystem, and thus pose high risk. This is not a preferred option. The coastline is mostly soft landscape not suited for seawalls. Coastal vegetation is also very healthy.</p>
Access road on ring road	<p>Request to seal about 200m road to be constructed as escape route for residents on the coastline.</p> <p><b>Responsibility: LTA / MWTI / Village</b></p>	<p>This could be argument that part improvement in the form of an advanced gravel or metal road will provide road safety access/egress. However it should not be sealed down to the coast because (a) it would be in a high hazard zone and (b) it could encourage further development within the coastal flood hazard zone.</p>

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant to Sector Plans
Clean-up of Mangrove Ecosystem	<p>Implement a post tsunami/ cyclone Evan clean-up of the mangrove:</p> <p>Clear out all rubbish and debris, dead mangrove trees to allow natural flow of water.</p> <p>Declaration of the mangrove ecosystem as a conservation site under RAMSAR Convention</p>	<p>Increase ecological resilience of mangrove ecosystem</p>	<p>MNRE – DEC to provide guidance and advice of clean-up of natural habitats</p> <p>NBSAP 2015-2020</p> <p>Community based fisheries management plan</p>	<p>National Environment Sector Plan 2017-2021</p>



	<p><b>Responsibility:</b>  <b>MNRE / MAF-  Fisheries /CSSP  /UNDP-GEF  SGP/village</b></p>			
<p>Marine / Fisheries Reserve</p>	<p>Expand existing fishery reserves  Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area</p> <p><b>Responsibility: MAF / Village</b></p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>
<p>Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources</p>	<p>Assess and identify sustainable sources of sand for domestic and commercial use</p> <p>Village, government and the private sector to collaborate on designated areas for sand mining</p> <p>Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe</p> <p>Strengthen sand mining monitoring and enforcement</p> <p>Mass media awareness on sustainable sand mining practices</p>	<p>Village gains benefit from sand mining activities</p> <p>Reduce impact to natural coastal protection mechanism via control of scale and site of extraction</p> <p>Improve village resource management and sustainable development</p> <p>Minimize impacts of coastal inundation and erosion</p> <p>Improve the sustainable management of sand as a natural resource</p>	<p>Follow existing MNRE guidelines for sand mining or extracting such as:  MNRE monitoring of sand extraction operations</p> <p>Secure relevant permits before any sand mining occurs</p> <p>Incorporate environmental and social safeguards concerns including consultations with any affected community</p> <p>Village environmental management plans established including annual monitoring systems</p>	<p>National Environment Sector Plan 2017 - 2021</p>

	<p>Develop sand mining regulation</p> <p><b>Responsibility:</b> <i>MNRE / District &amp; Village</i></p>		<p>For access to sites, obtain written consents from Alii Faipule and landowners.</p> <p>Lands and Survey Environment Act 1989</p> <p>Consideration of EIA assessment of impact prior to any extraction</p> <p>PUMA Act 2004</p> <p>NAP – Sustainable Land Management Plan 2015-2019</p> <p>(draft)  Sand Mining Policy 2001</p> <p>Draft Soil Resource Management Bill 2018</p>	
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<b>Livelihood and Food Security</b>	<b>Best Solutions</b>	<b>Other Benefits</b>	<b>Guidelines to assist Implementation</b>	<b>Relevant to Sector Plans</b>
<p>Invasive pests</p>	<p>Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: merremmia peltata (fue lautetele), insects, African snail</p> <p>Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations</p> <p><b>Responsibility:</b> <i>MNRE / village</i></p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>National Environment Sector Plan 2017-2021</p>

<p>Disturbed forests and plantation areas / invasive pests</p>	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops ( i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p> <p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p><b>Responsibility: MAF MNRE /villages</b></p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p>	<p>Agriculture Sector Plan 2016-2020</p>
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			<p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Village Governance	Best Solutions and Other Solutions Proposed	Implementation Guidelines	Comments
District /Village By-laws	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial</p> <p><b>Responsibility: Village / MWCS D</b></p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>



Vaovai coastal replanting program along the seawall provides strong natural barrier from coastal erosion and Storm surges.



# Vaovai Village Map



## 4.4 Matautu Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant to Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones  Investments within the hazard zone adopt appropriate mitigation measures such as:  Raise building foundations at a level that takes into account the CFHZ in the vicinity  <b>Responsibility: Village/Families / MWTI/MWCSO</b>	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Application of National Building Code 2002  PUMA Act 2004	Application of the National Building Code (Draft Sept 2016) and permit compliance  CIM Strategy (2015)
Access road	Reconstruction and sealing of village access/plantation road and to families residing along this road: Costing was in LTA list of pipeline roads for Falealili Length: 680 m Estimated Cost: SAT\$ 244,800.00  <b>Responsibility: LTA / MWTI / village</b>	Improve rate of recovery  Increase number of families relocate to higher grounds	Construction of access roads should be guided by the following:  Environmental and Social Safeguard policy  Samoa Code of Environmental Practice (2007)  Review of National Road Standards in Samoa (2016)  Vulnerability Assessment of the Samoa Road Network (2017)  National Infrastructure Strategic Plan (NISP) 2011  Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015  Transport Sector Plan 2014-2019



