Community Integrated Management Plan

Aleipata Itupa I Lalo - Upolu

Implementation Guidelines 2018

Foreword

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

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

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

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

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

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

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

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

Thank you

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

Participants in the Plan

The 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 Aleipata-Itupa I Lalo (Satitoa, Lotopu'e, Malaela, Mutiatele, Saleaumua, Amaile, Samusu, Utufaalalafa and Tiavea-uta/tai) District

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

Date of Signing: <u>22 June 2018</u>

Representatives: Signature

Satitoa Village

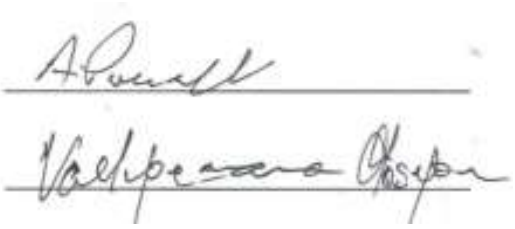
- Lemusu Mikaele L
- Selesetina Taisia
- Leota Tauese Leota
- Malae Poai Logovā
- Samia Ta'amu Samia

Lotopu'e Village

- Faigataupuoatua Feagiai
- Lili Lauiala
- Tagaloa Lautala

Malaela Village

- Faiaigalelei Alatina
- Vaelupe Olosepu



- Leota Ioane Su'a
- Tifa'I Su'a
- Uluao Tauelia

Mutiatele Village

- Vaimaota Faitala
- Falataituave Ieti Taisa
- Tautolo Anae
- Laifaleseu Iulio Masealii
- Tu'ave Kuki Siaki

Salea'aumua Village

- Maui'a P Matiasi
- Losivale Konelio
- Tinei Paulo Puā
- Laulu Topule Tauāpa'i
- Lepua Visesio Pāuga

Amaile Village

- Malō Kurene
- Rita T
- Melesete Ilimaleota
- Faasuamaleaui Eletise
- Ituau Pule

Samusu Village

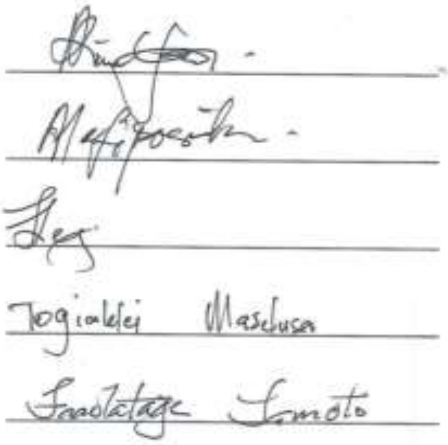
- Moe Makiasi
- Pitolau Ta'i
- Samusu Lavai Lemoa
- Aumua Mamoa Sopi
- Malouamaua Amu Kapeli Su'a

Utufaalalafa Village

- Fuetoa Sauiluma
- Puao Vaeau
- Leteu Taualai
- Letiu Kainano

Tiavea-uta/tai Village

- Sola Siuele
- Tupa'I Mefuposeta Agafili
- Fa'alii Leo
- Togialelei Maselusa
- Maulupe Tamoto



The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of Aleipata-Itupa I Lalo (Satitoa, Lotopu'e, Malaela, Mutiatele, Saleaumua, Amaile, Samusu, Utufaalalafa and Tiavea-uta/ tai) 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.

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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
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
NISP	National Infrastructure Strategic Plan
NRW	Non Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan

Glossary

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 Aleipata-Itupa I Lalo 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 "CIM Plan Solution 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).

3. Description of Aleipata-Itupa I Lalo District Environment

3.1 Physical and Natural Resource Setting

Aleipata itupa I Lalo is located on the eastern most part of Upolu Island. It comprises of villages, from north to south: Tiavea, Amaile, Samusu, Utufaalalafa, Saleaaumua, Mutiatele, Lotopue, Malaela and Satitoa. The district has a gently graded mid slope hinterland that rises steadily from the east to steeper ravine country about 2-3kms inland. For the north-east areas the coastal plateau is thinner with very steep country close to the sea. The flat coastal areas are subject to hazard influences from run-off from the mid hinterlands to steeper ranges inland. Some areas inland are extremely steep and integrated catchment management measures would be beneficial. The coastal areas are frequently inundated from storm surges, cyclones, and minor and extreme rainfall events.

The Aleipata Itupa i Lalo coastal area has changed noticeably over the last several decades. In a number of places along the coast, in particular near Utufa'alalafa, Lotopu'e and Satitoa, the coastline has receded up to 50 metres since 1954. Namua Island acts as a significant erosion buffer for the villages in the south of the District, and parts of the coast are protected by low sea walls (revetments).

The district is part of the wider Aleipata Marine Protected Area that also includes Aleipata Itupa I Luga. The majority of the coral reef system was damaged by the tsunami but is showing signs of recovery with some patches of corals repopulating part of the lagoon and outer reef. Aleipata inshore reef systems is comprised of a wide inner lagoon dominated by recovering mixed corals and fine sandy bottom. The reef crest and outer reef once had a vibrant mixed coral assemblages and seagrass beds which was decimated by the 2009 tsunami. The lagoon supports a rich fish and bivalve's populations along with the hawksbill and green turtles that forage in the area. There is regrowth but it will take many years for it to get back to its previous pristine state.

The outer islands of Aleipata are a significant key biodiversity for Samoa both for marine and terrestrial biodiversity. The Aleipata Islands include Fanuatapu and Namua in Aleipata Itupa I Lalo and Nuutele and Nuulua in Aleipata itupa I Luga are important hawksbill turtle nesting grounds while the Aleipata lagoon is an important foraging area for the turtles especially in the seagrass beds. Furthermore, the islands are important nesting grounds for the sea birds such as frigate birds, boobies, noddies, terns, and tropic birds. Off the coast of Aleipata is a feeding ground for migrating humpback whales that are regulars during the southern hemisphere winter months from June to October.

Despite the fact that the majority of the lowlands of the Aleipata district has been cleared for farms, plantations and settlements, significantly important pockets of terrestrial ecosystems are present. These include the lowland rainforests in the north extending from Amaile on the east to Tiavea on the west and extending to the Fagaloa district-ridge rainforest. These intact lowland rainforest areas although not identified as key biodiversity area, are just as important as the neighbouring Uafato-Tiavea Key Biodiversity site. These important ecosystems are rich in lowland rainforest plants as well important avifauna such as several fruit bat roosts, the presence of some of endangered and threatened birds of Samoa such as the tuaimeo and manumea. Additionally, the Aleipata islands are important refugia for the avifauna which regular migrate to the islands during the day for feeding because of the pristine condition that still exists due to the absence of human settlement.

The remaining lowland areas of the district is covered by mixed vegetation of plantations, farm lands and fallow lands from old plantations during the height of taro export during the 1980-1990s before the taro blight. These fallow lands are now mostly dominated by a mixture of secondary forests and exotic invasive species.

The invasive trees and shrubs are present around the village settlements as well as along the access roads throughout the district. *Spathodea campanulate* (African tulip) *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 open areas.

Myna birds and red-vented bulbuls were found in abundance along the whole northern Savaii especially closer to settlements.

3.2 Social and Economic Setting

The Aleipata-Itupa I Lalo has a population of 4,227 persons according to the last census (2016). New developments in the district included the tar sealing of all inland roads and shifting of key infrastructure such as electricity and water to accommodate for the many families that have moved on higher grounds and away from coastal area after the 2009 Tsunami, which devastated much of the eastern side of the country.

The Satitoa wharf services boats and commutes between Samoa and American Samoa, however after the 2009 tsunami it has not been fully functional. All other primary services have also moved inland such as shops, schools and health facilities. The main district hospital is in Lalomanu in Aleiptata Itupa I Luga. The road to Tiavea-tai has been sealed with only a few areas that has not been covered. There are some problems with water availability and Tiavea-uta is where the SWA pipeline comes from which feeds the nearby villages.

The cash economy of the District is dominated by traditional work. In all villages, the majority of residents are largely sustained by plantation work and fishing. The District supports several primary schools and a District Secondary as well as a number of denominations / churches. In addition, there are a number of small shops and home occupations throughout the area.

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 2007 Aleipata Itupa I Lalo 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 village of Tiavea-tai to the north associates with narrow coastline, where rapid erosion generates from a combination of high energy wave activity and stream channel. Thick calcareous deposit zone on the eastern side (Fig. 1) indicate that there will be an increased in erosion activity due to sand mining practices on the beachfront or in the inshore area. The eastern most part of Upolu where Aleipata itupa I lalo is located is still vulnerable to tsunami according to Fepuleai (2017) because of the narrow coastline and its location opposite and close to the Northern Terminus zone of the Tonga trench.

Inland Hazards and Risks: The groundwater sources between Lalomanu and Amaile could be threatened due to the rapid development in these villages. For instance, cases reported of previous boreholes in the area were commonly contaminated with saline intrusion. According to Fepuleai (2017) the Seismic study is a better option to

[1] Pacific-Australia Climate Change and Adaptation Planning Program Partners (2015) Current and Future Climate of Samoa, Government Australia and Government Samoa.

determine the activity along the interconnection of fault and fissure network in the area, where predicted to be a high potential vent zone. This will also provide valuable information for landslide and rockfall hazards in the Lepa district, Aleipata-Itupa-I-Luga district and Aleipata-Itupa-I-Lalo district.

Overall activities such *as* in several sections, rebuilds of reef resilience and sustain the extension in marine habitats of the area, will help in erosion reduction. Groundwater resource is needed to be sustained through good management between villages and governments.

