Community Integrated Management Plan

Faleata West - 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 West (Toamua/Puipaa, Saina, Vaitele-tai, Vaitele-fou / Vaitele-uta, Elise Fou, Vaigaga, Vaiusu, Tulaele/Talimatau, and Tafaigata / Falelauniu) District

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

Date of Signing: **22 June 2018**

Representatives: Signature:

Toamua / Puipaa Village

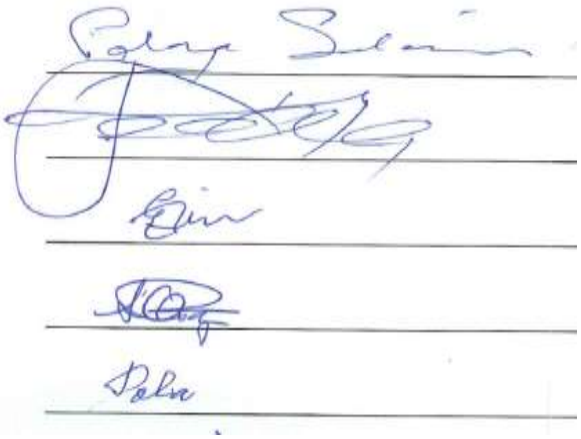
- Leuo Leta
- Vaine Inailaunaoo Palaamo
- Aiga Fualaga
- Tasimale Panamalie
- Fa'ivalu Ituala
- Valentino Leta

Saina Village

- Lauaki Simona
- Nofoao Lauaki
- Tuipalusami Vai
- Nu'ufou Tuipalusami
- Saina La'ala'ai Ieremia

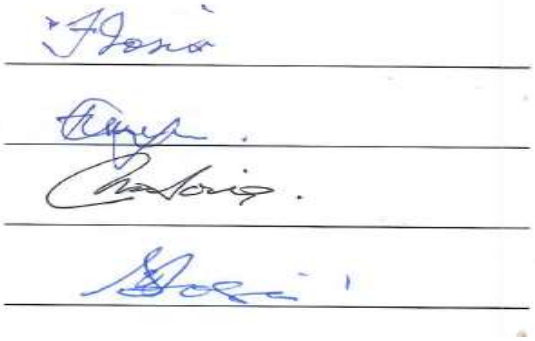
Vaitele-tai Village

- Paloa Salaina
- Toi Malaga
- Eseta Fiu
- Linda Palepoi
- Pola Fali



Vaitele-fou / Vaitele-uta Village

- Faleao Iosia
- Taefu Liugafou To'afia
- Moondy Iosia
- Sosefina Iosia

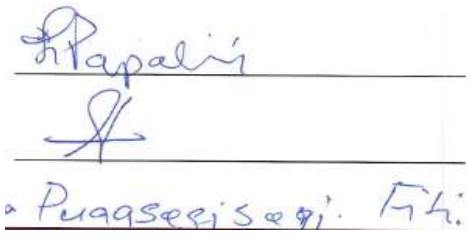


Elise Fou Village

- Vaitogi
- Nu'u Talalelei Galo
- Nancy Talalelei

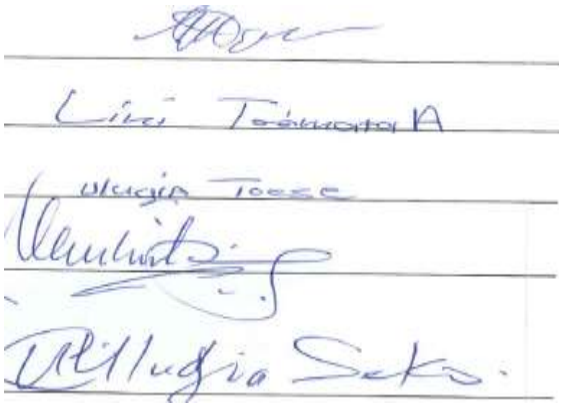
Vaigaga Village

- Leone Papali'i
- Noema Perenise
- Puaasegisegi Fiti



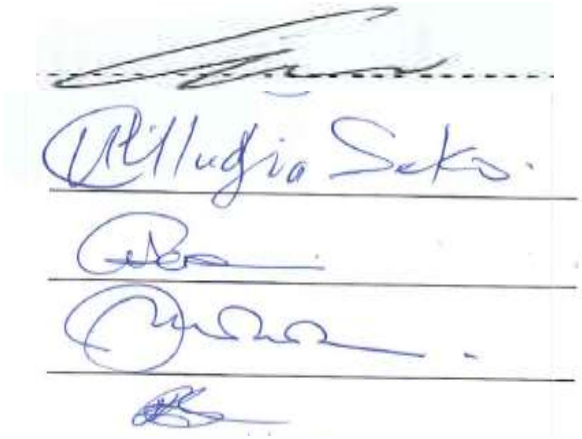
Vaiusu Village

- Ulugia Siaki
- Lini Toomata Alesana
- Ulugia Toese
- Ulugia Mata'u Matafeo
- Ulalia Ulugia Seto



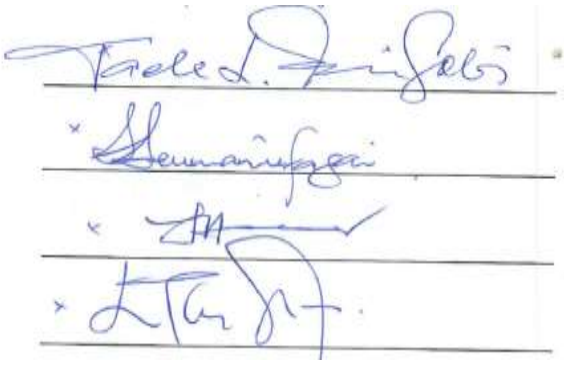
Tulaele / Talimatau Village

- Leiataua Elisaia
- Aigaga Ulutaaloga
- Fui'availili Lolesio
- Ropati Mariner
- Ilalio Kopeni Ilalio



Falelauniu / Tafaigata Village

- Taele Leuta Saifoloi
- Faigata Seumanufagai
- Ropeti Tuisalega
- Letoa Taylor Toeaso



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.

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

The Strategy has as its central vision "Resilience – Communities and their resources are Resilient to Natural Hazards". The CIM Plan takes this vision and provides the practical tools with which the communities and the government, in partnership, can implement the Strategy.

To be resilient is to be adaptive, responsive and quick to recover so that communities are environmentally, socially and economically sustainable.
(CIM Strategy, August 2015)

1.2 The Aim of the CIM Plan

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

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

1. Enhance awareness of hazard risks from the ridge to reef;

2. Improve climate resilience planning and development

3. Better adapt, respond and recover from natural disasters and other extreme events

1.3 The Structure of the Plan

The CIM Plan consists of two parts each serving a separate and distinct purpose.

- ***Plan Development,*** which describes the process undertaken to prepare the CIM Plan in conjunction with representatives of the Communities involved, the Government and other stakeholders with interests in the Plan area.

- ***Implementation Guidelines,*** which describes the Plans and Actions recommended as outcomes of the process, together with the partner responsible for implementing these outcomes.

2. Implementation Guidelines

2.1 Purpose of the Plan

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 Sisifo District Environment

3.1 Physical and Natural Resource Setting

The Faleata Sisifo District spans both sides of Vaitele Street/West Coast Road west of Apia on the northern coast of Upolu. The District comprises nine villages including Toamua/Puipa'a, Saina, Vaitele Tai, Vaitele Uta and Vaitele Fou, Vaigaga, Elise Fou, Vaiusu, Tulaele/Talimatau and Falelauniu and Tafaigata. There is a combination of customary and freehold title land within the District, including a common land settlement of descendants from Tuvalu at Elise Fou.

