Community Integrated Management Plan

Sagaga le Usoga – 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

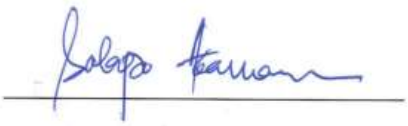
Participants in the Plan

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 Sagaga le Usoga (Afega, Malie and Tuanai)

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

Date Signed: 22 June 2018

Representatives	Signature
Afega Village	
• Puna Kelekolio	
• Fata Saifoloi	
• Fata Enoka	
• Vaotuua Pologā	
Malie Village	
• Salapo Faamanu	
• Lusila Hunt	
• Masusui Talalelei	
• Laulua Faitasi	
• Siolo Satini	

Tuana'i Village

- Tauā Petelo
- Amaamaula Lesā
- Tuitea Sonny Foe
- Ainoa Tusaga

The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of Sagaga le Usoga (Malie, Afega and Tuana'i Villages) 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
CCCS	Congregation Christian Church Samoa
CC	Climate Change
CCA	Climate Change Adaptation
CDCRM	Community Disaster & Climate Risk Management
CEP	Community Engagement Plan
CHZ	Coastal Hazard Zone
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flooding Hazard Zone
CIM	Community Integrated Management (Plan) or (Strategy)
CLHZ	Coastal Landslip Hazard Zone
COEP	Code of Environmental Practice
CSO	Civil Society Organization
CSSP	Civil Society Support Programme
DSP	District Sub Project
EbA	Ecosystem based Adaptation
ECCCR	Enhancing Coastal Community Climate Resilience
ECR	Enhancing Climate Resilience
EMP	Environmental Management Plan
EPC	Electric Power Corporation
ERN	Emergency Radio Network
HCSI	High Coastal Sensitive Index
IAS	Invasive Alien Species
IG	Implementation Guideline
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
NISP	National Infrastructure Strategic Plan
NRW	Non Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme

VCDMP	Village Climate Disaster Management Plan
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 Sagaga le Usoga District 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 Plan is to help communities and government improve climate resilience by identifying actions and solutions for sustainable development.

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

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

2. Improve climate resilience planning and development

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

1.3 The Structure of the Plan

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

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

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

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines (IG)

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

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

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

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

2.2 Funding options to support CIM Plan Implementation

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

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

2.3 Duration of the Plan

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

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

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

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

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

3. Description of District Environment

3.1 Physical and Natural Resource Setting

The Sagaga Le Usoga District is located on the north side of the island of Upolu, 8- 10 kilometers west of Apia. The entire district lands extend from the coastline to the Central Upolu dividing ridge separating northern and southern Upolu. The district is characterized by low-lying, intensively developed, coastal plains to the north and gently sloping land covered in village plantations and fields to the south. The district contains the coastal village of Afega located on a large headland and the low-lying coastal villages of Tuana'i and Malie on either side of Afega.

The reef system is between 2km and 3km off shore in the Sagaga le Usoga District, and provides a barrier from wave action. Over the years siltation from inland clearing and the clearance of mangroves along the coast for settlement have had a direct impact on the reef as the first line of defense from cyclone hazards. These have also increased coastal erosion and risk of damage to the coast as fine sediments suffocated most of the coral reefs closer to the coast. The loss of coastal wetland has also caused a decline of the District's fish stocks including crabs, lobsters, jelly fish and sea slugs. Concern is evident with villages keen on establishing marine protected areas as well as some mangrove replanting programs already initiated.

The absence of proper drainage along the sealed access roads have further contributed to the siltation of the coastal areas as well as flooding and ponding along the main road where runoff is blocked by the West Coast Road. Although the majority of the coastal area within the district was once covered by mangroves, much has been cleared for settlement. The loss of mangroves has increased the exposure of coastal development to damage from cyclones and heavy seas. The receding coastline is estimated to be more than 40m in some areas since 1954.

A number of families now live on their plantations, cattle farms and agricultural activities some distance inland from the coast. Some inland land use practices appear to be affecting coastal processes including the incidence and degree of flooding in coastal areas, the rates of sediment accretion along the coast and the impact on the health of the lagoon and reef system. The terrestrial biodiversity of the district is made up of mostly non-forest areas along the coast and inland plantations. Secondary and disturbed mixed forests are located in old coconut plantations and parts of the customary lands that have not been cleared yet by the villages. The districts in not within a Key Biodiversity Area according to the study conducted on Priority Sites for Conservation in Samoa: KBAs (2010). Although most of the invasive species were found inland and around plantations, no specific activity is proposed for actions as families continually clear them once plantations reach these areas as well as they being in already disturbed vegetation areas.

3.2 Social and Economic Setting

The Sagaga Le Usoga District currently has a population of 5652 persons (2016 Census Preliminary Count). Development is mostly near the coast although more families are choosing to settle along the work roads as a safer alternative to coastal living.