Figure 1 Coastal section between Aufaga of Lepa District and Tiavea of Aleipata Itupa I Lalo District and Aleipata Itupa I Luga. It shows reef channel with thick deposits of sand causing coastal erosion.
Map credit: Aleni Fepuleai, 2017

4. Aleipata Itupa I Lalo District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Main inland East Coast Road	Maintenance of inland roads supporting the district relocation of families inland away from coastal hazard zone: The list of road maintenance from LTA include: Lotopu'e: Contsruction Access road / Emergency escape route Length: 1800 Estimated Cost: SAT$ 522,318.00 Re-construction of Access Roads for: Utufaalalafa: Length: 640m Est cost: SAT$ 230,400.00 Saleaumua Rd , Mutiatele RD and Malaela Rd Length: 2000 Est cost:SAT$ 720,000.00 each Satitoa Rd: Length:1660m Est cost: 597,600.00 ***Responsibility: LTA / MWTI / District***	*Improved rate of recovery *Improved coastal protection *Reduced potential for flooding in coastal areas *Improved lifeline access *Safer village houses and roads *Improved sustainability of natural resources *Improved safety and resilience of residents in the coastal hazard zones	LTA and MWTI should provide the design and close monitoring of road infrastructure development following the guidelines below: Programme road maintenance in budget and work programme Prepare assessment of road drainage systems 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) Programme road safety activities into budget and work programme National Infrastructure Strategic Plan (NISP) 2011	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Box Culvert	Reconstruction and upgrade works			

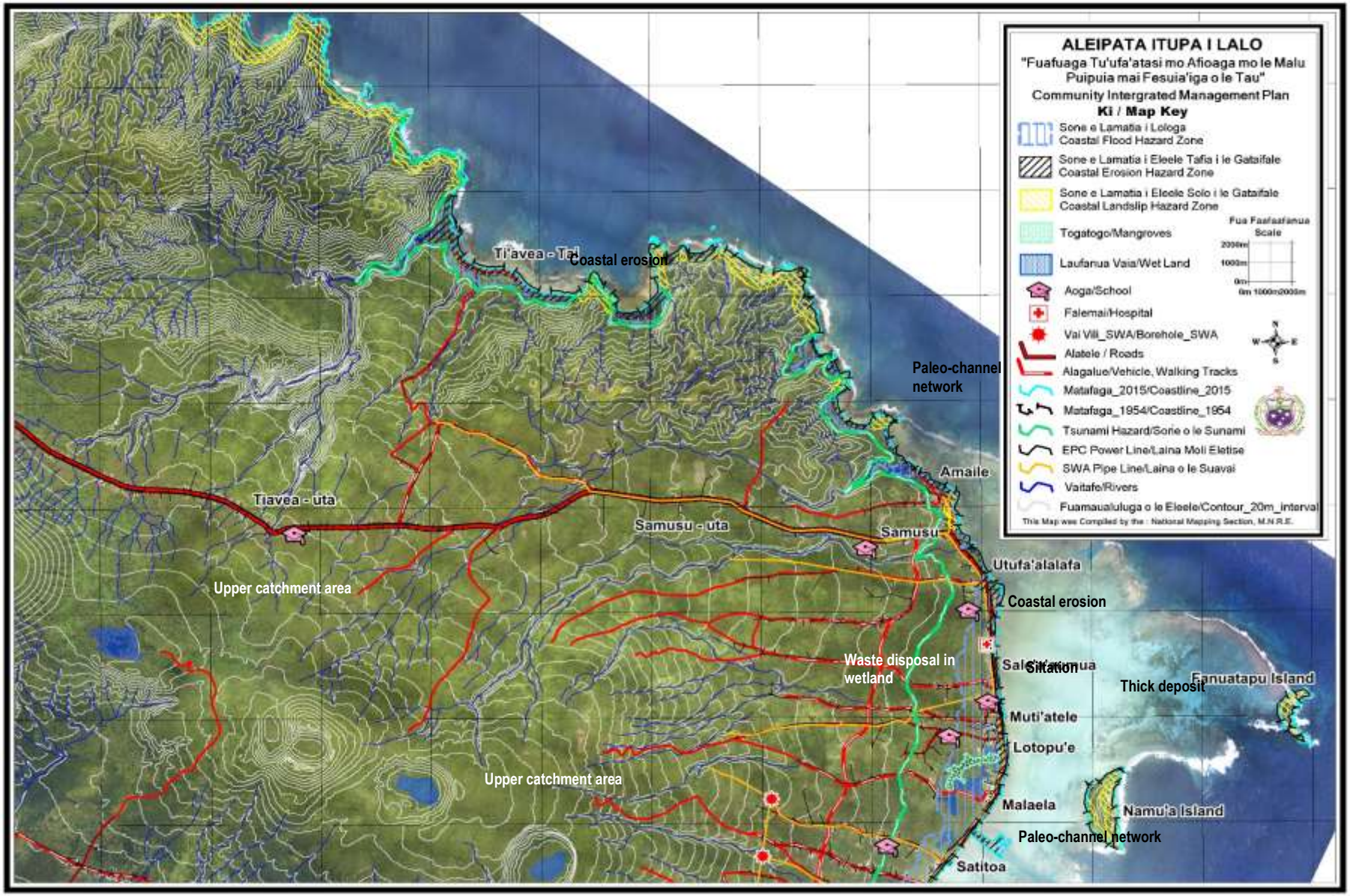
Proposed Airport at Tiavea	Construction of proposed airport at Tiavea ***Responsibility: LTA / MWTI***			
SWA (borehole)	Drill borehole in Saleaumua village and distribute piped water network to all families with limited or no access to water ***Responsibility: SWA***	Improve infrastructure resilience Climate proof the road transport network.	Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy SWA 10 Year Investment Plan	Water and Sanitation Sector Plan 2016-2020
Environment & Natural Resources	**Best Solution**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant to Sector Plans**
Marine Environment	Revived the Aleipata marine protected area that includes fish reserves, and mangrove, wetland rehabilitation: Implement an integrated coastal resource management program for the district covering all coastal communities Conduct community education and awareness program on the importance of marine ecosystems (coral reef, wetlands and mangroves) Strengthen existing village marine management plan with an over-arching district marine protected area management plan ***Responsibility: MAF / MNRE / District & Villages***	Improve sustainable livelihood and food security Natural barriers and protection from storm surges Increase biodiversity Improve ecological resilience of marine ecosystems Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	Community-based Fishery Plan NBSAP 2015-2020 Update existing Management Plans for Marine Protected Area	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Livelihood & Food Security	Best Solution	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Implement Sustainable land management practices. Implement integrated pest management programme Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF/ MNRE/villages***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security 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.	Agriculture Sector Plan 2016-2020

Governance	Solutions/ Issues	Guidelines to assist Implementation	Comment
Village By-laws	Implement village by-laws for community to follow and include protection of natural resources both marine and terrestrial ***Responsibility: Village / MWCSD***	MWCSD to provide assistance to district /village in developing by-laws Community Development 2016-2021	Support the development of village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.

Aleipata Itupa Lalo CIM Plan District Consultation covering nine villages

Aleipata Itupa Itupa I Lalo District Map



4.1 Ti'avea Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines 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 ***Responsibility: Village/Families / MWTI/MWCSD***	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 Application of National Building Code 2002 PUMA Act 2004	CIM Strategy (2015)
River Crossing on Main Ti'avea Road	Upgrade the current single lane river crossing which was previously completely washed out during a heavy rainfall event in 2014-2015 ***Responsibility: LTA***	Safer road *Improved lifeline access	LTA and MWTI should provide the design and close monitoring of road infrastructure development following the guidelines below: Programme road maintenance in budget and work programme Prepare assessment of road drainage systems Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Road upgrade and maintenance	Tar sealed Ti'avea-tai road and installed proper drainage Ti'avea-uta (box culvert) enlarge box culvert to accommodate large volume of water flow upstream and out into the sea. LTA Est Cost: SAT$350,000.00 Reconstruction of the village access / plantation road: Length: 1.8km Est Cost: SAT$648,000.00 Uafato to Tiavea construction of	*Improved rate of recovery *Improved coastal protection *Reduced potential for flooding in coastal areas *Safer village houses and roads *Improved sustainability of natural resources *Improved safety and resilience of residents in the coastal hazard zones		

	escape-route or access road: Length: 7.6km Est Cost:SAT 5,500,000.00 ***Responsibility: LTA / MWTI / Village***		Strategic Plan (NISP) 2011 Vulnerability Assessment of the Samoa Road Network (2017) Programme road safety activities into budget and work programme	
Rainwater harvesting systems (water tanks)	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. ***Responsibility: CSSP / UNDP-GEF SGP/NGO/ MWCSD / village***	Improve community adaptive capacity to respond to climate change impacts	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system. National Water Resources Management Strategy 2007-2017	Water and Sanitation Sector Plan 2016-2020

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Marine Reserve	Established fishery reserves and include tourism activities such as snorkeling Implement coral gardening Conduct training on village based monitoring programs for marine areas Implement all activities under the village Fisheries Management Plan Enforce Fisheries By Laws Implement program to remove crown of	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan Enforce Fisheries village by-laws	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

	thorns from inshore area ***Responsibility: MAF / MNRE / Village***			
Forest Loss (loss of indigenous forest due to cyclone damages and land clearance)	Replanting of native tree species in open fallow lands Rehabilitate fallow land and degraded area Implementation of replanting program for village of native tree species Implement replanting of coastal vegetation along the coastal area ***Responsibility: MNRE / village***	Reverse land degradation Improve coastal and inland biodiversity	MNRE-Forestry Division to provide advice to community on reforestation / restoration program by providing tree seedlings for planting. 2016-2020 National Forestry Plan NBSAP 2015-2020 NAP – Sustainable Land Management Plan 2015-2019 NBSAP 2015-2020 Forestry Management Act 2011 2 Million Tree Planting Strategy 2015 - 2020	National Environment Sector Plan 2017-2021 Restoration Operational Plan 2016-2020

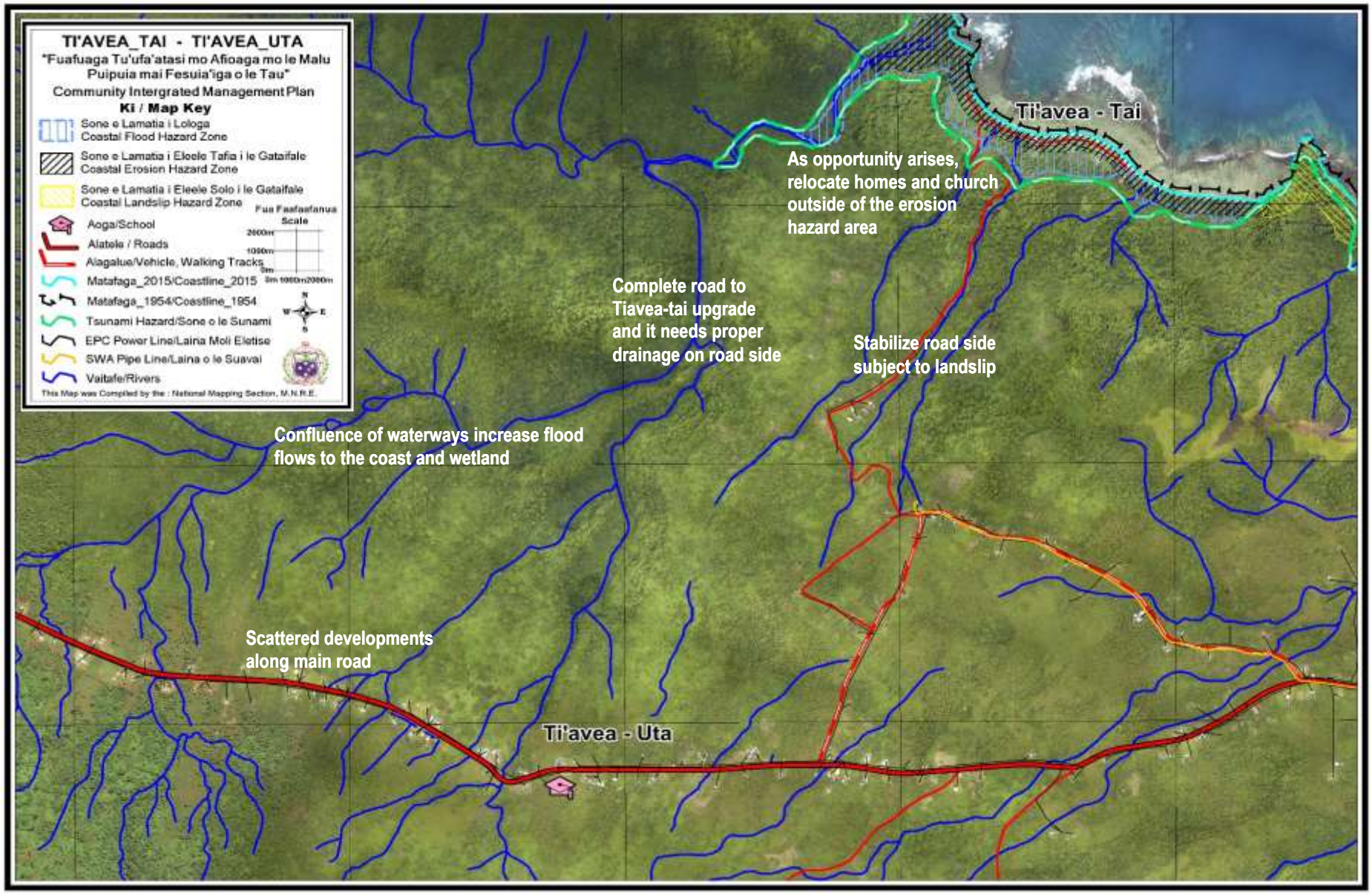
Livelihood and Food Security	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme Promote agro-	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership with	Agriculture Sector Plan 2016-2020