Half of the villages are located on the flat coastal plain, however, Vaitele Fou, Vaitele Uta, Tulaele/Talimatau, Elise Fou, Tafaigata and Falelauniu are villages that lie away from the coast on gently undulating land.

The reef system is between 1.0 and 2.5 km from the shoreline. The coastline has experienced considerable change over the last 60 years as shown in the aerial photo records have been kept, including erosion, accretion and engineered change through reclamation. A number of villages along the coast have reclaimed land up to 30 metres from the original shoreline. Sedimentation/siltation is occurring in front of Vaitele, Vaiusu, Vaigaga, and Saina. The Faleata west 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 Vaisusu Bay and the increased siltation from the rapidly increasing inland population, the inshore reef of Faleata district has become extremely polluted. The lagoon is now dominated by seagrass beds (*Halophila* and *Syringodium*) indicating the increasingly eutrophic conditions. 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. Fishing is still practiced in the villages of the district although not as much as in the past mostly due to the reducing number of fisher people and the unhealthy status of fisheries found in the area.

Sand mining occurs in front of several villages including Toamua, Puipa'a and Saina and has impacted on the ecosystems and fisheries. Two private companies are conducting sand mining in the village under permits that were granted by government. The village of Toamua has three freshwater springs, one of which has dirty water caused by both run off from the main road and salt water inundation from the sea, the other natural spring has been upgraded through a small-grant received from the UNDP GEF-SGP. Few mangroves remain on the coast. There are a number of reclamations including for launching recreational boats such as fautasi. This village also hosts a cultural heritage site known as Puipa'a (crab cave) that is currently exposed to wave damage. Faleata West is the western most part of the Vaiusu Bay Mangrove area as such most of the mangroves on are located on the coastal edge. No streams or rivers drain into this part of Vaiusu Bay, although the surface runoff from the roads now drain into the bay has added to the deteriorating condition of the marine environment. A major program is needed to rehabilitate the Vaiusu Bay which is also under plans for major wharf development. Depending on the proposed wharf plans, a rehabilitation of the Vaiusu Bay might not be possible.

The terrestrial biodiversity within the district is mostly non-forest area made up of ornamental gardens around settlements extending all the way to Falelauniu and Tafaigata. Beyond it is the Fuluasou Watershed Area which is part of the Apia Catchment Key Biodiversity Area. The Apia Catchment Area is important not only for the conservation of native flora and fauna, but it is also a very important site for climate resilience work. Protecting this area for water supply, and reducing impact on the inshore reef and coastal flooding add to the importance of the catchment.

The Apia Catchment Area is very rich in birdlife with information collected in previous survey from 1991 ecological surveys to the recent BIORAP showing that most of the threatened native birds such as tooth billed pigoen, samoan triller, many coloured fruit dove, maomao, and white throated pigeons as well as the culturally

important pacific pigeon and fruit bats are found in good populations in this catchment area. Therefore, supporting the activities of the Apia Catchment Watershed Management Plan will be critical for the conservation of these important biodiversity. 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 Faleata Sisifo District currently has a population of approximately 21271 persons, according to the 2016 national Census. The district is developed along the coast and in inland villages, particularly on both sides of Vaitele Street, which is the main road to the west of Upolu. The main road is an important part of the district's infrastructure. It is in good condition apart from the need for better drainage and regular maintenance. There are also concerns for pedestrian safety and traffic speed, particularly in front of churches and schools. The road provides access from each village to the central business district of Apia (to the east), the airport (to the west), other villages and important social infrastructure such as schools and churches. Access roads also provide inland and coastal access to houses, schools, churches and recreational open spaces.

This district supports more than 9 schools including pre-school, primary and secondary schools, and more than 35 churches of different denominations. The district also hosts the South Pacific Games sporting complex (Faleata Sports Complex) and shares with Faleata Sasa'e recreational open spaces such as the Faleata Golf Course and Horse Racing Track.

There is a large industrial area at Vaitele Tai in a narrow coastal strip vulnerable to coastal flooding. Large industries such as the Vailima Factory, Bluebird Hardware, supermarkets, banks and a range of other businesses operate on both sides of the main road. Smaller commercial businesses also line the main road. Vaitele-tai is almost the second-town for the island, as it is the center of businesses and industrial activities.

Inland, Vaitele Fou has a number of new roads and intersections that have yet to be signposted and illuminated with streetlights. Also within Vaitele Fou a former quarry which was used as an illegal rubbish dump has been converted into a Park Reserve with a full forest restoration program. The area is now filled with native trees and a walking track used for recreational activities, as well it has been fenced to stop people from dumping there rubbish their illegally. The main road located near the coast is within 20 metres of the sea in front of the villages of Vaiusu, Vaitele and Saina. The main road is also within the Flooding Hazard Zone (FHZ) in these villages. The road is drained via open swale grass drains and intermittent culverts of varying sizes throughout the district mostly occurring on the southern side of the road.

Electricity poles follow the main road and are evenly spread along both sides of the road. In many cases throughout the district the poles are located close to church buildings, houses, or within the road reserve too close to the carriageway. In a number of cases the lines are low hanging and a potential hazard during bad weather. Electricity is supplied by EPC to all villages, apart from the new inland settlements. Supply is generally reliable; however, it is sometimes disconnected without warning. The West Coast Road upgrade from Vaitele-tai to the airport also upgraded electricity by installing lines underground for more safety purposes and to prevent potential hazard of falling electricity lines during an extreme event such as cyclones etc.

Most landline telephones are phase-out and replace by the fast growing mobile phones providing excellent competitive services. Within the district water is supplied via mains supply piped along the main road and via access roads. Most of the villages have a reliable supply however when water is disconnected without warning there is often no alternative supply. There are more than 6 springs within the district each of varying condition and quality of supply. A number of villages have already applied for funding to improve their village supply of fresh

water through upgrading springs or for provision of water tanks.

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 West 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 in the inland areas with the exception of Toamua/Puipaa, Saina, Vaiusu and Vaitele-tai that are located on the coast along the Vaiusu bay. Faleata West district is part of the wider Apia urban area that are highly exposed to climate change risks because of the lack of climate related 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 West (Laloanea) which has increase flood and erosion risk from expansion of cattle farms etc, and thus exacerbates the potential impacts on low-lying settlement and infrastructure. The TC Evan in 2012 impact is inidicative 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**:** Rocky beaches in several coastal sections indicate high coastal erosion in the area. Like Faleata East District the coastal erosion in the area could also trigger from the longshore littoral drifts process associates with reef-channel networks. It is noted that, the reef-channel network associates longshore drift process transports sediment from this particular coastal zone into deep-ocean Figure 1. Certain human activities create significant sediment deficiencies and aggravate coastal erosion. These include sand mining, construction of shoreline structures such as seawalls and rock revetments. The exposed Mulifanua rock formation lava along the coastline acts as seawall in several coastal sections and degradation of coral reefs are all contributors to coastal erosion in the area.

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

Figure1 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. The geology of the area is young with thick lava of Mulifanua Formation overlying Salani Fomation is evidence of the water sources deficiency in the area. It noted by Fepuleai (2017) that groundwater source could thin toward the coast corresponds with thick Mulifanua lava cropped out in areas including Vaigaga, Vaitele-tai, Saina, Toamua / Puipaa, Tulaele, Talimatau and Vaitele-fou but it seems thicker further inland toward Vaitele-uta, Elise-fou and Falelauniu, where the Salani rocks starts to expose. Groundwater aquifer is expected to occur in the area is referred to as basal aquifer, and it is trigger from fracture and joint network of Mulifanua rock.

There is a strong need to restore and protect coral reef ecosystem in the area as natural barriers to storm surges and high energy waves. Seawall construction is needed to be reconsidered in the near future. Collapsed seawall in these coastline areas is a similar problems that are commonly occurred all over Samoa, which includes poor building materials and seawall-slope angle. Most seawall building materials are part of Mulifanua Formation, which dominates with scoria nature and high vesicular lava suites. These rocks contain a lot of vesicles that can be easily soak or fill up with water, which enable to move as the seawall absorbs the impact from breaking wave. The

Fagaloa Formation and Salani Formation lava suites are recommended the best seawall building materials in Samoa, due to their high specific gravity and less or absent of vesicle.

