Community Integrated Management Plan

Faleata East - 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.

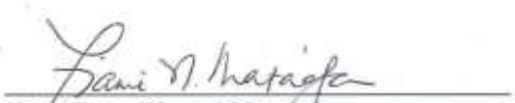
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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 Faleata East (Vaimoso, Lepea & Seesee, Vailoa, Vaitoloa, Sinamoga, Moamoa, Alafua, Pesega and Lotopa, Tapatapao and Tanumapua, Siusega, Ululoloa, Tuaefu, and Tuanaimato) District

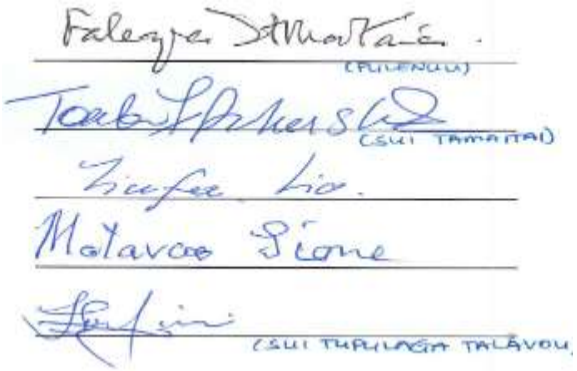
The village representatives participated in the preparation of this CIM Plan in partnership with the Government of Samoa.

Date of Signing: **22nd June 2018**

Representatives: Signature:

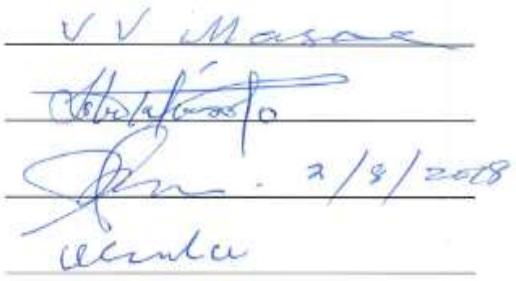
Vaimoso Village

- Faleafa Mataia
- Toala Fuifui Schuster
- Tiufea Leo
- Matavao Sione
- Faamanu Tiufea



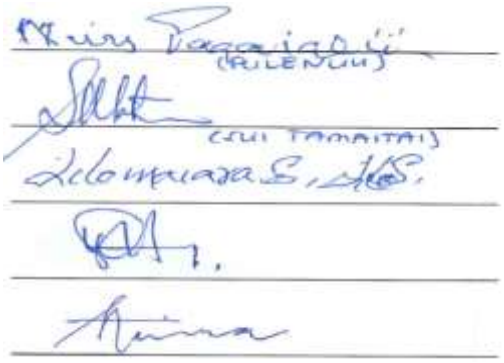
Lepea & Seesee Village

- Vaitanutu Masoe
- Lotu Petero
- Fainu'ulelei Felise Moors
- Ululu Numia



Vailoa Village

- Nu'u Pogisa Fagaalii
- Ana S. Mataiumu
- Lilo Salesa
- Selesele Uili
- Nuu Titi Urima

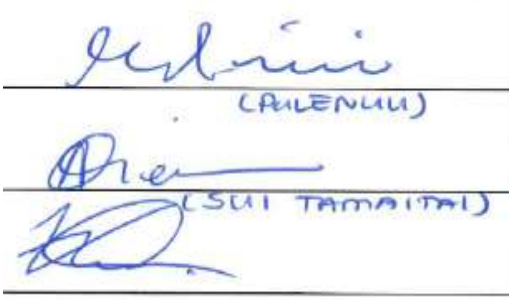


Vaitoloa Village

- Lepale Faafitu
- Lonise Su'a
- Soisoi Samuelu
- Iiga Laki
- Paloa Koki Mafi

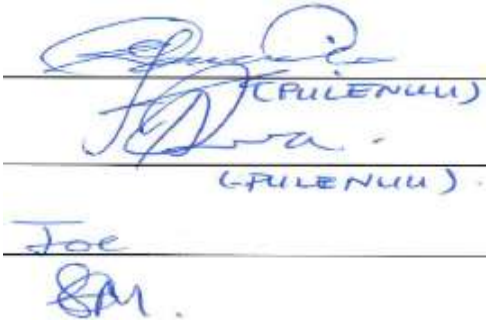
Sinamoga Village

- Sailimalo Finau Elisara
- Sala Ana Siemsen
- Pipi Malo Vagā



Moamoa Village

- Tofilau Uelese
- Tunaimati'a Peneueta
- Tanutanupo Semanaia Joe
- Vui Sagato Amosa

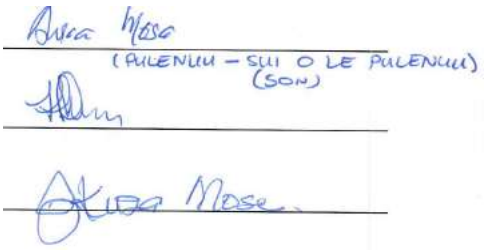


Alafua Village

- Niuafolau Muliaga Mamaia
- Selina Aloiai
- Leota Lalani Anesoni

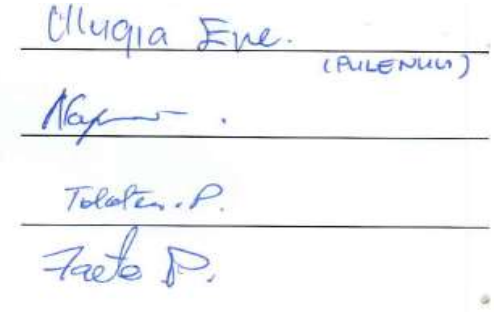
Pesega and Lotopa Village

- Pisapisao Tusa
- Otila Toa
- Johana Kusa Mose



Tapatapao and Tanumapua Village

- Ulugia Ene
- Napoleono
- Tolotea Peleila
- Fa'ete Pelila



Siusega, Ululoloa, Tuaefu, and Tuanaimato Village

- Seve Leiataua
- Toleafoa Pepe Tanielu
- Taoa Fainuu
- Tuigamala Opetaia Liu

The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of Faleata East (Vaimoso, Lepea & Seesee, Vailoa, Sinamoga, Moamoa, Alafua, Pesega and Lotopa, Tapatapao and Tanumapua, Siusega, Ululoloa, Tuaefu, and Tuanaimato) District as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

The Ministry of Natural Resources and Environment, as lead organization of Government, on behalf of the participating Government Ministries and Corporations, confirms the participation of the Government of Samoa in the preparation of this Community Integrated Management Plan and its adoption as a Management Plan for the implementation of the Community Integrated Management Strategy 2015.

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Ulu Bismarck Crawley
Chief Executive Officer, MNRE

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Acronyms

ASCH	Areas Sensitive to Coastal Hazards
BCA	Benefit Cost Analysis
CBFMP	Community Based Fisheries Management Plan
CC	Climate Change
CCA	Climate Change Adaptation
CDCRM	Community Disaster & Climate Risk Management
CEP	Community Engagement Plan
CHZ	Coastal Hazard Zone
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flooding Hazard Zone
CIM	Community Integrated Management (Plan) or (Strategy)
CLHZ	Coastal Landslip Hazard Zone
COEP	Code of Environmental Practice
CSO	Civil Society Organization
CSSP	Civil Society Support Programme
DSP	District Sub Project
EbA	Ecosystem based Adaptation
ECCCR	Enhancing Coastal Community Climate Resilience
ECR	Enhancing Climate Resilience
EMP	Environmental Management Plan
EPC	Electric Power Corporation
ERN	Emergency Radio Network
HCSI	High Coastal Sensitive Index
IAS	Invasive Alien Species
IG	Implementation Guidelines
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
NGO	Non-Governmental Organization
NISP	National Infrastructure Strategic Plan
NRW	Non Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment

SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan

Glossary

Coastal Hazard Zones	Defined areas landward of the coast which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to four coastal hazard zones: ASCHs (areas sensitive to coastal hazards); CEHZs (coastal erosion hazard zones); CFHZs (coastal flood hazard zones) and CLHZs (coastal landslip hazard zones).
"Do Minimum"option	A Management option that involves continuing with the present maintenance and upgrading programme on and when required basis.
Emergency Management	To provide communities with skills, facilities and materials so that they may adapt, respond and recover more quickly in the event of emergencies.
Hazard	A source of potential harm or a situation with a potential to cause loss.
Infrastructure	Built structures and networks which support the national, regional or local community.
Lifeline infrastructure	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
Secondary infrastructure	Infrastructure that contributes to the every-day development of the community.
Implementation Guidelines	A document to guide land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defenses and works.
Issue	A specific concern regarding both cause and effect.
Land and Resource Use	The use of land and resources by the community for social, economic or other benefit (e.g. land use includes areas used for villages or crops, resource use includes activities such as sand mining, gravel extraction or fishing).
Monitoring	Process of measuring the effectiveness or impacts of projects and works against predicted standards, levels or outcomes.
Resilience	The ability to be adaptive, responsive and quick to recover.
Community Resilience	The ability for the community to be adaptive, responsive and quick to recover from the adverse effects of hazard.
Natural Resilience–	The ability of natural systems to be adaptive, responsive and quick to recover from natural processes or hazards.
Risk	The chance of something happening that will have an impact on objectives. It is measured in terms of consequence and likelihood. In the Community Integrated Management Plan context it is the likelihood that infrastructure, environment and biological resources and agricultural and marine resources (food security) will be subject to inland and coastal hazards and the potential for loss of property, life or land due to natural processes.
Stakeholders	Those people and organizations who may affect, be affected by, or perceive themselves to be affected by, a decision or activity. The term stakeholder may also include interested parties.

Strategy	Direction or course of action to achieve a define division.
Susceptibility	The degree to which infrastructure at risk is likely to be damaged by coastal hazards and how easy/difficult, expensive/cheap it is to replace. In the context of the CIM Plan the term susceptibility is equivalent to the term vulnerability as the Samoan phrase for both susceptibility and vulnerability is the same.
Vision	A desired destiny.
Livelihood	A livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).
Food access	Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).
Utilization	Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.
Stability	To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

1. Introduction to the CIM Plan

1.1 The Strategic Vision

The District CIM Plan for Faleata East 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 Guideline

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

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

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

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

2.2 Funding options to support CIM Plan Implementation:

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

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

2.3 Duration of the Plan

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

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

1. The CIM Plan full review will be undertaken every 10 years or decade;

2. Once implemented, the solutions will be monitored on a bi-annual basis for progress and updated every five years in accordance with the Strategy for the Development of Samoa;

3. Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators (KPI).

3. Description of Faleata Sasae District Environment

3.1 Physical and Natural Resource Setting

Faleata East district is made up of traditional villages of Vaimoso, Lepea and Vailoa, as well as non-traditional villages of Sinamoga, Moamoa, Alafua, Seesee, Tuaefu, and Ululoloa. The District of Faleata East is located on the north side of the island of Upolu within the urban area of Apia. The landscape varies between low- lying land with coastal frontage and gentle undulations that slope into river valleys to the foothills of Mount Maugafolau and Mount Vaea extending to steep inland areas of Tanumapua.

There are three main rivers and a number of tributaries that run through the district. During heavy rains these rivers overflow into the villages and onto main roads such as Vaitele Street and Vaea Street as well as access roads. Drainage is a significant issue. Fords at Vaimoso and Moamoa were upgraded and culverts cleared off debris but heavy rain continues to add stress similar to other fords throughout the district with signs of water damage. This is noted in Sinamoga where the ford has recently had concrete shoulders constructed. A small ford at Tanumapua in the highlands frequently floods and blocks access. The ford at Alafua behind the University of the South Pacific has a blocked culvert and experiences severe flooding.

In Sinamoga, river run off affects 30-40 households due to the gradient of the land and the natural flow of water down the hill into the village. To counteract floodwater, the village has built a rock wall approximately 25 metres long to protect village fales along the access road. A single lane wooden bridge in Sinamoga provides access to a Catholic Church and inland fales located on the hillside. This wooden bridge provides access to the village's main church and was fixed to in order to accommodate heavy vehicles.

The main roads are in good condition generally; however, they are exhibiting signs of stress from flood damage, particularly close to river crossings. Inland access roads to Tanumapua and Lepea (access road to the sliding rocks) has been resealed providing good access to residential places inland. Some riverbanks have been eroded contributing to sedimentation and siltation downstream. This is significant in Vaimoso and Sinamoga but is also common throughout the district.

Mangrove areas remain on the coastal strip in front of the villages of Vailoa, Vaimoso and Lepea. There has been some reclamation of the mangrove swamp at Vaimoso and Lepea for business development and family homes. New fales are being built on the waterfront at Lepea and a homemade sea wall has been constructed with medium sized rocks approximately 6 metres long. Large reclamation on the other side of the mangrove in Vaimoso has blocked the flow of water into the sea and results in regular flooding.

