Community Integrated Management Plan

Sagaga le Falefa - Upolu

Implementation Guideline 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 Falefa (Tufulele, Utuali'I, Nono'a, Salepou'ae, Lotosoa, Levi and Alamutu, Faleula, Aelefou, Aleisa East and Aleisa West villages)

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

Date of Signing: 22 June 2018

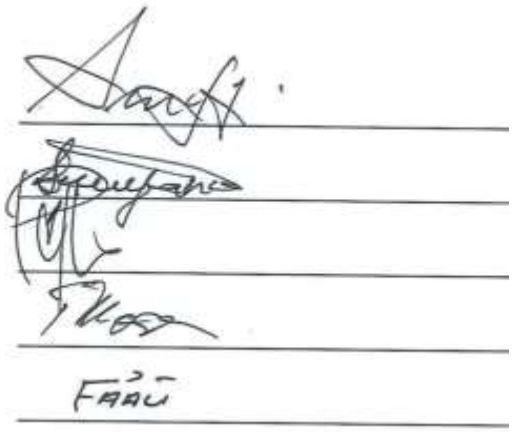
Representatives: Signature

Tufulele Village

- Leatuau Iulai
- Tagiilima Si'u
- Polumanaia Ioane
- Puatā Si'u
- Lava Enosa

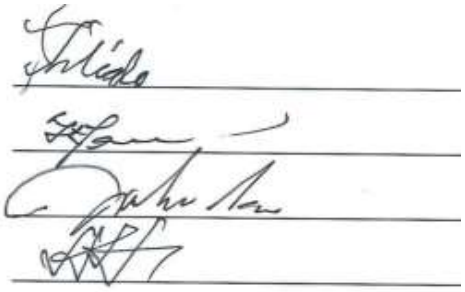
Utuali'i Village

- Vaiafia Mafaufau
- Sofarania Si'ufanua
- Pualele Tagisia Leale
- To'iaimanū Mose
- Fa'aū Pualele Talosaga



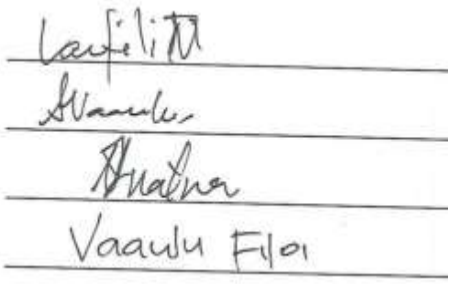
Nono'a Village

- Vaea Sosaia Tilialo Pulafiti
- Telesia Agaimalo
- Liutagata Vaoga
- Avamua Tavita



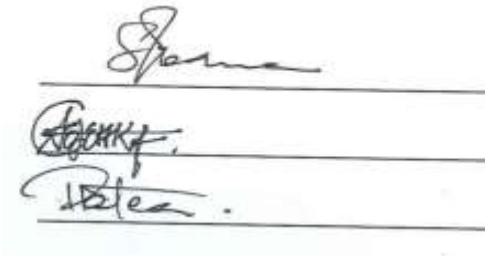
Salepou'ae Village

- Laufilitoga To'alua Va'aulu
- Sivaito'a Salepou Va'aulu
- Vaivaimalemalō Vesi
- Vaaulu Filoi



Lotosoa Village

- Sagaga Ailaoa Ioane
- Soliaimalo Motu Pa'iena
- Pagisā Merota Patea

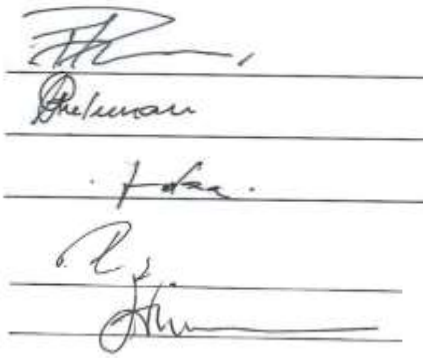


Levi and Alamutu

- Nuualiitia Ioane Tusi
- Kalala Tusitino
- Faatulia Sanele
- Agai Mauga Tu'ipao
- Si'uguta Saulo

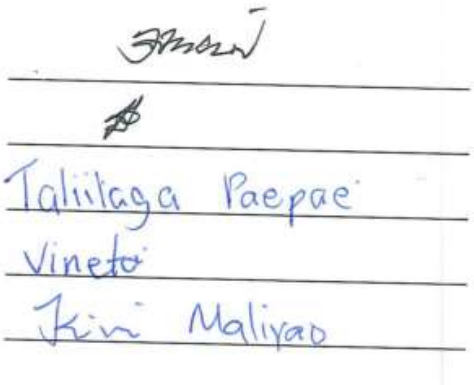
Faleula Village

- Tuuimaialu Petelo Tupuola
- Gaga Pulemau
- Nuuialii Ioka
- Fetaiai Vaauli
- Lealali Niko



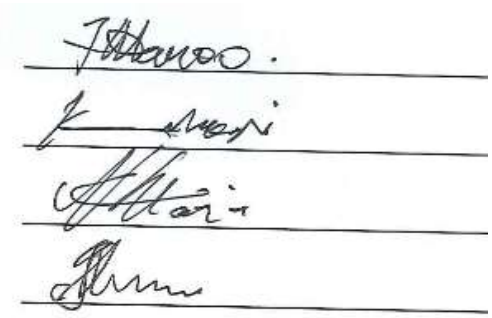
Aele fou Village

- Toeafua Auapa'au Faamasino Ioane
- Tanielu Faasipa
- Taliilagi Paepae
- Vineta
- Kini Malivao



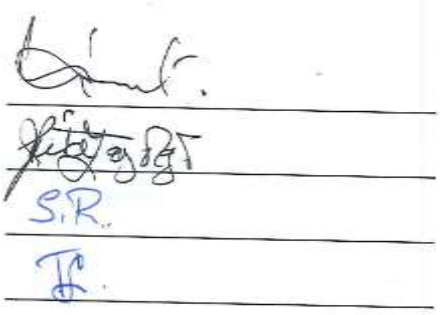
Aleisa East Village

- Filisita Mano'o
- Kirisimasi Afitu
- Vitale Manoo
- Ioane Maposua



Aleisa West Village

- Sitagata Falemalu Hunt
- Janet Pritchard-Lagolago
- Sinalei Robert Sands
- Tuineta Lalotoa



The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of A'ana Alofi III as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS)

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

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Ulu Bismarck Crawley
Chief Executive Officer, MNRE

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Acronyms

ASCH	Areas Sensitive to Coastal Hazards
BCA	Benefit Cost Analysis
CBFMP	Community Based Fisheries Management Plan
CC	Climate Change
CCA	Climate Change Adaptation
CDCRM	Community Disaster & Climate Risk Management
CEP	Community Engagement Plan
CHZ	Coastal Hazard Zone
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flooding Hazard Zone
CIM	Community Integrated Management (Plan) or (Strategy)
CLHZ	Coastal Landslip Hazard Zone
COEP	Code of Environmental Practice
CSO	Civil Society Organization
CSSP	Civil Society Support Programme
DSP	District Sub Project
EbA	Ecosystem based Adaptation
ECCCR	Enhancing Coastal Community Climate Resilience
ECR	Enhancing Climate Resilience
EMP	Environmental Management Plan
EPC	Electric Power Corporation
ERN	Emergency Radio Network
HCSI	High Coastal Sensitive Index
IAS	Invasive Alien Species
IG	Implementation Guidelines
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
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 Sagaga le Falefa has been prepared under the Government of Samoa's Pilot Programme for Climate Resilience (PPCR)- Enhancing Climate Resilience for Coastal Resources and Communities Project. The CIM Plans is the primary means of implementing the CIM Strategy, which was formally approved by the Government of Samoa in February, 2001, and revised in August 2015, to provide Strategic direction for the management of government and community resources within the districts and villages.