<p>Water (Existing water from SWA has strong chlorine smell / taste)</p>	<p>Assess and monitor the piped water network and regulate the levels of chlorine in the water</p> <p>Conduct water quality testing for compliance</p> <p><b>Responsibility: SWA/MoH/village</b></p>	<p>Improve sanitation and hygiene</p> <p>Reduce number of sick people from poor drinking water</p> <p>Improve community resilience to proactively adapt</p>	<p>Samoa Water Authority Pipeline Work Program for FY17/18</p> <p>Environmental and Social Safeguard Policies</p> <p>Apply - MoH Water Quality Standards</p> <p>SWA 10 Year Investment Plan (2016) to improve water supply network</p>	<p>Community Integrated Management Strategy, August 2015)</p> <p>Water and Sanitation Sector Plan 2016-2020</p>
<p>Community pool</p>	<p>Upgrade community pool such as: Maintenance of freshwater chamber in the pool for drinking by using shells/coral grit at the bottom for purifying and filter;</p> <p>Repair western side wall of the pool to raise up to assist with retarding sea water influence during storms</p> <p>Implement drainage on roadside to prevent the runoff down from the road via houses into the pool.</p> <p><b>Responsibility: CSSP/ UNDP-GEF SGP / NGO/MNRE/ MWTI / village</b></p>	<p>Improve alternative source of water supply as back-up during piped water shortage</p>	<p>Upgrade to the pool should follow these guidelines:</p> <p>Environmental and Social Safeguard Policies apply</p> <p>Community Engagement Plan (2015)</p> <p>Code of Environmental Practice (2007)</p> <p>Assess the need for a Development Consent from PUMA</p>	<p>Community Development Plan 2016-2021</p> <p>Community Integrated Management Strategy, August 2015)</p> <p>Water and Sanitation Sector Plan 2016-2020</p>

<p>Rainwater harvesting systems (water tanks)</p>	<p>Rainwater harvesting immediate action, supported by the installation of water tanks for families residing inland without access to water for consumption and domestic use and to provide alternative water source for families receiving saline water.</p> <p><b>Responsibility: CSSP / UNDP-GEF SGP/ NGO/MWCSD / village</b></p>	<p>Improve community adaptive capacity to respond to climate change impacts</p>	<p>Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system.</p> <p>National Water Resources Management Strategy 2007-2017</p>	<p>Water and Sanitation Sector Plan 2016-2020</p>
<p>Electricity Supply</p>	<p>Install and connect power supply for inland residents</p> <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><b>Responsibility: EPC / MWTI / Villages</b></p>	<p>Maintain electricity supply at all times including during 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 to installed electricity lines to reach families residing inland and streetlights</p> <p>Consider energy efficiency developments for communities using renewable energy guided by existing framework –</p> <p>Development of a Renewable Energy and Energy Efficiency Framework, 2016</p>	<p>Samoa Energy Sector Plan 2017-2022</p>

**Other Solutions Considered or Further Issues Raised**

Infrastructure	Solutions/ Issues	Comment
<p>seawall</p>	<p>Village representatives requested seawall about 400m in the oceanfront where the community pool is located – prevent coastal erosion</p> <p><b>Responsibility: CSSP/NGO/MWTI / Village</b></p>	<p>This is not recommended because the lower plateau is some 2-3 meter’s higher than the beach and has healthy coastal vegetation providing natural resilience. Other adaptation measures including planned retreat and dwelling defense mechanisms are preferred option.</p>

Women's committee house	Village request support for the repairing of existing Women's Committee House <b>Responsibility: Village/CSSP</b>	This is a village development and has no climate resilience objective.
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Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine / Fisheries Reserve	<p>Expand existing fishery reserves Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area</p> <p>Training on understanding the importance of seaweed to coral reef ecosystems and for fish species</p> <p><b>Responsibility: MAF / Village</b></p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>

Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Invasive pests	<p>Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: merremmia peltata (fue lautetele), insects, African snail, myna birds.</p> <p>Conduct awareness</p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>National Environment Sector Plan 2017-2021</p>

	and education community programs on the adverse impact of invasive alien pests on plantations  <b>Responsibility: MNRE / village</b>			
Marine Restocking	Expand existing marine reserve to include: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption.  Enforce Fisheries By Laws  <b>Responsibility: MAF / village</b>	Improve food security and healthy living and increase community resilience and adaptive response to climate change  Increase diversity of marine species and coral reef ecosystem  Reduce coral bleaching	Improve existing marine reserve and encourage expanding to other nearby sub-villages  Community-Based Fisheries Management Plan	Agriculture Sector Plan 2016-2020

Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans  <b>Responsibility: MWCS D / Villages</b>	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae “refer Clause 5 Amendment”.  Fisheries Village By-Laws for Matautu	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCS D and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.



**Community pool on the coast with drinking water – in good condition**



**Matautu access road inland to plantation request from village to tar seal.**



# Matautu Village Map



## 4.5 Tafatafa and Matavai Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Link to Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones  Investments within the hazard zone adopt appropriate mitigation measures such as:  Raise building foundations at a level that takes into account the CFHZ in the vicinity  <b>Responsibility: Village/Families / MWTI/MWCS D</b>	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Application of the National Building Code (2016) and permit compliance  Code of Environmental Practice 2007  PUMA Act 2004	CIM Strategy (2015)
Access road (2 roads list by LTA to plantations and 1 road identified by community towards beach tourism development)	Reconstruction and sealing of village access/plantation road and to families residing along this road: Costing was in LTA list of pipeline roads for Falealili – Tafatafa & Matavai Length: 1146 m Estimated Cost: SAT\$ 412,560.00  Tafatafa-uta Length: 615m Estimate Cost: SAT\$ 221,400.00  Sealed road towards tourist development – escape route about 100m  <b>Responsibility: LTA / MWTI / village</b>	Improve rate of recovery  Increase number of families relocate to higher grounds	Construction of access roads should be guided by the following:  Environmental and Social Safeguard policy  Samoa Code of Environmental Practice (2007)  Review of National Road Standards in Samoa (2016)  Vulnerability Assessment of the Samoa Road Network (2017)  National Infrastructure Strategic Plan (NISIP) 2011  Programme road safety activities into budget and work program	Community Integrated Management Strategy, August 2015  Transport Sector Plan 2014-2019