Based on previous records from Apia Observatory and the Public Works, drilled boreholes from several sites within this district, for groundwater sources were commonly contaminated by seawater intrusion. Groundwater assessment, management and water quality for future water projects are highly recommended in this area. This will enable the relevant government agencies understand the dimension of groundwater body lying underneath the areas and identify major components that contaminate the source. These skills and knowledge needs to be shared among communities to build a firm foundation of natural resource management and planning for adaptation approach towards combating climate change impacts.

Polluted drainage / waste discharge from industrial area at Vaitele-tai coast

4. Faleata West District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access road	Tar sealed access road in the following villages: Toamua / Puipaa – escape route Saina – sealed road to Primary School Laloanea – sealed road to relocate people upland area Enforce road reserve on side of road for safety ***Responsibility: MWCSD / District / MWTI and LTA***	Improve infrastructure resilience and rate of recovery Climate proof the road transport network. Reduce impact of flooding Improve road network Improve access to elevated areas Safer village houses and roads Improve coastal protection	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) Implementation of drainage upgrade by MWTI and LTA should be guided by existing infrastructural policies, strategies and action plans. Program into works for budget support Vulnerability Assessment of the Samoa Road Network, 2016 National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Drainage	Address drainage system issues by: Implementing 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 ***Responsibility: MWCSD / District / MWTI and LTA***			
Evacuation Shelter/ Emergency	Implement the CDCRM Program for villages in the district:	Improve public facility used by communities for safety during times of	MNRE-DMO to provide sound advice to communities guided by existing programmes:	National Disaster Management Plan 2017-2021

Shelter and services	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 Installed emergency signs for evacuation ***Responsibility: MNRE-DMO / MWTI/ MWCSD / District-Villages***	natural disasters Reduce number of casualties during disasters Improve adaptive response of communities in preparation for natural disasters or extreme events	Community Disaster Climate Risk Management Program	

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as infront of schools and church Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: MWTI/ LTA / Village***	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 Provide budget into work programme Land Transport Sector Plan 2016-2020 National Infrastructure Strategic Plan (2011)

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	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce fines upon individuals,	National Environment Sector Plan 2017-2021 Heath Sector Plan 2008-2018

	for schools within district and women's committee / church groups and youth; 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***	culverts allows for quick flow of water into the sea	businesses and families within village that dispose rubbish illegally. National Chemicals and Hazardous Waste Policy 2012 A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto Waste Management Act 2010	
Mangrove forest and inshore reef	Enforce a village ruling to stop building or clearance from atleast 5m from the mangrove forest edge Rebuild the spring pools within mangrove area with proper filters to reduce pollution reaching the sea and affecting fish nurseries Rehabilitation and replanting program utilizing the mangrove seedlings Conduct rapid biodiversity assessment to take stock of marine species diversity inside mangrove ecosystem Conduct testing for fisheries found in the Vaiusu Bay to determine contamination from landbased pollution Determine the impact of the proposed	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

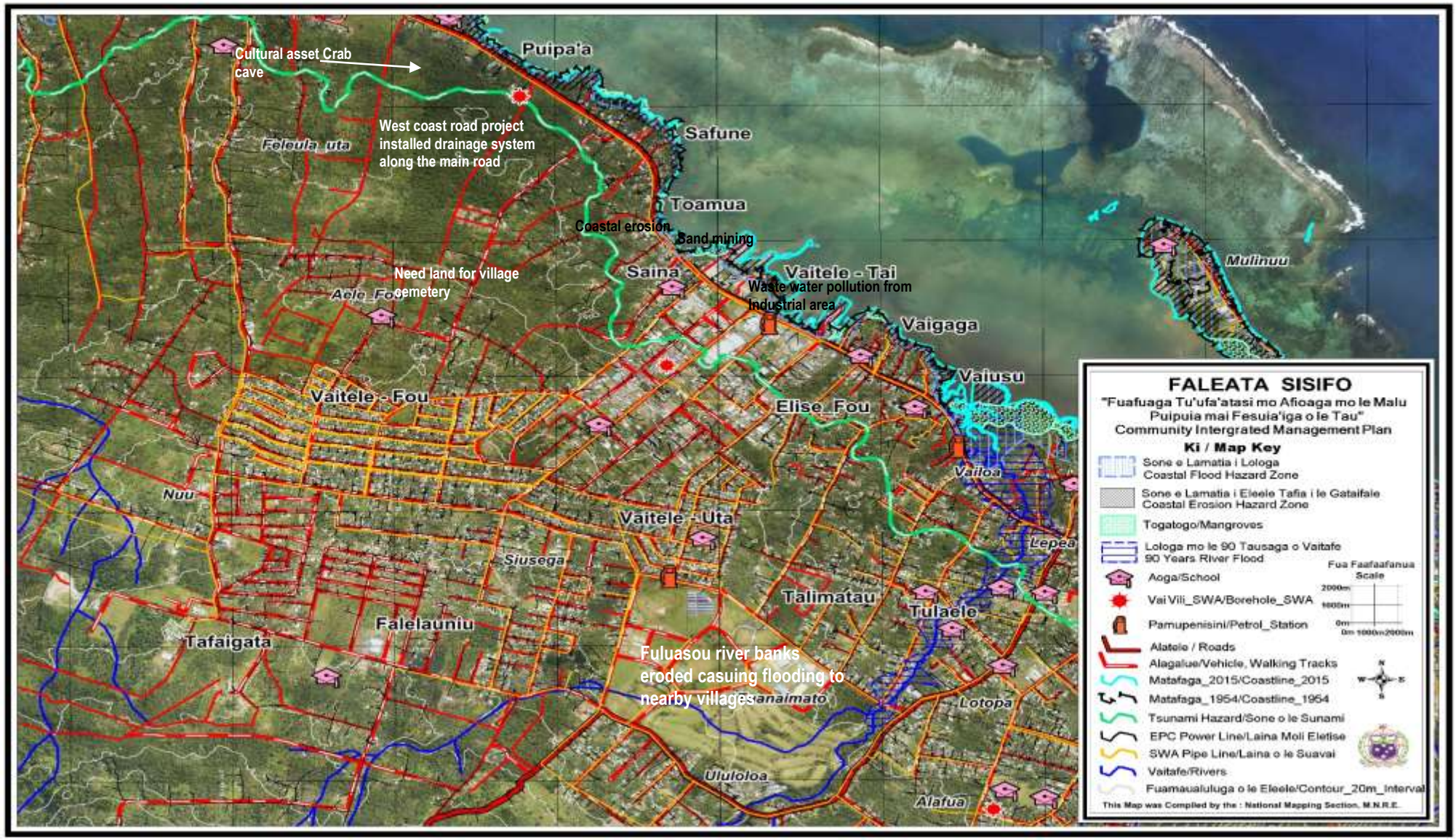
	wharf on Vaiusu Bay mangrove forest and the seabird colonies that utilize the bay mudflats ***Responsibility: MNRE / MWTI / MWCSD / District / villages***			
Sand mining for commercial and domestic use affecting the marine and coastal environment	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for 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 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill, 2018	National Environment Sector Plan 2017 - 2021