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

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

1.2 The Aim of the CIM Plan

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

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

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

2. Improve climate resilience planning and development

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

1.3 The Structure of the Plan

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

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

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

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines (IG)

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

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

- Column 1: Indicates the issues or problem identified during the CIM Plan consultation and site assessments
- Column 2: Solutions – these are the interventions/ solutions identified by the CIM Plan team and 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 "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 Sagaga le Falefa District Environment

3.1 Physical and Natural Resource Setting

Sagaga le Falefa district is made up of villages of Faleula, Saleimoa (Levi, Alamutu, Lotoso'a, Salepouae, and Nonoa), Utualii and Tufulele, as well as the inland communities of Aleisa East. Aleisa West, Nuu, Aele Fou and the EFKS Theological College community of Malua. The district is unusually shaped like a "U" with the villages Tufulele, Utuali'i, Nono'a, Salepou'ae, Lotosoa, Levi – Alamutu along the north coast on the west side, the village of Faleula, along the coast on the eastern side, Aele Fou inland from Faleula, and the villages of Aleisa i Sisifo, and Aleisa Sasa'e inland along the Alafa'alava Road. In between the two legs of the district lie two other districts, Sagaga Le Usoga and part of Gagaemauga 1. The largest village is Faleula, which is located at the intersection of the main road along the coast (two-lane and sealed) and an inland road, which connects to Alafa'alava Road at Siusega.

The inshore reef and lagoon from Apia to Aana which includes Sagaga le Falefa is an extensive reef system with a large inshore lagoon that extends out to over 2km. It used to be a rich marine biodiversity both in fisheries and coral communities. The Sagaga le Falefa inner reef and shore is usually rocky and muddy with mangrove stands along the coastline. The inner lagoon is muddy with a mixture of seagrasses, macro algae and some dead and standing corals. The outer lagoon is sandy with coral rubble and coral regrowth.

Mangrove and littoral vegetation clearance along the coast for settlement have increase coastal erosion and reduce resilience from cyclone hazards. Sedimentation buildup in the lagoon and inshore reef has suffocated most of the coral. The loss of coastal wetland has also caused a decline of the district's fish stocks over the years.

Mangrove forests exist in between Alamutu and Lotosoa as well as between Nonoa and Salepoua'e sub-villages of Saleimoa. These mangrove stands are dominated by *Rhizophora* and *Bruguiera sp*p with some saato (*Acrostichum aureum*) along the wetland edges. Both mangrove stands are fed by spring-pools at the edge of the wetlands which have been used by families from the surrounding areas in the past for bathing, washing and drinking. The mangrove forest drains into the sea has been somewhat restricted affecting the status and health of the wetlands. The Lotosoa mangroves drainage is limited by the current east coast road crossing which only has two culvert pipes for the outflow thus restricting the regular flow between the sea and the mangrove wetland. The Nonoa mangroves is restricted by both the road crossing culvert pipes and a family reclaiming part of the natural drainage for residences and a tilapia pond. By restricting the natural free-flow of freshwater and sea water, some of the mangroves are dying. Additionally the conditions of the spring-pools at the edge of the mangroves have deteriorated over the years due to the lack of maintenance since the regular availability of the SWA reticulated water supply system. The conditions of the wetlands have also been affected by other reclamations and being used as rubbish dumps. The mangrove stands although small in size do provide a very important function as a natural filtration system for the land-based pollution flowing into the sea, and as natural climate resilience for coastal communities and nursery ground for juvenile fisheries. Therefore actions are needed to rehabilitate the mangrove forests in both locations.

The inland access roads are now mostly populated by family residences, cattle farms and agricultural activities. These mostly drain into the sea either through the roads, streams or wetlands. The surface runoff draining straight into the sea has exasperated the polluted condition of the marine environment impacting the fisheries, and coral reefs.

The terrestrial ecosystems of Sagaga le Falefa is made up non-forest areas classified as a mixture of disturbed secondary forests, old coconut plantations, food crop plantations, livestock farms and gardens from the coastal village settlements all the way inland. The native disturbed forest which is only found in the water catchment areas is a mixture of native forest trees identified such tava *Pometia Pinata*, growing together with secondary forests such as by tavai along with invasive species such as tamaligi, pulu mamoe and pulu vao.

Most of the invasive species found in Samoa are present in this district, which include trees such as the different types of tamaligi *Albizia chinesis*, *Falcateria moluccana;* pulu vao *Funtumia elastica*; pulu mamoe *Castilla elastica* and faapasi *Spathodea campanulata*, birds such as the two specieis of myna birds, the red-vented bulbul, and invertebrates such as the African snail. The national invasive species program and the specific watershed management plan for the Apia Catchment areas is anticipated to provide activities for any possible eradication activities for these invasive species.

3.2 Social and Economic Setting

The most recent census (2016) puts the population of Sagaga Le Falefa at 12,036. The ten villages have the following populations: Tufulele with 1336, Utuali'i, 506, Saleimoa (Levi/Togo, Lotosoa, Salepouae, Nonoa, Malua) 3816, Faleula 2668, Aele Fou 608, Aleisa 1520 (Aleisa East and West). Most residential areas are in the coastal villages located along the inland side of the main road with single row of houses and other business buildings between the road and the sea. The vulnerability of these buildings in particular, to storm damage has encouraged more and more villagers to move inland along nearby work roads away from the coast.

The main road is an important district infrastructure. Although it is not often located directly on the coast, along most of its length through the district it lies within the Coastal Flood Hazard Zone (CFHZ) and the Coastal Erosion Hazard Zone (CEHZ).

The main West Coast Road (WCR) provides the most direct access between Faleolo Airport and Apia and it is the lifeline for villages along the coast. The WCR is currently being upgraded to include two lanes all the way from Vaitele to Mulifanua and this will help alleviate the congested traffic and to climate proof road development for improved infrastructure resilience to extreme events. There are also plans in the pipeline to consider constructing a new road inland parallel with the WCR, but location has not yet been determined. Power and telephone lines usually follows the main road.

Piped and metered water is available to all villages and Aleisa Sasa'e recently received piped water after the upgrade in water supply from Fuluasou. Families residing further inland water supply and pressure is sometimes unreliable. There are two main pipelines, one along the main road and the other along the inland road of Alafa'alava.

There are also village pools and springs. These are located both on the coast and inland (near swamps/springs) and some are in need of repair (e.g. Faleula, Salepou'ae, Utuali'i, Alamutu - Levi and Tufulele).

From the main road, work roads to the village plantations, homes and in some cases schools extend inland several kilometres. Roads to schools and churches in Nono'a are sealed, with power and some with telephone service, although the road to the quarry is unsealed. Other work roads are generally unsealed, and have no power or telephone services along them. After storms they can become flooded and in some areas, impassable. The village of Salepou'ae has a unique horseshoe shape, with an inner and outer road, a centrally located church, meeting house, school and a pre-school.

The cash economy of the District is dominated by traditional work. Fishing and plantations provide the main source of income for village residents although there is some employment in local schools, shops and at the Nono'a quarry. Some village residents are also employed in Apia or in nearby resorts and industry. In addition the District supports several schools and a number of churches.

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 20111 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 Falefa, 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 Falefa reside with only a few villages located inland such as Aele fou, Faleula-uta, Nuu, Aleisa East and Aleisa West. Most of the government infrastructure, village developments and family businesses are located along the WCR. While the infrastructure along the coastal area are the lifeline of the district for commuting to town, wharf and airport, for 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: The Coastal Hazard Mapping by BECA in 2000 showed that Sagaga le Falefa 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.

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 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.

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

4. Sagaga le Falefa District Interventions

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 ***Responsibility: LTA / MWTI***	Improve infrastructure resilience Climate proof the road transport network. Reduce impact of flooding	Use existing information for guidance but not limited to: Environmental Social Safeguard Policy "Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; MWTI "Samoa Code of Environmental Practice (2007)" *National Infrastructure Strategic Plan 2011 *Use updated Hazard Maps to inform designs *Undertake a Cost Benefit Analysis to weigh options for funding *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 Identify funding/budget requirements and implementation programme for construction and development	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019 National Infrastructure Strategic Plan (NISP) 2011
Drainage	Maintenance of road side drains and regular inspection of drainage system; ***Responsibility: MWCSD / District / Village / MWTI and LTA***	Improve road network Emergency response access for evacuation		