### Other Solutions Considered or Further Issues Raised

Infrastructure / Environment / Livelihood	Solutions/ Issues	Comment
Waste Management	Request for government rubbish collection service to be consistent in collection rubbish and community continue with village clean-up and waste management program  <b>Responsibility: Village / MNRE / MWCSO / STA</b>	Village representatives raised concern with regards to the poor collection of rubbish from village stands by the contractors
Tilapia Farm	Village request for MNRE-DEC and MAF-Fisheries to conduct a rapid biodiversity assessment for their wetland area and swamp to consider converting it into a tilapia farm  <b>Responsibility: MAF / MNRE / Village</b>	Careful consideration regarding such request given the expectation to develop tilapia farm in the natural as they can lead to adverse impacts on existing native species, if a new species is introduced into the habitat.
Water	Request that families would like to switch from SWA to Independent Water Scheme  <b>Responsibility: MWCSO-IWS / SWA/ Village</b>	The CIM Plan consultations community wanted to make this move because they said the water bills were too costly and also most families don't use the SWA water due to very high chlorine smell.
	Water Tanks – request for installation of water tanks for families with no access to water and who can't afford the SWA metered water  <b>Responsibility: CSSP / Village</b>	This request was mainly to provide access to water without having to pay for water bills.

Livelihood and Food Security	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Invasive pests	Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: merremmia peltata (fue lautetele), insects, African snail, myna birds.  Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations  <b>Responsibility: MNRE / village</b>	Reduce impact of invasive species on forest  Increase number of native trees reforestation  Improve soil stability	Implementation of invasive species program should be guided by:  NBSAP 2015-2020  National Invasive Species Plan 2008-2011	National Environment Sector Plan 2017-2021



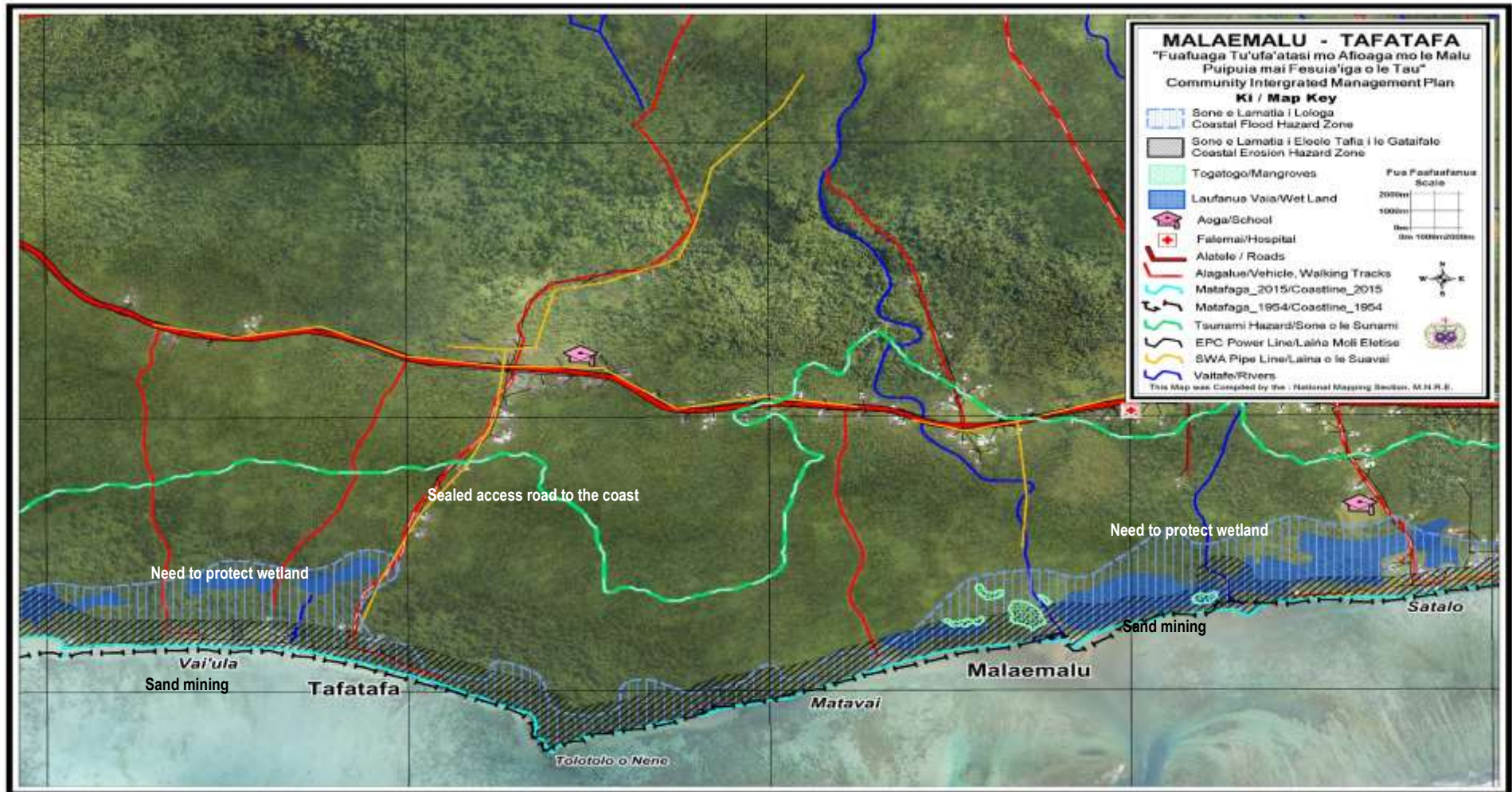
<p>Marine Restocking</p>	<p>Expand existing marine reserve to include: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption.</p> <p>Need awareness on the usefulness of seaweed dominating much of the inshore area</p> <p>Installed floating poles to mark area of Marine Reserve</p> <p>Enforce Fisheries By Laws</p> <p><b>Responsibility: MAF / village</b></p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p> <p>Increase diversity of marine species and coral reef ecosystem</p> <p>Reduce coral bleaching</p>	<p>Improve existing marine reserve and encourage expanding to other nearby sub-villages</p> <p>Community-Based Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p>
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Village Governance	Best Solutions	Guidelines to assist Implementation	Comments
<p>District /Village bi-laws and institutional setting</p>	<p>Develop and enforce related by-laws to support implementation of CIM Plans</p> <p><b>Responsibility: MWCS D / Villages</b></p>	<p>Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae “refer Clause 5 Amendment”.</p> <p>Fisheries Village By-Laws for Tafatafa and Matavai</p>	<p>The Amendment allows for the village to establish their own governing constitution and have it registered with MWCS D and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.</p>