			NAP Sustainable Land Management Plan 2015-2019	
Water Catchment area rehabilitation	Replanting of native forest species for upland forest to restore the resilience and ecological functions of catchment area; Implement mapping of watershed area for Fulusou Watershed and identify hazard areas inland as well as good farming areas Block off new tributary that currently floods the village Conduct consultation and awareness program on the proposed watershed area Implement water quality testing ***Responsibility: MNRE / MoH /MWCSD-IWS /village***	Restoration of native forests species increases the resilience against climate change impacts by improving the biodiversity, reducing the risk of forest fires, providing land stabilization, reducing erosion, reducing land slips and maintaining water quality Flood management Contribute to the 2 million tree planting	MNRE-DEC, WRD and Forestry Division to provide advice such as: Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project NBSAP 2015-2020 Forestry Restoration Operational Plan 2016-2020 Two Million Tree Planting Strategy 2015-2020 Forestry Management Act 2011 National Water Resources Management Strategy 2007-2017	National Environment Sector Plan 2017-2021 Water and Sanitation Sector Plan 2016-2020

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 Implement village response plan (CDCRM) that includes identification of safe haven/emergency shelters, installation of local signs for evacuation during natural disasters,	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.

	and mapping out key places and actions for emergencies. Protect natural assets, historical artefacts and food supply during natural disaster ***Responsibility: MNRE / Villages***	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
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.
Village clean-up drainage	Implement district/village drainage/ culvert clean-up and awareness program regularly Conduct village monitoring of drainage clean-up. ***Responsibility: MWCSD / Villages***	Village council / women's committee continue to enforce drainage clean-up and culverts.

Faleata West District Map



4.1 Toāmua / Puipa'a Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road - Toamua access road inland - Saina access road towards Primary School coast	Sealed access road in Toamua as escape route / emergency road for evacuation Assess cost of access road upgrade Conduct EIA prior to approval of upgrading access road ***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) 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
Drainage	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; Installed new sized outlets or culverts and	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding	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	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019

	deepen drainage that can channel water away from road Implement district/village drainage/ culvert clean-up and awareness program regularly ***Responsibility: MWCSD / District / MWTI and LTA***	Improve road network Emergency response access for evacuation	policy National Infrastructure Strategic Plan (NISP) 2011 PUMA Act 2004 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	
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 Installed emergency signs for evacuation ***Responsibility: MNRE-DMO / MWTI/ 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

Coastal spring	Rehabilitate two coastal spring Assess the quality of freshwater spring for drinking by conducting water testing ***Responsibility: MoH / Village / MNRE /CSSP / NGO***	Improve access to clean quality water for inland families; Alternative source of water supply	Village to ensure that guidance from MNRE are sought prior to upgrading the coastal springs Environmental & Social safeguard policies apply	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan: Framework For Action 2016 - 2020,

Other solutions considered or further issues raised

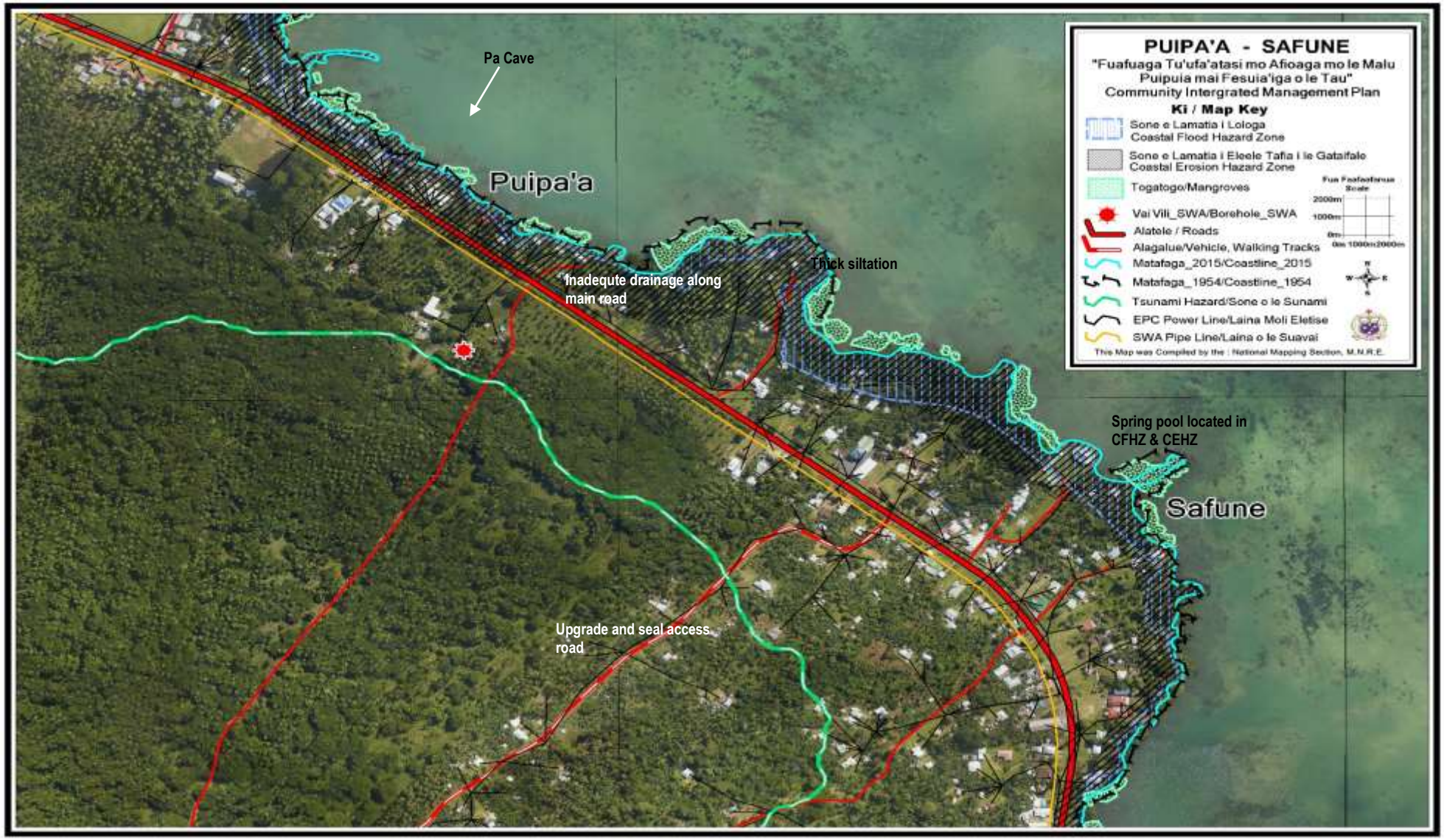
Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as schools and church; Installed footpath on the road reserve for pedestrian safety Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: LTA / MWTI/Village***	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) 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
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Waste Management	Implement community waste management programs:	Improve healthy living and cleanliness in communities	MNRE-DEC to ensure that new established roads are included in collection of rubbish	National Environment Sector Plan 2017-2021

	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 / MoH/ District-Village***	Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	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 Policy 2012	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 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***	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

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.