			Work with the communities to keep the drainages clear of any debris 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/ Villages***	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 that runs through Aleisa Alafaalava Road to Faleolo/Mulifanua: Implement SWA service on pressure management and leak detection work as part of Non-Revenue Water (NRW) reduction program for Rural areas Chlorination of water supply ***Responsibility: SWA/MoH/ /District and 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- - FY16/17 extension of Water Distribution for areas of Nonoa, and extension of Fuluasou distribution network to areas of Aele fou and extension of Aleisa distribution to Aleisa East - FY 17/18 work program including extension of Aleisa Distribution network for areas of Aleisa West.	Community Integrated Management Strategy, August 2015) Water and Sanitation Sector Plan: Framework For Action 2016 - 2020,
Schools within the CEHZ	When replacement is required relocate schools outside of coastal 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
Evacuation Shelter	Implement the CDCRM Program for villages in the district: Map out emergency shelters within villages away from hazard zone for use during natural disasters such as Primary School in Aele fou; Store emergency	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	Community Disaster Climate Risk Management Program 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

	supplies including First Aid Kit, food supplies and water and ensure they are secured before a cyclone hits; Identify nearest location of emergency services for sources of assistance after a cyclone are known ***Responsibility: MNRE-DMO / MWCSD / District-Villages***			
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guideline 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 Installation of rubbish bins along residential area ***Responsibility: MNRE/MWCSD / District-Village***	Improve healthy living and cleanliness in communities Reduce impact of flooding during rainy season because clear culverts allows for quick flow of water into the sea	MNRE-DEC to ensure that new established roads are included in collection of rubbish Village council enforce fines upon individuals, businesses and families within village that dispose rubbish illegally. A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto Waste Management Act 2010 National Chemicals and Hazardous Waste Management Policy 2012	National Environment Sector Plan 2017-2021 Health Sector Plan 2008-2018

Sanitation & Hygiene	Provide sanitation facilities specifically for large vulnerable families in communities; Put in place sanitation measures through the STA Beautification Committee for improve village cleanliness Women's Committee include inside and outside of residential area inspection Consultation and awareness on waste management ***Responsibility: MoH / MNRE / STA / MWCSD / District-Village***	Reduce community vulnerability to vector borne diseases Reduce the number of typhoid cases Improve healthy environment for community	STA Beautification Committee to continue working with village communities for improved clean environment A Healthy Samoa - Health Sector " The Past, Current and the Future" 2000 - 2025 Manifesto	Heath Sector Plan 2008-2018 Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021
Mangrove and wetland rehabilitation Saleimoa (Lotosoa, Alamutu, Salepouae and Nonoa) and Faleula	Established mangrove rehabilitation program for district/villages: Replanting if necessary and declare the area as conservation site (wetland) Conduct rapid biodiversity assessment to take stock of marine species diversity inside mangrove ecosystem Discourage reclamation within mangrove forest Enforce village rules to stop the dumping of rubbish/waste inside mangrove area Installed box	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

	culverts wide enough to allow of water from mangrove into the sea ***Responsibility: MNRE / MWCSD/ MAF / District-Village***			
Sand mining for commercial and domestic use affecting the marine and coastal environment	Assess and identify sustainable sources of river sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for river sand mining Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation Responsibility: MNRE / Village	Improve the sustainable management of sand as a natural resource Minimize impacts of coastal inundation and erosion Reduce impact to natural coastal protection mechanism via control of scale and site of extraction	Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community For access to sites, obtain written consents from Alii Faipule and landowners. Alii Faipule and landowner provide consent Develop sand mining regulation Follow existing MNRE guidelines for sand mining or extracting such as: PUMA Act 2004 Lands and Survey Environment Act 1989 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill, 2018 NAP Sustainable Land Management Plan 2015-2019	National Environment Sector Plan 2017-2021
Marine Reserve	Rehabilitate inshore coral reef ecosystem for district:	Improve resilience of coral reef ecosystem to combat climate	Established marine reserve for all the coastal villages in Sagaga le Falefa	National Environment Sector Plan 2017-2021

	Coral reef restoration program established – coral gardening Conduct assessment to determine safety of bivalves and shellfish from inshore area of the district for consumption ***Responsibility: MNRE / MAF / villages***	change impacts Increase marine species diversity within the marine reserve / MPA	Village council to enforce a no take zone within the established marine reserves Seek funding support to undertake assessments and implement activities for marine reserve Develop Community-based Fisheries Management Plan (CBFMP) NBSAP 2015-2020	Community Development Plan 2016-2021
Natural Freshwater Springs: Levi – Alamutu, Lotosoa, Salepouae, Nonoa	Regular cleaning and maintenance of springs for health reasons Encourage regrowth of wetland plants (saato and vaoutu'utu – local names) at mouth of pools to help with filtration for both the pools and wetland. MoH to test water quality for consumption. ***Responsibility: MNRE / MoH / MWCSD / District-Villages***	Improve alternative source of water resources available to communities	MNRE-DEC to provide support to village communities in the rehabilitation process Develop a management plan and rules to assist in monitoring the use of natural pools and enforce fines MNRE-Water Resource Division to provide guidance support to village communities with awareness programs on water management and protection of river reserved areas NBSAP 2015-2020 Water Resources Management Act 2008 National Water Resources Management Strategy 2007-2017	National Environment Sector Plan 2017-2021
Dry stream beds Infrastructure – install drainage along the coast (LTA/MWTI)	Conduct awareness program to inform village communities not to reclaim areas that are natural stream beds because of potential danger from flash flooding; Identify suitable locations inland away from dormant	Increase communities reactive response to disaster risk areas Improve resilience of communities to cope with potential risks	MNRE to provide support to village communities in mapping out potential risk areas where there are dry stream beds in villages; MNRE- Water Resource Division to support awareness program in communities informing them of dry stream bed risks	National Environment Sector Plan 2017-2021

	waterways for residential development ***Responsibility: MNRE / villages***		NBSAP 2015-2020 National Water Resources Management Strategy 2007-2017 Water Resources Management Act 2008	

Livelihood and Food Security	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests : Promote and facilitate planting of root-crops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement Sustainable Land management practices Implement integrated pest management programmes	Improve food security and healthy living and increase community resilience and adaptive response to climate change	MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity Implementation of solutions are guided by the	Agriculture Sector Plan 2016-2020

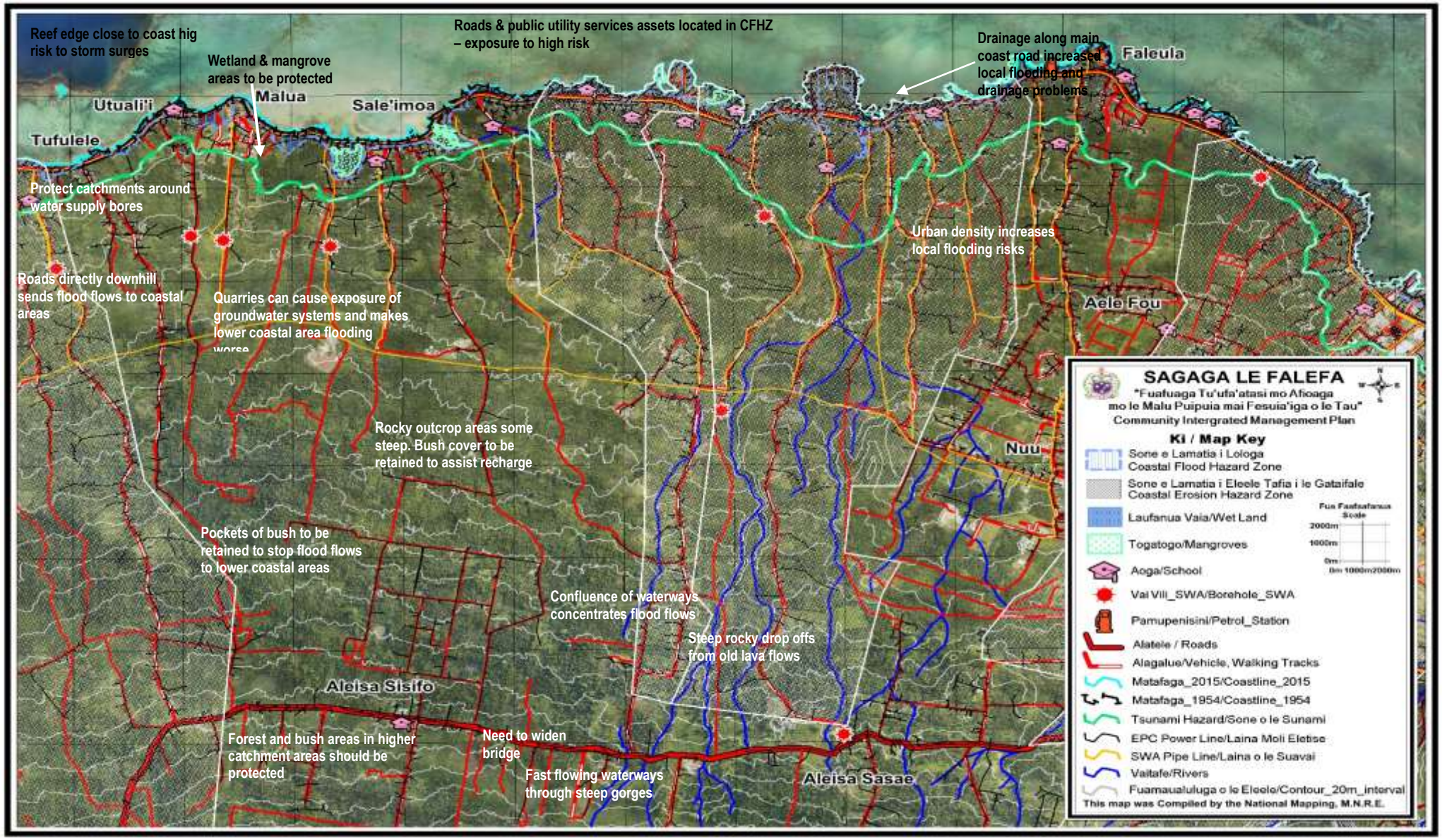
	Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages		following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 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***	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	**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 Evacuation Shelter/emergency shelters, installation of local signs for evacuation during natural disasters, and mapping out key places and actions for emergencies. Protect natural assets, historical artefacts and food supply during natural disaster National Disaster Management Plan 2017-2021 Community Development Plan 2016-2021	Developing community disaster response plan will improve community resilience and reactive response during times of natural disasters. There will be more survivors and village and public asset protected due to improved disaster preparation plans. Village council 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