**Tafatafa Beach Fales located in hazard zone and coastal vegetation help reduce coastal erosion.**

# Tafatafa and Matavai Village Map





## 4.6 Malaemalu Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Access road	<p>Reconstruction and sealing of village access/plantation road and to families residing along this road:            Costing was in LTA list of pipeline roads for Falealili            Length: 680 m            Estimated Cost: SAT\$ 244,800.00</p> <p><b>Responsibility: LTA / MWTI / village</b></p>	<p>Improve rate of recovery</p> <p>Increase number of families relocate to higher grounds</p>	<p>Construction of access roads should be guided by the following:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work programme</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>
Water (IWS)	<p>Maintenance of IWS piped water network and ensure all families in the village have access to clean water</p> <p><b>Responsibility: MWCS-D-IWS / Village</b></p>	<p>Improve access to clean water</p>	<p>Develop a pre-assessment survey of existing water supply pipeline systems and identify leaks and faults</p> <p>Independent Water Scheme Workplan program for FY17/18</p> <p>Environmental and Social Safeguard Policies apply</p> <p>MoH Water Quality Standards – Water quality compliance with National Drinking Water</p>	<p>Community Integrated Management Strategy, August 2015)</p> <p>Water and Sanitation Sector Plan 2012-2016</p> <p>Community Development Sector 2016-2021</p>

			Standards	
Evacuation Center	<p>DMO to conduct assessment of existing buildings within the village located away from the hazard zone to identify a suitable building for safe haven, prior to considering following request.</p> <p>Request building a safe haven house (evacuation centre) further inland to be managed by the Women’s Committee away from the hazard zone and use during times of natural disasters and emergency.</p> <p><b>Responsibility: MNRE / MWCS / Village</b></p>	<p>Improve public facility used by communities for safety during times of natural disasters</p>	<p>Emergency house or shelters priority are given to existing buildings within the village that suits the criteria for a safe haven and are retrofit for this purpose, and most targeted are school buildings.</p>	<p>National Disaster Management Plan 2016-2019</p>
Electricity Supply	<p>Install and connect power supply for inland residents</p> <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><b>Responsibility: EPC / MWTI / Villages</b></p>	<p>Maintain electricity supply at all times including during 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 to installed electricity lines to reach families residing inland and streetlights</p> <p>Consider energy efficiency developments for communities using renewable energy guided by existing framework –</p> <p>Development of a Renewable Energy and Energy Efficiency Framework, 2016</p>	<p>Samoa Energy Sector Plan 2017-2022</p>

**Other Solutions Considered or Further Issues Raised**

<b>Infrastructure / Environment</b>	<b>Solutions/ Issues</b>	<b>Comment</b>
Seawall	Village to consider mitigation measures to reduce impact of the newly constructed seawall on marine environment and potential beachfront / sand shifting by building submerged wave breakers and placed at strategic locations to rectify energy systems  <i>Responsibility: MWTI / LTA / MNRE / Village</i>	The new seawall may interrupt lagoon circulation processes and see changes to the sand balance, which in turn impact on the success rate of marine reserve that village wants to establish. The impact of the seawall needs to be monitored closely especially the possibility of energy patterns shifting sand budgets and causing algal blooms etc.
Waste Management	Village council enforce waste management program for the village – imposing fine on littering or illegal dumping of rubbish  <i>Responsibility: Village</i>	Village has strong awareness on waste management and follows the national beautification program
Culvert	Box culvert upgrade  <i>Responsible: LTA</i>	Winged box culvert with riverbed overgrown and inlet obstructed with debris. More at risk from blockage due to lack of maintenance than a climate hazard; unless a large catchment area is served. Maintenance is required after heavy rain storms to remove debris washed down by the storm.

<b>Environment &amp; Natural Resources</b>	<b>Best Solutions Proposed</b>	<b>Other Benefits</b>	<b>Guideline to assist Implementation</b>	<b>Relevant to Sector Plans</b>
Natural Spring / pool (Punaotalalei)	Upgrade the natural spring close to the mangrove and wetland area with drinking water by: Using soft rock walling with limited concrete use for structural integrity;  Design should ensure chamber inflow and outflow points are correctly sized  Implement catchment reforestation program the steep area of land near the pool to stop soil erosion  <i>Responsibility: MWTI / LTA / CSSP / UNDP-GEF-SGP/ MNRE / Village</i>	Improve alternative source of water supply as backup during extreme event  Access to clean water	Ensure that proper guidelines are followed when implementing the natural spring upgrade such as:  Environmental Social Safeguard Policy  National Water Resource Strategy 2017  Community Engagement Plan 2015  Code of Environmental Practice 2007	Water and Sanitation Sector Plan 2016-2020  National Environment Sector Plan 2017-2021  Community Development Plan 2016-2021