The main road is considered an important part of the district's infrastructure. It is the district lifeline, the main access route to Apia for employment, hospitals and schools and also to the airport, wharf and other districts. Although it is in good condition, there are parts of the road that are subject to flooding and closure, especially near the river crossings at Malie and Tuana'i. Currently the road has no defined pedestrian path. There is a 'blind' corner where the road curves at Tuana'i, and is a concern for the village as it is located adjacent to the District secondary school and a number of accidents have occurred there. From the main road, work roads to village plantations extend inland. They are generally in good condition and are sealed in Afega and Tuana'i for the first kilometre with services extending along each road. One work road in Malie was sealed in 2011 up to 3075 m (2016, LTA list of sealed roads between 2002 -2012), and the rest are unsealed. These roads are often flooded and become impassable, floodwaters also damage the seal and cause pot holes.

Primary services such as water, power and telephone follow the main road, and generally lie in the CFHZ except through parts of Malie. In Tuana'i power lines extend only 1km inland from the main road. As the main road is located close to the water's edge, the District is at risk of being cut off from power, water and telephone during a cyclone. The District Secondary School is located at the water's edge and is also at risk from coastal flooding and erosion. Malie has a grave of cultural significance opposite the Catholic Church. In addition the District supports several primary schools, a number of other churches and the small medical facility used to be the District hospital now operates as a Community Health Care Centre near Afega. According to the Ministry of Health (Health Sector Plan Division), the District hospital is closed down due to poor condition. As well, its current location within the hazard zone exposes it to high risk of damage from extreme events. Thus, any consideration for a new hospital in Afega to replace the old district hospital will have to be located away from the hazard zone for long term sustainability and safety. The cash economy of the District is dominated by traditional work in plantations, agriculture and fishing.

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 Sagaga le Usoga, mapped out all vulnerable areas along the coast and most of the lowland coastal areas identifying them as hazard zones given the exposure to natural disasters, climate change and variability. It is the coastal area where most of the population for Sagaga le Usoga reside, and where many of the government infrastructure, village developments and family businesses are located. While the coastal areas and infrastructure are the lifeline of the district for commuting to town, wharf and airport, for the CIM Plan updates we need to consider the 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: The Coastal Hazard Mapping by BECA in 2000 showed that Sagaga le Usoga District coastal area has a High Coastal Sensitivity Index, and has changed noticeably over the last several decades. The coastline has receded by 5 to 10metres from its 1954 location. Coastal erosion highly affects this part of Upolu and is the probable cause of the deterioration in the health of the coral reef ecosystem, from a combination of high sedimentation, water pollution and the fast growing algae bloom. Climate change and extreme events will further exacerbate the vulnerability of marine and coastal environment, as seen in Afega village experiencing inundation during strong storm surges and king tides. According to Fepuleai (2017), implementing more effective beach management practices for Sagaga le Usoga district and the rest of Samoa, through beach nourishment and preservation together with sustainable development of the coastal zone will enhance ecological resilience of coastal/beach ecosystems. This includes the identification of erosion hotspots and the implementation of beach restoration activities, whilst erosion watchspots is early detection of possible threats to coastal environment and pre-planning can help mitigate impacts of shoreline erosion trends in the future.

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,

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

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. Human induced activities are one of the biggest culprits that contributes to the build-up of hazard areas and are made worse when natural disaster strikes. For example, in Tuanai village an old quarry which is now used as rubbish dump (Figure: 1) shows a basal-aquifer as seen in the exposed ground water table. Fepuleai (2017), reports that this exposure poses a high risk during heavy rainy season as it can generate flooding activity downslope and can easily burst through the surface bringing great volume of water down to the coast.

Pollutants and sediments can be transported to the coastal environs, 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. Additionally, a better understanding of the hydro-geological and water resources of the catchment and how they interact with landcover and land use practices, enables the identification of options to address water security issues.

Figure 1: Tuanai village – Old quarry inland shows exposed groundwater table, see arrow pointed

4. Sagaga Le Usoga District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Main Road West Coast Road (WCR)	The WCR project will rehabilitate: - main road from Vaitele tai to Faleolo International Airport includes- widen lanes, footpaths, culverts/drainage and shoulders - Upgrade and widen the Afega bridge	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding	Use existing information for guidance but not limited to: "Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; MWTI *National Infrastructure Strategic Plan 2011 *Use updated Hazard Maps to inform designs	Community Integrated Management Strategy, August 2015
Access Road	Provide sealing for access road to link with Aleisa road. Upgrade central Afega access road to Aleisa Road: Approximate length road: 6,800m Approximate cost ST884,000 Benefit cost ratio: 2.55 ***Responsibility: LTA / MWTI***	Improve road network Emergency response access for evacuation	*Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities. *Apply for necessary permits as required by law Environmental Code of Practice - West Coast Road (2012), LTA	Transport Sector Plan 2014-2019
Drainage maintenance	Maintenance of road side drains and regular inspection of drainage system; ***Responsibility: MWTI and District***		Identify funding/budget requirements and implementation programme for construction and development Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	