Rock revetment at Vaigaga coastal area – loose rocks starting to fall out from strong waves and sea-level rise

Puipa'a – Safune Village Map



4.2 Saina Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road (to Primary School)	Reseal and widen road to Primary school as escape route Assess cost of access road upgrade Conduct EIA prior to approval of upgrading access road ***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) National Infrastructure Strategic Plan (2011) 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
Village houses, cemetery and other infrastructure in CEHZ and CFHZ	Find appropriate land outside of the hazard zone for a new cemetery and relocation of old cemetery on the coast ***Responsibility:*** ***Lead: Village-families*** ***Support: MoH / MNRE***			
Sand mining for commercial and domestic use affecting the marine and coastal environment	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation	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	National Environment Sector Plan 2017 - 2021

	Responsibility: MNRE / Village		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 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill, 2018 NAP Sustainable Land Management Plan 2015-2019	

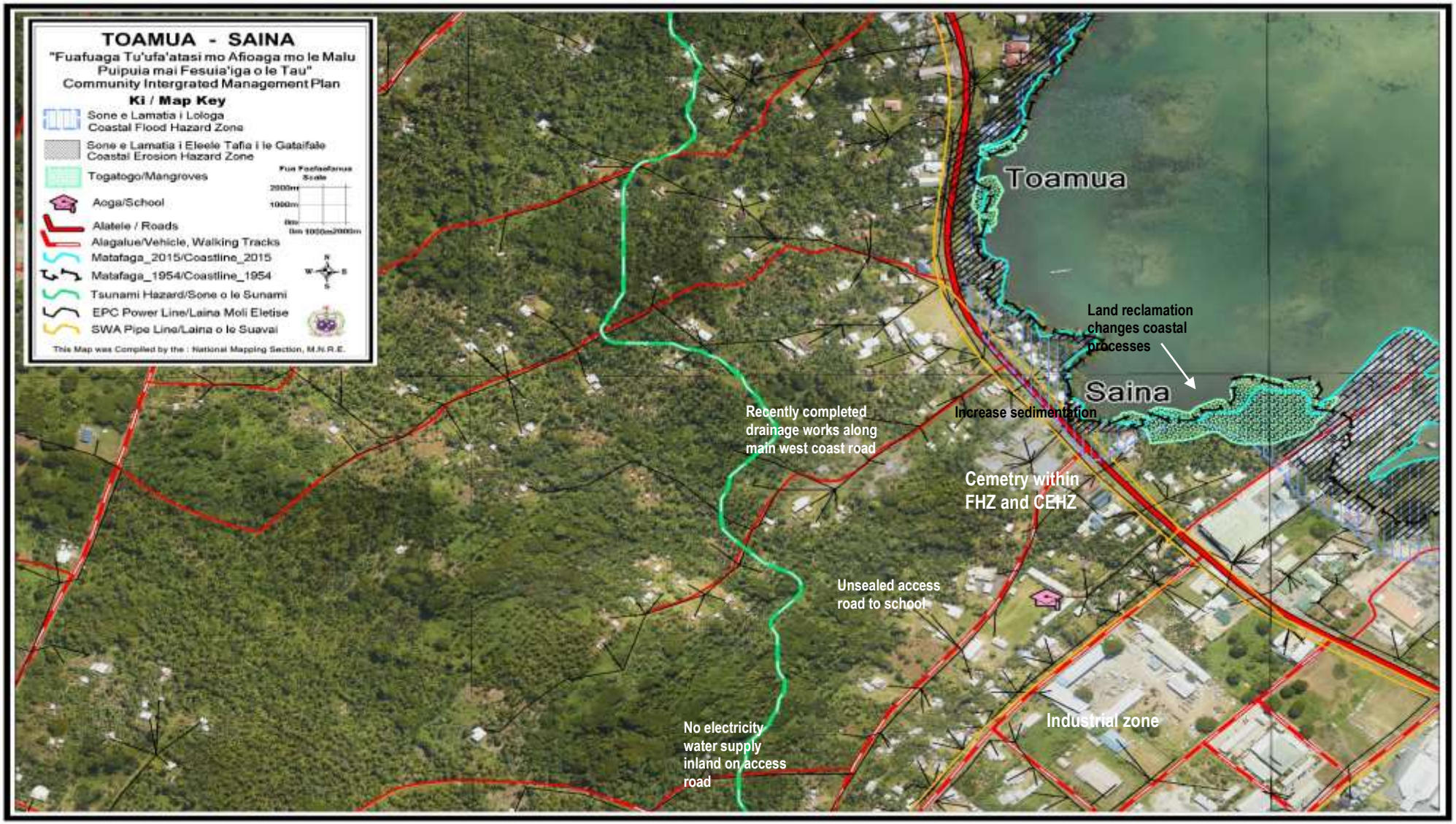
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within district and women's committee; Village Council 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 / MoH / 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 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

Infrastructure / Environment	Solutions / Issues	Comments
Water Well	Upgrade and restore old village well on the coast as back-up water supply. ***Responsibility: MNRE-WRD/ MOH/ / Village***	This request requires quality water testing. During the site assessment the well or pool and its current status it looks like it has not been used for a long time. Therefore it is very low priority and the cost to fix it would out - weigh any climate resilience benefits. Strong potential for well to be inundated with sea water

Cemetery located near the coast – Saina village requesting assistance for relocation

Toamua – Saina Village Map



4.3 Vaitele-tai Village Interventions

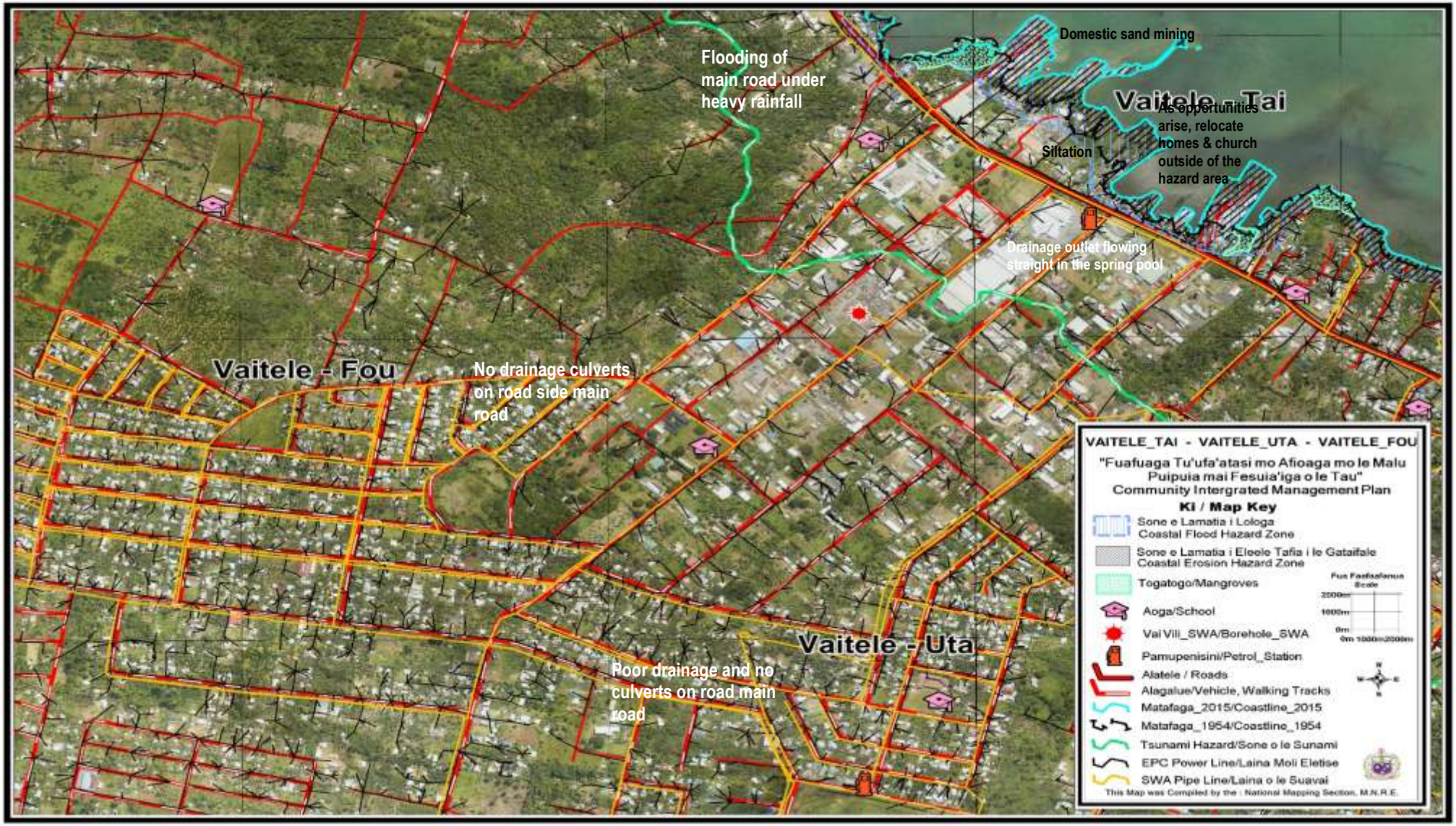
Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Rain water harvesting systems (Vulnerable families)	Implement the installation of rainwater harvesting systems or water tanks for families in Vaitele-tai without access to water (specifically vulnerable/hardship families) ***Responsibility: CSSP / NGO/ MNRE / village***	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
National Road	Maintain regular road routine maintenance programs ***Responsibility: LTA / village***	Improve resilience of public infrastructure Climate proof road Road safety More lives saved	Implementation of road maintenance follow existing policies and actions plans: Review of National Road Standards in Samoa (2016) MWTI National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2016)	Land Transport Sector Plan 2016-2020
Land reclamation (extension of households / businesses)	Limit all land reclamation to MNRE approved areas Extractive industries (mining) monitored and corrected in the coastal fringe Village environmental management plans established including annual monitoring systems ***Responsibility: MNRE / District & Village***	Village gains benefit from sand mining activities Reduce impact to natural coastal protection mechanism via control of scale and site of extraction	MNRE monitoring of sand extraction operations should be guided by following policies, strategies and action plans: Alii Faipule and landowner provide consent Environmental Social Safeguard Policies Consideration of an assessment either PEAR or EIA prior to approval of any extractive activities PUMA Act 2004	National Environment Sector Plan 2017-2021