The Faleata east coastline is predominantly muddy from the Vaiusu Bay wetland which is also the main drainage for the inland Fuluasou and associated watersheds. Previously, the inshore reef was amongst the richest in bivalves and shellfish. Since the 1970's when commercial dredging and reclamation started in Vaiusu Bay and the increased siltation from the rapidly increasing inland population, the inshore reef of Faleata district has become seriously polluted by domestic and industrial wastes via storm water drains, water table and springs, and agrichemicals. Very high nutrient levels and fecal coliform bacteria have been reported in the area. The outer lagoon has cyclone banks made up of corals damaged from Cyclone Ofa and Cyclone Val, with live corals only present on the outer reef. Traditional mangrove fishing practices have not been done for many years due to village fears of the pollution in the area as well as the increasing muddy flats.

All invasive species are present in this area both along the human settlements, while the Apia catchment has also been invaded by prominent alien species such as tamaligi, pulu vao and pulu mamoe, alii o le po, African tulip and mint weed. Actions for the eradication of the invasive species in the catchment area are important in increasing retention of water to reduce flooding.

3.2 Social and Economic Setting

The district contains fourteen villages with three being traditional villages and the rest freehold title. These include Vaimoso, Lotopa, Pesega, Alafua, Moamoa, Sinamoga, Lepea, Vaiola, Ululola, Siusega, Tuanaimato, Tafaigata, Tanumapua and Tapatapao. All villages are located inland without direct coastal access, apart from Vaimoso, Vailoa and Lepea that extend to the sea. There is some development of hillside fales in Sinamoga, Moamoa and Tanumapua.

Vaimoso village has rich historical significance, as it is the birthplace of Samoan Independence from New Zealand in 1962. A small gazebo of heritage significance remains where the freedom fighters gathered to march into Apia. This District also contains the Mormon temple within the combined villages of Lotopa and Pesega. Within the district, there are over 12 schools including primary, secondary and pre- schools as well as the University of South Pacific. Each village has at least one school. There is also more than one church per village with over 20 churches within the district of a variety of denominations including Catholic, Congregational Christian Church of Samoa, The Church of Jesus Christ of Latter Day Saints (LDS), Methodist, Assembly of God and Mormon faiths. For recreation, there are a number of fields that form part of the secondary schools that are used for sporting activities.

Water is the main supply to the district in addition to a number of other sources. The Fuluasou reservoir located in Tanumapua supplies inland villages. However it does not have a large capacity and dries up during low rainfall. The Sou River provides water to Lepea, Vaimoso and Vailoa via a pump in Lepea. A pipeline at Alafua provides water to Alafua and Moamoa. A number of springs also occur throughout the district. These provide alternative water supply to Lepea, Vailoa and Moamoa (however, the Moamoa spring does not currently have public access). Water tanks are also scattered throughout the district.

There are two quarries in the district one in Vaimoso and Moamoa, the latter has been sold and is being subdivided for residential use. As a large proportion of freehold title land is located within this district, there are a number of new subdivisions being created in the area by the Catholic Church for relocation of families that were leasing from Catholic Church land in central Apia. Power is supplied by EPC throughout the district and lines generally follow main and access roads with extensions to fales. Often the power lines are inappropriately located too close to the road or riverbanks and fales. In particular, the Vaimoso power lines are located within half a metre of the eroding riverbank. Since the introduction of mobile phones and strong competition between two phone companies Digicel and Bluesky, most landline phones are phasing out because mobile coverage is throughout the whole district and island.

Being an urban settlement within the wider area of Apia most of the villagers are employed in commercial or industrial activities within the Central Business District. Some of the inland villages have traditional income from plantations. This is significant in Tanumapua and Tapatapao where the plantations supply fruit and vegetables to Apia markets including the hospital. The “sliding rocks” are also a natural attraction that assists Lepea’s inland villages with income from tourists and locals.

The district is supported by a number of local stores, industry and commercial operations both accessing main and local roads. A Police Post is now established within the Faleata Sports Complex and intervention that was identified in the 2007 CIM Plan and has been implemented since then, as well as the Fire and Emergency Station.

The biggest change in this district is the establishment of the Faleata Sports Complex which is host to a number of sporting facilities such as: Swimming Center; Soccer Headquarters and fields, Squash Courts, Weight Lifting Centre and the Rugby Headquarters and sporting facilities. It is also the location for the Victim Support Group housing and the Samoa RED Cross Office.

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[1] 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 CIM Plan for Faleata East, mapped out all vulnerable areas along the coast and most of the lowland CFHZ and CEHZ given the exposure to natural disasters, climate change and variability. Most of the villages within the district are located inland with the exception of Vaimoso, Lepea and Vailoa that are located along the Vaiusu bay covered with the one's largest mangrove area in the country, but much has been reclaimed over the years for development. Faleata East district is part of the wider Apia urban area that are highly exposed to climate change risks because of the lack of climate relate data consideration of the potential hazard areas. As noted, there are significant areas of existing development at risk from sea level rise, storm surge, flooding and drainage issues. Similarly, the outward expansion of our urban area has allowed new development into upland areas of Faleata East (from Tapatapao to Laloanea) which has increase flood and erosion risk from expansion of cattle farms etc, and thus exacerbate the potential impacts on low-lying settlement and infrastructure. The TC Evan in 2012 impact is indicative of the type of hazard risks that are associated with development.

The CIM Plan updates takes and integrated approach covering a broader landscape hazards (both coastal and inland), climate risks and responses to increase resilience. A 'ridge to reef' approach is used to ensure all hazards, risks and potential responses are canvassed in an integrated manner.

Coastal Hazards and Risks: Coastal erosion in several parts is a result of a longshore littoral drifts process associates with reef-channel activities (Figure 1). A coastal zone between Sogi and Mulinuu is dominated with terrigenous materials that could derive from surface flows and underground water through lava tube/tunnel system that never expose on the surface. A high sedimentation rate during these terrigenous activities buries and destroys coral reefs in the area. Additionally, land-based pollution activities from fast development of town area, provide more problems for marine organism at this part of Faleata district, as coral reefs are choked by the influx of waste and high sedimentation deposits that all end up at the mouth of river estuaries, thus allows the current to generate reef channel network along a reef platform, shown in Figure-1. The network of reef-channels associates with longshore littoral drift, is responsible for transporting a great volume of sand into deep sea, and not sand mining activities along the Vaiusu bay. This assumption is based on the fact that, the south easterly trade prevailing wind is the main driver of the longshore littoral process according to Fepuleai (2017).

Flood activities continue to dominate areas like those of Vaimoso, Lepea, Vailoa, Seesee, Pesega and Lotopa. It is noted that surface water and groundwater flow through a great network of joints and lava tube (tunnels) along the Salani Formation, and are all link to the main outlet along Sogi to Vaiusu coastal area. However if these joints and lava tunnel networks are exposed along the coastal zone then in results in flooding. This is possible because of the thick sand dune lying parallel to the coast along the broad mangrove zone together with the increase in land reclamation from development causes the surface water and underground flow to reverse to inland and trigger flooding in the coastal area (Figure 1). This sand dune is a product of the longshore littoral process and high sedimentation rate of terrigenous materials.

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

Figure 1 Coastal section between Sogi and Vaiusu with a broad mangrove zone dominated by terrigenous materials. Reef channel networks to the northwest of Mulinuu responsible in transporting great volume of sand in deep water
Map credit: Aleni Fepuleai, 2017

Inland Hazards and Risks: Consistent with the 'ridge to reef' (R2R) approach the new LiDAR mapping data was used to determine likely inland hazards and risks from terrestrial flooding, waterway erosion and sedimentation. During the community consultations, it was evident that many coastal hazard issues, like severe waterway flooding, lowland inundation, uncontrolled runoff, bridge and culvert wash-outs and troublesome sedimentation – mostly had their origins in excessive inland clearance of forests, catchment land use changes, poor drainage along roads and poor sustainable land management practices. Such changes to the landscape in an uncontrolled manner severely affects the natural waterway systems, the run-off from nearby land and the groundwater flows.

Pollutants and sediments can be transported to the coastal environment, then through to the lagoons and reefs. In the medium to long term the decline in the health of the lagoons and reefs reduces the efficiency of these natural barriers to climate change and natural disasters.

Landslide and rockfall hazards commonly occurred in area like those of Sinamoga, Moamoa Vaea, Moamoa-fou and Tuaefu (Figure 2). These natural hazards associate with highly jointed, highly fractured and intense weathered of Salani lava rock formation. The dotted light blue lines (Figure 2) between Moamoa and Vaimoso represented potential rockfall activities in the future. These line estimates are based on expose huge boulders believed to be rolled down from Mount Vaea.

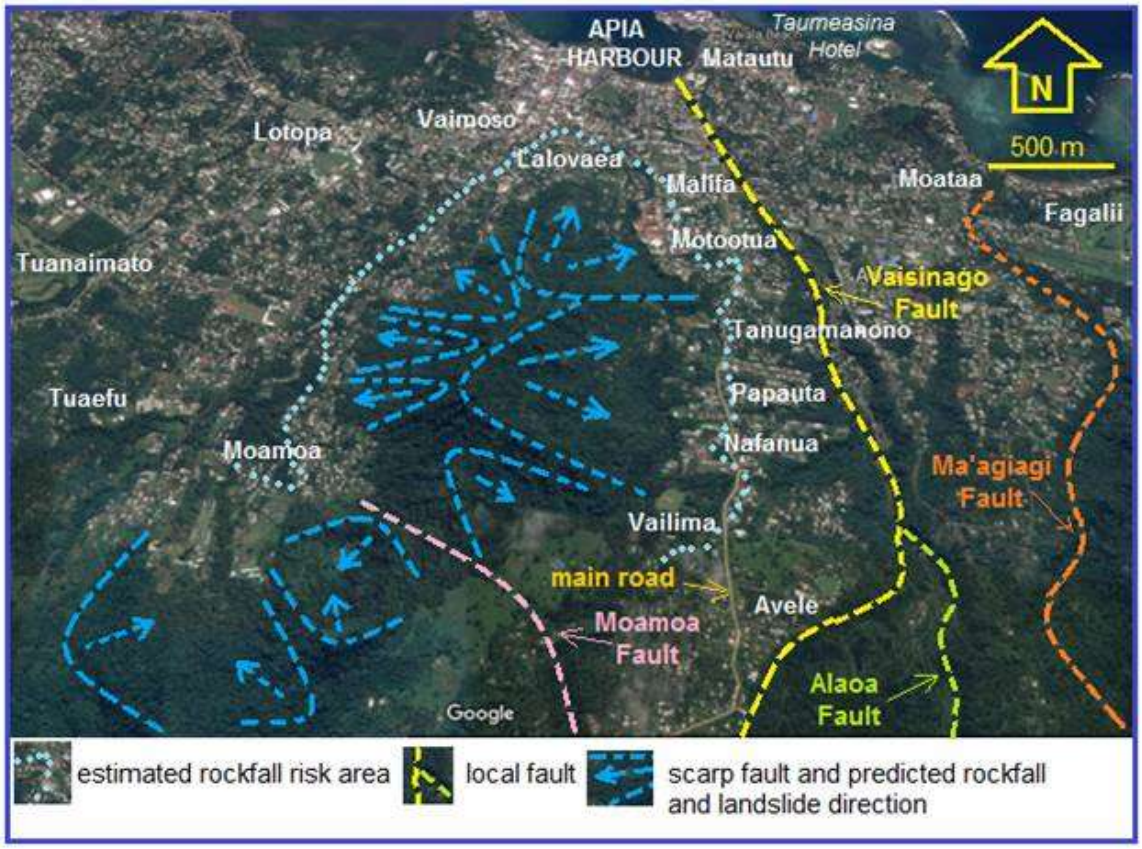


Figure 2 Shows some of the villages vulnerable to landslide on the western part of Mt Vaea. Landslide and rockfall activities commonly associated with fault system.
Map credit: Aleni Fepuleai, 2017

Site Assessment Faleata East

Seesee SWA Water Intake - providing piped water to all inland families of Lepea without access to water, supported by PPCR-ECR large sub-project
Photo credit: MNRE-PUMA, 2017

4. Faleata East District Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Drainage upgrade and maintenance	Address drainage system issues by: Implement proper routine maintenance of existing culverts and drainage channels on roadside and ensure surface runoff is properly channeled away from road; Install new sized outlets or culverts and deepen drainage channels that can absorb the flow of water from upstream Implement district/village drainage/ culvert clean-up and awareness program regularly Install proper drainage and stream beds within Vaimoso and Lepea villages to reduce flooding and ponding ***Responsibility: MWCSD / District / MWTI and LTA***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network Emergency response access for evacuation	Implementation of drainage upgrade by MWTI and LTA should be guided by existing infrastructural policies, strategies and action plans: Environmental Code of Practice - West Coast Road (2012), Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Water Main water distribution network / Piped water to families living inland	Connect all the inland residents of Faleata East District with the SWA new Water Tank intake in Seesee and piped water network Install a water pump and main pipeline to reach residential areas inland without access to water	Improve access to clean quality water for inland families; Enhance resilience of water distribution network infrastructure due to the upgrade CRWCR project	SWA work to be guided by existing policies and work programme: Environmental & Social safeguard policies apply Implementation of the SWA 10 Year Investment Plan (2016) to improve	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan: Framework For Action 2016 - 2020,