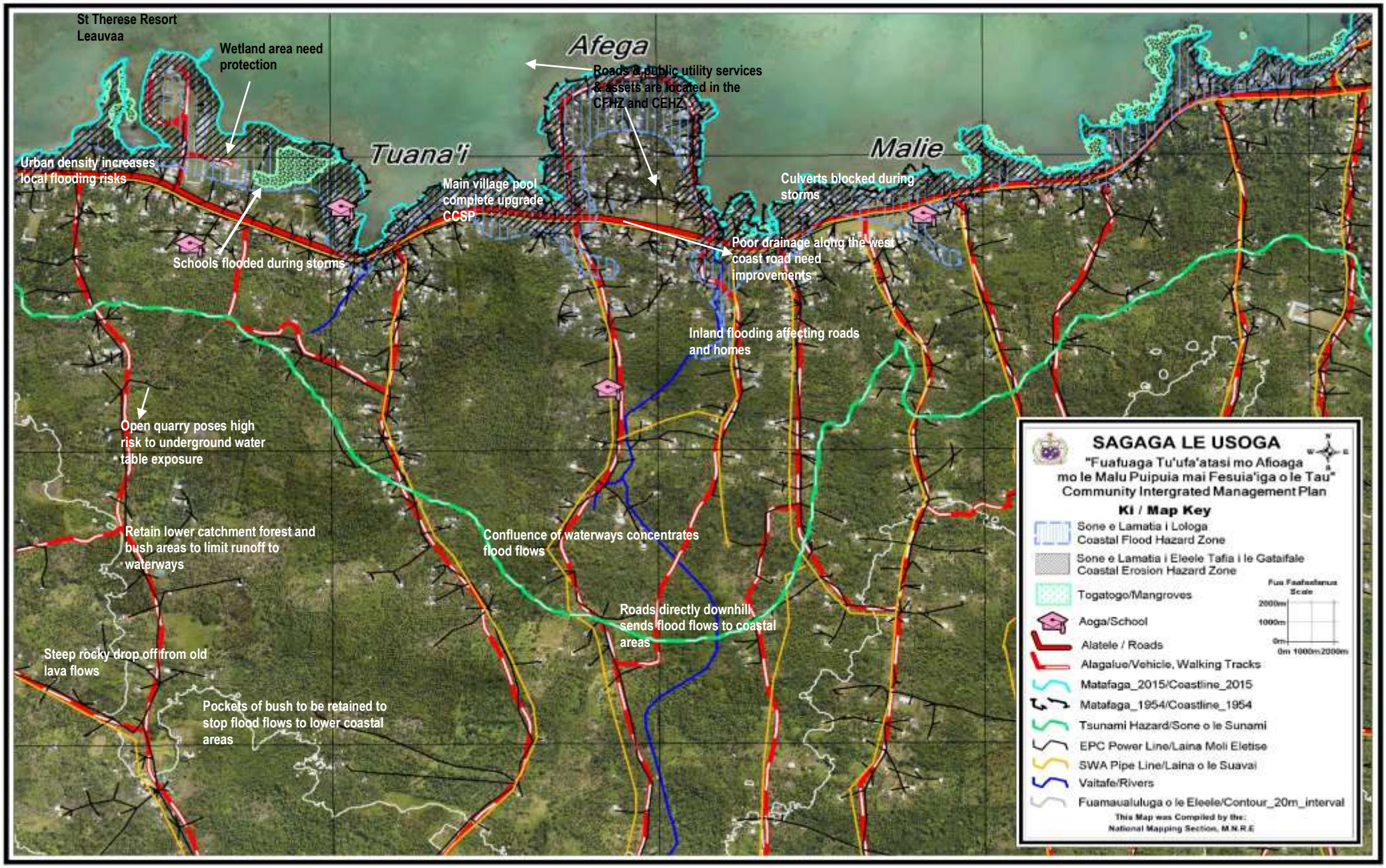
Electricity Supply	Install and connect power supply for residents inland. Install streetlights along the access roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground electricity lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC/MWTI/Village***	Maintain electricity supply at all times including during natural disasters Avoid accidents due to fallen electricity posts.	Monitor distribution networks to avoid overloading poles and contributing to line failures Development of a Renewable Energy and Energy Efficiency Framework, 2016	Samoa Energy Sector Plan 2017-2020
Main water distribution network / Piped water to families living inland	Improve water supply system to connect all families without access to water: Implement SWA service on pressure management and leak detection work as part of Non-Revenue Water (NRW) reduction program for Rural areas Inspect and upgrade district reservoir behind Afega and Tuana'i Chlorination of water supply ***Responsibility: SWA/MOH / villages***	Improve access to clean quality water for inland families; Enhance resilience of water distribution network infrastructure due to the upgrade CRWCR project	Environmental & Social safeguard policies apply Implementation of the SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water- - FY 17/18 work program including. Sagaga le Usoga	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan: Framework For Action 2016 - 2020,