	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 Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***		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 Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

Village Governance	**Best Solutions and Other Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Village By-laws	Implement village by-laws for community to follow and include protection of natural resources both marine and terrestrial ***Responsibility: Village / MWCSD***	MWCSD to provide assistance to village in developing by-laws Community Development 2016-2021	Support the development of village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.

Tiavea-uta ford village request for rails on the side to ensure road safety

Tiavea Village Map



4.2 Samusu Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Rainwater harvesting systems (water tanks)	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. ***Responsibility: CSSP /NGO/ MWCSD / village***	Improve community adaptive capacity to respond to climate change impacts	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system. National Water Resources Management Strategy 2007-2017	Water and Sanitation Sector Plan 2016-2020
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 ***Responsibility: EPC / MWTI / Villages***	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
Box culvert upgrade Drainage	Install properly sized box culvert to accommodate heavy water flow and reduce risk of damaging bridge during extreme events	Improved rate of recovery Reduce potential for flooding in village areas Safer village houses and roads	LTA and MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system:	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

	Maintenance of road side drains and regular inspection of drainage system; ***Responsibility: MWCSD / District / Village / MWTI and LTA***	Improved safety community and resilience	Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure Strategic Plan (NISP) 2011 Programme road safety activities into budget and work programme Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Community Pool (Vai o Teine)	Request to rehabilitate the community pool because of its cultural significance and village use ***Responsibility: Village / CSSP / UNDP-GEF SGP / MNRE***	From the CIM Plan site assessment it was clearly noted that the pool is not filled with freshwater but instead dependent on high tide which fills the pool with seawater. This is not a climate resilience investment, but community can pursue the restoration of the pool through other funding mechanisms.
Access Road x2	Village requested to tar sealed two access roads ***Responsibility: Village / LTA***	The two access roads are located inland and there is not enough sufficient information for a climate resilience investment in the roads
Water Sources	Investigate the feasibility of drilling a borehole in the upper catchment area of the village where the Sigasiga waterfalls locate. ***Responsibility: MNRE-WRD***	It was noted from community observation and request their need to investigate if a borehole can be drilled inland given the abundance of freshwater. Drilling borehole would enable all families residing inland to have access to water.

Environment & Natural Resources	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Water Catchment	Conduct an assessment of the 4 waterfalls within the village (Fogaselesele, Aga Pe'ape'a, Lotopupula and Sigasiga) to examine possibility of sourcing community water Established a water catchment area for Samusu Develop a management plan Consultation with village on the water catchment Water quality testing ***Responsibility: MNRE /MWSCD – IWS / MoH / village***	Improve ecological resilience of watershed area	MNRE-DEC, WRD and Forestry Division to provide advice such as: Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project NBSAP 2015-2020 National Water Strategy Plan 2007-2017 Water Resources Management Act 2008 Restoration Operational Plan 2016 - 2020	National Environment Sector Plan 2017-2021 Water and Sanitation Sector Plan 2016-2020
Marine / Fisheries Reserve	Established fishery reserves Implement coral gardening Conduct training on village based monitoring programs for marine areas Implement all activities under the village Fisheries Management Plan	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

	Implement program to remove crown of thorns from inshore area ***Responsibility: MAF / Village***			

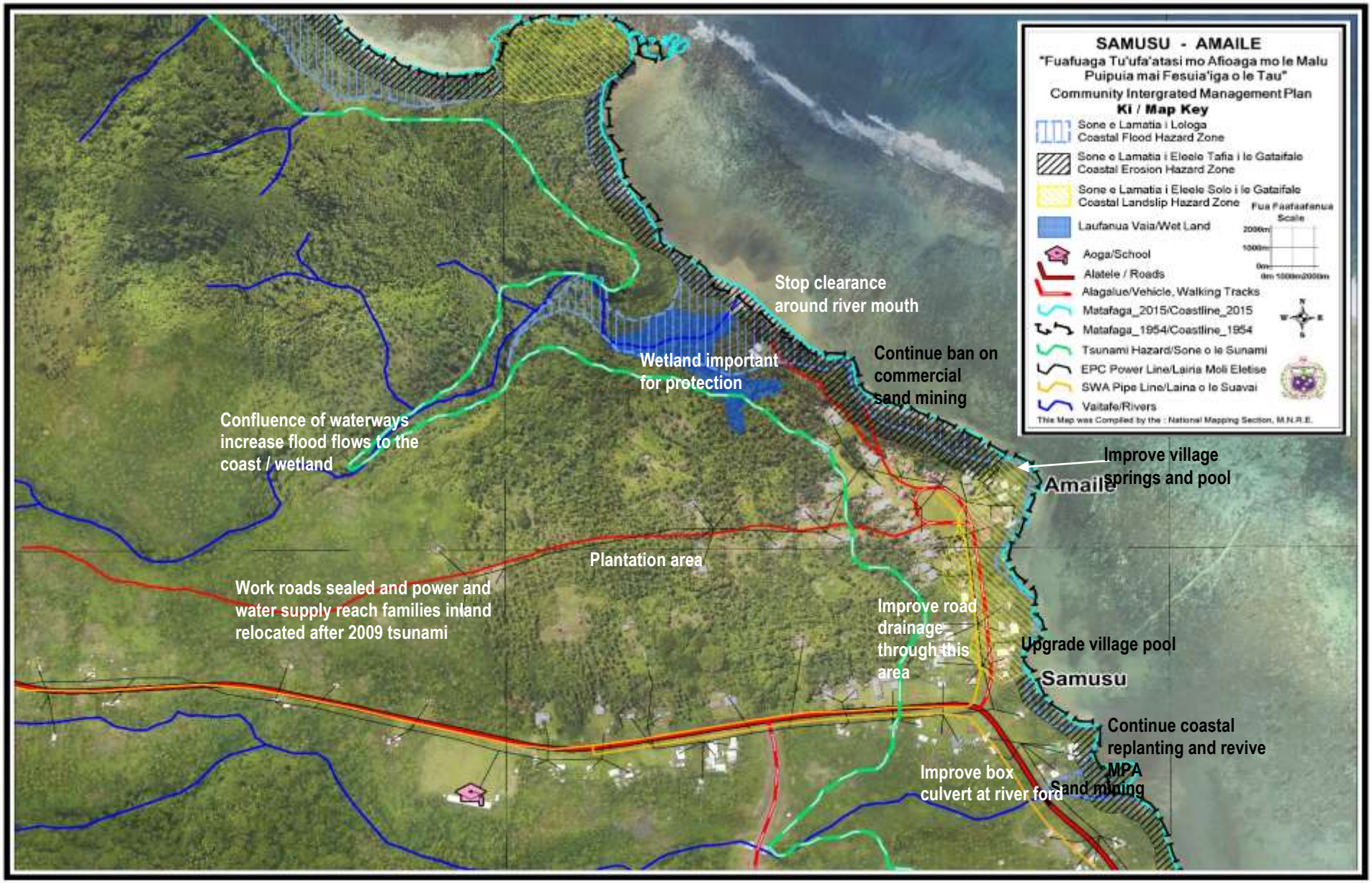
Livelihood and Food Security	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme 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 Implement a control program to manage	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security 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 Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018	Agriculture Sector Plan 2016-2020

	invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***		Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	
Gardening and Handicrafts	Request support for Women's vegetable garden program and handicraft activities for income generation ***Responsibility: MWCSD / WIBDI / Village***	Increase opportunities for income benefits	Implementation and support should follow guidelines from relevant agencies	Community Development Plan 2016-2021

Village Governance	**Best Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Village By-laws	Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial ***Responsibility: Village / MWCSD***	MWCSD 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.
Drainage	Undertake village inspection of culverts along main roads; - Implement district/village drainage/ culvert clean-up and awareness program ***Responsibility: Village***	MWCSD to provide assistance to district /village in developing by-laws Community Development 2016-2021	Village council and women's committee undertake responsibility of ensuring that drainages and culverts are cleared to reduce impact of flooding

Degraded Vai o Teine coastal spring Samusu

Samusu Village Map



4.3 Amaile Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access road	Extend sealing of access road and to connect with inland parallel road to other villages; Include drainage in the design of the access road extension Request other service infrastructure ***Responsibility: LTA / MWTI / village***	Improve rate of recovery Increase number of families relocate to higher grounds	Construction of access roads should be guided by government requirements as stated in the following policies, strategies and action plans: Environmental and Social Safeguard policy National Infrastructure Strategic Plan (NISP) 2011 Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) Vulnerability Assessment of the Samoa Road Network (2017) Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Coastal community pool (Vai o Tama)	Implement the rock wall around the coastal spring to protect drinking water; Installed wave breakers in the inshore area opposite the beachfront or land to help reduce strong wave energy when it reaches coastal area	Back-up source of alternative water supply Families continue to cart drinking water from the source, improved structure will make more freshwater available	Prepare a design for a rock wall that can withstand strong waves; Village pool maintenance should be guided by National Beautification program	Community Development Plan 2016-2021 Water and Sanitation Sector Plan 2016-2020