	Responsibility: SWA / District		water supply network	
Evacuation Shelter/ Emergency Shelter and services	Implement the CDCRM Program for villages in the district: Map out emergency shelters within villages away from hazard zone for use during natural disasters such as Primary School, church buildings etc and retrofit buildings suitable for evacuation centre Store emergency supplies including First Aid Kit, food supplies and water and ensure they are secured before a cyclone hits; Install emergency signs for evacuation ***Responsibility: MNRE-DMO / MWCSD / District-Villages***	Improve public facility used by communities for safety during times of natural disasters Reduce number of casualties during disasters Improve adaptive response of communities in preparation for natural disasters or extreme events	MNRE-DMO to provide sound advice to communities guided by existing programmes: Community Disaster Climate Risk Management Program	National Disaster Management Plan 2017-2021
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within district and women's committee; Village Council enforce the clearing of all rubbish from culverts and drainage	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. National Chemicals and Hazardous Waste Management Policy 2012	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018 Water and Sanitation Sector Plan 2016-2020

	systems; Installation of rubbish bins Include all established roads inland where there are residents in the waste collection Install septic tanks for families in low-lying / coastal areas ***Responsibility: Lead: MNRE Supporting: MWCSD / District-Village Committee/MoH /STA***		Waste Management Act 2010 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto	
Mangrove forest and inshore reef	Enforce a village ruling to stop building or clearance from at least 5m from the mangrove forest edge Rebuild the spring pools within mangrove with proper filters to reduce pollution reaching the sea and affecting fish nurseries Rehabilitation and replanting program utilizing the mangrove seedlings and other coastal plant species/ Removal of waste old remnants from landfill Relocate existing vulnerable developments within the vicinity of the mangrove area Vaimoso, Vaitoloa and Lepea Conduct rapid biodiversity assessment to take stock of marine species diversity	Improve protection of coastal resources Improved sustainability of natural resources Improved biodiversity and ecological resilience mangrove ecosystem	Develop an Environmental Management Plan for the mangrove ecosystem MNRE-DEC to provide advice to communities on coastal replanting and suitable coastal plant species MNRE-DEC / MAF-Fisheries to provide support to communities on awareness and education programs on value of mangrove ecosystem biodiversity Include support for mangrove rehabilitation in budget planning Implementation of activities for mangrove restoration to be guided by the NBSAP 2015-2020 Community Based Fisheries Management Plan – village communities	National Environment Sector Plan 2017-2021 Community Development Plan 2016-2020 Agriculture Sector Plan 2016-2020

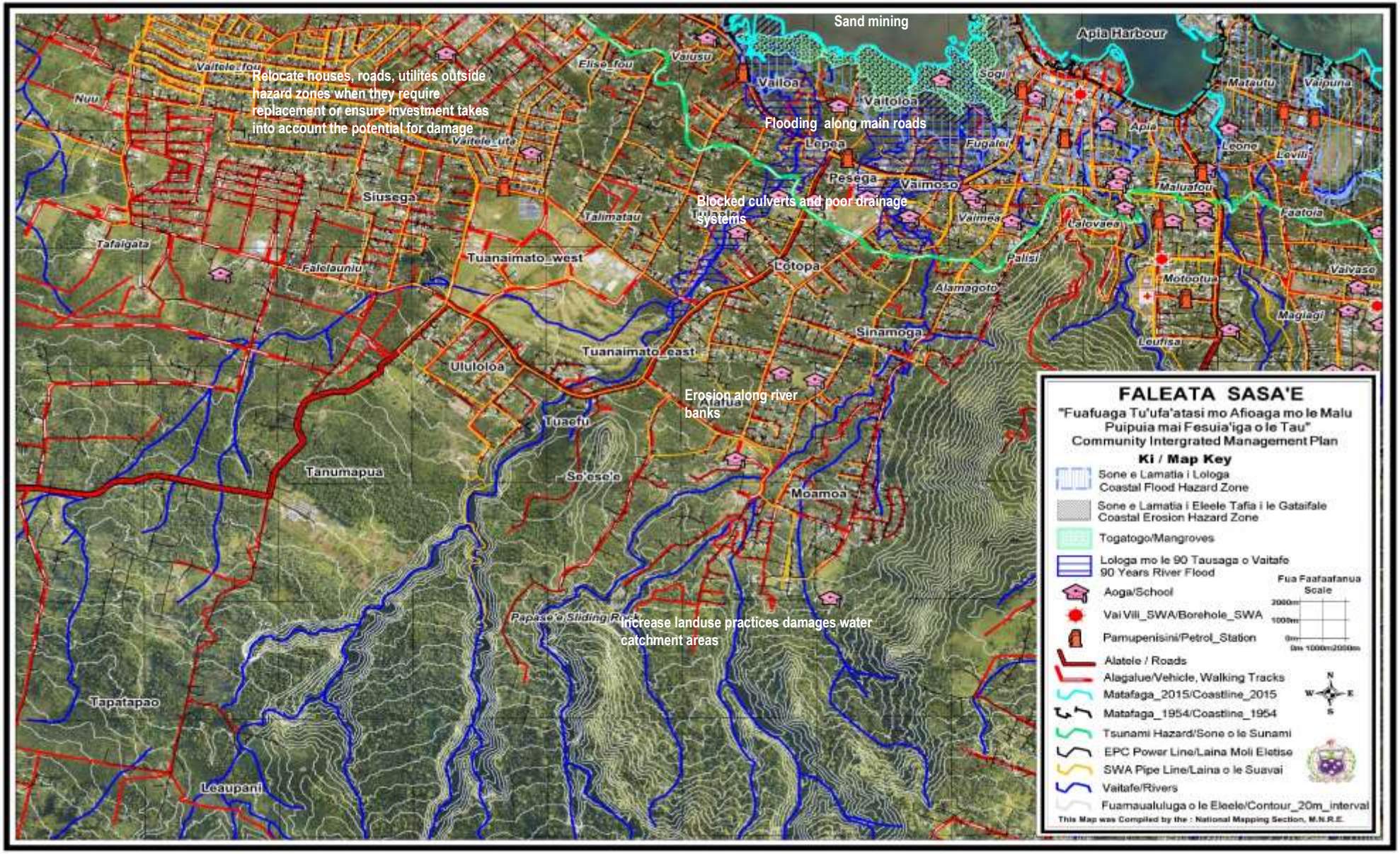
	inside mangrove ecosystem Conduct follow-up testing for fisheries and water quality found in the Vaiusu Bay to determine contamination from land based pollution Determine the impact of the proposed wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats ***Responsibility: MNRE / MWTI / MWCSD / District / villages***			
Sand mining for commercial and domestic use affecting the marine and coastal environment	Assess and identify sustainable sources of river sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for river sand mining Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation ***Responsibility: MNRE / Village***	Improve the sustainable management of sand as a natural resource Minimize impacts of coastal inundation and erosion Reduce impact to natural coastal protection mechanism via control of scale and site of extraction	Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community For access to sites, obtain written consents from Alii Faipule and landowners. Alii Faipule and landowner provide consent Develop sand mining regulation Follow existing MNRE guidelines for sand mining or extracting such as: PUMA Act 2004 Lands and Survey Environment Act 1989	National Environment Sector Plan 2017-2021

			(draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill, 2018 NAP Sustainable Land Management Plan 2015-2019	
Watershed management	Implement the Fuluasou and Gasegase Watershed Management Plan Conduct mapping and implement appropriate drainage systems for the Moamoa and Singamoga areas of the Gasegase Watershed Enforce compliance with the National Construction Code and Development Consent Extend the Mt Vaea Forest Reserve to Moamoa side of the Gasegase watershed and protect the mountain from further land selling. Protect important biodiversity found in the area and minimize hazards such as landslides ***Responsibility: MNRE / MWTI / District***	Increase biodiversity of forest ecosystem Improve ecological resilience of forest area Reverse land degradation Increase number of plants to reach the 2milion tree planting goal	MNRE to undertake an Ecosystem-based Adaptation Approach for catchment area measures: Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project National Action Programme: To combat land degradation and mitigate effect of drought, 2015-2020 National Water Resources Management Strategy 2007-2017 NBSAP 2015-2020 Water Resources Act 2008 Forestry Restoration Operational Plan 2016-2020 MNRE-DEC to provide guidance on effective ways to remove invasive plants from watershed area National Invasive Species Action Plan 2008-2011 Two Million Tree Planting Strategy 2015-2020 Upper Watershed Conservation Policy 2015	National Environment Sector Plan 2017-2021 Water and Sanitation Sector Plan 2016-2020

			(CDC Submission) Water Resource Management Act 2008 Upper Watershed Conservation Policy 2015 (CDC Submission) Water Catchment Regulation 2013	

Governance	**Solutions/ Issues**	**Comment**
Vulnerable Groups in village communities	Identify vulnerable people in communities (elderly, children, disabled and sick women) for specific care during times of disaster or emergency Update database on vulnerable Implement village response plan (CDCRM) that includes identification of safe haven/emergency shelters, installation of local signs for evacuation during natural disasters, and mapping out key places and actions for emergencies. Protect natural assets, historical artefacts and food supply during natural disaster ***Responsibility: MNRE / Villages***	Developing community disaster response plan will improve community resilience and reactive response during times of natural disasters. There will be more survivors and village and public asset protected due to improved disaster preparation plans. Village council / church groups support and assistance from all members of society – women's group, untitled men, youth, church groups etc will enhance disaster preparedness and response to procedures for protecting lives and valuable assets
Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae " refer Clause 5 Amendment". ***Responsibility: MWCSD / Villages***	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.

Faleata East District Map



4.1 Vaimoso Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	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 Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road (Sa Malaga access road and Laloanea inland road)	Implement the sealing of Sa Malaga and Laloanea inland road to accommodate for the increase number of families relocation away from the coast or hazard zone Assess cost of access road upgrade Conduct EIA prior to approval of upgrading access road	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	LTA to utilize existing national infrastructural policies and guidelines in the implementation of solutions: Relevant Environmental and Social Safeguard Policies apply - Samoa CODE of Environmental Practice (PUMA -	Land Transport Sector Plan 2016-2020

	Responsibility: LTA/MWTI / village		2007) National Infrastructure Strategic Plan (2011) Review of National Road Standard in Samoa (2016) Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 Provide budget into work programme	
Drainage (poor system)	Reverse poor drainage system by: Implement proper routine maintenance of existing culverts and drainage channels on roadside and ensure surface runoff is properly channeled away from road; Install new sized outlets or culverts and deepen drainage that can channel water flowing from village side into the Gasegase river Install a larger sized culverts at the bridge that goes to the Aitutaki Night Club / SISDAC (Curan Street) to accommodate large volume of water flowing into the sea (current culvert is like a bottleneck) Implement district/village drainage/ culvert clean-up and awareness program regularly	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network Emergency response access for evacuation	Implementation of drainage upgrade by MWTI and LTA should be guided by existing infrastructural policies, strategies and action plans: Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

	Responsibility: MWCSD / / MWTI and LTA/ District		Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	
Evacuation Shelter/ Emergency Shelter and services	Implement the CDCRM Program for villages in the district: Map out emergency shelters within villages away from hazard zone for use during natural disasters such as Primary School, church buildings etc and retrofit buildings suitable for evacuation centre Install emergency signs for evacuation ***Responsibility: MNRE-DMO / MWCSD / District-Villages***	Improve public facility used by communities for safety during times of natural disasters Reduce number of casualties during disasters Improve adaptive response of communities in preparation for natural disasters or extreme events	MNRE-DMO to provide sound advice to communities guided by existing programmes: Community Disaster Climate Risk Management Program	National Disaster Management Plan 2017-2021
Water piped network	Extend SWA piped water network to reach families without access to water residing in the upland area Laloanea Immediate action is to install rainwater harvesting system for these few families that have relocated inland. ***Responsibility: SWA / MNRE /CSSP/NGO Village***	Improve access to clean quality water for inland families; Enhance resilience of water distribution network infrastructure Increase number of families relocating away from hazard zone	SWA work to be guided by existing policies and work programme: Environmental & Social safeguard policies apply Implementation of the SWA 10 Year Investment Plan (2016) to improve water supply network	Community Integrated Management Strategy, August 2015)

Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Waste Management	Implement community waste management programs: Waste awareness and	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce	National Environment Sector Plan 2017-2021

	education programs for schools within district and women's committee; Village Council enforce the clearing of all rubbish from culverts and drainage systems; Include all established roads inland where there are residents in the waste collection ***Responsibility: MNRE/MWCSD / MoH /District-Village***	season because clear culverts allows for quick flow of water into the sea	fines upon individuals, businesses and families within village that dispose rubbish illegally. Waste Management Act 2010 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto National Chemicals and Hazardous Waste Policy 2012	Heath Sector Plan 2008-2018 Water and Sanitation Sector Plan 2016-2020
Mangrove forest and inshore reef	Enforce a village ruling to stop building or clearance from at least 5m from the mangrove forest edge Rebuild the spring pools within mangrove with proper filters to reduce pollution reaching the sea and affecting fish nurseries Rehabilitation and replanting program utilizing the mangrove seedlings Consider relocation of families in Vaimoso and sub-village Vaitoloa living on the edge of mangrove area Install proper drainage and stream beds within Vaimoso villages to reduce flooding and ponding Conduct rapid biodiversity assessment to take stock of marine	Improve protection of coastal resources Improved sustainability of natural resources Improved biodiversity and ecological resilience mangrove ecosystem	Develop an Environmental Management Plan for the mangrove ecosystem MNRE-DEC to provide advice to communities on coastal replanting and suitable coastal plant species MNRE-DEC / MAF-Fisheries to provide support to communities on awareness and education programs on value of mangrove ecosystem biodiversity Include support for mangrove rehabilitation in budget planning Implementation of activities for mangrove restoration to be guided by the NBSAP 2015-2020 Community Based Fisheries Management Plan – village communities	National Environment Sector Plan 2017-2021 Community Development Plan 2016-2020 Agriculture Sector Plan 2016-2020

	species diversity inside mangrove ecosystem Determine the impact of the proposed wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats ***Responsibility: MNRE / MWTI / MWCSD / District / villages***			

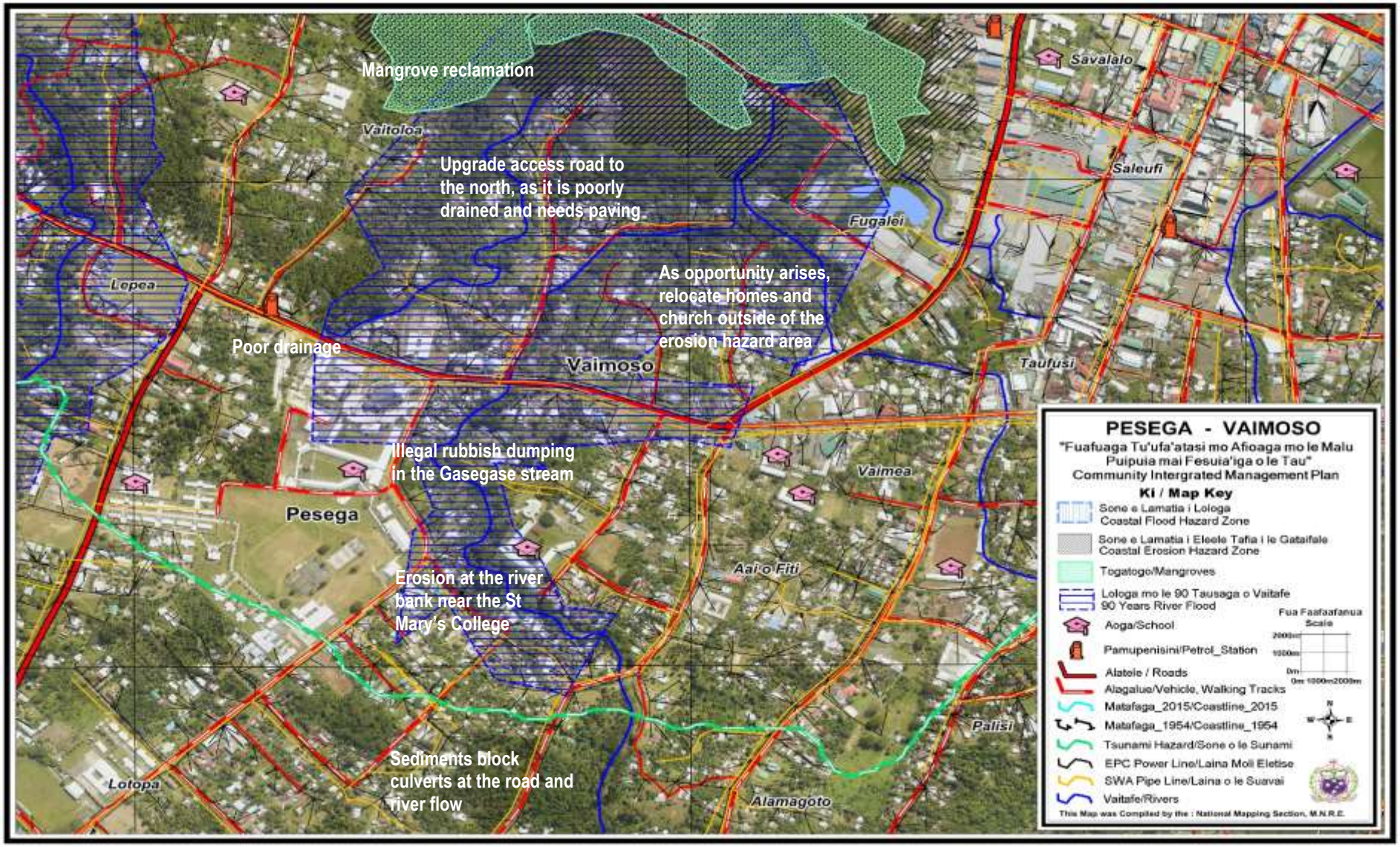
Governance	**Solutions/ Issues**	**Comment**
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae " refer Clause 5 Amendment". **Responsibility: MWCSD / Villages**	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.

Other Solutions Considered or Further Issues Raised

Infrastructure	**Best Solution**	**Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plan**
Road safety	Implement road safety programme: Install humps in areas used mostly by pedestrians such as schools and church; Install footpath on the road side next to the EFKS church for pedestrian and school children safety Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: LTA / Village***	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	LTA to utilize existing national infrastructural policies and guidelines in the implementation of solutions: Relevant Environmental and Social Safeguard Policies apply - National Infrastructure Strategic Plan (2011) Samoa CODE of Environmental Practice (PUMA - 2007) Review of National Road Standard in	Land Transport Sector Plan 2016-2020

			Samoa (2016) Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 Provide budget into work programme	

Vaimoso Village Map



4.2 Lepea & Seesee Village Interventions

Infrastructure	Best Solutions	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 Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/ MNRE/MWCSD***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road (Papaseea, Seesee to Mt Folau)	Resealed and widened inland road to Papaseea and Seesee towards the loop road around Mt Folau to Tuaefu Road Tar sealed road up to Laloanea Assess cost of access road upgrade Conduct EIA prior to approval of upgrading access road	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	LTA to utilize existing national infrastructural policies and guidelines in the implementation of solutions: Relevant Environmental and Social Safeguard Policies apply - Samoa CODE of Environmental Practice (PUMA - 2007)	Land Transport Sector Plan 2016-2020

	Responsibility: LTA/MWTI / Village		National Infrastructure Strategic Plan (2011) Review of National Road Standard in Samoa (2016) Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 Provide budget into work programme	
Drainage (poor system)	Reverse poor drainage system by: Implement proper routine maintenance of existing culverts and drainage channels on roadside and ensure surface runoff is properly channeled away from road; Install new sized outlets or culverts and deepen drainage that can channel water directly to the sea Implement district/village drainage/ culvert clean-up and awareness program regularly ***Responsibility: MWCSD / / MWTI and LTA/ District***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network Emergency response access for evacuation	Implementation of drainage upgrade by MWTI and LTA should be guided by existing infrastructural policies, strategies and action plans: Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development National Infrastructure Strategic Plan (NISP) 2011	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

			PUMA Act 2004 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	
Evacuation Shelter/ Emergency Shelter and services	Implement the CDCRM Program for villages in the district: Map out emergency shelters within villages away from hazard zone for use during natural disasters such as Primary School, church buildings etc and retrofit buildings suitable for evacuation centre Install emergency signs for evacuation ***Responsibility: MNRE-DMO / MWCSD / District-Villages***	Improve public facility used by communities for safety during times of natural disasters Reduce number of casualties during disasters Improve adaptive response of communities in preparation for natural disasters or extreme events	MNRE-DMO to provide sound advice to communities guided by existing programmes: Community Disaster Climate Risk Management Program	National Disaster Management Plan 2017-2021
Water Main water distribution network / Piped water to families living inland	Connect all the inland residents of Faleata East District with the SWA new Water Tank intake in Seesee and piped water network Install a water pump and main pipeline to reach residential areas inland without access to water ***Responsibility: SWA / District***	Improve access to clean quality water for inland families; Enhance resilience of water distribution network infrastructure due to the upgrade CRWCR project	SWA work to be guided by existing policies and work programme: Environmental & Social safeguard policies apply Implementation of the SWA 10 Year Investment Plan (2016) to improve water supply network	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan: Framework For Action 2016 - 2020,

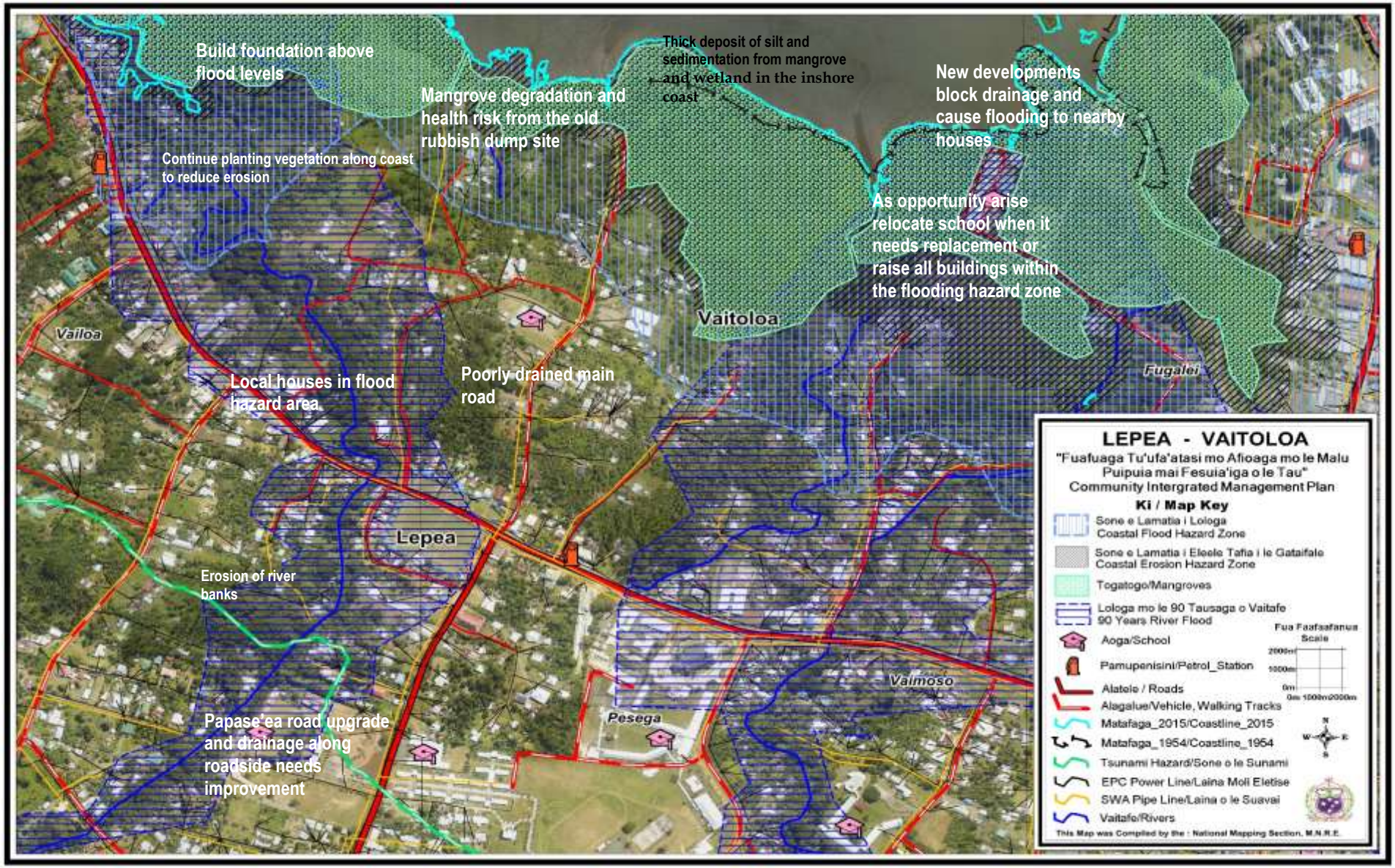
Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within district and women's committee; Village Council enforce the clearing of all rubbish from culverts and drainage systems; Include all established roads inland where there are residents in the waste collection ***Responsibility: MNRE/MWCSD / District-Village/ CSSP / UNDP-GEF SGP***	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. Waste Management Act 2010 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto National Chemicals and Hazardous Waste Management Policy 2012	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018
Mangrove forest and inshore reef	Enforce a village ruling to stop building or clearance from at least 5m from the mangrove forest edge Rebuild the spring pools within mangrove with proper filters to reduce pollution reaching the sea and affecting fish nurseries Rehabilitation and replanting program utilizing the mangrove seedlings Consider relocation of families in Lepea, living on the edge of mangrove area Install proper drainage and stream beds within Lepea villages to reduce flooding and ponding Conduct rapid biodiversity	Improve protection of coastal resources Improved sustainability of natural resources Improved biodiversity and ecological resilience mangrove ecosystem	Develop an Environmental Management Plan for the mangrove ecosystem MNRE-DEC to provide advice to communities on coastal replanting and suitable coastal plant species MNRE-DEC / MAF-Fisheries to provide support to communities on awareness and education programs on value of mangrove ecosystem biodiversity Include support for mangrove rehabilitation in budget planning Implementation of activities for mangrove restoration to be guided by the NBSAP	National Environment Sector Plan 2017-2021 Community Development Plan 2016-2020 Agriculture Sector Plan 2016-2020

	assessment to take stock of marine species diversity inside mangrove ecosystem Determine the impact of the proposed wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats ***Responsibility: MNRE / MWTI / MWCSD / District / villages***		2015-2020 Community Based Fisheries Management Plan – village communities	