Community Healthcare Centre (CHC)	Support supply of necessary medical equipment's and materials required by Women's Committee to provide daily care to mothers and new born babies in the district. Health Promotion Activities – women's vegetable gardens and exercise ***Responsibility: Ministry of Health, MWCSD and villages***	Healthy Living and Improved lifestyle Improved resilience to response to natural disaster	* Putting Focus back into Public Health *Revitalizing Primary Health Care close to our Communities	Health Sector Plan (2000-2025 Manifesto) Section - Health and Wellbeing "Climate Change and Health"
Sagaga le Usoga High School	Relocate the Sagaga Primary School away from hazard zone Investigate alternative inland location for future school relocation ***Responsibility: MESC, MWTI and District***	Improve resilience of government/district assets Enhance adaptive capacity of school children and teachers	Programme in MESC local budget	Education Sector Plan 2012-2016 CIM Strategy 2015 Community Development Plan 2016-2021
Seawall	Upgrade and extend seawalls in Sagaga le Usoga Seawall length – 200m Approximate cost – SAT125,000 Benefit cost ratio – 0.17 ***Responsibility: MWTI / District***	Protect public and community assets located in coastal area	Environmental and Social Safeguard Policy application National Infrastructure Strategic Plan (NISP) 2011 Provide budget for implementation Samoa Code of Environmental Practice (2007) Coastal Protection COEP-10	Transport Sector Plan 2014-2019
Old Quarry Site	Rehabilitation of the site turning it into a District Reserve and replant with native trees	Restore ecological balance of ecosystem Reduce impact of flooding onto coastal area	NBSAP 2015-2020 National Action Programme: To combat land degradation and mitigate effect of drought, 2015-2020	National Environment Sector Plan 2017-2020

	Design appropriate drainage system to flush out pools of water in the quarry and to channel influx of rainwater directly to the coast Need to undertake EIA for future proposed quarries prior to approval for extraction. ***Responsibility: MNRE / District***	Improved environmental management of natural resources	Samoa Code of Environmental Practice (2007) Waste Management Act 2010 PUMA Act 2004	Water and Sanitation Sector Plan: Framework For Action 2016 - 2020

EPC low hanging exposed wire along inland access road potential risk for pedestrians and nearby families.

Sagaga le Usoga District Map



4.1. Malie Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses: gas station; shops; 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: MWCSD/MNRE/Village/ / MWTI***	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 Application of National Building Code 2002 PUMA Act 2004	CIM Strategy (2015)
Access Road sealed and maintained	Complete sealing of the Malie access road inland to connect with neighboring villages ***Responsibility: LTA/MWTI***	Improve resilience of public infrastructure Reliable access to plantations allows for reduced travel times and more efficient use of labour. Allows easy transportation of produce from farm to market Access ruts also assist in disaster management	Construction of access roads should be guided by: Environmental and Social Safeguard Policy Implementation of WCR project will cover main road improvement Samoa CODE of Environmental Practice (PUMA - 2007) Upolu West Coast Road, Environmental Code of Practice (2012) SMEC, Vulnerability Assessment of the Samoa Road Network (2016) Review of National Road Standard in Samoa (2016)	Land Transport Sector Plan 2016-2020 National Infrastructure Strategic Plan (2011)

			Provide budget support for implementation	
Water (SWA)	Extension of piped water distribution network from Aleisa area to connect inland residents of Malie ***Responsibility: SWA/ MoH/ village***	Improve piped water access Improved community livelihood and healthy living	Samoa Water Authority Pipeline Work Program for FY16/17 and FY17/18 Environmental and Social Safeguard Policies apply - MoH Water Quality Standards SWA 10 Year Investment Plan (2016) to improve water supply network	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan 2012-2016,
Electricity Supply	Install and connect power supply for residents inland. Install streetlights along the access roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground electricity lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC/MWTI/Village***	Maintain electricity supply at all times including during natural disasters Avoid accidents due to fallen electricity posts.	Monitor distribution networks to avoid overloading poles and contributing to line failures Development of a Renewable Energy and Energy Efficiency Framework, 2016	Samoa Energy Sector Plan 2017-2020

Natural Resources and Environment	**Best Solutions**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Replanting /coastal restoration	Replant vegetation / littoral plants in coastal areas. Encourage natural regeneration of coastal plants ***Responsibility: Village/ MNRE***	Protects coastline against normal wave action Maintains natural ecosystem connectivity	MNRE Forestry to advice on appropriate species, and provide seedlings for different vegetation types suitable to the habitats (coastal lowland area) and planting materials for	

Mangrove and wetland protection	Develop a marine integrated management plan to include: Mangrove replanting in locally managed protected area Implementing conservation activities to support the protection mangrove and wetland ecosystem ***Responsibility: MNRE / Village***	Mangrove forest provide a range of livelihoods benefit to individual and communities through waves protection, timber and biodiversity habitat Healthy mangrove = enhanced ecological resilience of coastal ecosystem	villages that need them. NBSAP 2015-2020 Two Million Tree Strategy 2015-2020 Forestry Management Act 2011	National Environment Sector Plan 2017-2021
Marine Reserve	Established a marine reserve – conservation of inshore fish species and coral reef ecosystem rehabilitation ***Responsibility: MNRE / Village***	Improve coral reef ecological functions and resilience Coral reef provide habitats for fish which are important elements for livelihood	Community-based Fisheries Management Plan (CBFMP) NBSAP 2015-2020	Agriculture Sector Plan 2016-2020
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:	National Environment Sector Plan 2017-2021