<p>Marine Restocking</p>	<p>Established a marine reserve to include: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption.</p> <p>Need awareness on the usefulness of seaweed dominating much of the inshore area</p> <p>Installed floating poles to mark area of Marine Reserve</p> <p>Enforce Fisheries By Laws</p> <p><b>Responsibility: MAF / village</b></p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p> <p>Increase diversity of marine species and coral reef ecosystem</p> <p>Reduce coral bleaching</p>	<p>Establishing the Marine Reserve needs further consideration given potential impact from the recent developed seawall.</p> <p>Community-Based Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p>
<p>Mangrove Ecosystem</p>	<p>Implement a post tsunami/ cyclone Evan clean-up of the mangrove: Clear out all rubbish and debris, dead mangrove trees to allow natural flow of water.</p> <p>Declaration of the mangrove ecosystem as a conservation site under RAMSAR Convention</p> <p><b>Responsibility: MNRE / MAF-Fisheries /village</b></p>	<p>Increase ecological resilience of mangrove ecosystem</p>	<p>MNRE – DEC to provide guidance and advice of clean-up of natural habitats</p> <p>NBSAP 2015-2020</p> <p>Community based fisheries management plan</p>	<p>National Environment Sector Plan 2017-2021</p>
<p>Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources</p>	<p>Assess and identify sustainable sources of sand for domestic and commercial use</p> <p>Village, government and the private sector to collaborate on designated areas for sand mining</p> <p>Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe</p>	<p>Village gains benefit from sand mining activities</p> <p>Reduce impact to natural coastal protection mechanism via control of scale and site of extraction</p> <p>Improve village resource management and sustainable development</p>	<p>Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations</p> <p>Secure relevant permits before any sand mining occurs</p> <p>Incorporate environmental and social safeguards concerns including</p>	<p>National Environment Sector Plan 2017 - 2021</p>

	<p>Strengthen sand mining monitoring and enforcement</p> <p>Mass media awareness on sustainable sand mining practices</p> <p>Develop sand mining regulation</p> <p><b>Responsibility: MNRE / District &amp; Village</b></p>	<p>Minimize impacts of coastal inundation and erosion</p> <p>Improve the sustainable management of sand as a natural resource</p>	<p>consultations with any affected community</p> <p>Village environmental management plans established including annual monitoring systems</p> <p>For access to sites, obtain written consents from Alii Faipule and landowners.</p> <p>Lands and Survey Environment Act 1989</p> <p>Consideration of EIA assessment of impact prior to any extraction</p> <p>PUMA Act 2004</p> <p>NAP – Sustainable Land Management Plan 2015-2019</p> <p>(draft)  Sand Mining Policy 2001</p> <p>Draft Soil Resource Management Bill 2018</p>	
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Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Invasive pests	<p>Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: merremmia peltata (fue lautetele), insects, African snail, myna birds.</p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>National Environment Sector Plan 2017-2021</p>



	<p>Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations</p> <p><b>Responsibility:</b> <i>MNRE / village</i></p>			
Gardening and Handicrafts	<p>Request support for Women’s vegetable garden program and handicraft activities for income generation</p> <p><b>Responsibility:</b> <i>MWCSD / WIBDI / Village</i></p>	Increase opportunities for income benefits	Implementation and support should follow guidelines from relevant agencies	Community Development Plan 2016-2021

Village Governance	Best Solutions and Other Solutions Proposed	Implementation Guidelines	Comments
District /Village bi-laws and institutional setting	<p>Develop and enforce related by-laws to support implementation of CIM Plans</p> <p><b>Responsibility:</b> <i>MWCSD / Villages</i></p>	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae “refer Clause 5 Amendment”.	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCSD and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.