	Responsibility: MNRE / Villages	
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.

Most common issue identified inland during site assessment around Saleimoa area (Sagaga le Falefa District) is the amount of illegal waste disposal around the mangrove or wetland area

Sagaga le Falefa District Map



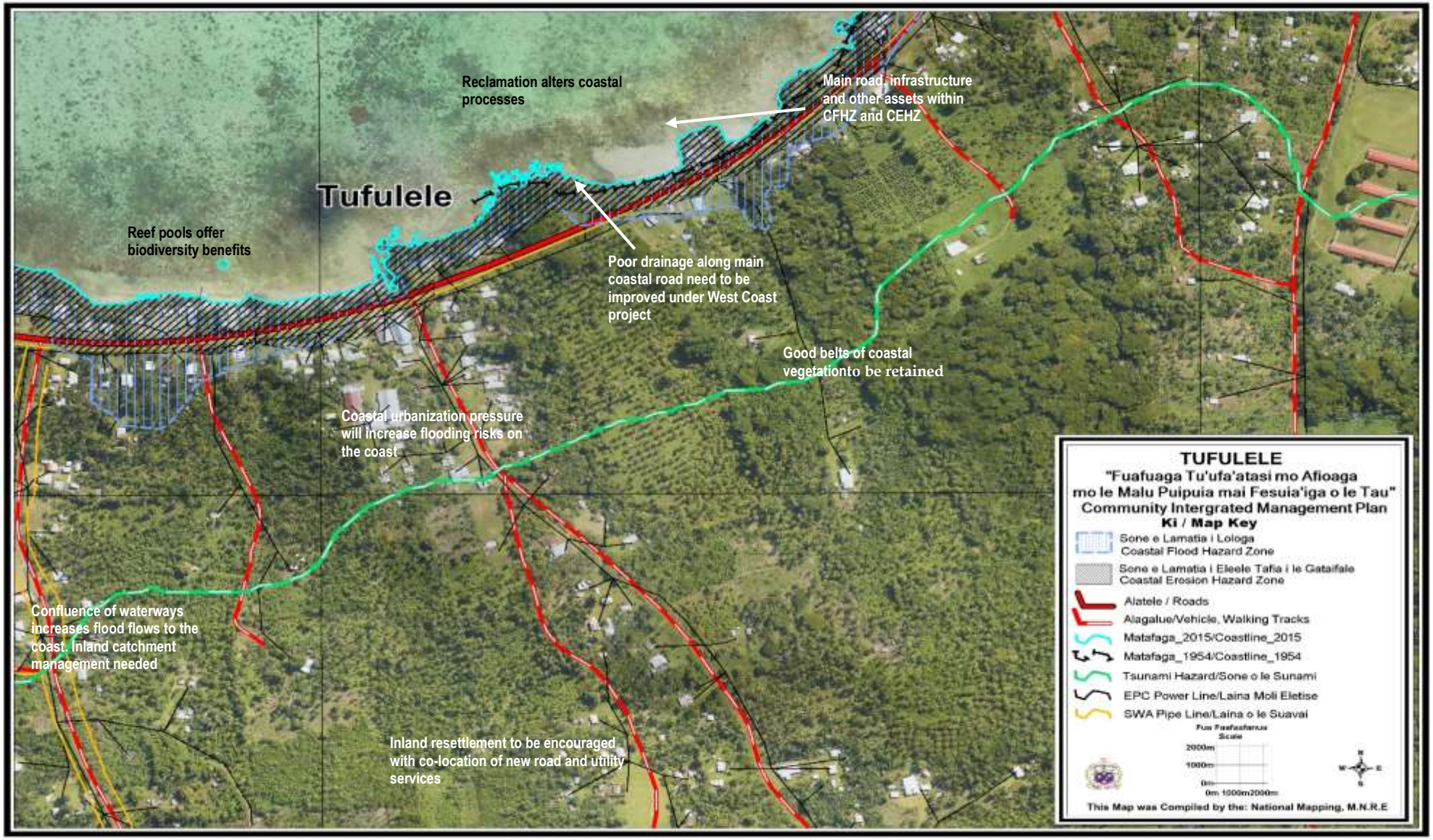
4.1 Tufulele Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road	Complete road sealing to reach main road Aleisa to facilitate relocation Assess cost of access road upgrade 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)	Land Transport Sector Plan 2016-2020

			National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
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. Implement retrofitting buildings that are suitable for emergency shelters Community Request for building a	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

	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. ***Responsibility: MWTI MNRE-DMO / MWCSD / Village***			
Village pool	Rehabilitate existing village pool for bathing as alternative source of water during drought and shortage period ***Responsibility: Village MNRE / MWCSD / CSSP/NGOs***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool	Community Development Plan 2016-2021

Tufulele Village Map



4.2 Utualii Village Interventions

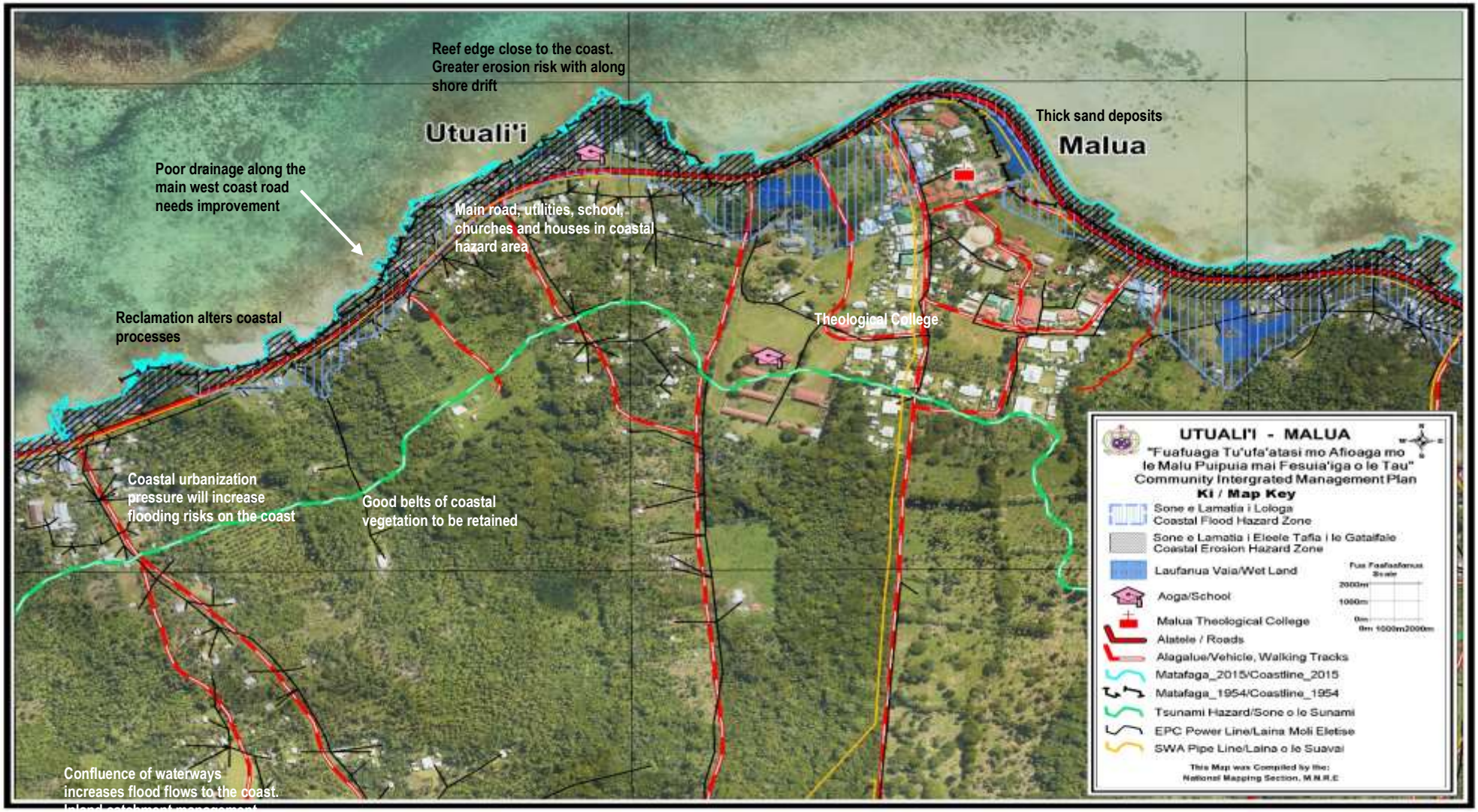
Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road	Complete sealing Utualii access road to facilitate relocation and access to plantations Assess cost of access road upgrade 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	Land Transport Sector Plan 2016-2020