			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	Water and Sanitation Sector Plan 2016-2020
Village well (vai eli)	Rehabilitate the village well – clean and test water quality Conduct feasibility assessment first to determine whether it is worth rehabilitation ***Responsibility: MNRE/MWCSD-IWS/MoH/MWT/Village/***	Alternate or back-up source of drinking water for village during periods of piped water shortage or rationing	PUMA Act 2004 National Water Resources Management Strategy 2007-2017	National Environment Sector Plan 2017-2021 Water and Sanitation Sector Plan 2012-2016 Community Development Plan 2016-2021

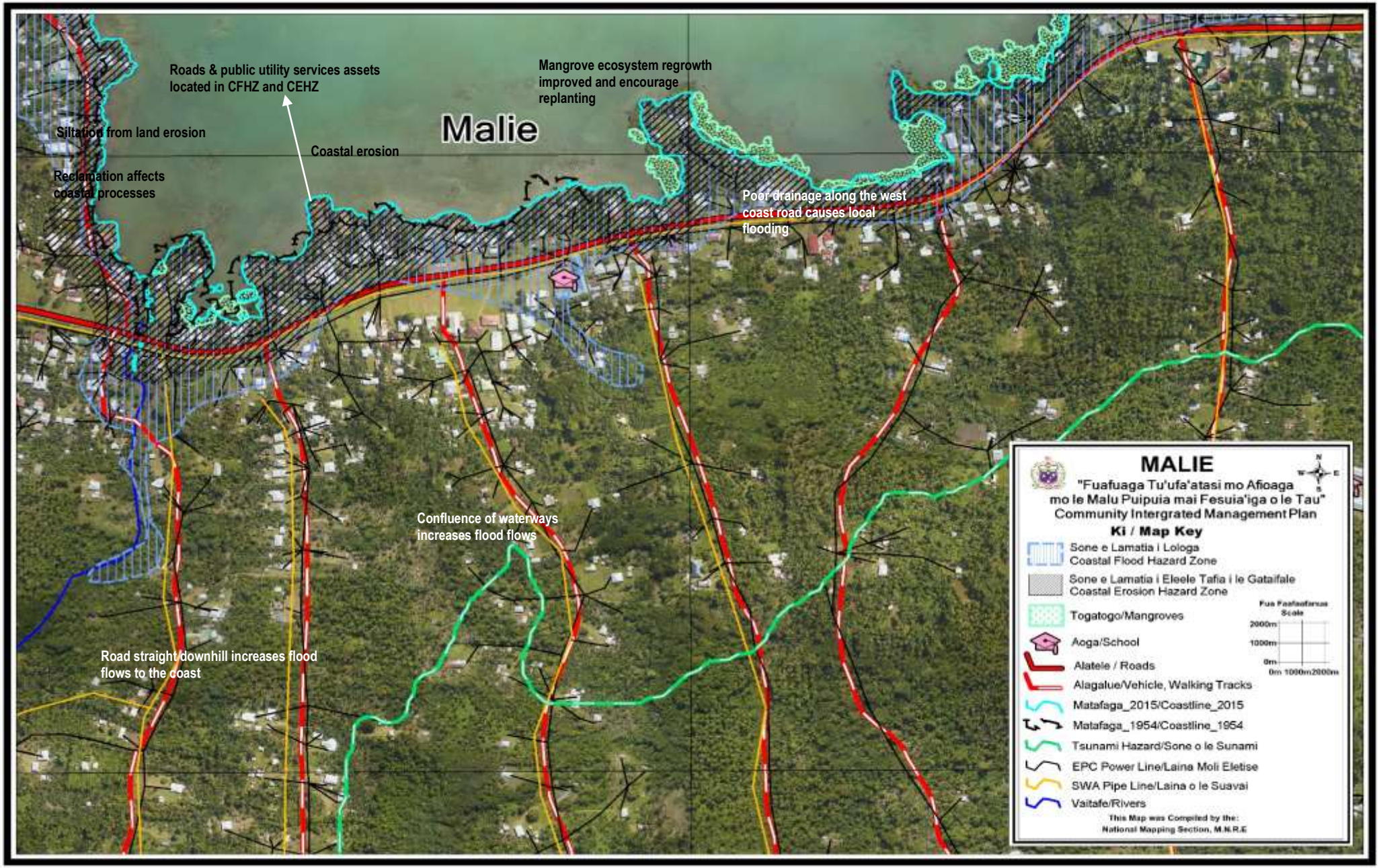
Livelihood and Food Security	**Best Solutions**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests : Promote and 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	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	Agriculture Sector Plan 2016-2020 Community Development Plan 2016-2021

	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***	Increase diversity of marine species and coral reef ecosystem Reduce coral bleaching	as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	
Marine Restocking	Established marine reserve to: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility: MAF / village***		Improve existing marine reserve and encourage expanding to other nearby sub-villages Community-Based Fisheries Management Plan	Agriculture Sector Plan 2016-2020

Governance	Best Solutions	Guidelines to assist Implementation	Comments
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans ***Responsibility: MWCSD / Villages***	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae "refer Clause 5 Amendment".	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCSD and in this way village by-laws to manage community and public asset as well as natural resource management can be part of the village constitution.
Institutions	Encourage participation of untitled men, youth and women in village decision making: Consultation framework that promotes representation of untitled men, women and youth Process that informs the village on all projects either by government or NGO ***Responsibility: MWCSD / Villages***	SDS 2016/17 - 2019/20 Community Development Plan 2016-2021	CIM Plan consultation witnessed the strong and active participation of all groups within village community
Village Drainage Clean up	Undertake village inspection of culverts along inland / main roads; Implement district/village drainage/ culvert clean-up and awareness program Conduct village site inspection of culverts and drainage clearance to avoid clogging from debris and rubbish ***Responsibility: Village / MWCSD***	Improved rate of recovery Reduce potential for flooding in village areas Safer village houses and roads Improved safety community and resilience	Prepare a local education programme on need for keeping drainage systems clean Women's committee monitor hygiene and clean-up program Village beautification committee to monitor clean-up program for drainage and culverts

No piped water inland of Malie, the small water catchment in the picture support some of the inland families.