			NAP – Sustainable Land Management Plan 2015-2019	

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Coastal Spring/Road side drainages	Upgrade spring pool by reconstructing protective walls and relocating drainage outlet that flows straight into the pool ***Responsibility: Village /CSSP//NGO***	This request requires quality water testing. During the site assessment the current location of the pool is close to the main West Coast Road and high inundated with seawater and lots of rubbish being dumped at the site. The coastal spring would not provide any long term benefit to the community nor does it have resilience outcome
Foul smell / Pollution	MNRE-PUMA / MoH to investigate / and implement actions to address the foul smell and dust (pollution) that affects most of the families within the village coming from industrial business Charge and penalized industries ***Responsibility: MNRE / MoH***	During CIM Plan consultation village raised concern about the foul smell coming from some of the industrial businesses, as well as the dust from another industry quarry. These concerns were more on the impact of these type of pollution on the health of village community.
Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as infront of schools and church Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: MWTI/ LTA / Village***	Village community raised concern with the high risk to pedestrians from speeding vehicles.

Vaitele-tai Village Map

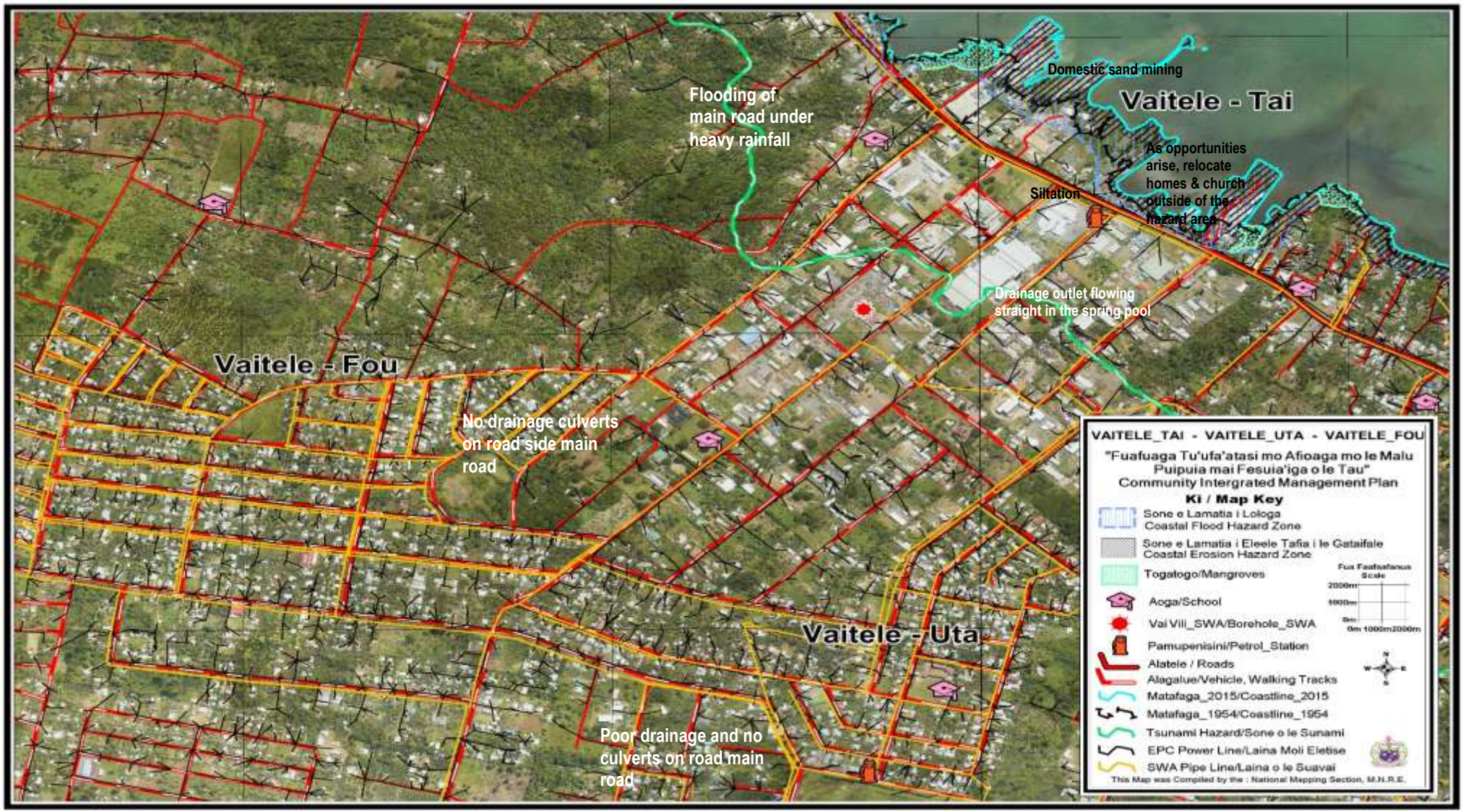


4. 4 Vaitele-fou and Vaitele-uta Village Interventions

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Drainage	Implement roadside drainage to clear water runoff from road ***Responsibility: LTA***	Members of the community raised concerned about poor roadside drainage has led to water runoff into their properties from the road.
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within district and women's committee; Installed rubbish bins and stands for ease of rubbish collection Include all established roads inland where there are residents in the waste collection ***Responsibility: MNRE / communities***	MNRE-DEC to ensure that new established roads are included in collection of rubbish and link waste management program to existing policies and action plans etc: Village mayor and Church Groups to enforce fines upon individuals, businesses and families within village that dispose rubbish illegally or report them to MNRE National Environment Sector Plan 2017-2021 National Waste Policy A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto Heath Sector Plan 2008-2018
Water	Irregular water shortage or rationing without warning ***Responsibility: SWA***	Community raise concern with SWA irregular water supply. Village request to SWA to inform communities via public notice in advance about the dry season or drought and preparedness for expected water shortage. Encourage families to invest in water tanks as back-up water supply.
Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as infront of schools and church Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: MWTI/ LTA / communities***	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 Provide budget into work programme Land Transport Sector Plan 2016-2020 National Infrastructure Strategic Plan (2011)