			Samoa (2016) National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
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. Implement retrofitting buildings that are suitable for emergency shelters Community Request for building a	Improve public facility used by communities for safety during times of natural disasters Improve survivors during natural disasters Improve adaptive capacity and resilience of community to respond to 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 2017-2021

	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. ***Responsibility: MWTI MNRE-DMO / MWCSD / Village***			
Village pool	Strengthen existing community pool by restoring eroding rock-wall around the pool ***Responsibility: Village / MWCSD / CSSP /NGO/ MNRE***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool	Community Development Plan 2016-2021
Water Borehole	Conduct assessment on existing SWA borehole located inland of the village on its feasibility for water extraction. ***Responsibility: MNRE-WRD / village***	Improve alternative water source options as backup support during water shortage period (drought etc)	SWA to advice community on the status of borehole SWA 10 year investment plan	Water and Sanitation Sector Plan 2016-2020
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Test water quality ***Responsibility: CSSP / MNRE / village/NGO/UNDP-GEF SGP / MoH***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Coastal replanting	Continue replanting along the coastal area to strengthen shoreline protection Protect natural re-generation of coastal plants Support MNRE-Forestry 2million tree replanting ***Responsibility: MNRE / Village***	Increase coastal ecosystem resilience	Village and Families to recognize the role that vegetation plays in stablizing coastal areas MNRE-Forestry to advice on appropriate tree species and where possible, provide seedlings Restoration Forestry Operational Plan 2016-2020 2 Million Tree Strategy 2015-2020 Forest Management Act 2011	National Environment Sector Plan 2017-2021

Utualii and Malua Village Map



4. 3 Salepou'ae Village Interventions

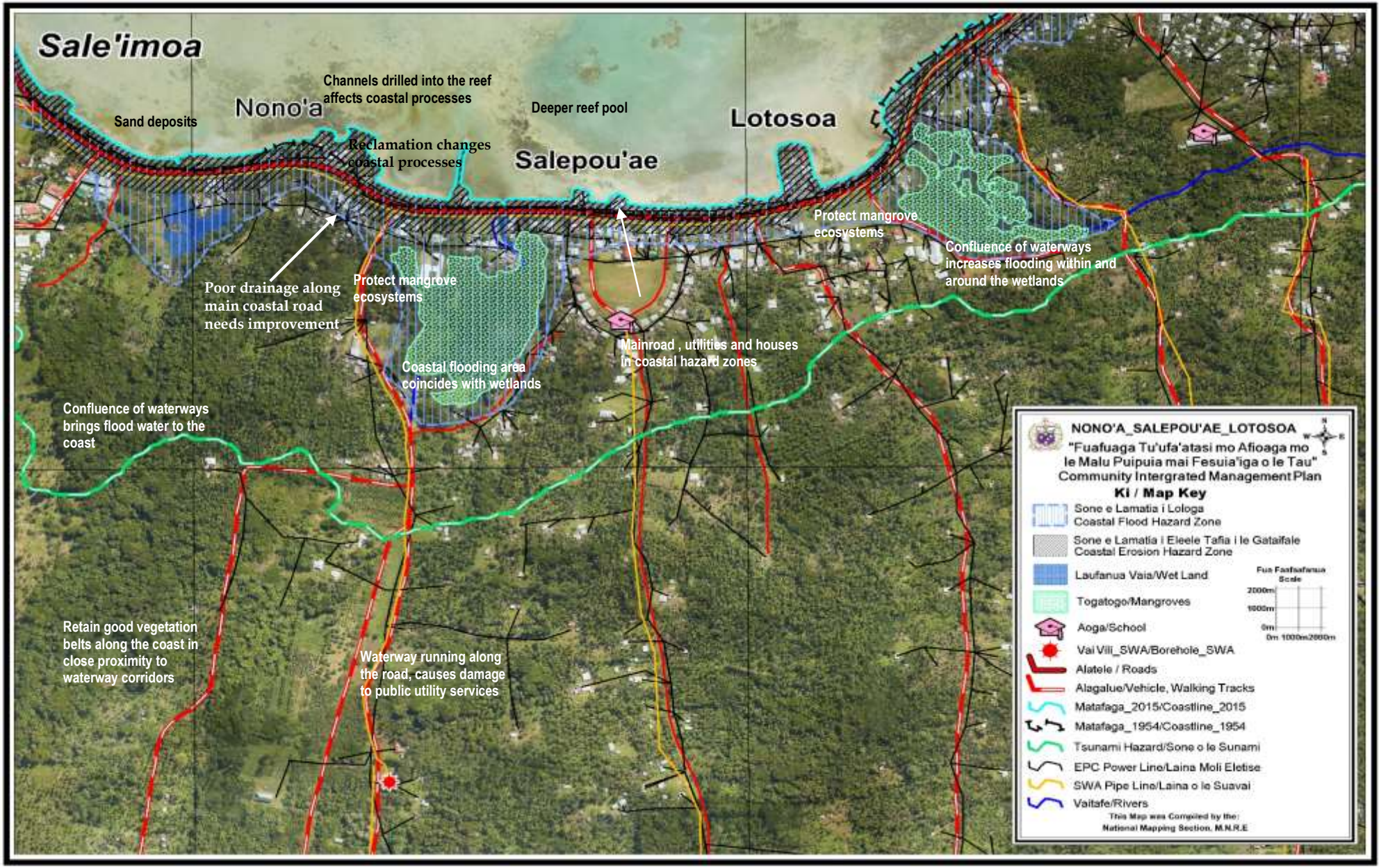
Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road	Sealed access road to the: Village pool to reduce risk of flooding from water overflow; ***Responsibility: LTA/MWTI/ village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market.	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)	Land Transport Sector Plan 2016-2020

		Access road also assist in disaster management	National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
Drainage	Implement road side 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 outfllow 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 Vulnerability Assessment of the Samoa Road Network (2016); West Coast Road - Environmental Code of Practice (2012) National Infrastructure Strategic Plan 2011 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage	Transport Sector Plan 2014-2019
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.	Improve public facility used by communities for safety during times of natural disasters Improve survivors during 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 2017-2021

	Implement retrofitting buildings that are suitable for emergency shelters 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. ***Responsibility: MWTI MNRE-DMO / MWCSD / Village***	Improve adaptive capacity and resilience of community to respond to natural disasters		
Village pool (inland)	Rehabilitate existing village pool for bathing as alternative source of water during drought and shortage period ***Responsibility: MNRE / MWCSD / CSSP / NGOs/Village***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool	Community Development Plan 2016-2021
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Water quality testing ***Responsibility: CSSP / MNRE /MoH/ village/NGO/ UNDP-GEF SGP***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Salepou'ae village pool is in very poor condition and beyond repairable, village wanted to rehabilitate the pool, however SWA water supply is regular.