	Ensure sanitation measures are in place for families living above the pool ***Responsibility: Village/MNRE/ CSSP / UNDP-GEF SGP***		Apply Environmental Social Safeguards when designing the wall structure for the pool	
Water	Conduct water quality testing for the village Ongoing monitoring program on water supply to the village. ***Responsibility: SWA/MoH***	Improve water quality for consumption Reduce cases of communicable diseases	SWA to provide support to communities through: Monitoring water network service and supply	Water and Sanitation Sector Plan 2016-2020
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 ***Responsibility: EPC / MWTI / Villages***	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
Evacuation Shelter	DMO to conduct assessment of existing buildings within the village located away from the hazard zone to identify a suitable building for Evacuation Shelter, prior to considering following request. Request building a Evacuation Shelter house (evacuation center) further inland	Improve public facility used by communities for safety during times of natural disasters	Emergency house or shelters priority are given to existing buildings within the village that suits the criteria for a Evacuation Shelter and are retrofit for this purpose, and most targeted are school buildings.	National Disaster Management Plan 2017-2021

	to be managed by the Women's Committee away from the hazard zone and use during times of natural disasters and emergency. ***Responsibility: MNRE-DMO / MWCSD / Village***			
Rainwater harvesting systems (water tanks)	Implement the installation of water tanks for families without access to water for consumption and domestic use ***Responsibility: CSSP / MWCSD / village***	Improve community adaptive capacity to respond to climate change impacts Provide alternative water source for families	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system. National Water Resources Management Strategy 2007-2017	Water and Sanitation Sector Plan 2016-2020

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Vai o Tama	Build a seawall or retaining wall around the coastal pool to protect it from getting inundated with seawater Test quality of drinking water located under the cave the second small pool ***Responsibility: MNRE / MWTI / MoH/ CSSP / UNDP-GEF SGP /Village***	The pool is used by the community daily and the last two major events Tsunami 2009 and TC Evan 2012 caused a lot of damages and deterioration of the pool. The drinking water is not used as there is very strong potential for salinity given the sea level rise that feeds into the pool during high tide. Community should maintain the pool since they are using it daily and building a wall structure to strengthen protection of the pool is a good maintenance option. However it is not a climate resilience investment since the current location of the pool makes it susceptible to strong wave energy and the pool will continue to erode regardless of the wall structure being built, the village will be doing this as part of maintenance. A possible option is to installed wave breakers behind the pool and along the inshore area to help reduce the strong wave energy before it hits the pool and landarea. Another concern is the drinking water section of the pool which is beneath the cave and on top are residential areas with lavatories. There is possibility of water contamination.
Bridge / Ford	Build a small bridge or ford for walking on Masa Vai to connect the village for easy crossing	The village requested the possibility of building a ford or bridge across Masa Vai for easy access during times of high tide or strong storm surges. Masa Vai is the estuary or river channel that runs

	Responsibility: LTA / MWTI	into the sea on the other side of the village with not much residential area but some people cross this river channel to reach their plantations or when taking tours for site seeing in some cultural heritage sites located in the village. The problem is during heavy rain or when it is high tide no one can cross the Masa Vai and it is a loss for tour operators as well as people getting to their plantations. In the long term a small bridge or ford for walking should be considered but further inland and not the river channel along the beach.

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Marine / Fisheries Reserve	Re-established fishery reserves Implement coral gardening Conduct training on village based monitoring programs for marine areas Develop a Fisheries Management Plan Enforce fisheries by Laws Implement program to remove crown of thorns / seaweed from inshore area ***Responsibility: MAF / Village***	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Fisheries to conduct an assessment on the most suitable location for a marine reserve Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021
Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Extractive industries	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs Incorporate environmental	National Environment Sector Plan 2017 - 2021

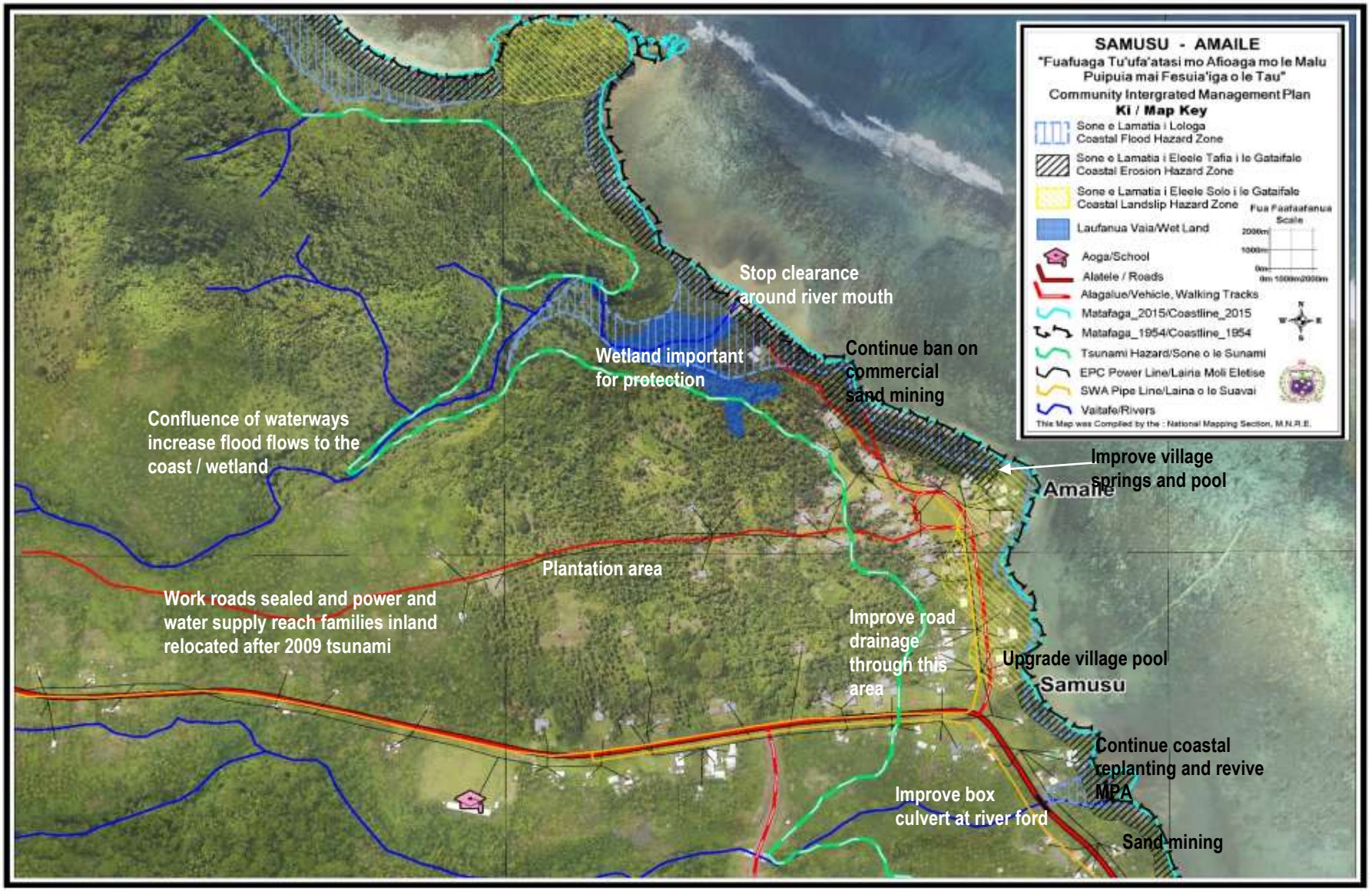
	(mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation Responsibility: MNRE / District & Village	Improve village resource management and sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable management of sand as a natural resource	and social safeguards concerns including consultations with any affected community Village environmental management plans established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	
Natural Cultural Heritage	Implement a village joint program with MNRE and MESC to protect cultural heritage sites: Fagatagi Laumei Aga Pe'ape'a Waterfalls – Tulua, Fogaseela and Lafogamalie and natural spring Tauolosina Conduct a site assessment to determine methodology used in	Preservation of cultural heritage sites can contribute to improve biodiversity in the area and leads to ecological resilience of ecosystem	MNRE / MESC to guide the preservation of the area through: Application of Environmental Social Safeguard if needed National Water Resource Strategy 2007-2017 Water Resources Management Act 2008	National Environment Sector Plan 2017-2021 Community Development Plan 2016-2021

	the preservation of these heritage sites Conduct consultation on the water catchment areas ***Responsibility: MNRE / MWCSD / MESC / NUS / Village***			

Village Governance	**Best Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Village By-laws	Implement village by-laws for community to follow and include protection of natural resources both marine and terrestrial. Implement the CIM Plans ***Responsibility: Village / MWCSD***	MWCSD to provide assistance to 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.

Vai o Tama Amaile village coastal spring water level dependent on high tide and drinking water has high risk of seawater intrusion

Amaile Village Map



4.4 Utufaalalafa Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines 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 ***Responsibility: Village/Families / MWTI/MWCSD***	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 Application of National Building Code 2002 PUMA Act 2004	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 Aleipata Itupa I Lalo Length: 640 m Estimated Cost: SAT$ 230,400.00 ***Responsibility: LTA / MWTI / village***	Improve rate of recovery Increase number of families relocate to higher grounds	LTA ensure that construction of access roads are guided by the following: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure Strategic Plan (NISP) 2011 Vulnerability Assessment of the Samoa Road Network (2017) Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

Water Access for all	Extend the main pipeline network to the remaining families inland without access to water. ***Responsibility: SWA / Village***	Improve access to clean water	Works implemented in extending the piped water network should follow national polices and strategies: Application of the Environmental Social Safeguard SWA 10 year Investment Plan	Water and Sanitation Sector Plan 2016-2021
Rainwater harvesting (water tanks)	Implement the installation of water tanks for families without access to water for consumption and domestic use ***Responsibility: CSSP / MWCSD / village***	Improve community adaptive capacity to respond to climate change impacts Provide alternative water source for families	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system. National Water Resources Management Strategy 2007-2017	
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 ***Responsibility: EPC / MWTI / Villages***	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
Drainage	Maintenance of road side drains and regular inspection of drainage system;	Improved rate of recovery Reduce potential for flooding in village	MWTI to provide advice and guidance using the following documents and work programme to	Community Integrated Management Strategy, August 2015

	Responsibility: MWCSD / District / Village / MWTI and LTA	areas Safer village houses and roads Improved safety community and resilience	support the management of drainage system: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure Strategic Plan (NISP) 2011 Programme road safety activities into budget and work programme Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	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 ***Responsibility: Village / MNRE / MWCSD / STA***	Village representatives raised concern with regards to the poor collection of rubbish from village stands by the contractors

Coastal Spring	Rehabilitate coastal spring that was used by villages prior to piped water ***Responsibility: MNRE / MWTI / village***	We visited the site and there is no coastal spring the area is covered with sand deposits and most of the coastal area has eroded with no beachfront.