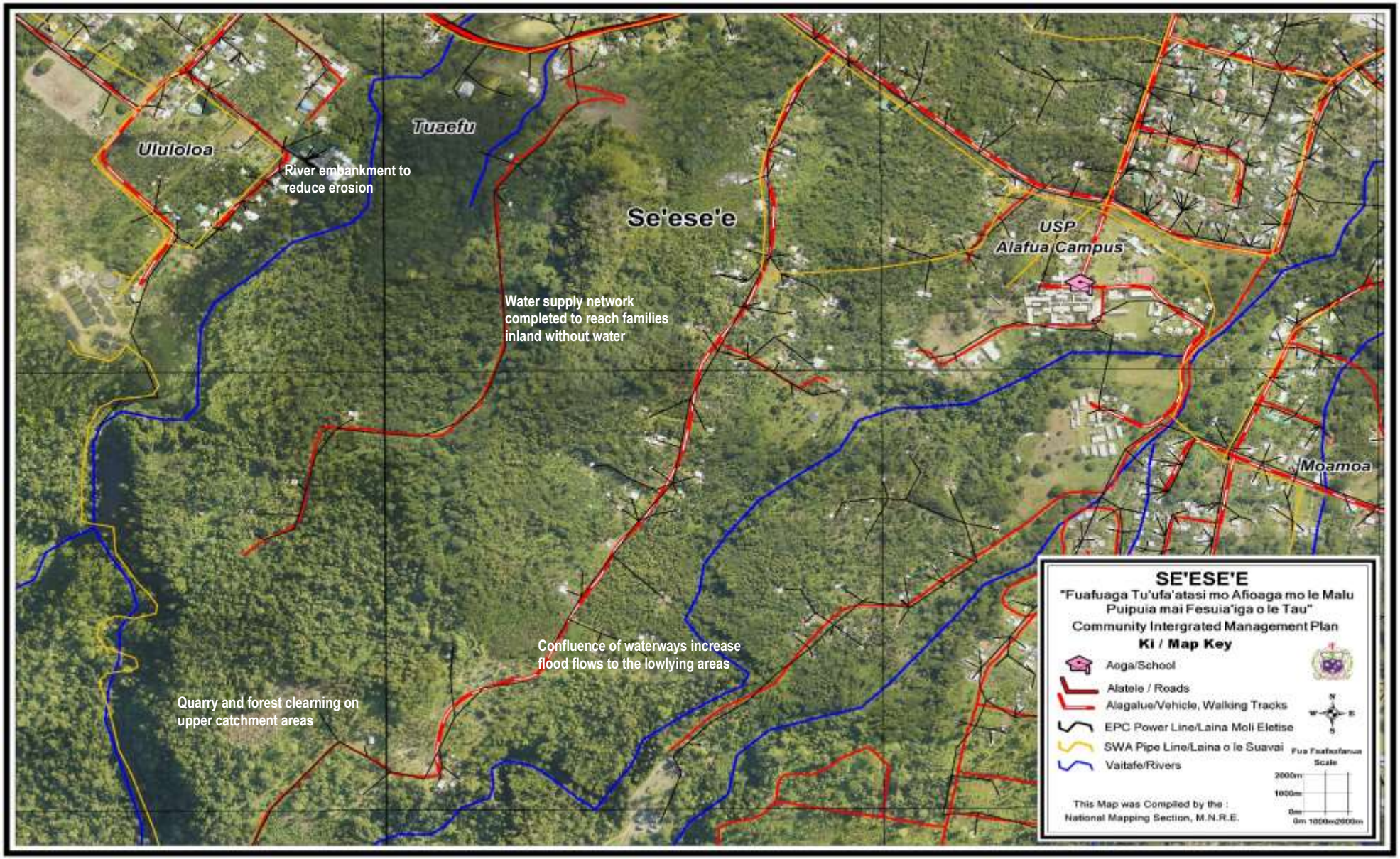
Other Solutions Considered or Further Issues Raised

Infrastructure	**Best Solution**	**Benefits**	**Guideline to assist Implementation**	**Relevant sector Plans**
Road safety	Implement road safety programme: Install humps in areas used mostly by pedestrians such as infront of Lepea Primary School in Vaitoloa and EFKS church Install footpath on the road side next to the EFKS church for pedestrian and school children safety Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: LTA / Village***	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	LTA to utilize existing national infrastructural policies and guidelines in the implementation of solutions: Relevant Environmental and Social Safeguard Policies apply - Samoa CODE of Environmental Practice (PUMA - 2007) National Infrastructure Strategic Plan (2011) Review of National Road Standard in Samoa (2016) Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 Provide budget into work programme	Land Transport Sector Plan 2016-2020

Lepea Village Map



Se’ese’e Village Map



4.3 Vailoa Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Drainage (poor system)	Reverse poor drainage system install after WCR: Implement proper routine maintenance of existing culverts and drainage channels on roadside; Install large sized culverts for water to easily flow across and not onto the road Implement district/village drainage/ culvert clean-up and awareness program regularly Recommend a river flood risk assessment River waste management program (community awareness – debris and dry stream reclamation/development etc) ***Responsibility: MNRE – WRD/ DMO/MWCSD / MWTI & LTA***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network Emergency response access for evacuation Reduce impact on village pool	Implementation of drainage upgrade by MWTI and LTA should be guided by existing infrastructural policies, strategies and action plans: Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 Waste Management Act 2010	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Village pool (drinking water)	Build protective wall on the side of the road above village pool to stop the surface runoff into the	Back-up water supply alternative for water shortage	MWTI / LTA to provide design in the protection of the Vailoa natural spring	Water and Sanitation Sector Plan 2016-2020

	pool affecting drinking water and bathing side Install a water storage tank back-up next to pump water from drinking side and store as back-up water supply ***Responsibility: LTA / MWTI /CSSP/UNDP-GEF SGP/ village***	in the district	that follows existing development guidelines: Environmental Social Safeguard Policy National Infrastructure Strategic Plan 2011 Development Consent from PUMA on design of natural spring	National Environment Sector Plan 2017-2021

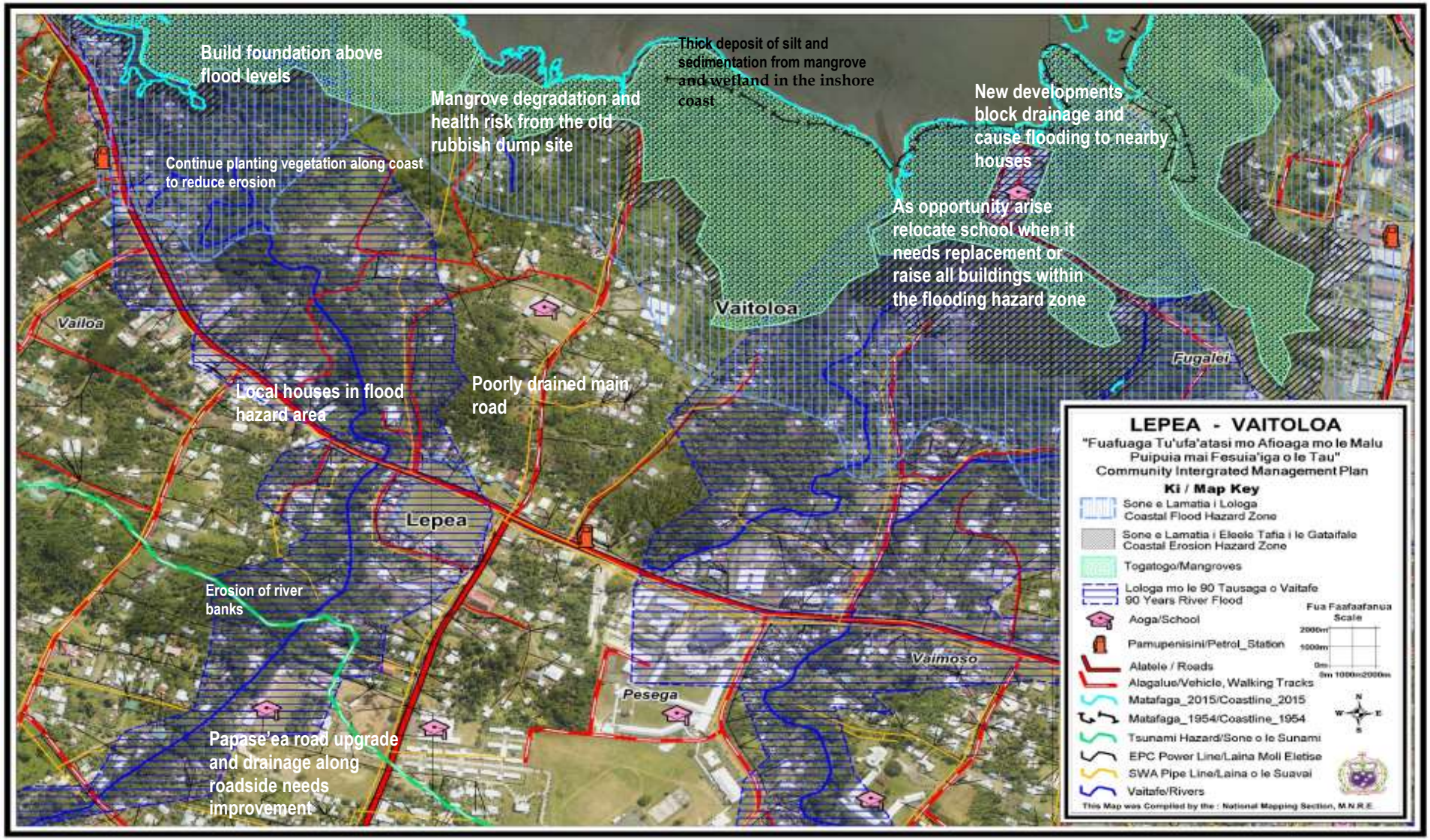
Other Solutions Considered or Further Issues Raised

Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as schools and church; Installed footpath on the road reserve for pedestrian safety Put up speed limit signs to stop drivers from speeding in residential areas **Responsibility: LTA / MWTI/Village**	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	LTA to utilize existing national infrastructural policies and guidelines in the implementation of solutions: Relevant Environmental and Social Safeguard Policies apply - Samoa CODE of Environmental Practice (PUMA - 2007) Review of National Road Standard in Samoa (2016) Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 National Infrastructure Strategic Plan (2011) Provide budget into work programme	Land Transport Sector Plan 2016-2020

Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Mangrove forest and inshore reef	Enforce a village ruling to stop building or clearance from at least 5m from the mangrove	Improve protection of coastal resources Improved	Develop an Environmental Management Plan for the mangrove	National Environment Sector Plan 2017-2021

	forest edge Rehabilitation and replanting program utilizing the mangrove seedlings Install proper drainage and stream beds within Vailoa village to reduce flooding and ponding Determine the impact of the proposed wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats Implement the recommendations from the Vailoa Mangrove Audit report ***Responsibility: MNRE / MWTI / MWCSD / District / villages***	sustainability of natural resources Improved biodiversity and ecological resilience mangrove ecosystem	ecosystem MNRE-DEC to provide advice to communities on coastal replanting and suitable coastal plant species MNRE-DEC / MAF-Fisheries to provide support to communities on awareness and education programs on value of mangrove ecosystem biodiversity Include support for mangrove rehabilitation in budget planning Implementation of activities for mangrove restoration to be guided by the NBSAP 2015-2020 Community Based Fisheries Management Plan – village communities	Community Development Plan 2016-2020 Agriculture Sector Plan 2016-2020

Vailoa Village Map



4. 4 Vaitoloa Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village pool /natural spring located	Rehabilitate existing village pool for bathing as alternative source of water during drought and water shortage period ***Responsibility: MNRE / MWCSD / CSSP / Village/ UNDP-GEF SGP***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool	Community Development Plan 2016-2021
Rainwater harvesting	Implement the installation of rainwater harvesting systems to be placed at the Pastor (EKFS) church hall for back-up water supply ***Responsibility: CSSP / NGO/ village/ UNDP-GEF SGP***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Mangrove area	Enforce a village ruling to stop building or clearance from at least 5m from the mangrove forest edge Rehabilitation and replanting program utilizing the mangrove seedlings Consider relocation of families in Vaitoloa, living on the edge of mangrove area Install proper drainage and stream beds within Vaitoloa villages to reduce	Improve protection of coastal resources Improved sustainability of natural resources Improved biodiversity and ecological resilience mangrove ecosystem	Develop an Environmental Management Plan for the mangrove ecosystem MNRE-DEC to provide advice to communities on coastal replanting and suitable coastal plant species MNRE-DEC / MAF-Fisheries to provide support to communities on awareness and education programs on value of mangrove ecosystem biodiversity	National Environment Sector Plan 2017-2021 Community Development Plan 2016-2020 Agriculture Sector Plan 2016-2020