Salepoua'e Village Map



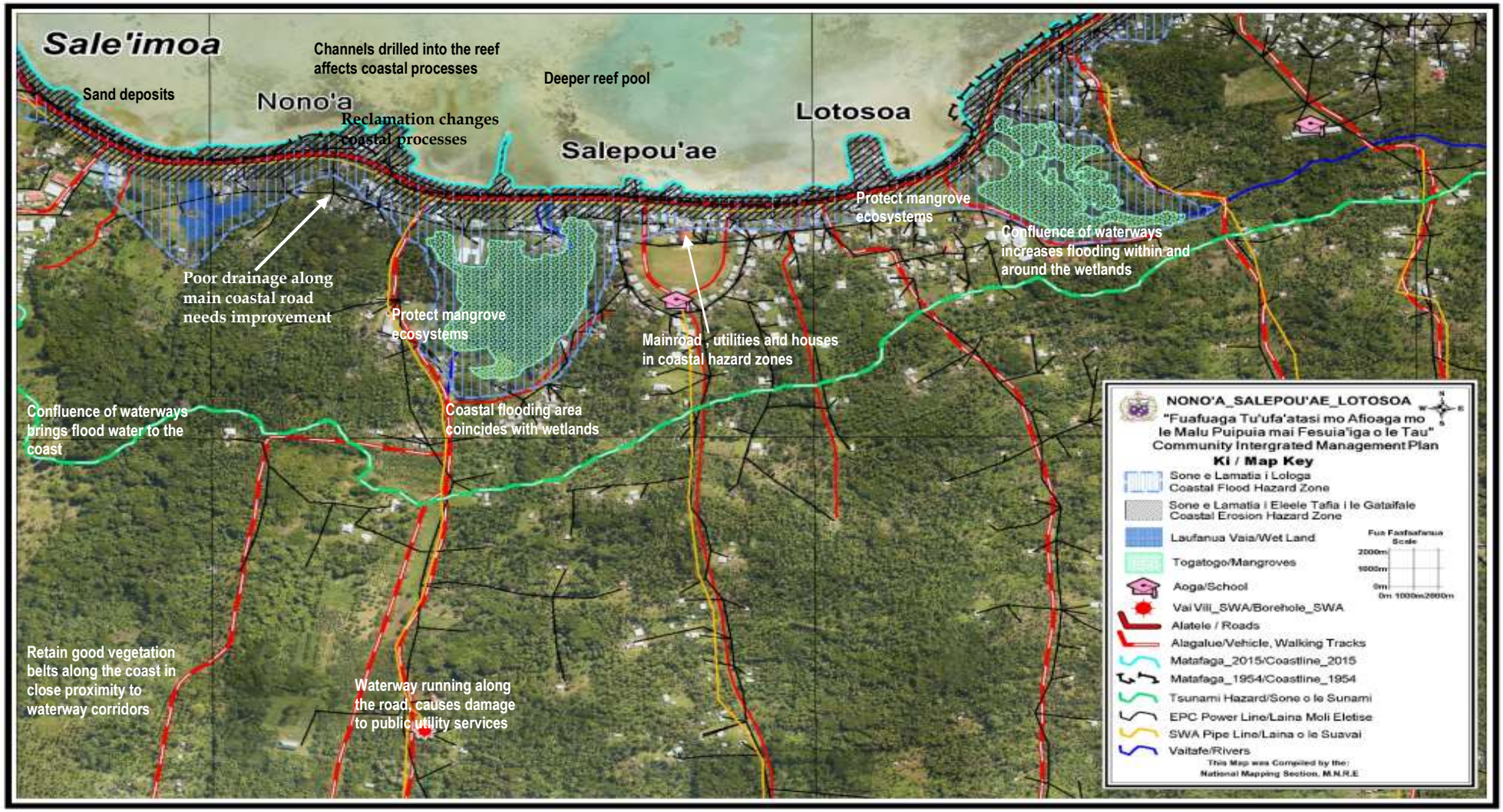
4.4 Lotoso'a Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road	Complete access road inland to facilitate relocation: Approximate length: 1500m Approximate cost: $649,650.00 SAT Best Cost Ratio: 2.1 ***Responsibility: LTA/MWTI/ village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market.	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)	Land Transport Sector Plan 2016-2020

		Access road also assist in disaster management	National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
Drainage	Implement road side 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 outfllow of water Enlarge existing box culvert to allow flow of storm water runoff into the sea ***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 Vulnerability Assessment of the Samoa Road Network (2016); West Coast Road - Environmental Code of Practice (2012) National Infrastructure Strategic Plan 2011 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	Transport Sector Plan 2014-2019
Electricity Supply	Install and connect power supply for residents inland. Install streetlights along the access roads where needed for community safety	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

	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***			
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. Implement retrofitting buildings that are suitable for emergency shelters Community Request forbuilding 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. ***Responsibility: Village /MWTI MNRE-DMO / MWCSD / Village***	Improve public facility used by communities for safety during times of natural disasters Improve survivors during natural disasters Improve adaptive capacity and resilience of community to respond to 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

Lotoso'a Village Map



4.5 Nono'a Village Intervention

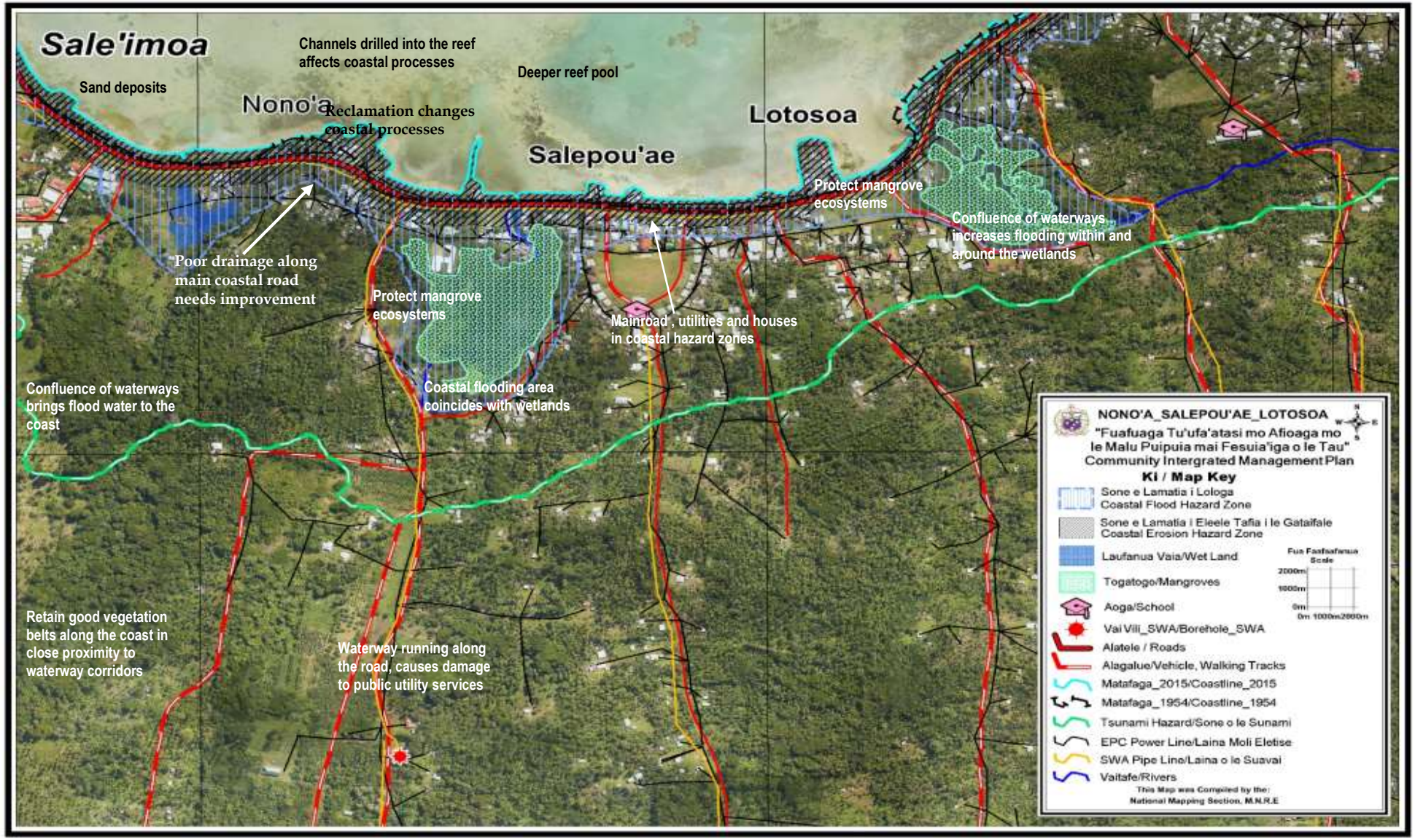
Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: 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)
Drainage maintenance	Implement road side 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 outfllow of water	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 Vulnerability Assessment of the	Transport Sector Plan 2014-2019