Vaitele Tai, Vaitele Fou & Vaitele Uta Map



4.5 Elise Fou Village Interventions

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Road safety	Implement road safety programme: Installed humps in areas used mostly by pedestrians such as infront of schools and church Put up speed limit signs to stop drivers from speeding in residential areas ***Responsibility: MWTI/ LTA / Village***	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 Provide budget into work programme Land Transport Sector Plan 2016-2020 National Infrastructure Strategic Plan (2011)
Waste Management	Implement community waste management programs: Waste awareness and education programs for schools within district and women's committee; Installed rubbish bins and stands for ease of rubbish collection Include all established roads inland where there are residents in the waste collection ***Responsibility: MNRE / village***	MNRE-DEC to ensure that new established roads are included in collection of rubbish and link waste management program to existing policies and action plans etc: Village mayor and Church Groups to enforce fines upon individuals, businesses and families within village that dispose rubbish illegally or report them to MNRE National Environment Sector Plan 2017-2021 National Waste Policy A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto Heath Sector Plan 2008-2018
Rainwater Harvesting	Implement the installation of rainwater harvesting systems or water tanks with families in Elise-fou without access to water (specifically vulnerable/hardship families) ***Responsibility: CSSP / NGO/ Church Group***	During the Non-Traditional Village consultation 29 May 2017 the Faith based Group (EFKS/LMS) from the village requested the following small sub-project that they would like to implement. - Rainwater harvesting (water tanks) for vulnerable families in the church residing in the village - EFKS Women's Group Vegetable gardens
Vegetable garden	Set-up greenhouse nursery to propagate seedlings for vegetable garden Established a composting to get nutrients for vegetable garden ***Responsibility: MAF / CSSP / NGO/ Community***	

Elise Fou Village map

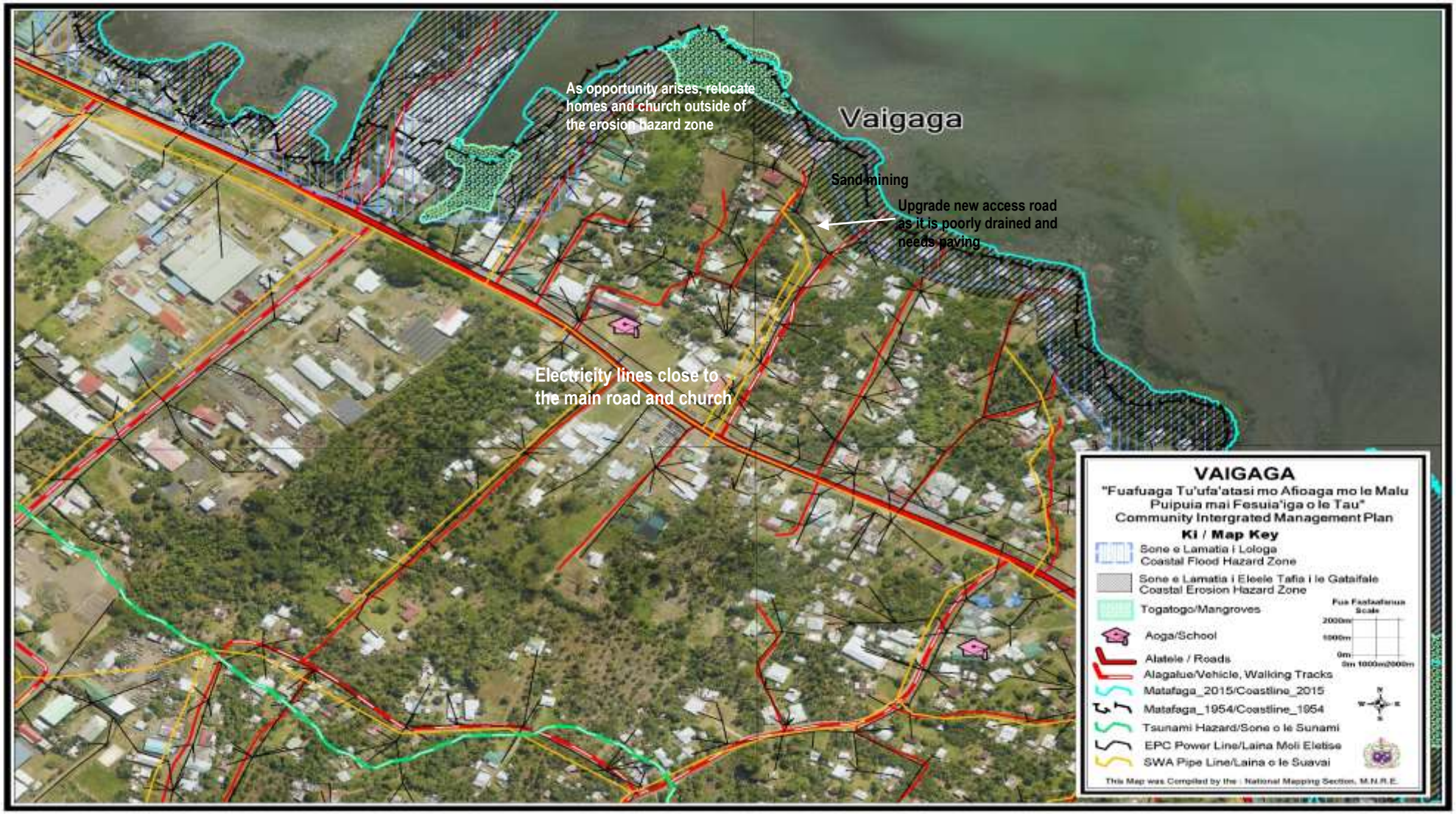
4.6 Vaigaga Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road / Drainage, Proposed wharf (Vaitele tai or Vaiusu) SPA, SSS	Implement proper routine maintenance of existing culverts and drainage channels on roadside Upgrade of access road inland to assist relocation away from hazard zone Design and construct drainage channels that can direct water away from village and school grounds during heavy rain and to flow directly to the sea Assess whether a PEAR or EIA is needed prior to the upgrade of road, drainage and bridge ***Responsibility: MWTI / LTA / Village***	More resilient to natural hazards Safer houses Better use of economic resources Improved protection and resilience Improved sustainability of natural resources Mitigate impact of flooding	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 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

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Church fence	LTA to complete fixing the EFKS cement wall on side of the road ***Responsibility: LTA / Village***	Village raised concern with LTA regarding church fence that was taken down because of the widening road for West Coast Road project. LTA is replacing the cement fence with a wired fence and the church is not accepting it. Issue to be resolved by EFKS Church Vaigaga and LTA During consultation village requested assistance from MNRE to assess the impact of the proposed wharf on their mangrove ecosystem as well as families residing near the coast.
Impact of proposed wharf on mangrove	Determine the impact of the proposed wharf on the mangrove ecosystem ***Responsibility: CSSP /NGO/ Village Church Groups***	

Vaigaga Village Map



4.7 Vaiusu Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Main Road / drainage (WCR)	LTA to fix the drainage so that surface runoff water from road can channel away from the village pool and into the sea directly ***Responsibility: MWTI / LTA / Village***	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	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 Samoa Energy Sector Plan
Other Roads	Tar sealed the one remaining access road inland for evacuation point during extreme events Tar seal Laloanea dirt road in the upland area for families to access their lands in these area ***Responsibility: MWTI / LTA / Village***			

Other Solutions Considered or Further Issues Raised

Environment / Livelihood	Issues / Solutions	Comment
Water Pump	Request a water pump to ensure water in the community pool flows even during dry periods. ***Responsibility: Village***	This request from the village is due to their concern about the village pool being shallow when there low tide and also during dry periods / drought. However from site assessment the pool is filled up during high tide and very much depends on seawater. The current status is fine, village make sure that debris are cleared from water channels to the sea. During consultation village requested assistance from MNRE to assess the impact of the proposed wharf on their mangrove ecosystem as well as families residing near the coast
Impact of proposed wharf on Mangrove ecosystem	Request MNRE to conduct an assessment on the impact of the proposed wharf to the mangrove ecosystem and also families residing on the coast ***Responsibility: MNRE / village***	