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Coastal Restoration	Implement replanting of the coastal area with coastal vegetation ***Responsibility: MNRE / village***	Improve natural barriers and resilience of coastal area reduce coastal erosion	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020 National Forestry Plan 2016-2020 Restoration Operational Plan 2016 – 2020 2 Million Tree Strategy 2015 - 2020 Forestry Management Act 2011	National Environment Sector Plan 2017-2021 Restoration Operational Plan 2016-2020
Forest Loss	Protect a 100m buffer zone between ravines and land used for plantations and cattle farms Replant native trees in fallow lands and encourage native regrowth ***Responsibilities: MNRE / village***	Improve resilient of forest ecosystem Increase biodiversity		
Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction Improve village resource management and sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community Village environmental management plans	National Environment Sector Plan 2017 - 2021

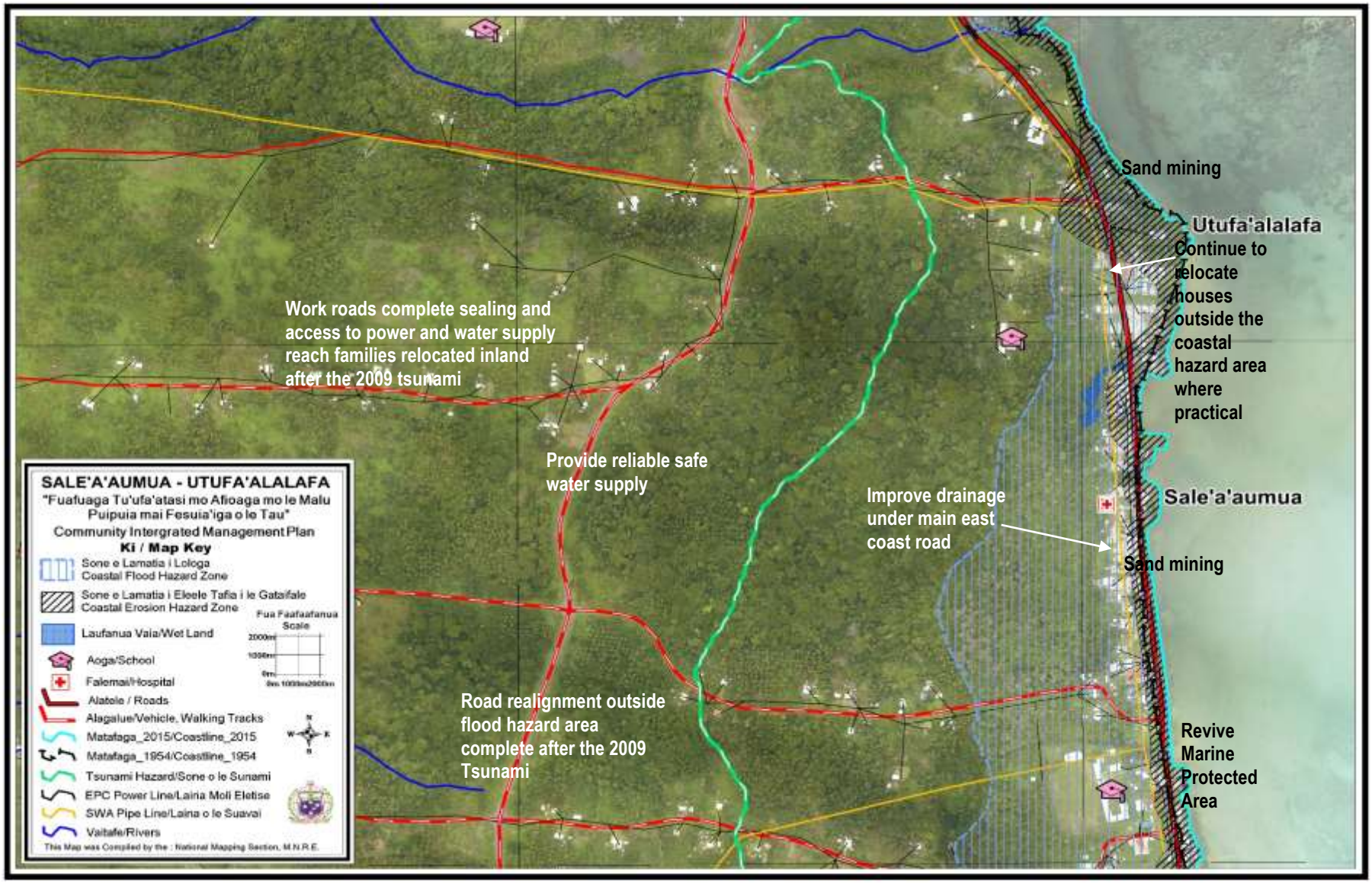
	Mass media awareness on sustainable sand mining practices Develop sand mining regulation ***Responsibility: MNRE / District & Village***	management of sand as a natural resource	established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	

Livelihood and Food Security	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Pesticides	Enforced banned on the use of pesticides in plantations Village promote organic farming ***Responsibility: MAF/ MoH / Village***	Improve soil fertility Improve healthy living	Implementation of actions to stop the use of pesticide should be guided by: NBSAP 2015-2020	National Environment Sector Plan 2017-2021 Agriculture Sector Plan 2016-2020 Community Development Plan 2016-2021
Women's vegetable gardening	Continued women's vegetable gardening program ***Responsibility*: *MAF / MoH/ village***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	Women's Vegetable garden program: Follow National Health Service Nutrition Program	

Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Implement CIM Plans ***Responsibility*: *MWCSD / Villages***	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.
Drainage	Undertake village inspection of culverts along main roads; - Implement district/village drainage/ culvert clean-up and awareness program	MWCSD to provide assistance to district /village in developing by-laws Community Development 2016-2021	Village council and women's committee lead the monitoring of drainage and culverts clean-up

Utufaalalafa coastal spring village wanted to rehabilitate and the current status the pool has dried up and it cannot be restored

Utufalalafa Village Map



4.5 Saleaaumua Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
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 Aleipata Itupa I Lalo Length: 2000m Estimated Cost: SAT$ 720,000.00 Extend road seal (access road) to connect with inland parallel road, Assess the feasibility of sealing the road to the Primary School ***Responsibility: LTA / MWTI / village***	Improve rate of recovery Increase number of families relocate to higher grounds	LTA ensure that construction of access roads are 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
Drainage	Maintenance of road side drains and regular inspection of drainage system; -Implement new properly sized outlets and drainage channels resulting from inland development which include families located in natural waterways etc Ensure surface runoff is properly channeled to the ocean	Improved rate of recovery Reduce potential for flooding in village areas Safer village houses and roads Improved safety community and resilience	MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) National Infrastructure Strategic Plan (NISP)	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

	Build proper drainage system to drain surface runoff and wetland into the sea ***Responsibility: MWCSD / District / Village / MWTI and LTA***		2011 Review of National Road Standards in Samoa (2016) Programme road safety activities into budget and work programme Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	
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 ***Responsibility: EPC / MWTI / Villages***	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
Rainwater harvesting (water tanks)	Implement the installation of water tanks for families without access to water for consumption and domestic use as immediate option	Improve community adaptive capacity to respond to climate change impacts Provide alternative water source for families	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system. National Water Resources Management Strategy 2007-2017	Water and Sanitation Sector Plan 2016-2020

	Responsibility: CSSP /UNDP-GEF SGP/ MWCSD / village			
SWA piped water network	SWA to installed piped water network from borehole / water intake to reach all families	Access to water for all	Implementation of the SWA 10 Year investment plan	Water and Sanitation Sector Plan 2016-2020

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment / Livelihood	**Solutions/ Issues**	**Comment**
Primary School relocation	If the Primary School building is to be upgraded it is best to relocate away from coastal hazard zone ***Responsibility: MESC / MWTI / Village***	The Primary School is currently located within the coastal hazard zone and they want to tar sealed road to school. Village also requested that in future they would like the Primary School relocated further inland away from coastal hazard zone.
Seawall	Seawall has resulted in the increase coastal erosion ***Responsibility: MNRE / MWTI / Village***	Village commented that prior to having a seawall the coastal area didn't have much coastal erosion like how it is now. There is a need for coastal replanting to help stabilize the soil in the coastal area.

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Coastal Restoration	Implement replanting of the coastal area with coastal vegetation ***Responsibility: MNRE / MAF-Fisheries /village***	Improve natural barriers and resilience of coastal area reduce coastal erosion	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020 2 Million Tree Replanting Strategy 2015 -2 020	National Environment Sector Plan 2017-2021
Marine / Fisheries Reserve	Re-established 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	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

	Develop a Fisheries Management Plan Implement program to remove crown of thorns / seaweed from inshore area ***Responsibility: MAF / Village***	to combat climate change Reduce loss of marine habitats	NBSAP 2015-2020 Update village Fisheries Management Plan	
Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation ***Responsibility: MNRE / District & Village***	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction Improve village resource management and sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable management of sand as a natural resource	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community Village environmental management plans established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management	National Environment Sector Plan 2017 - 2021

			Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	
Forest Loss	Protect a 100m buffer zone between ravines and land used for plantations and cattle farms Replant native trees in fallow lands and encourage native regrowth (refer previous intervention) ***Responsibilities: MNRE / village***	Improve resilient of forest ecosystem Increase biodiversity	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020 National Forestry Plan 2016-2020 Forestry Management Act 2011 2 Million Tree Replanting Strategy 2015 -2 020	National Environment Sector Plan 2017-2021 Restoration Operational Plan 2016-2020
Wetland	Clean-up drainage to allow for water flushing Conduct an assessment of wetland biodiversity to take stock of species and status ***Responsibility: MNRE / MWTI / village***	Reduce risk of flooding and ponding Improve wetland biodiversity	Implementation of solutions to be guided by: NBSAP 2015-2020	National Environment Sector Plan 2017-2021
Waste Management	Implement waste management program: Village clean-up of waterways and around households Conduct waste awareness and education programs Ensure the rubbish collection is consistent to collect rubbish ***Responsibility: MNRE/MWCSD / Village***	Improve hygiene and sanitation	Implementation of solutions to be guided by: Waste Management Policy 2008 NBSAP 2015-2020 Waste Management Act 2010 Hazardous Waste and Chemicals Waste Management Policy 2012	National Environment Sector Plan 2017-2021