	Responsibility: LTA/MWTI/Village		Samoa Road Network (May 2016); West Coast Road - Environmental Code of Practice (2012) NISP (2011) Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 – Drainage	
Village pool upgrade	Implement a few structural improvements to strengthen wall of existing village pool. Clean-up waterway system and flush out all rubbish and debris blocking the water circulation in the pool ***Responsibility: Village / MWCSD / CSSP / MNRE / UNDP-GEF SGP***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool Village to implement rules on land use activities around the pool National Water Resource Strategy 2007-2017	Community Development Plan 2016-2021 National Environment Sector Plan 2017-2020 Water and Sanitation Sector Plan 2016-2020
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Water testing ***Responsibility: CSSP / MNRE / MoH/NGO/village***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Mangrove and wetland protection	Develop a marine integrated management plan to include: Mangrove replanting in locally managed protected area Implementing conservation activities to support the clean-up and protection mangrove and wetland ecosystem ***Responsibility: MNRE /CSSP / UNDP-GEF SGP/ 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	MNRE DEC to provide advice and guidance on establishing a conservation site to protect mangrove ecosystem: NBSAP 2015-2020	National Environment Sector Plan 2017-2021
Conservation site and Aquatic farm (tilapia farm in the natural setting)	Assess the ecological status of the Nonoa Conservation Site by finding out: Any adverse impact on natural environment, Species diversity and abundance. ***Responsibility: MNRE / Village***	Increase ecological resilience of conservation area	MNRE to conduct assessment of the Conservation site and status of tilapia farm NBSAP 2015-2020	National Environment Sector Plan 2017-2021
Marine Reserve	Established a marine reserve that will contribute to the protection of coastal and inshore marine area, as well as coral reef ecosystem. ***Responsibility: MNRE / MAF / Village***	Mitigate beach coastal erosion Reduce coral bleaching Managed marine areas creates awareness the will provide biological abundance that has a spill-over effect with benefits beyond the protected area boundaries. Benefits are sustainable livelihoods, improved food security.	Establishment and maintenance of marine protected areas requires community consent and government approval along with biological surveys Fisheries Division to advice villages on the Community-based Fisheries Management Program (CBFMP) - Fisheries Management Plans NBSAP 2015-2020	National Environment Sector Plan 2017-2021 Agriculture Sector Plan 2016-2020

Nonoa village pool is fenced however the pool is in very poor condition due to rubbish and debris blocking the water circulation and flushing, inside the pool is full of green algae and water is stagnant. Drinking water needs testing due to current deteriorating condition of pool.

Nonoa Village



4.6 Levi-Alamutu Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plan
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road (Alamutu)	Complete sealing access road Alamutu inland to facilitate relocation: Approximate length: 1500m Approximate cost: $649,650.00SAT Best Cost Ratio:2.1 ***Responsibility: LTA/MWTI/ village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market.	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)	Land Transport Sector Plan 2016-2020

		Access road also assist in disaster management	National Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
Drainage	Implement road side 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 Enlarge existing box culvert to allow flow of storm water runoff into the sea ***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 Samoa CODE of Environmental Practice (PUMA - 2007) COEP 11 - Drainage	Draft Vulnerability Assessment of the Samoa Road Network (May 2016); West Coast Road - Environmental Code of Practice (2012) Transport Sector Plan 2014-2019 NISP (2011)
Village pool located in Alamutu (inland – Fuilala and Vaipovi) Levi coastal area	Rehabilitate two inland natural spring for Alamutu as back-up water supply during drought or water shortage: * Need to test water source for quality *Upgrade the protection of the Levi coastal pool and protection from storm water runoff from main road ***Responsibility: Village MNRE / MWCSD / MoH/CSSP/NGO / UNDP-GEF SGP***	Improved water source alternative for domestic use	Village to enforce rules to manage community pool Village to seek funding to upgrade and rehabilitate pool	Community Development Plan 2016-2021 Water and Sanitation Sector Plan 2016-2020

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plan
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 clean-up and protection mangrove and wetland ecosystem ***Responsibility: MNRE /CSSP / 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	MNRE DEC to provide advice and guidance on establishing a conservation site to protect mangrove ecosystem: NBSAP 2015-2020	National Environment Sector Plan 2017-2021
Marine Reserve	Established a marine reserve that will contribute to the protection of coastal and inshore marine area, as well as coral reef ecosystem. ***Responsibility: MNRE / MAF / Village***	Mitigate beach coastal erosion Reduce coral bleaching Managed marine areas creates awareness the will provide biological abundance that has a spill-over effect with benefits beyond the protected area boundaries. Benefits are sustainable livelihoods, improved food security.	Monitor marine protected areas requires community consent and government approval along with biological surveys Fisheries Division to advice villages on the Community-based Fisheries Management Program (CBFMP) - Fisheries Management Plans NBSAP 2015-2020	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

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 :	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	Agriculture Sector Plan 2016-2020

	Promote and facilitate planting of root-crops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods. Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement Sustainable Land management practices Implement integrated pest management programmes ***Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages***	Implementing best practices for home and commercial production	season Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020 National Invasive Species Strategy and Action Plan 2008-2011 2 Million Tree Planting Strategy 2015-2020	
Marine Restocking	Established marine reserve to: Restock reefs and	Increase diversity of marine species and coral reef ecosystem	Improve existing marine reserve and encourage expanding	Agriculture Sector Plan

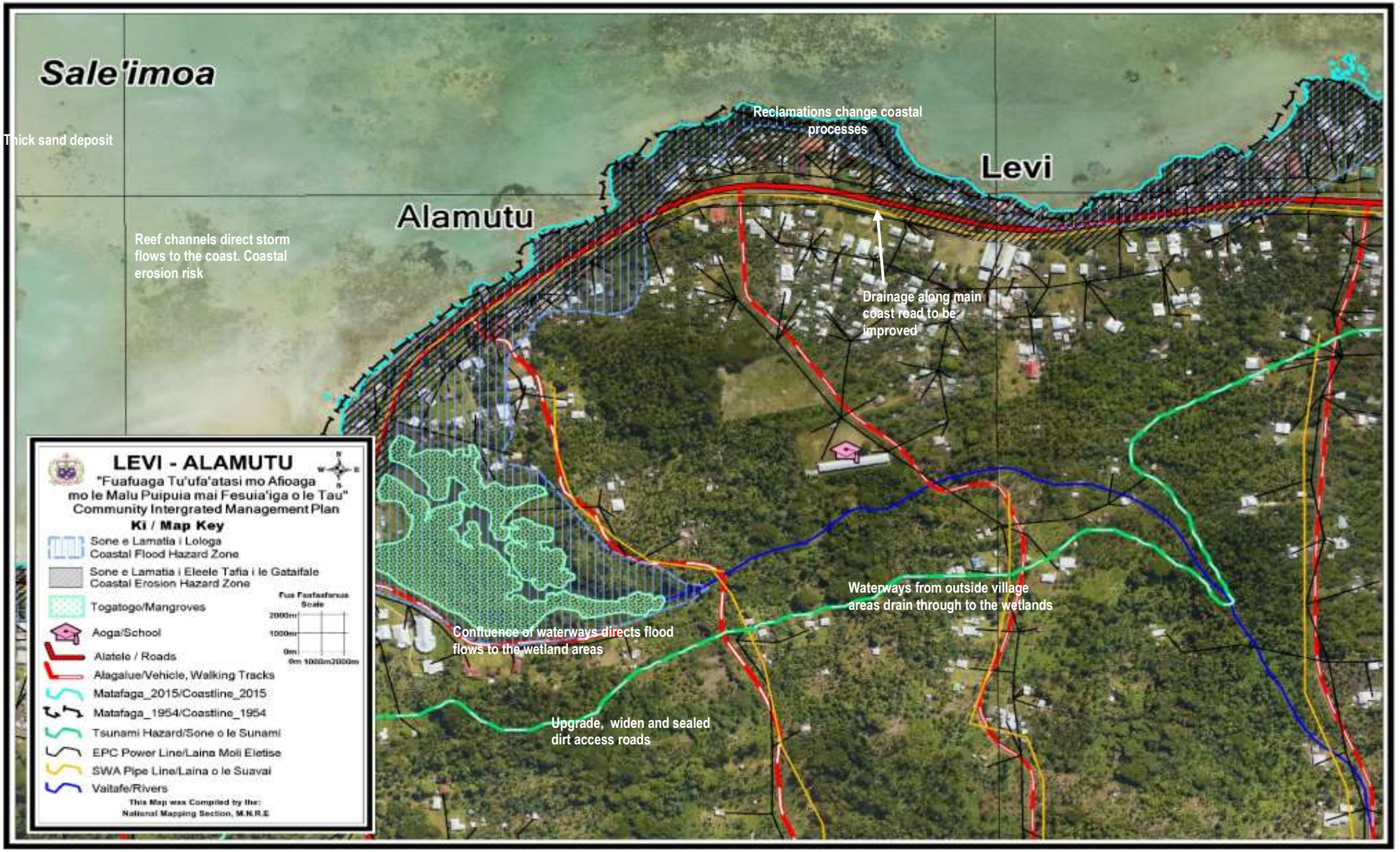
	lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility: MAF / village***	Reduce coral bleaching	to other nearby sub-villages Community-Based Fisheries Management Plan	2016-2020