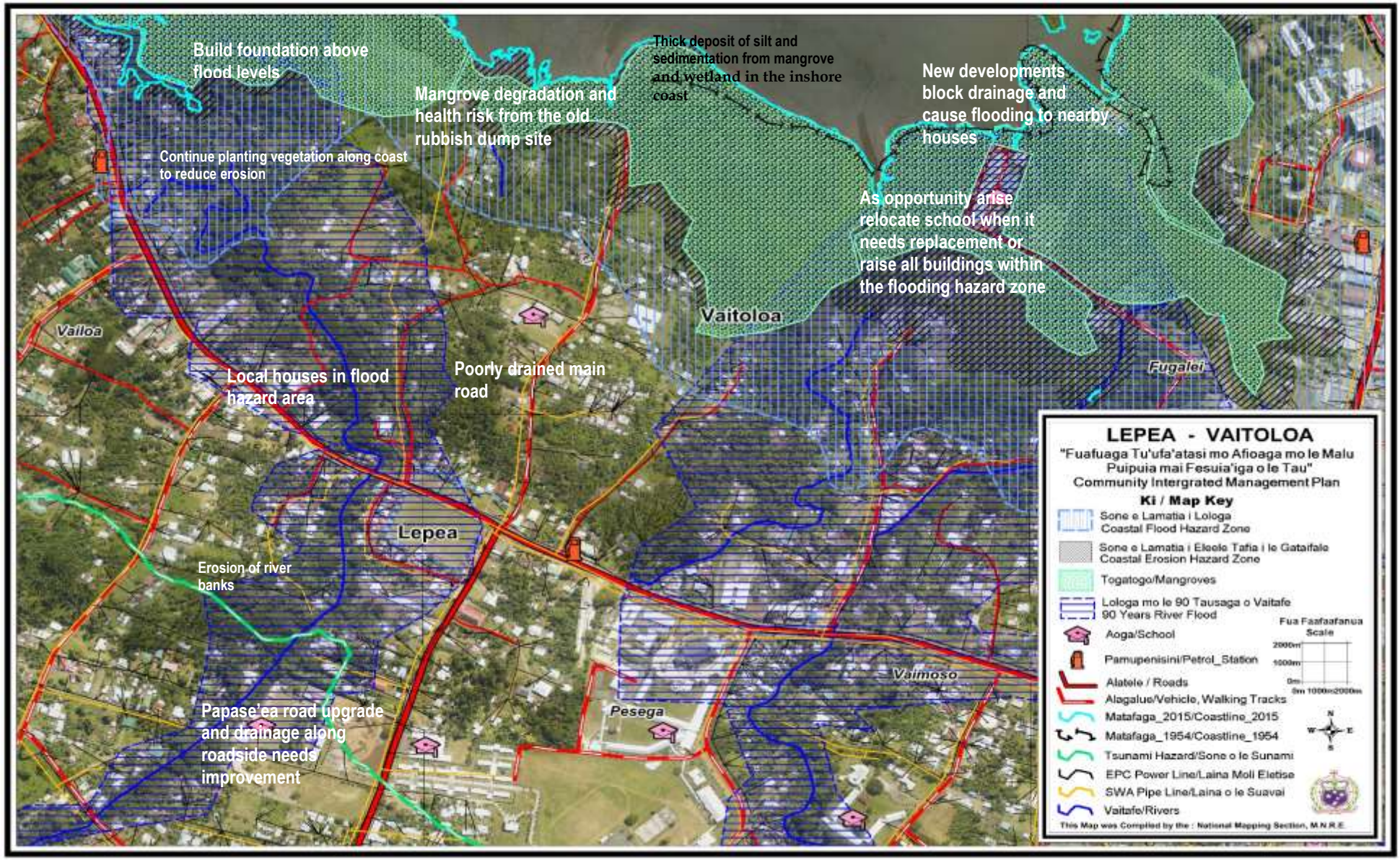
	flooding and ponding Conduct rapid biodiversity assessment to take stock of marine species diversity inside mangrove ecosystem Determine the impact of the proposed wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats ***Responsibility: MNRE / MWTI / MWCSD / District / villages***		Include support for mangrove rehabilitation in budget planning Implementation of activities for mangrove restoration to be guided by the NBSAP 2015-2020 Community Based Fisheries Management Plan – village communities	
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within village Village Committee enforce the clearing of all rubbish from culverts and drainage systems; Install rubbish stand infront of household Utilize organic waste for household community gardening ***Responsibility: MNRE/MWCSD / District-Village***	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. Waste Management Act 2010 National Chemicals and Hazardous Waste Management Policy 2012 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018

Other Solutions Considered or Further Issues Raised

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Road safety / Street lights	Install speed hump infront of the Primary	Improve infrastructure	Implementation of infrastructure related work should follow	Community

	School Install streetlights for community safety ***Responsibility: MWTI / LTA / EPC / Village***	resilience Climate proof the road transport network. Reduce impact of flooding Improve road safety at all times Safeguard electricity lines during time of storms and extreme events – natural disasters. Reduce vulnerability and avoid accidents due to fallen electricity posts.	existing policies and strategies and action plans: Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development Development of a Renewable Energy and Energy Efficiency Framework, 2016 National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage EPC to install underground electricity lines during	Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019 Samoa Energy Sector Plan 2017-2021

Vaitoloa Village Map



4.5 Sinamoga Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Drainage Inland access road upgrade (Sinamoga – Palisi)	Reverse poor drainage system by: Implement proper routine maintenance of existing culverts and drainage channels on roadside to drain directly into Gasegase river Implement district/village drainage/ culvert clean-up and awareness program regularly ***Responsibility: MWCSD / District / MWTI and LTA***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network Emergency response access for evacuation Reduce impact on village pool	Implementation of related infrastructural work should follow existing policies, strategies and action plans: Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Rain water harvesting	Implement the installation of rainwater harvesting systems to be placed at the Pastor (Methodist) church hall for back-up water supply	Improve community resilience to climate change impacts – drought and extreme events	Installing water tank at Methodist Church to support all the congregation during water shortage	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

	Responsibility: CSSP / UNDP-GEF SGP/ NGO/ Communities/ Church Group			
Build river rock wall/assess and investigate-flood protection measures (meander kiwi bridge)	Implement a rock wall along the river to protect families from flooding Conduct a feasibility assessment on the pros and cons of a rock wall and provide appropriate recommendation ***Responsibility: MNRE - DMO/Communities***	Improve climate resilience infrastructure Reduce impact from flooding	Implementation of infrastructure related work or consideration should follow existing policies and strategies such as: Environmental Social Safeguard policies Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Replanting along river banks	Implement riparian river replanting along river channel ***Responsibility: MNRE / Communities***	Reduce impact of soil erosion and flooding	MNRE to provide guidance on riparian replanting using existing policies and strategies: National Forestry Plan 2016-2020 National Water Resources Management Strategy 2007-2017 NBSAP 2015-2020 Water Resources Act 2008 Forestry Restoration Operational Plan 2016-2020	Water and Sanitation Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

			Two Million Tree Planting Strategy 2015-2020	
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within village Village Committee / church groups enforce the clearing of all rubbish from culverts and drainage systems; Install rubbish stand infront of household Utilize organic waste for household community gardening ***Responsibility: MNRE/MWCSD / MoH / District-Communities***	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village committee or church groups enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. Waste Management Act 2010 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto National Chemicals and Hazardous Waste Policy 2012	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018

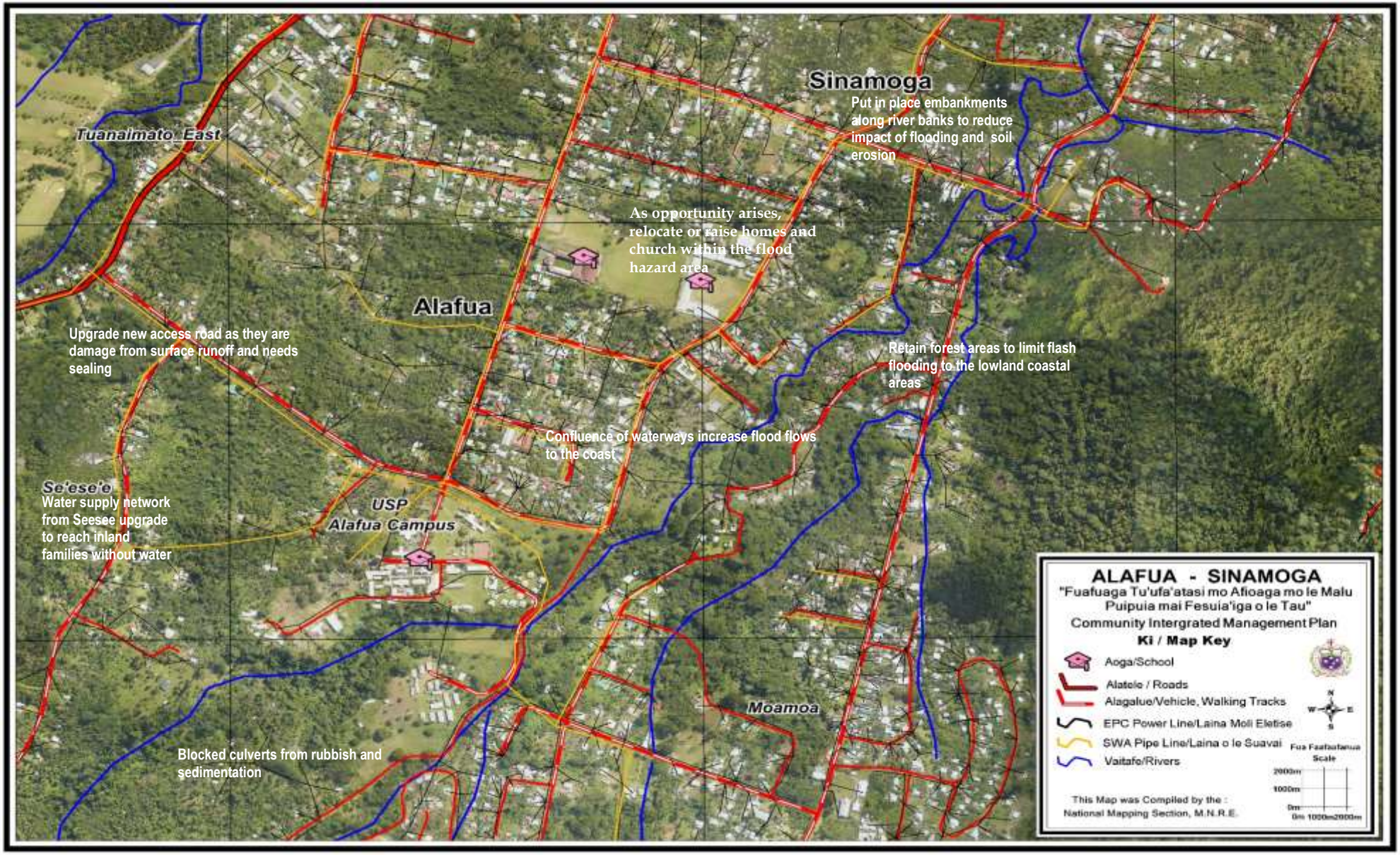
Other solutions considered or further issues raised

Road safety	Enforce road reserve on side of road for safety Install speed-humps, road safety signs and designate bus stop as well as footpath to protect pedestrians ***Responsibility: MWCSD / District / MWTI and LTA***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding Improve road network	Implementation of related infrastructural work should follow existing policies, strategies and action plans: Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) National Infrastructure	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

		Emergency response access for evacuation Reduce impact on village pool	Strategic Plan (NISP) 2011 PUMA Act 2004 Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	

Poor drainage system as shown in the picture the drains runs directly behind residential places - vulnerable to flooding

Sinamoga Village Map



4.6 Alafua Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Road, Drainage, Fords (Alafua – Moamoa) in the FHZ	Implement proper routine maintenance of existing culverts and drainage channels on roadside Assess feasibility for new crossing between Alafua & Moamoa Implement an EIA prior to the upgrade of road, drainage and bridge ***Responsibility: MWTI / LTA / MNRE-DMO/Communities***	More resilient to natural hazards Safer houses Better use of economic resources Improved protection and resilience Improved sustainability of natural resources	Implementation of related infrastructural work should follow existing policies, strategies and action plans: Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019 National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004