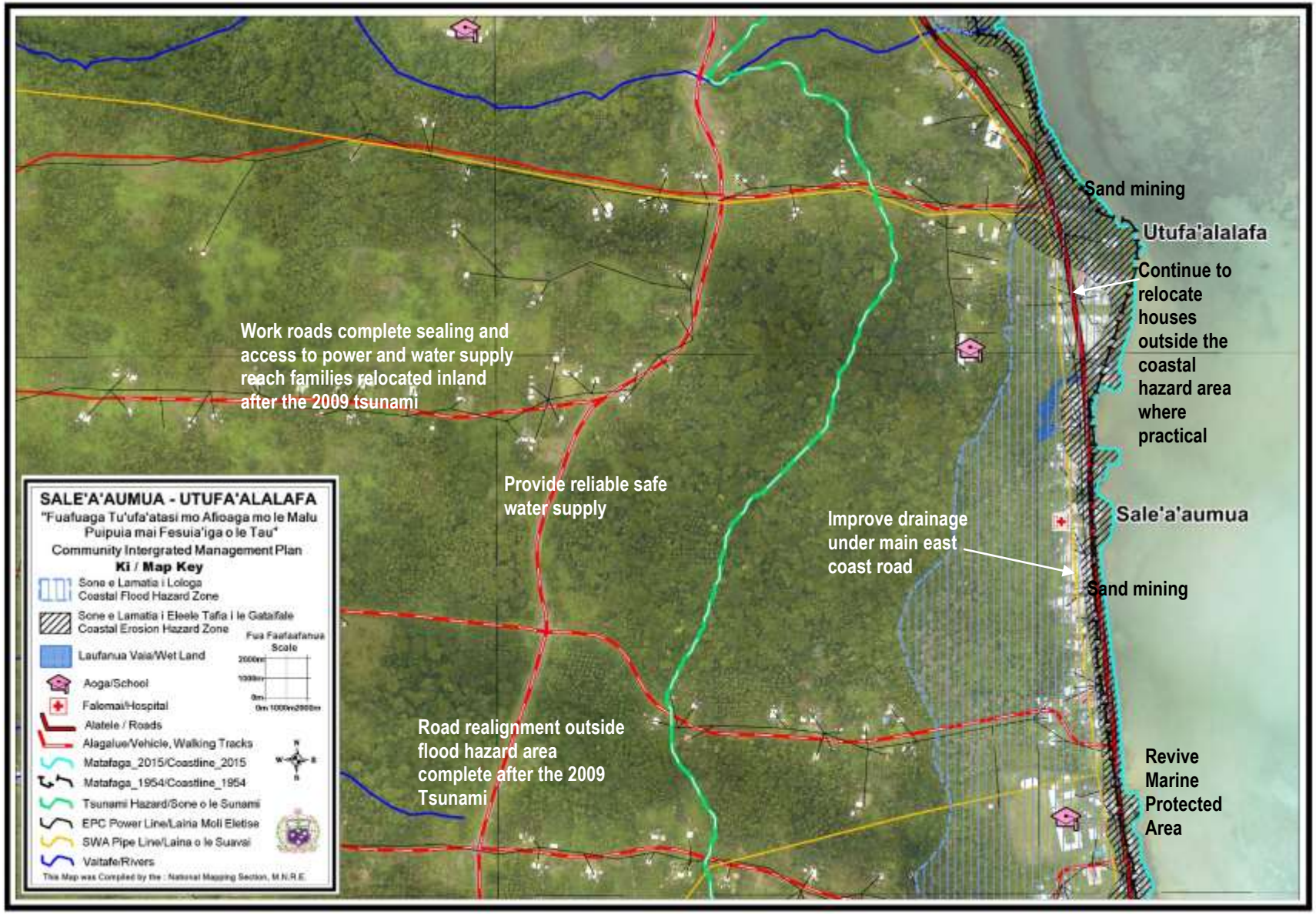
Livelihood and Food Security	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Invasive pests	Implement control or eradication programs to remove or managed invasive weeds and pests, causing damages to taro and banana plantations: *merremmia peltata* (fue lautetele) *Mikania micrantha* (fue saina), insects, African snail, myna birds. Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations (refer previous comments) ***Responsibility: MNRE / village***	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
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. Need awareness on the usefulness of seaweed dominating much of the inshore area Enforce Fisheries By-Laws Installed floating poles to mark area of Marine Reserve	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

	Responsibility*: *MAF / village			
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme 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 Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security 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 Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020	Agriculture Sector Plan 2016-2020

			National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

Village Governance	**Best Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Drainage	Undertake village inspection of culverts along main roads; - Implement district/village drainage/ culvert clean-up and awareness program ***Responsibility: Village***	MWCSD to provide assistance to district /village in developing by-laws Community Development 2016-2021	Village council and women's committee lead the clean-up of drainages and monitoring
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Village council enforce these rules for ensuring sustainable management of natural resources: Livestock – pigs are penned no free roaming, cattle farms should be fenced no free roaming cows; and horses not allowed to roam freely. Village fines are imposed on families with free roaming animals; Banned on the use of flashlights and spearhead fishing at night – impose fine on anyone who conducts these type of fishing activity Need to demarcate village boundaries for marine area to avoid illegal fishing Women committee conduct site visit to families to ensure cleanliness ***Responsibility*: *MWCSD / Villages***	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae " refer Clause 5 Amendment". Fisheries Village By-laws	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.

Saleaaumua Village Map



4.6 Mutiatele Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access road	Reconstruction and sealing of village access/plantation road up to the last EPC installed post. Costing was in LTA list of pipeline access road for Aleipata Itupa I Lalo Length: 2km Estimated Cost: SAT$ 720,000.00 ***Responsibility: LTA / MWTI / village***	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) National Infrastructure Strategic Plan (NISP) 2011 Vulnerability Assessment of the Samoa Road Network (2017) Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
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 ***Responsibility: Village/Families / MWTI/MWCSD***	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 Application of National Building Code 2002 PUMA Act 2004	CIM Strategy (2015)

Evacuation Shelter	DMO to conduct assessment of existing buildings within the village located away from the hazard zone to identify a suitable building for Evacuation Shelter, prior to considering following request. Request building an Evacuation Shelter 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. ***Responsibility: MNRE -DMO/ MWCSD / Village***	Improve public facility used by communities for safety during times of natural disasters	Emergency house or shelters priority are given to existing buildings within the village that suits the criteria for a Evacuation Shelter and are retrofit for this purpose, and most targeted are school buildings.	National Disaster Management Plan 2017-2021
Drainage (culverts)	Maintenance of road side drains and regular inspection of drainage system; -Implement new properly sized outlets culverts and drainage channels to allow the free flow of water from wetland into the sea and vice versa Build proper drainage system to drain surface water runoff and wetland between Mutiatele – Lotopue into the sea ***Responsibility: /Village / MWTI/ LTA/MNRE***	Improved rate of recovery Reduce risk of ponding and flooding which affects both villages Safer village houses and roads Improved safety community and resilience Climate proofing road	MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) National Infrastructure Strategic Plan (NISP) 2011 Review of National Road Standards in Samoa (2016) Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

			Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions/ Issues	Comment
Seawall	Upgrade existing seawall ***Responsibility: MWTI / LTA / MNRE / Village***	This is not a climate resilience solution, as noted from the area there has been much reclamation along the village coastline. Upgrading the seawall would be a maladaptation action.

Environment & Natural Resources	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine Protected Area	Re-established fishery reserves as part of the MPA: Map out area for Fisheries Reserve and whole Aleipata MPA Implement coral gardening Conduct training on village based monitoring programs for marine areas Develop a Fisheries Management Plan (refer previous comments) Implement program to remove crown of thorns / seaweed from inshore area ***Responsibility: MAF / Village***	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation Responsibility: MNRE / District & Village	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction Improve village resource management and sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable management of sand as a natural resource	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community Village environmental management plans established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	National Environment Sector Plan 2017 - 2021

Livelihood and Food Security	Best Solutions s 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 (previous comments ***Responsibility: MNRE / village***	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	Draft NESP 2017-2021
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private	Agriculture Sector Plan 2016-2020

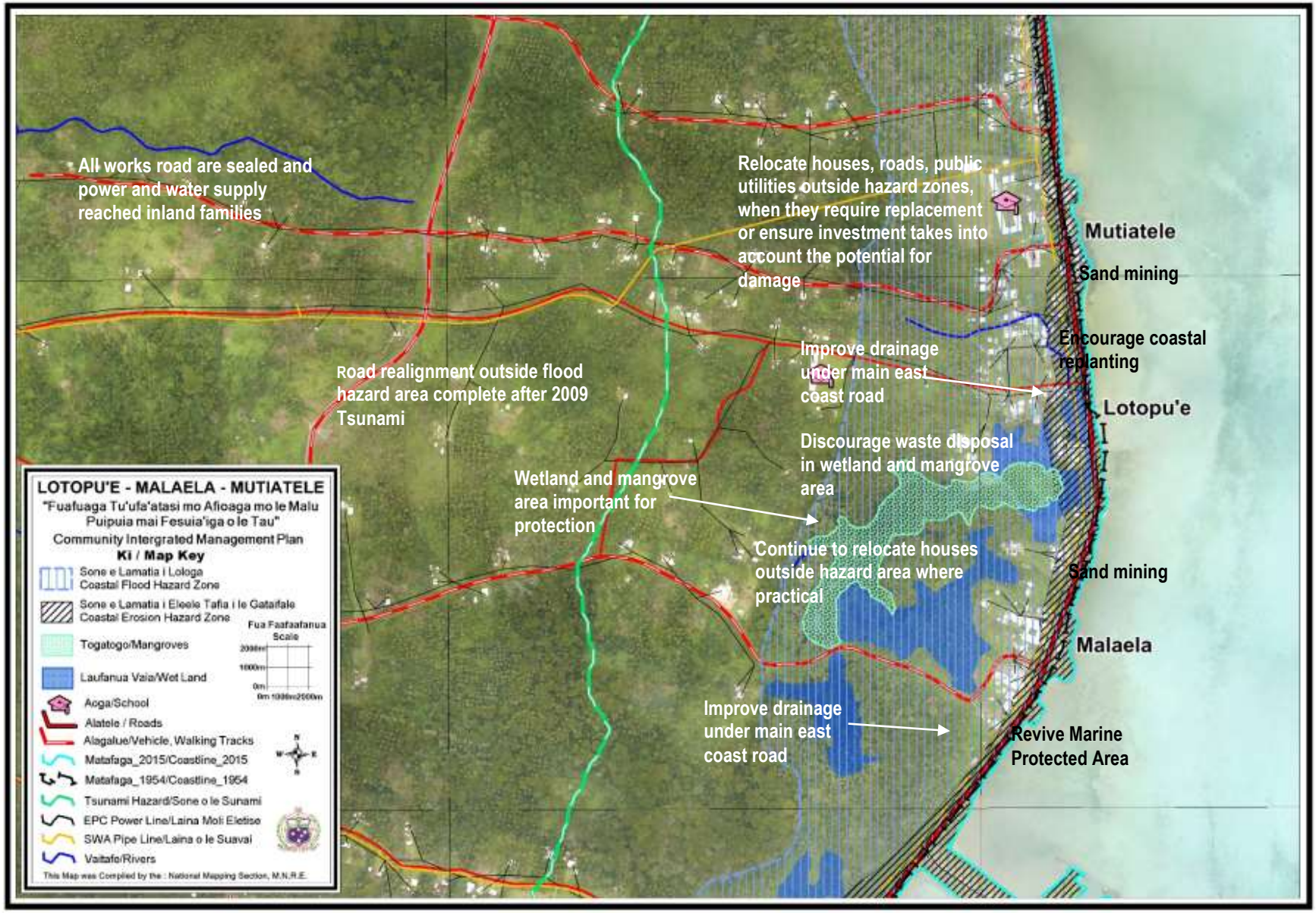
	Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***		sector to support rural farmers through training opportunities and marketing productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

Village Governance	**Best Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Drainage	Undertake village inspection of culverts along main roads; - Implement district/village drainage/ culvert clean-up and awareness program ***Responsibility: Village***	MWCSD to provide assistance to district /village in developing by-laws Community Development 2016-2021	Village council and Women's committee lead the monitoring and enforcing of drainage clean-up
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Village by-laws include: • Banned on inshore fishing by outsiders except for village people • No dynamiting allowed / illegal • Banned on cutting	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

	down native trees in the forest • Banned on any family reclaiming drainage area bordering village of Mutiatele and Lotopue and Malaela (need permit) ***Responsibility*: *MWCSD / Villages***		constitution.