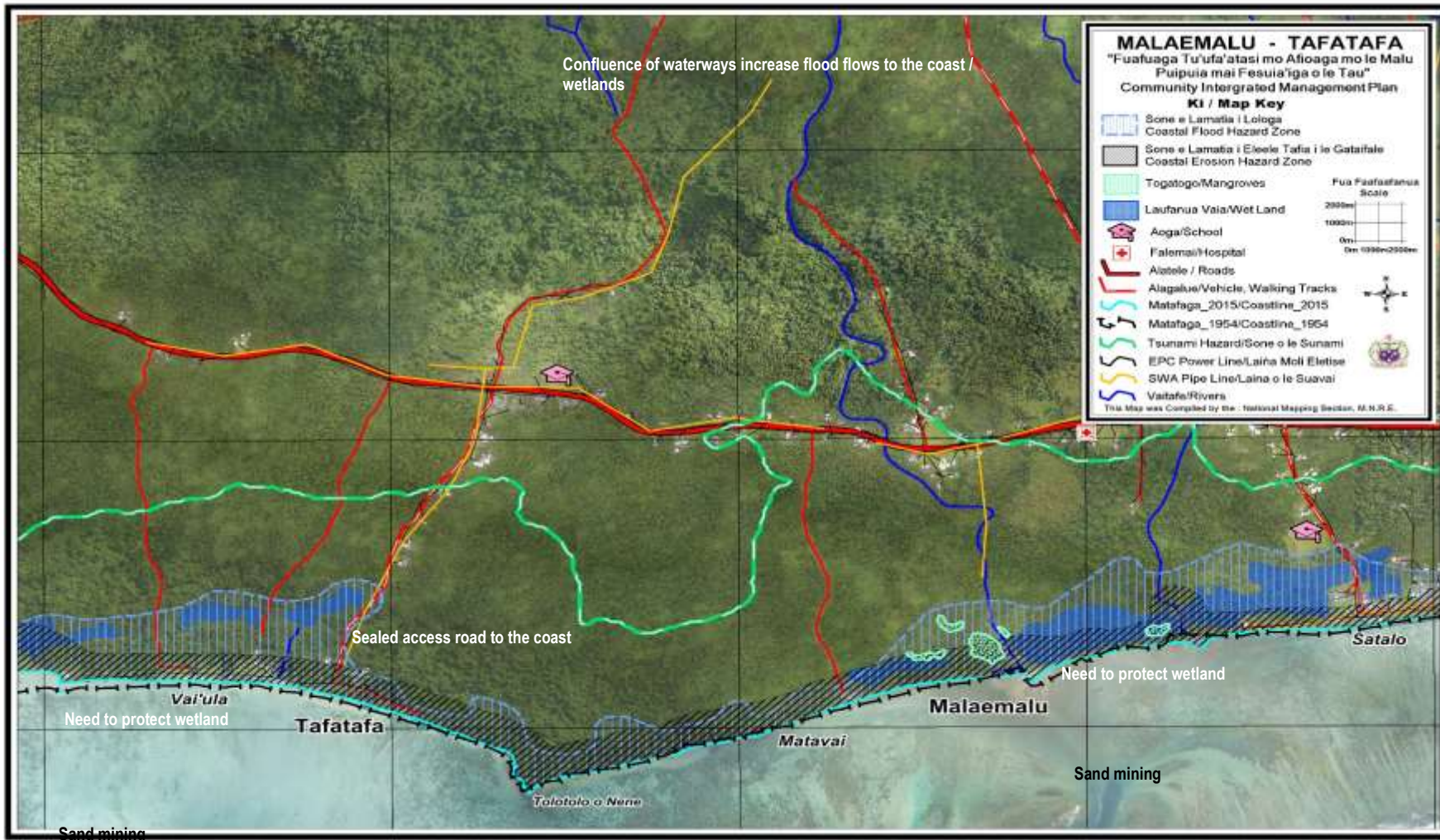


**Seawall recently completed in Malaemalu has shown very weak and poor loose structure, strong potential to have adverse impact on marine environment.**



**Malaemalu wetland/ mangrove area and natural spring the community is requesting to protect and conserve the natural habitat**

# Malaemalu Village Map





## 4.7 Sapunaoa and Piu Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House (Village Primary School and Women's Committee)</p>	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as:</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p><b>Responsibility: Village/Families / MWTI</b></p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Code of Environmental Practice 2007</p> <p>PUMA Act 2004</p> <p>Application of the National Building Code (2016) and permit compliance</p>	<p>CIM Strategy (2015)</p>
<p>Access road</p>	<p>Reconstruction and sealing of village access/plantation road and to families residing along inland road: Costing was in LTA list of pipeline roads for Sapunaoa &amp; Piu Length: 400m Estimated Cost: SAT\$ 144,000.00</p> <p>Upgrade ford crossing on inland access road to Piu (leading to SWA chlorination plant), with small-medium sized square basal culverts with slab crossing</p> <p><b>Responsibility: LTA / MWTI / village</b></p>	<p>Improve rate of recovery</p> <p>Increase number of families relocate to higher grounds</p>	<p>Construction of access roads should be guided by the following:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work program</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>

Water (Existing water from SWA has strong chlorine smell / taste)	<p>Assess and monitor the piped water network and regulate the levels of chlorine in the water</p> <p>Conduct water quality testing for compliance</p> <p><b>Responsibility: SWA/MoH/village</b></p>	<p>Improve sanitation and hygiene</p> <p>Reduce number of sick people from poor drinking water</p> <p>Improve community resilience to proactively adapt</p>	<p>Samoa Water Authority Pipeline Work Program for FY17/18</p> <p>Environmental and Social Safeguard Policies apply - MoH Water Quality Standards</p> <p>SWA 10 Year Investment Plan (2016) to improve water supply network</p>	<p>Community Integrated Management Strategy, August 2015)</p> <p>Water and Sanitation Sector Plan 2016-2020</p>
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### Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Access road from Primary School near coast to main road	<p>Tar sealed the recently cleared dirt road from coastal area near Primary school to main road as an escape route</p> <p><b>Responsibility: CSSP / Village</b></p>	This road was funded under the CSSP small sub-project and it was supposed to be an escape walkway. Village request LTA to seal the road.
Bridge	<p>Bridge maintenance</p> <p><b>Responsibility: LTA</b></p>	Culvert with water currently in the stream. Would be a climate change hazard if it drains a large catchment area. Otherwise, unlikely to be climate change hazard.

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine / Fisheries Reserve	<p>Expand existing fishery reserves</p> <p>Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area</p> <p>Training on</p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>



	<p>understanding the importance of seaweed to coral reef ecosystems and for fish species</p> <p><b>Responsibility: MAF / Village</b></p>			
<p>Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources</p>	<p>Assess and identify sustainable sources of sand for domestic and commercial use</p> <p>Village, government and the private sector to collaborate on designated areas for sand mining</p> <p>Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe</p> <p>Strengthen sand mining monitoring and enforcement</p> <p>Mass media awareness on sustainable sand mining practices</p> <p>Develop sand mining regulation</p> <p><b>Responsibility: MNRE / District &amp; Village</b></p>	<p>Village gains benefit from sand mining activities</p> <p>Reduce impact to natural coastal protection mechanism via control of scale and site of extraction</p> <p>Improve village resource management and sustainable development</p> <p>Minimize impacts of coastal inundation and erosion</p> <p>Improve the sustainable management of sand as a natural resource</p>	<p>Follow existing MNRE guidelines for sand mining or extracting such as:</p> <p>MNRE monitoring of sand extraction operations</p> <p>Secure relevant permits before any sand mining occurs</p> <p>Incorporate environmental and social safeguards concerns including consultations with any affected community</p> <p>Village environmental management plans established including annual monitoring systems</p> <p>For access to sites, obtain written consents from Alii Faipule and landowners.</p> <p>Lands and Survey Environment Act 1989</p> <p>Consideration of EIA assessment of impact prior to any extraction</p> <p>PUMA Act 2004</p> <p>NAP – Sustainable Land Management Plan 2015-2019</p>	<p>National Environment Sector Plan 2017 - 2021</p>