Other Solutions Considered or Further Issues Raised

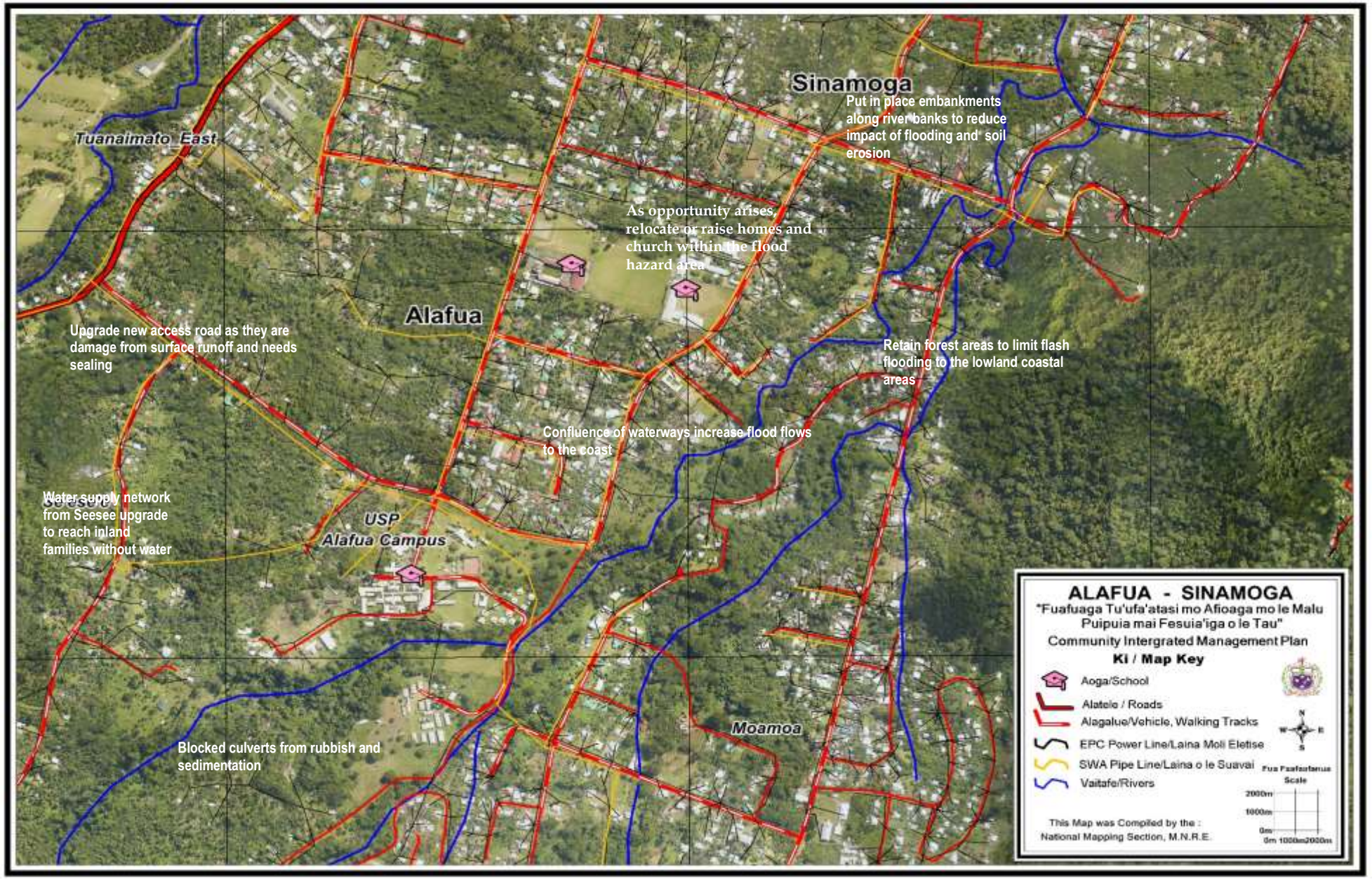
Infrastructure	Solutions/ Issues	Comment
Rain Water Harvesting	Village representatives from EFKS church requested 4 large water tanks: Install water tanks at each of the 4 different denominations in the village ***Responsibility: CSSP / Village Church Groups/NGO***	The Non-Traditional Village consultation meeting on the 29 May 2017 the church group representatives who attended the workshop made a request for their small sub-project to support the installation of large water tanks in each of the 4 denominations as back-up water supply and to provide seedlings for Women's Church Group household vege gardening and composting.
Vegetable garden / Composting	Women's Committee in Church Groups implement household vegetable gardening and composting.	

	Responsibility: CSSP / Village Church Groups/NGO	

Water way track that connects Moamoa to Alafua village – community request to upgrade the existing track to a bridge for short cut and easy access

Village mayor request for LTA to install road side drainage to reduce impact of flooding from water run-off from the road

Alafua Village Map



4.7 Pesega and Lotopa Village Interventions

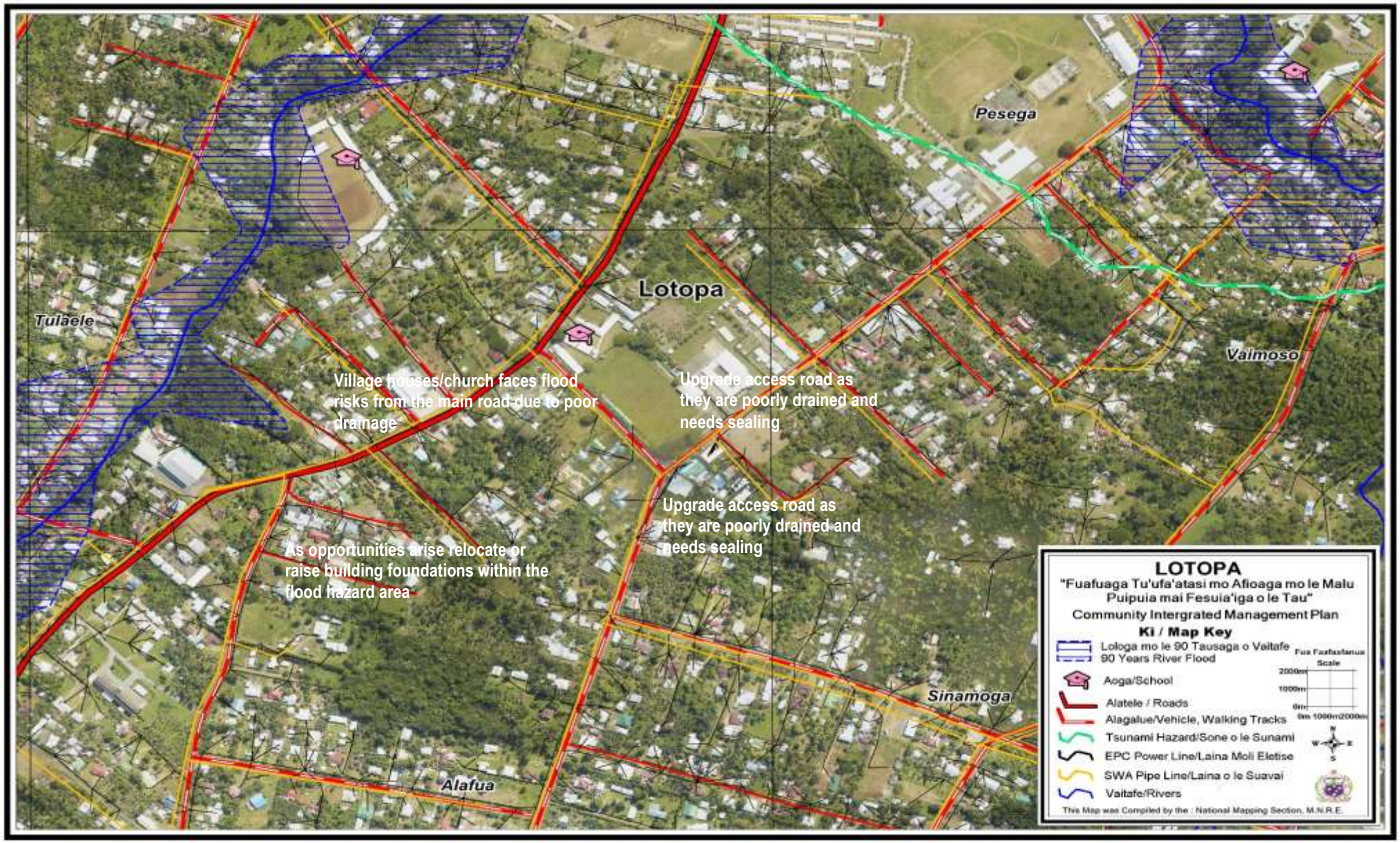
Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Main Road / drainage (Lotopa/Pesega)	Regular maintenance of drainage and construction of new sizeable culverts along Lotopa Road Conduct study and upgrade drainage and outflow to ensure flow of water and avoid stagnant storm water at Pesega High School and opposite LDS Temple Upgrade access roads (Pesega access road connecting to Vaimoso) including sealing remaining sections; Design and construct proper drainage in front of Nazareth Church to mitigate flooding ***Responsibility: MWTI / LTA / Communities***	More resilient to natural hazards Safer houses Better use of economic resources Improved protection and resilience Improved sustainability of natural resources Reduce impact of flooding Safeguard electricity lines during time of storms and extreme events – natural disasters. Reduce vulnerability and avoid accidents due to fallen electricity posts.	Implementation of related infrastructural work should follow existing policies, strategies and action plans: Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage EPC to install underground electricity lines Coordinate distribution networks to avoid overloading poles and contributing to line failures Development of a Renewable Energy and Energy Efficiency Framework, 2016	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019 Samoa Energy Sector Plan 2017-2021
Other Roads	Upgrading and sealing of dirt road going into residential areas Construct drainage along sides of inland dirt roads – covered in issue1-above) ***Responsibility: MWTI / LTA / Communities***			
Electricity	Remove trees close to electricity lines Relocate electricity lines away from village houses where practical Provision of underground electricity in the long-term ***Responsibility: EPC /Communities***			

Other Solutions Considered or Further Issues Raised

Environment / Livelihood/ Infrastructure	Issues	Comment
Rainwater harvesting	Village representatives from Methodist church requested one large water tank; Install water tanks at church place to support families of congregation during water shortage. ***Responsibility: Church Groups / CSSP/NGO***	The Non-Traditional Village consultation meeting on the 29 May 2017 the church faith based representatives who attended the workshop made a request for their small sub-project to support: • Water Tank for church • Rubbish stands • Septic Tanks for improved sanitation Methodist Church Representative • Household drainage infront of chapel to mitigate flooding • Road safety speed humps • Low hanging electricity lines Nazareth Church • Mangrove clean-up and relocation of families living there • Septic tanks for vulnerable families for improved sanitation Mormon Church
Waste Management	Conduct assessment of most vulnerable families in the church with larges families to allocate the installation of septic tanks. Install rubbish stands for ease of rubbish collection and reduce impact of waste to promote a clean Samoa **Responsibility:** ***Church Groups / CSSP / MNRE***	
Mangrove clean-up	Mangrove clean-up of all debris that are deposited there to allow for easy flow of water to the sea and clear blocked culverts etc. Consider relocation of those families living on the edge of mangrove ecosystem. Mangrove replanting. ***Responsibility: MNRE / Church Group***	
Road safety	Installation of road safety measures: road humps, footpaths, crossings, signage, road names. ***Responsibility : LTA / community***	Representative from Church Groups raised concern about safety of pedestrians and the need to have road safety measures in place.