Village pool Vaiusu – impacted by water runoff from road during heavy rain

Vaiusu – Elise Fou Village Map

4.8 Talimatau and Tulaele Village Interventions

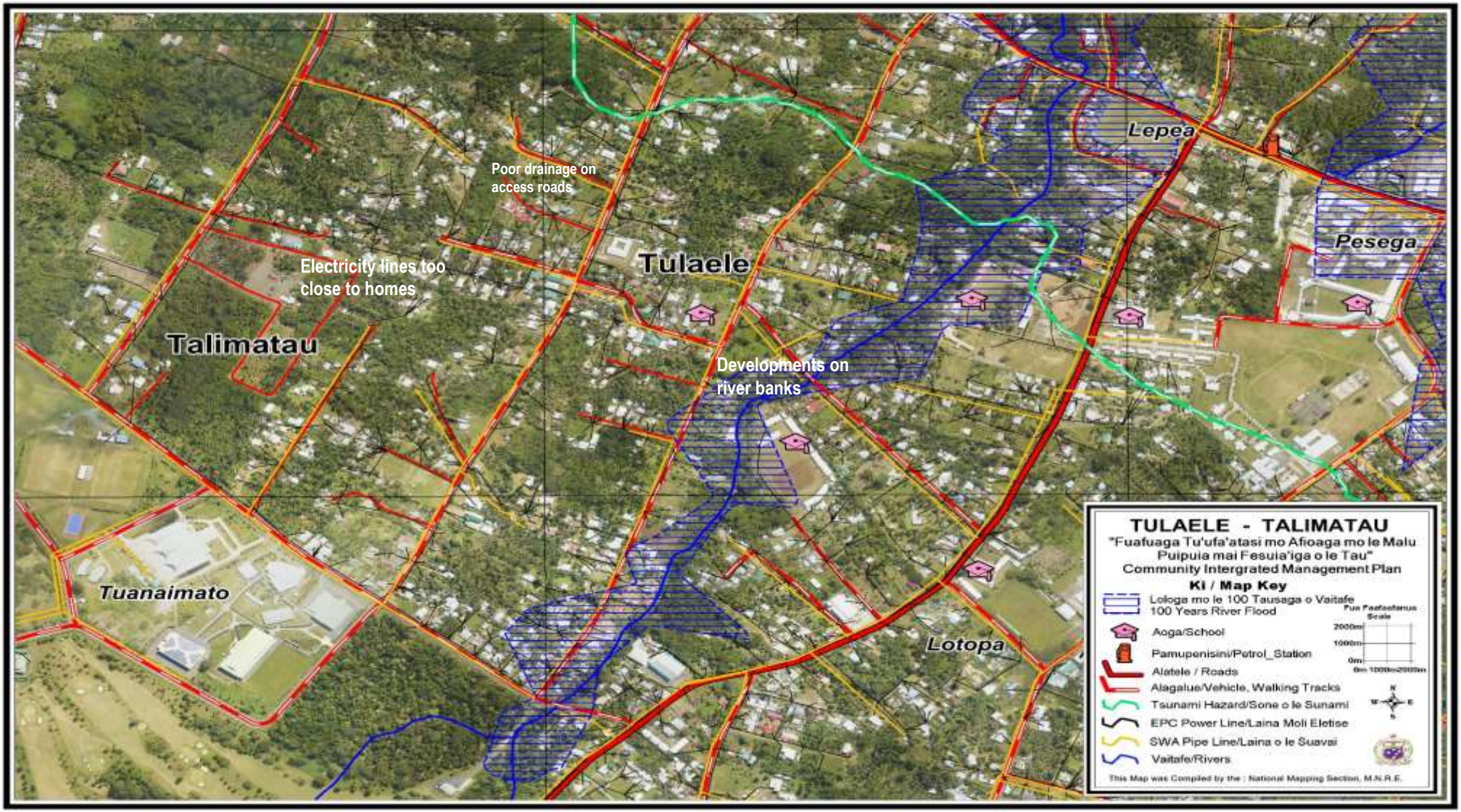
Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Main Road Talimatau / Tulaele	Regular maintenance of drainage and construction of new sizeable culverts along Talimatau road Installation of road safety measures: road humps, footpaths, crossings, signage, road names and streetlights at appropriate places Construct roadside drainage on sealed road to school to channel surface runoff water away from school but into drainage during heavy rain ***Responsibility: MWTI / LTA / communities***	More resilient to natural hazards Improved protection and resilience of infrastructure Reduce impact of flooding	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 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

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Waste Management	Installed wheelie bins for rubbish collection Implement composting for gardening (vegetables) ***Responsibility: Church Group /***	During the Non-Traditional Village workshop on the 29 May 2017 the Church group from the village requested that they would like to implement the following small sub-project:

	MNRE	Rubbish stands for village households Lawn mowing business and collect grass for composting in wheelie bins
Rainwater harvesting	Installed rainwater harvesting system (water tanks) specifically for vulnerable families in the congregation who reside in the village. ***Responsibility: Church Group / CSSP/NGO***	

Talimatau and Tulaele Village Map



4.9 Falelauniu and Tafaigata Village Interventions

Other Solutions Considered or Further Issues Raised

Infrastructure / Environment	Solutions / Issues	Comments
Rainwater harvesting	Installed a rainwater harvesting system or water tanks targeting vulnerable families ***Responsibility: Church Group/CSSP/NGO***	During the Non-Traditional Village workshop on the 29 May 2017 the Church Group (AOG) from the village requested that they would like to implement the following small sub-project: Rubbish stands for village households Water tanks and septic tanks for vulnerable families in the church Food security – vegetable gardening and composting, gardening tools and green jobs Purchase tarpaulins as part of preparedness response to any natural disaster
Sanitation	Installed septic tanks for vulnerable families to improve sanitation and hygiene ***Responsibility:*** ***Church group &*** ***MNRE /MoH***	
Food security	Propagate vegetable seedlings in a nursery Set-up composting to feed the vegetable garden Purchase gardening tools and materials Create green jobs through vegetable gardening and marketing ***Responsibility: MAF / Church Group***	
Waste Management	Installed wheelie bins for rubbish collection ***Responsibility: Church Group***	
Access road	Sealed inland access dirt road to facilitate families moving inland ***Responsibility: LTA***	Some families residing further inland away from main road requested for sealing of access roads to residential areas
SWA water supply	SWA to provide a pipe network to reach all families inland area of Tafaigata and Falelauniu ***Responsibility: SWA***	Families requested the need for SWA to have a pipe network to reach all families within these areas.

Livelihood and Food Security	Best Solutions and Other Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Mixed Crop diversification	Promote and facilitate pilot site trials for climate resilient varieties: Promote agro-forestry and mixed planting including root crops and fruit trees to reduce crop vulnerability to pests and diseases.	Improve food security and healthy living and increase community resilience and adaptive response to climate change Implementing best practices for home	CROP Division of MAF: to provide trainings and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons. The implementation	Agriculture Sector Plan 2016-2020 NAP: to combat land degradation and mitigate the effects of

	Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon etc and plant in suitable areas outside hazard zones Conduct pilot site trials for climate resilient varieties ***Responsibility: MAF / MNRE Land Management Division /communities***	and commercial production	of best practice comes from direct observation of pilot plots, neighbors or extension officers. The strengthening of farmer knowledge of the potential disruptions to their farming from climate change is vital for adaptation	drought 2015-2020 Community Development Plan 2016-2021

Village request traffic lights at the four corner at Tuanaimato Sports Complex, Talimatau due to busy traffic and speeding

Access road – village in Talimatau and Tulaele request to seal and install street lights

Tafaigata – Falelauniu Village Map