Wetland infront of Mutiatele Aleipata Itupa Lalo District College – wetland is poorly managed and used as rubbish dump

Mutiatele Village Map



4.7 Malaelā Village Interventions

Infrastructure	Best Solutions s Proposed	Other Benefits	Guidelines 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 ***Responsibility: Village/Families / MWTI/MWCSD***	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	Reconstruction and sealing of village access/plantation road and to families residing along inland road to Tafetafe and Mauga: Costing was in LTA list of pipeline roads for Malaela Length: 2km Estimated Cost: SAT$ 720,000.00 ***Responsibility: LTA / MWTI / village***	Improve rate of recovery Increase number of families relocate to higher grounds Boost utilization of lands for farming	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

Culverts (bridge)	Installed properly sized outlets culverts or heavy duty water piping that can accommodate the volume of water outflow from wetland and inflow from sea, Build proper drainage system and widen bridge to drain surface water runoff and wetland between Malaela – Lotopue into the sea ***Responsibility: MWCSD / District / Village / MWTI and LTA***	Improved rate of recovery Reduce risk of ponding and flooding which affects both villages Safer village houses and roads Improved safety community and resilience Climate proofing road	MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure Strategic Plan (NISP) 2011 Programme road safety activities into budget and work programme Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
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	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	Samoa Energy Sector Plan 2017-2022

	Responsibility: EPC / MWTI / Villages		Consider energy efficiency developments for communities using renewable energy guided by existing framework – Development of a Renewable Energy and Energy Efficiency Framework, 2016	

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Water Reservoir	Reconstruction of the old existing reservoir tank located at Satitoa for water supply back-up when there is limited water availability during dry season or drought. ***Responsibility: SWA***	Old existing reservoir tank located at Satitoa village used to be the main water source feeding Malaela in the past but somehow abandoned at this stage. The village is requesting that reconstruction of this water tank would provide back-up water source supply for the village during drought.

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

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

			(draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	
Coastal Restoration	Implement replanting of the coastal area with coastal vegetation ***Responsibility: MNRE / MAF-Fisheries /village***	Improve natural barriers and resilience of coastal area reduce coastal erosion	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020	Draft NESP 2017-2021
Clean-up of Mangrove Ecosystem	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. Conduct a major clean-up of the invasive water lily clogging up the mangrove waterways Declaration of the mangrove ecosystem as a conservation site under RAMSAR Convention Replanting of mangrove ecosystem using existing native species ***Responsibility: MNRE / /village***	Increase ecological resilience of mangrove ecosystem Mangrove clean-up and water lily eradication will improve the water quality and circulation for the Lilly Natural Spring	MNRE – DEC to provide guidance and advice of clean-up of natural habitats NBSAP 2015-2020 Community based fisheries management plan	National Environment Sector Plan 2017-2021

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:	Reduce impact of invasive species on forest Increase number of native trees reforestation	Implementation of invasive species program should be guided by: NBSAP 2015-2020	National Environment Sector Plan 2017-2021

	merremia peltata (fue lautetele), insects, African snail, myna birds. Conduct awareness and education community programs on the adverse impact of invasive alien pests on plantations (refer previous comments) ***Responsibility: MNRE / village***	Improve soil stability	National Invasive Species Plan 2008-2011	
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme 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	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security 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	Agriculture Sector Plan 2016-2020

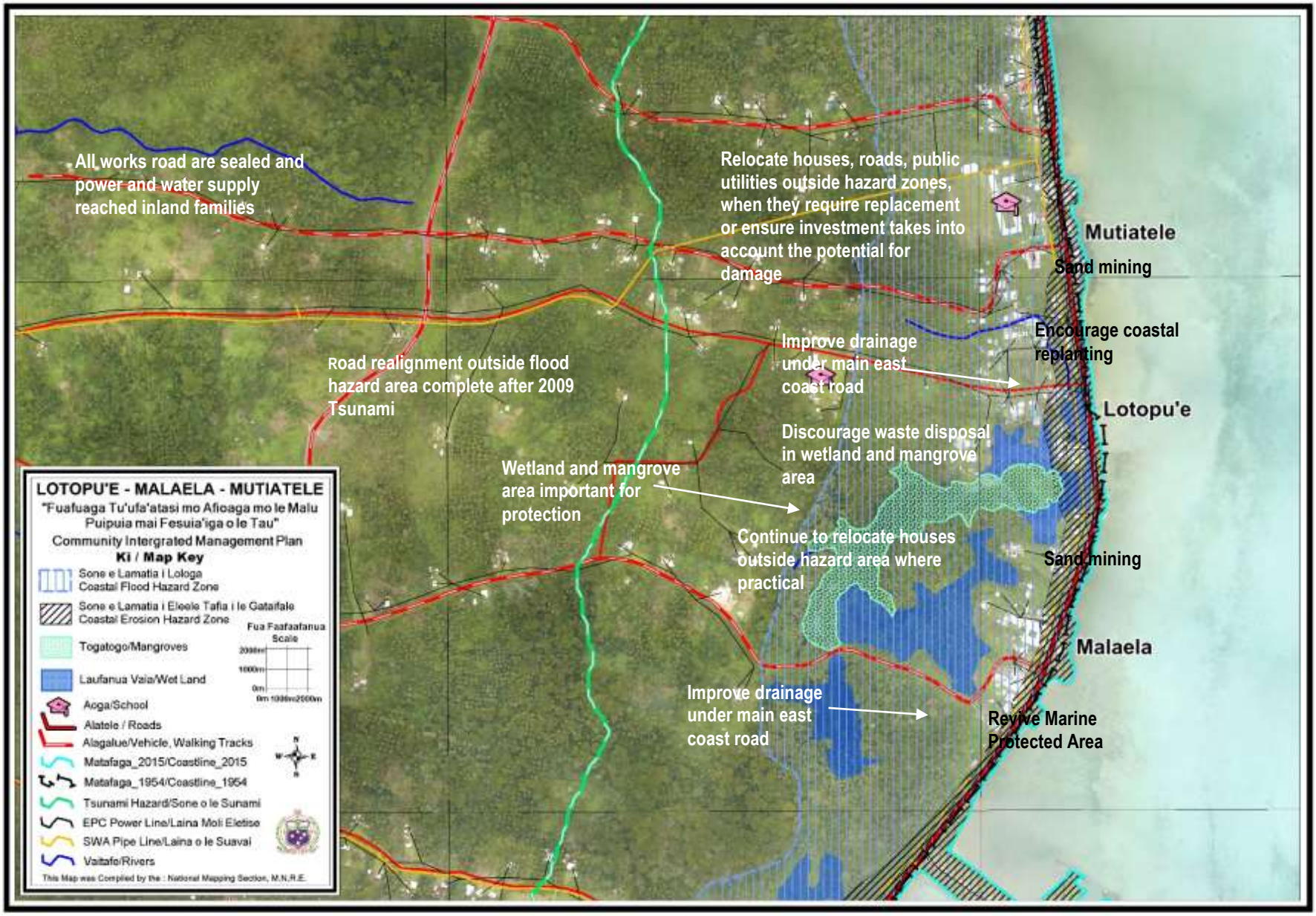
	Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***		Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

Village Governance	**Best Solutions Proposed**	**Guidelines to assist Implementation**	**Comments**
Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Village by-laws include the following: Banned dynamite fishing, sand mining, washing and bathing in village pool on Sunday and illegal drugs and fire arms; Monday is observed for village meetings Waste Management Program: - Village monitoring of all families to ensure clean-up of family households/backyards etc - Domesticated animals such as pigs are expected to in a pig-sty / penned and families only allowed to have 2 dogs (pets) Health Program: -Village clean-up contribute to	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.

	improve hygiene and sanitation, reduce risk from communicable disease caused by poor waste disposal and areas of ponding; - Sanitation places in good condition no leaked septic tanks ***Responsibility*: *MWCSD / Villages***		
CDCRM (Community Disaster and Climate Risk Management) program Life Jackets	Implement CDCRM Program for preparation in the event of a disaster Conduct more timely drills for emergency preparedness for village reactive response to extreme events and natural disasters, atleast every 3 months. Disseminate life jackets to households on the coast and fishermen as part of ***Responsibility: MNRE / MWCSD /village***	National Disaster Management Plan 2017-2021	

Invasive water lilies blocking the freshwater circulation within mangrove area and pushing culverts above water – need to remove lilies from pond

Malaela Village Map



4.8 Lotopu'ē Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines 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 ***Responsibility: Village/Families / MWTI/MWCSD***	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)
Culverts (bridge)	Consider implementation of recommendation from DMO hazard assessment for suitable sized outlets culverts that can accommodate the volume of water outflow from wetland and inflow from sea, Implement drainage system and widen bridge to drain surface water runoff and wetland Lotopu'e into the sea ***Responsibility: MWTI/LTA /MNRE-DMO// Village /***	Improved rate of recovery Reduce risk of ponding and flooding which affects both villages Safer village houses and roads Improved safety community and resilience Climate proofing road	MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system including the MNRE DMO hazard assessment report: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) National Infrastructure Strategic Plan (NISP) 2011 Review of National Road Standards in Samoa (2016) Programme road safety activities into budget and work programme	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

			Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Seawall	Upgrade existing seawall ***Responsibility: MWTI / LTA / MNRE / Village***	This is not a climate resilience solution, as noted from the area there has been much reclamation along the village coastline. Upgrading the seawall would be a maladaptation action.
Vai o Vāvāō River	Restore the river as it has cultural significance ***Responsibility: MWTI / MNRE /Village***	The river is located between Lotopu'e and Mutiatele, much of the river has been reclaimed and families on one side dumped all their rubbish into the river, as well as poor sanitation leaks into the river. There is a need for a full assessment of the river and develop an environmental plan with strong emphasis on sanitation. The river is high in green algae with very little life as it is choked by all the waste being dumped in there. MNRE DEC and WRD should conduct and environmental assessment and provide recommendations for rehabilitation measures.
Skin disease	Conduct assessment into the causes of the skin disease that affects most people in the village after rainy season ***Responsibility: MoH / MWSCD / Village***	This is a critical case and MoH should conduct an investigation as to the causes of the skin disease and what triggers it.