Malie Village Map



4.2. Afega Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses: gas station; shops; 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: MWCSD/MNRE/Village/Families / MWTI***	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 and West Coast Road	Upgrade the access road through Afega to Aleisa Road Assess cost of access road upgrade Upgrade the Afega bridge under the WCR project Conduct EIA prior to approval of upgrading access road ***Responsibility: LTA/MWTI***	Improve resilience of public infrastructure	Construction of access roads should be guided by: Relevant Environmental and Social Safeguard Policy Samoa CODE of Environmental Practice (PUMA - 2007) Review of National Road Standard in Samoa (2016) National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	Land Transport Sector Plan 2016-2020
Water (SWA)	Extension of piped water distribution network from Aleisa	Improve piped water access	Samoa Water Authority Pipeline Work Program for FY16/17 and FY17/18	Community Integrated Management

	area to connect inland residents of Afega. ***Responsibility: SWA / village***	Improved community livelihood and healthy living	Environmental and Social Safeguard Policies apply - MoH Water Quality Standards SWA 10 Year Investment Plan (2016) to improve water supply network	Strategy, August 2015) Water and Sanitation Sector Plan 2012-2016,
Coastal Spring	Continue maintenance and management of the newly upgraded coastal spring with improved wall structure to prevent water runoff from main road and storm surges Clean village pools used for bathing on a regular basis ***Responsibility: Village MWCSD / CSSP / NGO***	Enhance community resilience action - backup water supply for domestic use	Environmental and Social Safeguard Policies apply Community Engagement Plan (2015) Assess the need for a Development Consent from PUMA	Community Development Plan 2016-2021

Natural Resources and Environment	**Best Solutions**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Replanting /coastal restoration	Replant vegetation / littoral plants in coastal areas. Encourage natural regeneration of coastal plants ***Responsibility: Village/ MNRE***	Protects coastline against normal wave action Maintains natural ecosystem connectivity	MNRE Forestry to advice on appropriate species, and provide seedlings for different vegetation types suitable to the habitats (coastal lowland area) and planting materials for villages that need them. NBSAP 2015-2020 Restoration Operational Plan 2016-2020 Two Million Tree Planting Strategy 2015-2020 Forestry Management Act 2011	National Environment Sector Plan 2017-2021
Mangrove and wetland protection	Develop a marine integrated management plan to include: Mangrove replanting in locally managed protected area Implementing conservation activities to support the protection mangrove and wetland ecosystem	Mangrove forest provide a range of livelihoods benefit to individual and communities through waves protection, timber and biodiversity habitat Healthy mangrove = enhanced ecological resilience of coastal ecosystem		

	Responsibility: MNRE / Village			Agriculture Sector Plan 2016-2020
Marine Reserve	Expand existing marine reserve – conservation of inshore fish species and coral reef ecosystem rehabilitation ***Responsibility: MAF /MNRE/ Village***	Improve coral reef ecological functions and resilience	Community-based Fisheries Management Plan (CBFMP) NBSAP 2015-2020	

Livelihood and Food Security	**Best Solutions**	**Other Benefits**	**Guideline 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	Improve food security and healthy living and increase community resilience and adaptive response to climate change Implementing best practices for home and commercial production	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	Agriculture Sector Plan 2016-2020