			(draft)  Sand Mining Policy 2001  Draft Soil Resource Management Bill 2018	
Water Catchment	<p>Continue restoration work in the Piu Catchment area – replanting of native trees</p> <p>Conduct Consultations and awareness programmes with communities on proposed catchment area</p> <p>Water Quality Testing</p> <p><b>Responsibility: MNRE /MOH/ village</b></p>	Improve ecological resilience of watershed area	<p>MNRE-DEC, WRD and Forestry Division to provide advice such as:</p> <p>Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting</p> <p>Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project</p> <p>NBSAP 2015-2020 National Forestry Plan 2016-2020 National Water Strategy Plan 2007-2017</p>	<p>Draft NESP 2017-2021</p> <p>Water and Sanitation Sector Plan 2016-2020</p>

Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Invasive pests	<p>Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: merremia peltata (fue lautetele), insects, African snail, myna birds.</p>	<p>Reduce impact of invasive species on forest</p> <p>Increase number of native trees reforestation</p> <p>Improve soil stability</p>	<p>Implementation of invasive species program should be guided by:</p> <p>NBSAP 2015-2020</p> <p>National Invasive Species Plan 2008-2011</p>	<p>National Environment Sector Plan 2017-2021</p>

	<p>Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations</p> <p><b>Responsibility: MNRE / village</b></p>			
<p>Disturbed forests and plantation areas / invasive pests</p>	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops ( i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p> <p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>Strengthen partnership with farming NGO’s such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p>	<p>Agriculture Sector Plan 2016-2020</p>

	<b>Responsibility: MAF MNRE /villages</b>		<p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Village Governance	Best Solutions and Other Solutions Proposed	Implementation Guidelines	Comments
Village bi-laws and institutional setting	<p>Develop and enforce related by-laws to support implementation of CIM Plans</p> <p><b>Responsibility: MWCSO / Villages</b></p>	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae “refer Clause 5 Amendment”.	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCSO and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.