Lotopa village biggest problem is no roadside drainage as shown in the picture making it vulnerable to flooding

Lotopa Village Map



4.8 Moamoa-fou/ Vaea Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Main Road to Moamoa including drainage streetlights	Upgrade Moamoa ford to a bridge to ensure access during flooding Regular maintenance of drainage and construction of new sizeable culverts along Moamoa Road and inland roads to residential areas (and road to church) Construct footpaths and light poles ***Responsibility: LTA / MWTI / EPC / Communities***	More resilient to natural hazards Safer houses Better use of economic resources Improved protection and resilience Improved sustainability of natural resources Reduce impact of flooding Safeguard electricity lines during time of storms and extreme events – natural disasters. Reduce vulnerability and avoid accidents due to fallen electricity posts.	Implementation of related infrastructural work should follow existing policies, strategies and action plans: Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Vulnerability Assessment of the Samoa Road Network (2016) Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 Implement the CDCRM Program and promote disaster awareness respond and preparedness for the likelihood of an extreme event / disaster	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019 Samoa Energy Sector Plan 2017-2021 National Disaster Sector Plan 2016-2019
Road fords (6 Theological college, Catholic church, to new resettlement area, main ford,)	Enlarge or increase ford culverts to avoid floodwater flowing over the ford and blocking road access Construct drainage along sides of sealed inland roads to residential Replace fords with a bridge in the long term for the new resettlement Catholic area Widen and install ramps at the bridge at the Theological College and Church Area ***Responsibility: MWTI / LTA / /Land Owners***			
Village houses and infrastructure in hazard zones	Enforce development regulations and guidelines to inform development near river streams Relocate outside of FHZ when buildings require replacement or to ensure investment within hazard zone is considered in relation to the potential for			

	damage from flooding Consider building foundations at a level that takes into account the FHZ in the vicinity of the building Relocate away from Landslide/Landslip Hazard Zone or areas vulnerable to rockfall beneath Mt Vaea (Catholic Resettlement area) ***Responsibility: LTA/MWTI/MNRE/ Community***			
Evacuation Shelter	Implement the CDCRM Program for villages in the district: Map out emergency shelters within villages away from hazard zone for use during natural disasters such as Primary School, church buildings etc and retrofit buildings suitable for evacuation centre Install emergency signs for evacuation ***Responsibility: MNRE-DMO / MWCSD / District-Villages / Church Groups***	Improve public facility used by communities for safety during times of natural disasters Reduce number of casualties during disasters Improve adaptive response of communities in preparation for natural disasters or extreme events	MNRE-DMO to provide sound advice to communities guided by existing programmes: Community Disaster Climate Risk Management Program	National Disaster Management Plan 2017-2021
Rain water harvesting	Implement the installation of rainwater harvesting systems or water tanks with families in Moamoa-uta without access to water (specifically vulnerable/hardship families) ***Responsibility: CSSP /UNDP-GEF SGP / NGO/ Community***	Improve community resilience to climate change impacts – drought and extreme events	Immediate response to ensure all families being resettled inland (vulnerable families) have access to water	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021
Waste Management	Conduct assessment of most vulnerable families in the church with largest families to allocate the installation of septic tanks. Install rubbish stands for	Improve hygiene Reduce number of people getting vector borne disease	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village committee or church groups	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018

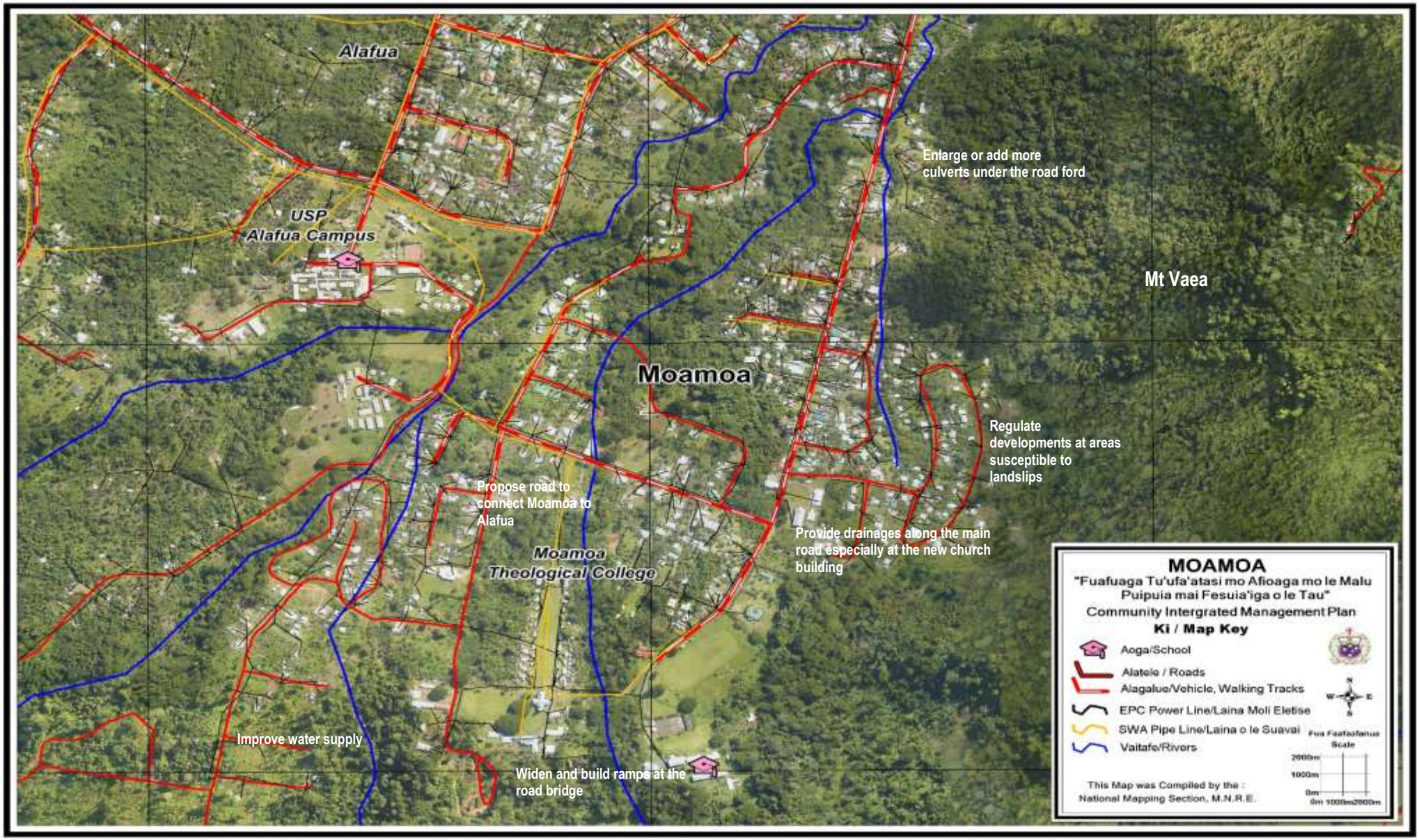
	ease of rubbish collection and reduce impact of waste to promote a clean Samoa Waste awareness and education programs for schools within village **Responsibility: *Church group / CSSP / MNRE***	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. National Chemicals and Hazardous Waste Management Policy 2012 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto Waste Management Act 2010	

Other Solutions Considered or Further Issues Raised

Infrastructure	Issues	Comment
Road safety	Installation of road safety measures: road humps, footpaths, crossings, signage, road names. ***Responsibility : LTA / community***	Representative from Church Groups raised concern about safety of pedestrians and the need to have road safety measures in place.

Ford at Moamoa-fou towards Catholic Resettlement Area, when it is heavy rain and flooding it will stop vehicles from crossing and can isolate families on the other side of the ford with no access to cross if there is an emergency. Long term solution is replace ford with a bridge

Moamoa/ Vaea Village map

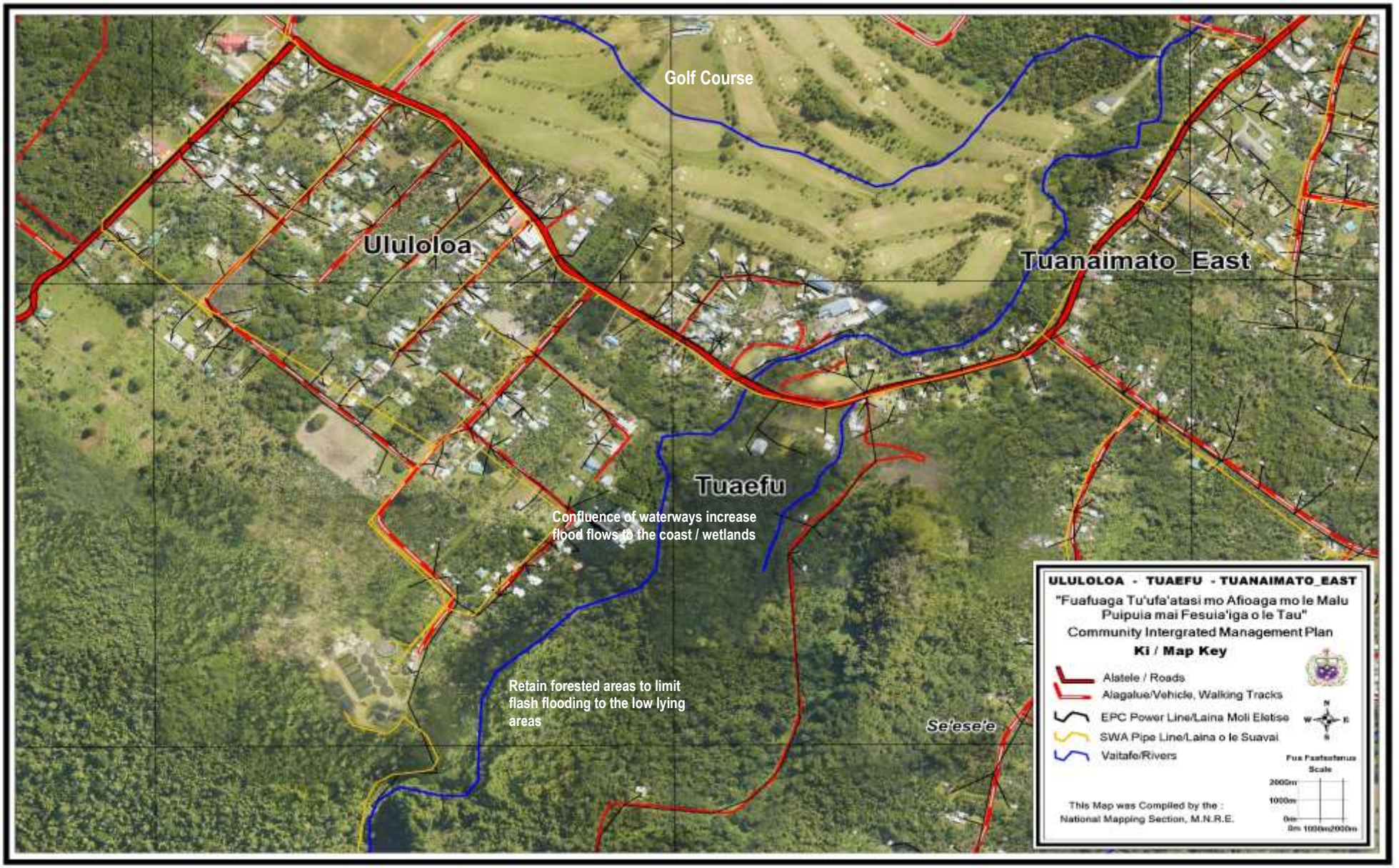


4.9 Ululoloa, Siusega, Tuaefu & Tuanaimato-East Village Interventions

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Roads (Ululoloa / Siusega / Tuaefu)	Construct drainage on roadside Upgrade and seal access dirt roads going inland to residential homes Regular maintenance of existing roads and drainage / culverts ***Responsibility: LTA/MWTI /***	Improvements to the village roads will increase the resilience of the community and safety of residents. Houses and other encroachment onto the public road reserve limits access, storm water drainage and utility use of the reserve that benefits the whole community. Although some families have claimed that some access roads are part of their land. Access roads are said to have been there before families moved in and investigations should be carried to solve this issue
Electricity (Ululoloa / Siusega)	Install more light poles and streetlights to provide light at night for pedestrian safety Remove trees located close to electricity lines ***Responsibility: EPC / Community***	Resilience will improve by removing trees near electricity lines Regular maintenance of the lines, including replacement of rotting poles is required.
Water	Request a sub-main line from SWA to connect families residing further inland from the main road. (confirm locations) ***Responsibility: SWA***	The Non-Traditional Village consultation meeting on the 29 May 2017 the church group representatives from 7th Day Adventist who attended the workshop made a request for their small sub-project to support: SWA sub-main pipe network connection so that families residing further inland can get access to water.
Nursery	Request for seedlings for vegetable gardening and the establishment of a nursery to be managed by church Women's Group ***Responsibility: Church group / MAF / CSSP/UNDP-GEF SGP/Community***	

Ululoloa, Tuaefu, Tuanaimato East



4.10 Tanumapua and Tapatapao Village Interventions

Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests : Promote and facilitate planting of root-crops (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. Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement Sustainable Land management practices Implement integrated pest management programmes ***Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/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	

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Roads (Tapatapao) / drainage	Upgrade, widen and seal the Tapatapao road with drainage Sealed the road from Tapatapao to Faleo mauga support relocation on higher grounds Construct drainage on roadside and sizeable culverts Implement road safety programs: such as road humps, footpaths, crossings, signage, road names and streetlights at appropriate places (other issues) ***Responsibility: LTA/MWTI / Church Group***	Improvements to the village roads will increase the resilience of the community and safety of residents. The existing road is too narrow
Water Supply	Request a sub-main line from SWA to connect families residing further inland from the main road. ***Responsibility: SWA***	The Non-Traditional Village consultation meeting on the 29 May 2017 the church faith based representatives from Catholic Church requested that their youth group would: Established a nursery for a vegetable garden Youth members will develop their own vegetable garden using seedlings from the nursery to support their families and church..
Plant nursery	Request for seedlings for vegetable gardening and the establishment of a nursery to be managed by church Women's Group ***Responsibility: Church Group / MAF / CSSP / MNRE-FD/ UNDP-GEF SGP***	

Photos from site assessment

Laloanea dirt road from Tapatapao (SWA Treatment Plant) connecting to Falemauga and Aleisa East area request to tar sealed road to help people relocate to higher grounds and away from hazard zone

Vaitoloa natural spring pool – with drinking water and area for bathing village use it when there is piped water shortage after heavy rain or cyclone.

Tanumapua & Tapatapao Village Map