Environment & Natural Resources	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction Improve village resource management and	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs	National Environment Sector Plan 2017 - 2021

	Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation ***Responsibility: MNRE / District & Village***	sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable management of sand as a natural resource	Incorporate environmental and social safeguards concerns including consultations with any affected community Village environmental management plans established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	
Forest Loss	Protect a 100m buffer zone between ravines and land used for plantations and cattle farms Replant native trees in fallow lands and encourage native regrowth ***Responsibilities: MNRE / village***	Improve resilient of forest ecosystem Increase biodiversity	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020 Forestry Management Act 2011 Restoration Operational Plan 2016-2020	National Environment Sector Plan 2017-2021

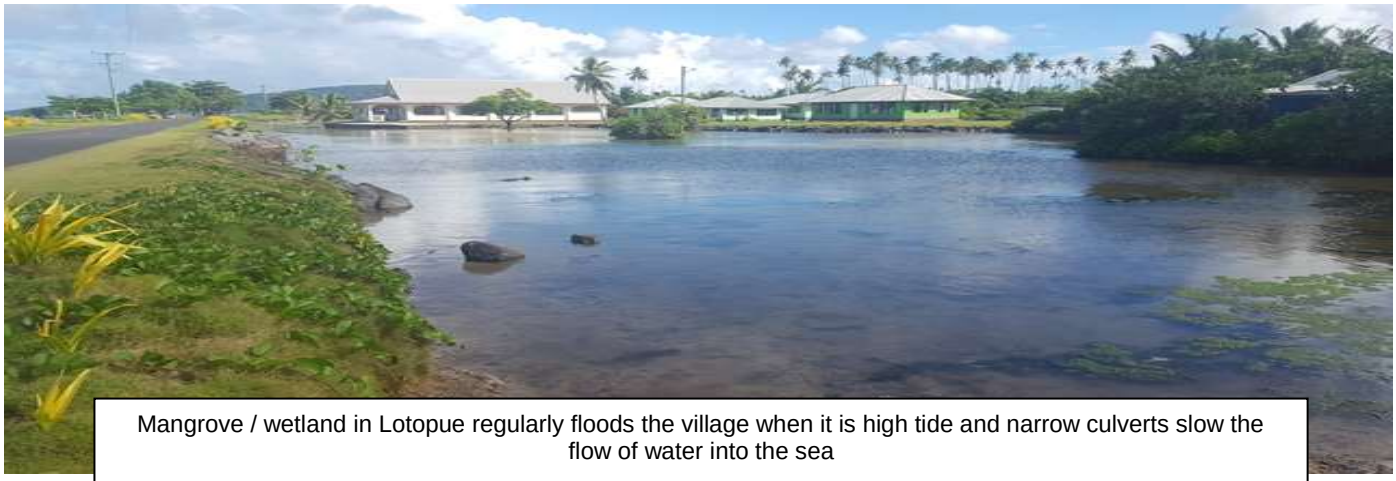
			Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 2 Million Tree Planting Strategy 2015-2020	
Marine Protected Area / Fisheries Reserve	Re- established fishery reserves and revival of the Marine Protected Area; Implement coral gardening Conduct training on village based monitoring programs for marine areas Implement all activities under the village Fisheries Management Plan Implement program to remove crown of thorns from inshore area Training on understanding the importance of seaweed to coral reef ecosystems and for fish species ***Responsibility: MAF /MNRE/ Village***	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Livelihood and Food Security	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Gardening and Handicrafts	Request support for Women's vegetable garden program and handicraft activities for income generation ***Responsibility: MWCSD / WIBDI / Village***	Increase opportunities for income benefits	Implementation and support should follow guidelines from relevant agencies	Community Development Plan 2016-2021

Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme 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 Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security 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 Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive	Agriculture Sector Plan 2016-2020

			Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

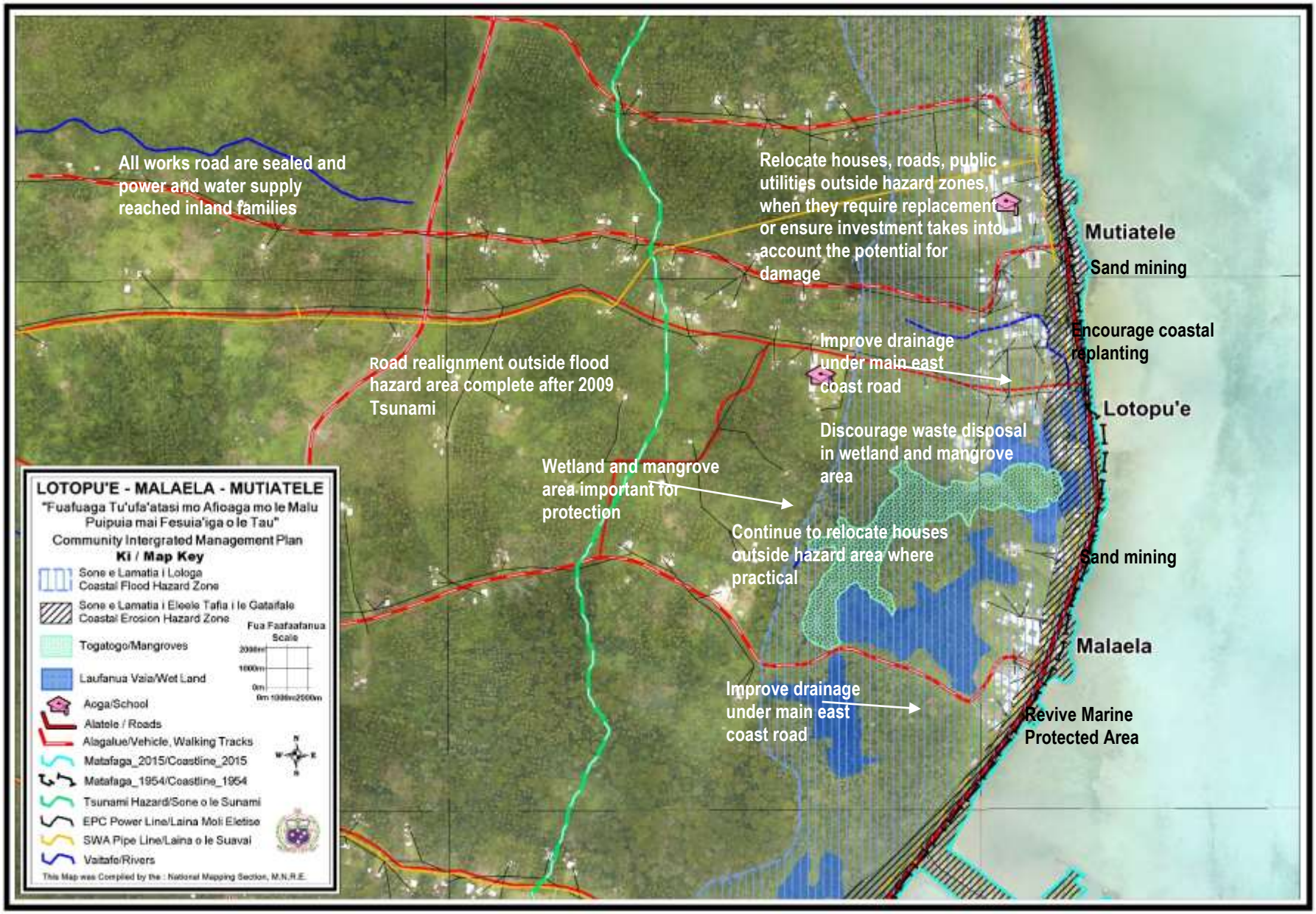
Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans ***Responsibility*: *MWCSD / Villages***	Village Fono Amendment Bill 2016, allows the 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.



Mangrove / wetland in Lotopue regularly floods the village when it is high tide and narrow culverts slow the flow of water into the sea

Lotopue field it is always ponding during rainy season and village indicated it is the cause of rash disease that people get when it is rains too much

Lotopu'e Village Map



4.9 Satitoa Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access road	Reconstruction and sealing of village access/plantation road. Costing was in LTA list of pipeline access road for Aleipata Itupa I Lalo Length: 1.66km Estimated Cost: SAT$ 597,600.00 Tar sealed road to the school ***Responsibility: LTA / MWTI / village***	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
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 ***Responsibility: Village/Families / MWTI/MWCSD***	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 Application of National Building Code 2002 PUMA Act 2004	CIM Strategy (2015)

Evacuation Shelter	DMO to conduct assessment of existing buildings within the village located away from the hazard zone to identify a suitable building for Evacuation Shelter, prior to considering following request. Request building a Evacuation Shelter 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. Implement the CDCRM Program ***Responsibility: MNRE / MWCSD / Village***	Improve public facility used by communities for safety during times of natural disasters	Emergency house or shelters priority are given to existing buildings within the village that suits the criteria for a Evacuation Shelter and are retrofit for this purpose, and most targeted are school buildings. Conduct CDCRM Program	National Disaster Management Plan 2017-2021
Drainage (culverts)	- maintenance of road side drains and regular inspection of drainage system; - Installed drainage along side of the road for new sealed roads inland ***Responsibility: MWCSD / District / Village / MWTI and LTA***	Improved rate of recovery Reduce risk of ponding and flooding which affects both villages Safer village houses and roads Improved safety community and resilience Climate proofing road	MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system: Environmental and Social Safeguard policy Samoa Code of Environmental Practice (2007) Review of National Road Standards in Samoa (2016) National Infrastructure Strategic Plan (NISP) 2011 Programme road safety activities into	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

			budget and work programme Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean	
Water	Upgrade IWS piped water network Build a storage tank ***Responsibility: MWCSD - IWS/ village***	Improve water supply back-up	MWCSD – IWS to consider request from village in-line with: Environmental Social Safeguard Policy National Water Resource Strategy 2007-2017	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Marine Protected Area	Re-established fishery reserves as part of the MPA: Map out area for Fisheries Reserve and whole Aleipata MPA Implement coral gardening Conduct training on village based monitoring programs for marine areas Develop a Fisheries Management Plan Implement program to remove crown of thorns / seaweed from inshore area ***Responsibility: MAF / Village***	Reduce impact of land-based pollution Reduce impact of coral bleaching Improve resilience of coral reef ecosystem to combat climate change Reduce loss of marine habitats	MAF-Fisheries division to provide advice following existing guidelines: Community-based Management Fishery Plan NBSAP 2015-2020 Update village Fisheries Management Plan	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation Responsibility: MNRE / District & Village	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction Improve village resource management and sustainable development Minimize impacts of coastal inundation and erosion Improve the sustainable management of sand as a natural resource	Follow existing MNRE guidelines for sand mining or extracting such as: MNRE monitoring of sand extraction operations Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community Village environmental management plans established including annual monitoring systems For access to sites, obtain written consents from Alii Faipule and landowners. Lands and Survey Environment Act 1989 Consideration of EIA assessment of impact prior to any extraction PUMA Act 2004 NAP – Sustainable Land Management Plan 2015-2019 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill 2018	National Environment Sector Plan 2017 - 2021

Coastal Restoration	Implement replanting of the coastal area with coastal vegetation ***Responsibility: MNRE / MAF-Fisheries /village***	Improve natural barriers and resilience of coastal area reduce coastal erosion	MNRE – Forestry to provide guidance and advice coastal vegetation for replanting NBSAP 2015-2020	National Environment Sector Plan 2017-2021

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 ***Responsibility: MNRE / village***	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
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Implement sustainable land management practices. Implement integrated pest management programme	Improve food security and healthy living and increase community resilience and adaptive response to climate change	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 Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security	Agriculture Sector Plan 2016-2020

	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 Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops. ***Responsibility: MAF MNRE /villages***		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 Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	

The Satitoa wharf used for servicing ships between Upolu and Savaii and Upolu and American Samoa

Satitoa Village Map