**Piu watershed area supply water to SWA Plant and feeds the piped network to the villages in Falealili District**

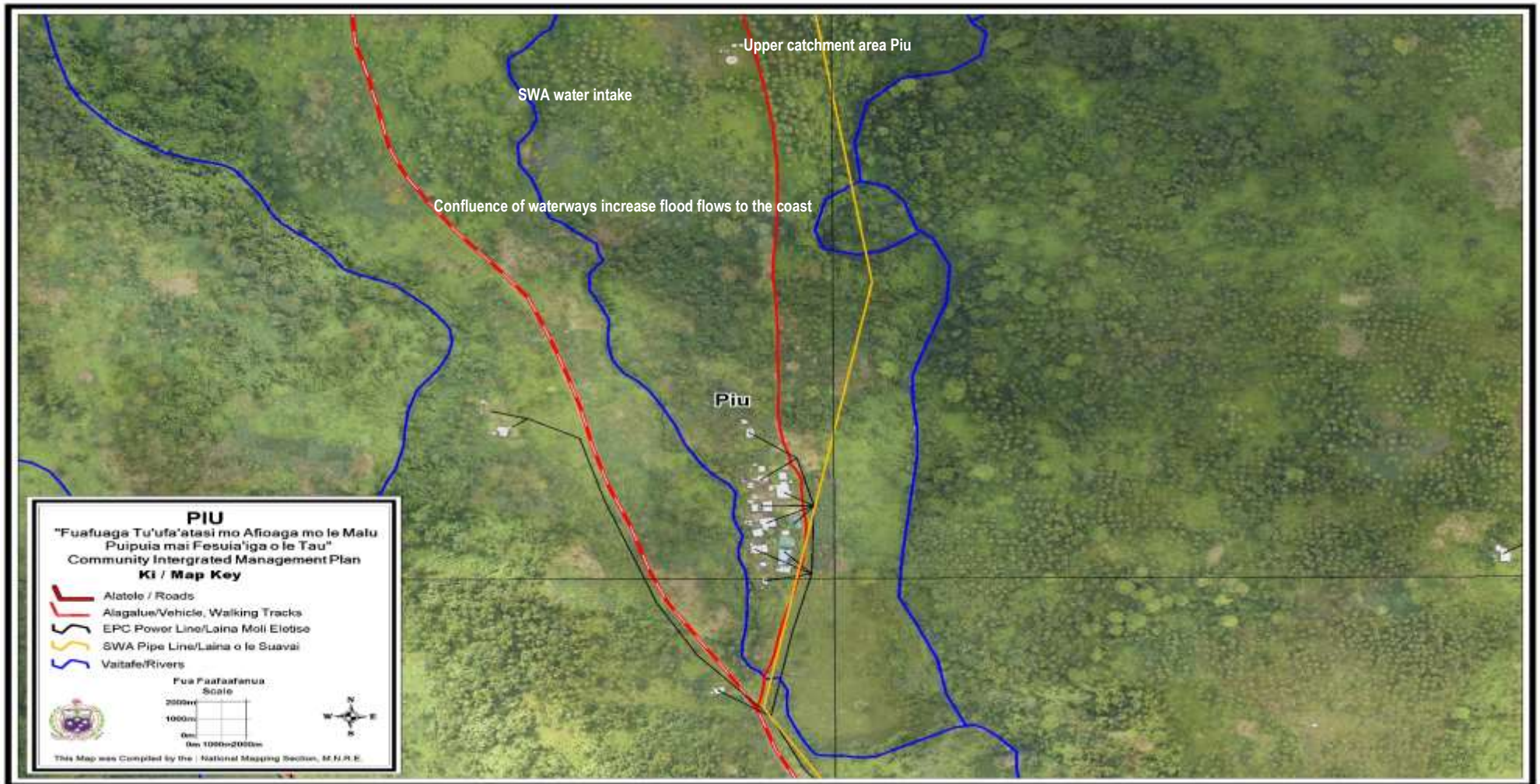


# Sapunaoa Village Map





# Piu Village Map



## 4.8 Satalo Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones  Investments within the hazard zone adopt appropriate mitigation measures such as:  Raise building foundations at a level that takes into account the CFHZ in the vicinity  <b>Responsibility: Village/Families / MWTI</b>	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Code of Environmental Practice 2007  PUMA Act 2004  Application of the National Building Code (2016) and permit compliance	CIM Strategy (2015)
Access road	Reconstruction and sealing of village access/plantation road and to families residing along inland road: Costing was in LTA list of pipeline roads for Satalo Length: 700m Estimated Cost: SAT\$ 252,000.00  <b>Responsibility: LTA / MWTI / village</b>	Improve rate of recovery  Increase number of families relocate to higher grounds	Construction of access roads should be guided by the following:  Environmental and Social Safeguard policy  Samoa Code of Environmental Practice (2007)  Review of National Road Standards in Samoa (2016)  Vulnerability Assessment of the Samoa Road Network (2017) National Infrastructure Strategic Plan (NISP) 2011 Programme road safety activities into budget and work program	Community Integrated Management Strategy, August 2015  Transport Sector Plan 2014-2019

### Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Water	Request SWA to test quality of water and cleaning water  <b>Responsibility: SWA</b>	Village raised concerned over the water they receive from SWA that chlorine smell is strong and water is dirty all the time during heavy rain. This is an issue to discuss between village and SWA
Community pool (Sinalilo)	Request to upgrade the Sinalilo pool near the main road with structural improvement of steps to go down to the pool  <b>Responsibility: Village</b>	The Sinalilo pool located near the main road in a cave. However it is not a climate resilient investment due to strong potential for flash flooding posing as a hazard area.

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine / Fisheries Reserve	<p>Expand existing fishery reserves Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area</p> <p>Training on understanding the importance of seaweed to coral reef ecosystems and for fish species</p> <p><b>Responsibility: MAF / Village</b></p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>
Sand mining for commercial and domestic use	Assess and identify sustainable sources of sand for domestic and commercial use	Village gains benefit from sand mining activities	Follow existing MNRE guidelines for sand mining or extracting such as:	National Environment Sector Plan 2017 - 2021

<p>affecting the marine and coastal environment as well as terrestrial resources</p>	<p>Village, government and the private sector to collaborate on designated areas for sand mining</p> <p>Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe</p> <p>Strengthen sand mining monitoring and enforcement</p> <p>Mass media awareness on sustainable sand mining practices</p> <p>Develop sand mining regulation</p> <p><b>Responsibility: MNRE / District &amp; Village</b></p>	<p>Reduce impact to natural coastal protection mechanism via control of scale and site of extraction</p> <p>Improve village resource management and sustainable development</p> <p>Minimize impacts of coastal inundation and erosion</p> <p>Improve the sustainable management of sand as a natural resource</p>	<p>MNRE monitoring of sand extraction operations</p> <p>Secure relevant permits before any sand mining occurs</p> <p>Incorporate environmental and social safeguards concerns including consultations with any affected community</p> <p>Village environmental management plans established including annual monitoring systems</p> <p>For access to sites, obtain written consents from Alii Faipule and landowners.</p> <p>Lands and Survey Environment Act 1989</p> <p>Consideration of EIA assessment of impact prior to any extraction</p> <p>PUMA Act 2004</p> <p>NAP – Sustainable Land Management Plan 2015-2019</p> <p>(draft)  Sand Mining Policy 2001</p> <p>Draft Soil Resource Management Bill 2018</p>	
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Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Gardening and Handicrafts</p>	<p>Request support for Women’s vegetable garden program and handicraft activities for income generation</p> <p><b>Responsibility:</b> <b>MWCSD / WIBDI / Village</b></p>	<p>Increase opportunities for income benefits</p>	<p>Implementation and support should follow guidelines from relevant agencies</p>	<p>Community Development Plan 2016-2021</p>
<p>Disturbed forests and plantation areas / invasive pests</p>	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops ( i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p> <p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>Strengthen partnership with farming NGO’s such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource</p>	<p>Agriculture Sector Plan 2016-2020</p>



	<p>invasive pests both flora and fauna impacting on plantations – crops.</p> <p><b>Responsibility: MAF MNRE /villages</b></p>		<p>Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Village Governance	Best Solutions and Other Solutions Proposed	Implementation Guidelines	Comments
District /Village bi-laws and institutional setting	<p>Develop and enforce related by-laws to support implementation of CIM Plans</p> <p><b>Responsibility: MWCS D / Villages</b></p>	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae “refer Clause 5 Amendment”.	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCS D and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.
Village drainage clean up	<p>Undertake village inspection of culverts along inland / main roads;</p> <ul style="list-style-type: none"> <li>- maintenance of road side drains and regular inspection of drainage system;</li> <li>- Implement district/village drainage/ culvert clean-up and awareness program</li> </ul> <p><b>Responsibility: MWCS D / District / Village / MWTI and LTA</b></p>	<p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>Programme road safety activities into budget and work programme</p> <p>Programme drainage in budget and work programme</p> <p>Prepare assessment of road drainage systems</p> <p>Prepare a local education programme on need for keeping drainage systems clean</p>	<p>Improved rate of recovery</p> <p>Reduce potential for flooding in village areas</p> <p>Safer village houses and roads</p> <p>Improved safety community and resilience</p> <p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p>



**Sinalilo pool in Satalo used for bathing and back-up water source - high risk of flashflood from waterways that links to upstream catchment**



# Satalo Village Map