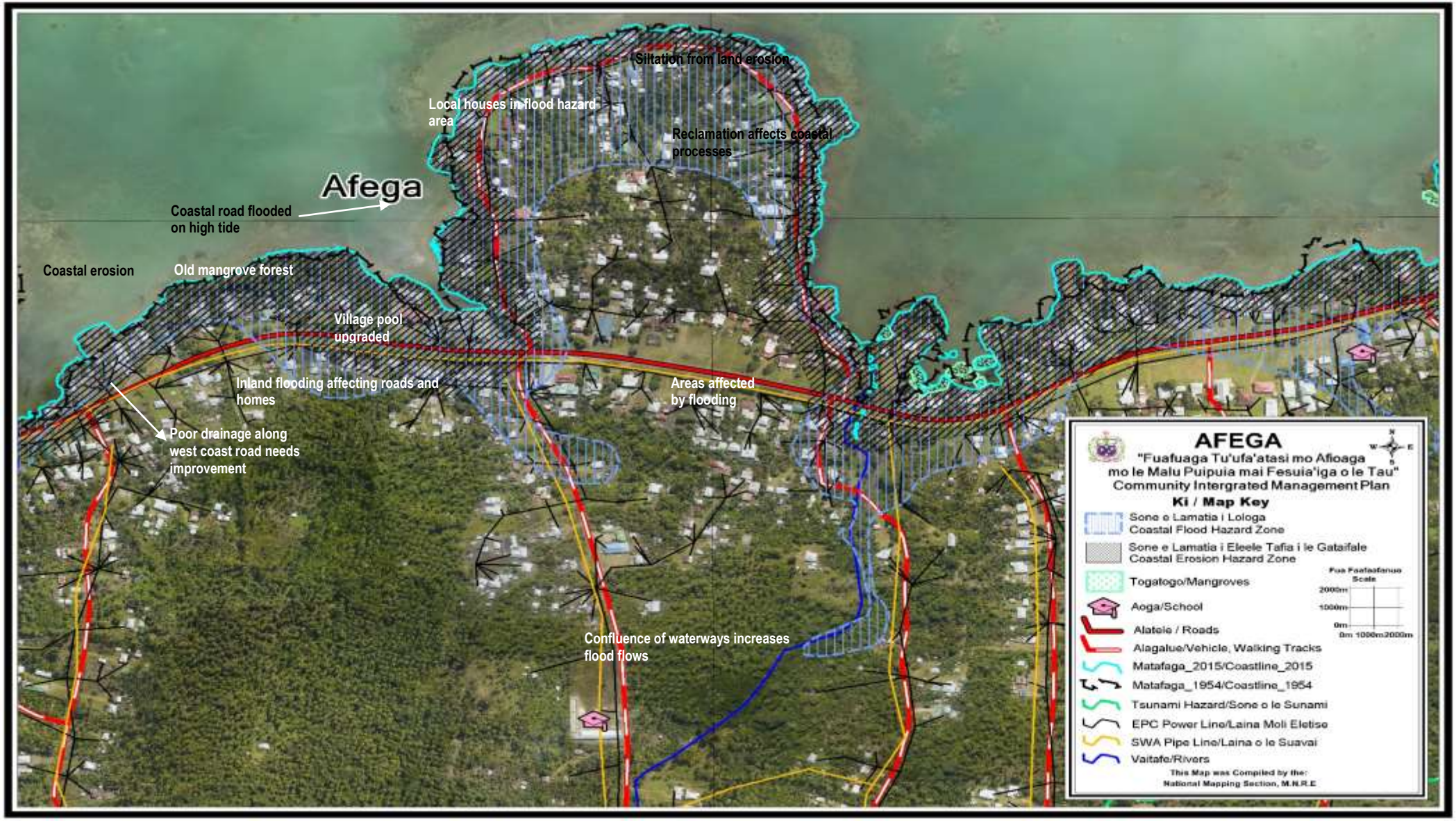
	programmes ***Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages***		productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	
Marine Restocking	Expand existing marine reserve to include: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility: MAF / village***	Increase diversity of marine species and coral reef ecosystem Reduce coral bleaching	Improve existing marine reserve and encourage expanding to other nearby sub-villages Community-Based Fisheries Management Plan	Agriculture Sector Plan 2016-2020

Governance	**Best Solutions and Other Solutions Proposed**	**Implementation Guidelines**	**Comments**
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans **Responsibility: MWCSD / Villages**	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae "refer Clause 5 Amendment". Fisheries Village By-Laws for Satui	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.
Institutions	Encourage participation of untitled men, youth and women in village decision making:	SDS 2016/17 - 2019/20 Community Development Plan 2016-2021	CIM Plan consultation witnessed the strong and active participation of all groups within village

	Consultation framework that promotes representation of women and youth Process that informs the village on all projects either by government or NGO **Responsibility: MWCSD / Villages**		community

King tide in February 2017, which inundated much of the coastal area for Afega village and strong waves came right up to the road as seen in this photo.

Afega Village Map



4.3 Tuanai Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in CEHZ and/or CFHZ : Households Schools Churches shops; 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/ / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance to mitigate potential damage from coastal erosion and flooding or 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)
Drainage	Implement road drainage system: - regular drainage inspection programme for maintenance, - clear storm water drainage to reduce surface runoff, and clear rubbish from the mouth of culverts to allow free outflow of water ***Responsibility: LTA/MWTI/Village***	Improve drainage system will reduce flooding during or after rainy season Reduce impact from flooding	WCR consider drainage on main road Identify funding/budget requirements and implementation programme for construction and development Draft Vulnerability Assessment of the Samoa Road Network (May 2016); National Infrastructure Strategic Plan 2011	Transport Sector Plan 2014-2019

			West Coast Road - Environmental Code of Practice (2012) Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	
Access Road	Upgrade inland access road by sealing remaining area and connecting to neighboring villages inland roads Conduct EIA prior to approval of upgrading access road ***Responsibility: LTA/MWTI***	Improve resilience of public infrastructure	Construction of access roads should be guided by: Relevant Environmental and Social Safeguard Policy Samoa CODE of Environmental Practice (PUMA - 2007) Review of National Road Standard in Samoa (2016) National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	Land Transport Sector Plan 2016-2020
Water (SWA)	Extension of piped water distribution network from Aleisa area to connect inland residents of Tuanai. ***Responsibility: SWA / MoH / village***	Improve piped water access Improved community livelihood and healthy living	Samoa Water Authority Pipeline Work Program for FY16/17 and FY17/18 Environmental and Social Safeguard Policies apply - MoH Water Quality Standards SWA 10 Year Investment Plan (2016) to improve water supply	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan 2016-2020

Electricity Supply	Install and connect power supply for residents inland. Install streetlights along the access roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground electricity lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC/MWTI/Village***	Maintain electricity supply at all times including during natural disasters Avoid accidents due to fallen electricity posts.	Monitor distribution networks to avoid overloading poles and contributing to line failures Development of a Renewable Energy and Energy Efficiency Framework, 2016	Samoa Energy Sector Plan 2017-2020
Evacuation Shelter	DMO to conduct assessment of existing buildings within the village located away from the hazard zone to identify a suitable building for Evacuation Shelter, prior to considering following request. Community Request for building a Evacuation Shelter house further inland to be managed by the Women's Committee away from the hazard zone and use during times of natural disasters and emergency. Conduct CDCRM for community ***Responsibility: MWTI / MWCSD / MNRE-DMO/Village***	Improve public facility used by communities for safety during times of natural disasters	Emergency house or shelters priority are given to existing buildings within the village that suits the criteria for a Evacuation Shelter and are retrofit for this purpose, and most targeted are school buildings.	National Disaster Management Plan 2017-2021
Access to water for consumption	Rainwater harvesting immediate action, supported by the installation of water tanks for families residing inland without access to water for	Improve community adaptive capacity to respond to climate change impacts	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system.	Water and Sanitation Sector Plan 2016-2020

	consumption and domestic use. Water quality testing ***Responsibility: MWCSD/CSSP / MoH/NGO/village***		National Water Resources Management Strategy 2007-2017	
Village pool contamination	Widen existing culverts and drainage on side of the road to allow water runoff from inland and road directly into the sea and away from the village pool. ***Responsibility: LTA/MWTI/Village***	Reduce impact from flooding and improve water quality	Assess impact of land use and drainage around the area and implement appropriate actions. Code of Environmental Practice, 2007 National Infrastructure Strategic Plan (2011)	Land Transport Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Environment & Natural Resources	**Best Solutions Proposed**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Replanting /coastal restoration	Replant vegetation / littoral plants in coastal areas Encourage natural regeneration of coastal plants ***Responsibility: Village/ MNRE***	Protects coastline against normal wave action Maintains natural ecosystem connectivity Increase sand build up minimizing erosion	MNRE Forestry to advice on appropriate species, and provide seedlings for different vegetation types suitable to the habitats (coastal lowland area) and planting materials for villages that need them. Restoration Operational Plan 2016-2020 Two Million Tree Planting Strategy 2015-2020 Forestry Management Act 2011	National Environment Sector Plan 2017-2021
Marine Reserve	Established a marine reserve – conservation of inshore fish species and coral reef ecosystem rehabilitation ***Responsibility: MNRE / Village***	Improve coral reef ecological functions and resilience Coral reef provide habitats for fish which are important elements for livelihood	Community-based Fisheries Management Plan (CBFMP) NBSAP 2015-2020	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2020

Water Catchment	Restore existing water reservoir located inland to support inland families without water. Rehabilitate old catchment area around the reservoir. Consultation and awareness on water catchment area ***Responsibility: MNRE / MWCSD-IWS / Village***	Improve alternative source of water supply for families inland	Conduct assessment to scope the feasibility of sourcing water from the existing old water reservoir before decision is made on restoration. National Water Resources Management Strategy 2007-2017 Water Resources Management Act 2008	Water and Sanitation Sector Plan 2016-2020

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	Improve food security and healthy living and increase community resilience and adaptive response to climate change Implementing best practices for home and commercial production	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	Agriculture Sector Plan 2016-2020

	Implement integrated pest management programmes ***Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages***		productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	
Marine Restocking	Expand existing marine reserve to include: Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility: MAF / village***	Increase diversity of marine species and coral reef ecosystem Reduce coral bleaching	Community-based Fisheries Management Plan (CBFMP) NBSAP 2015-2020	Agriculture Sector Plan 2016-2020

Governance	**Best Solutions**	**Guidelines to assist Implementation**	**Comments**
District /Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans ***Responsibility: MWCSD / Villages***	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae "refer Clause 5 Amendment".	The Amendment allows for the village to establish their own governing constitution and have it registered with MWCSD and in this way village by-laws to manage community and public asset as we ll as natural resource management can be part of the village constitution.
Institutions	Encourage participation of untitled men, youth and women in village decision making: Consultation framework that promotes representation of women	SDS 2016/17 - 2019/20 Community Development Plan 2016-2021	CIM Plan consultation witnessed the strong and active participation from women, untitled men and youth.

	and youth Process that informs the village on all projects either by government or NGO ***Responsibility: MWCSD / Villages***		

Old water reservoir inland of Tuanai village build during the German times (according to village mayor) village representatives expressed the need to rehabilitate the reservoir as an alternative option to support inland families without access to water.

Tuanai Village Map