Village Governance	**Best Solutions and Other Solutions Proposed**	**Comments**
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 Evacuation Shelter/emergency shelters, installation of local signs for evacuation during natural disasters, and mapping out key places and actions for emergencies. Protect natural assets, historical artefacts and food supply during natural disaster ***Responsibility: MNRE / Villages***	Developing community disaster response plan will improve community resilience and reactive response during times of natural disasters. There will be more survivors and village and public asset protected due to improved disaster preparation plans. Village council 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.

Fuilala natural spring pool in Alamutu, pool is used by community for bathing and drinking. Village wanted to cement the rocks around the pool.

Levi village coastal pool, currently used for bathing. Community requested for seawall to protect the seaward side of the pool from storm surges and getting inundated.

Alamutu-Levi village Map



4.7 Faleula Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MWCSD/MNRE***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.	Relocation to be guided by existing strategies and policies: Application of the National Building Code (Draft Sept 2016) and permit compliance *Refer to National Building Codes of Samoa *Use updated Hazard Maps to inform designs National Infrastructure Strategic Plan 2011 PUMA Act 2004 Application of the National Building Code (Draft 2016) and permit compliance	CIM Strategy (2015)
Access Road	Complete sealing access road Afugia inland to facilitate relocation and emergency escape route: Approximate length: 1500m Approximate cost: $649,650.00SAT Best Cost Ratio:2.1 ***Responsibility: LTA/MWTI/ village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market.	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	Land Transport Sector Plan 2016-2020

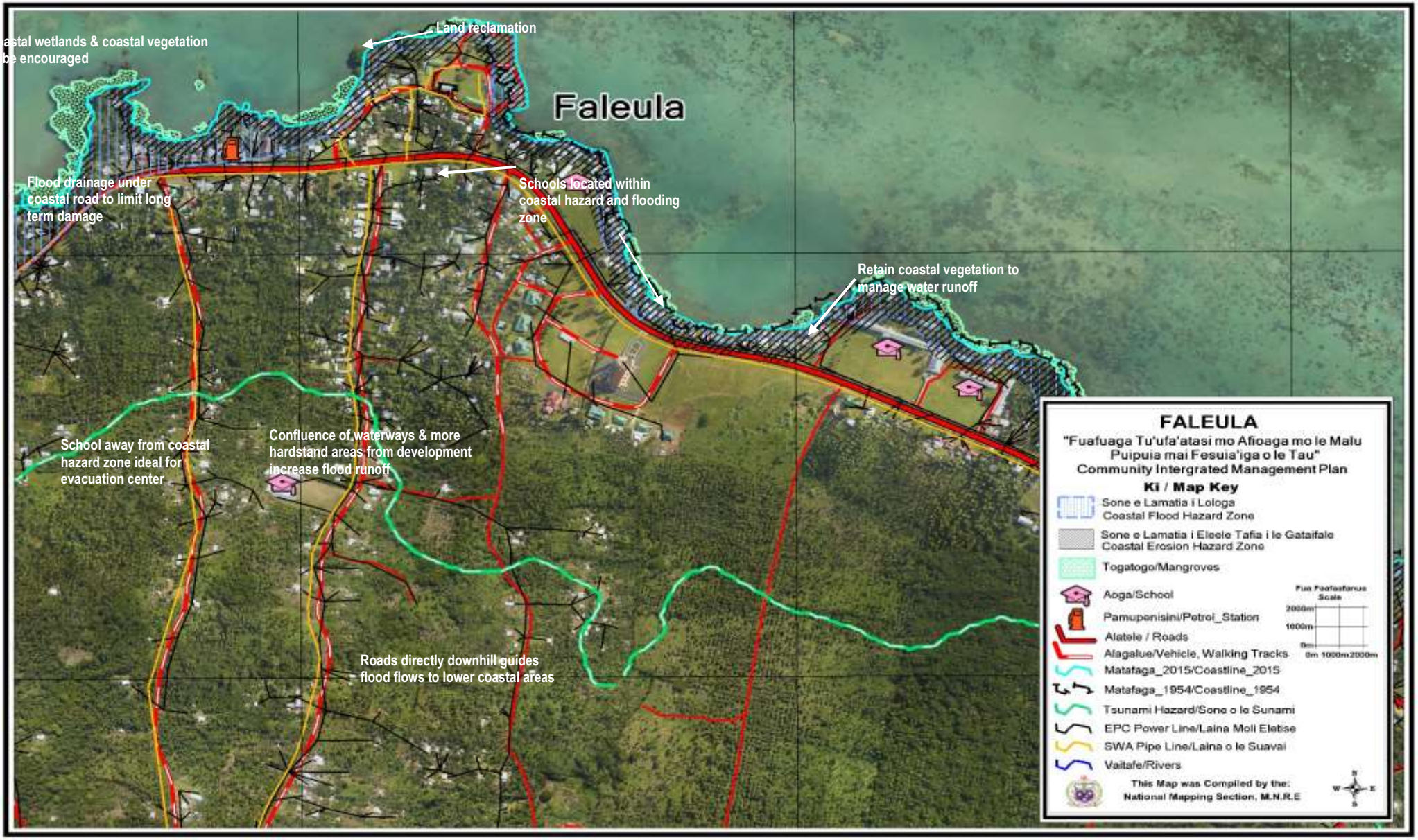
		Access road also assist in disaster management	Infrastructure Strategic Plan (2011) Vulnerability Assessment of the Samoa Road Network (2017) Upolu West Coast Road, Environmental Code of Practice (2012)	
Evacuation Shelter	The location inland of the existing Primary School is ideal for designated Evacuation Shelter: Implement retrofitting school buildings that are suitable for emergency shelters 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. ***Responsibility: MWTI MNRE-DMO / MWCSD / Village***	Improve public facility used by communities for safety during times of natural disasters Improve survivors during natural disasters Improve adaptive capacity and resilience of community to respond to 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
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Water quality testing ***Responsibility: CSSP / MNRE / MoH / UNDP-GEF SGP / village***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Other CIM Plan Issues and Solutions Considered

Infrastructure	Issues	Comment
Village pool (Vaialofa and Vaimasaga)	Existing land reclamation activities has adverse impact on the nearby Vaialofa pool: - increase coastal erosion - location of pool behind residential area has high risk of contamination by nearby lavatories and pig sty Recommended not to upgrade the pool given its current condition and it will be a poor investment. ***Responsibility: Village /MNRE/MWTI/CSSP/NGO/***	The village representatives wanted to rehabilitate the pool behind the Catholic Church known as Vaialofa. However during the site assessment it was clear that the pool is rarely used given the good condition of piped water in the community. Also current development taking place nearby has severe environmental impact on the existing pool.
School Sports Field	Village request much needed support to develop a sports field for the school to assist in improving sports development for the school, especially young students with potential in rugby etc. ***Responsibility: MESC / District / village***	This is not a climate resilience type of intervention, however noted due to its importance to the village and district for school sports development.
Road Safety	Put in place near Primary School road safety signs, humps and footpaths to protect school children and pedestrians from speeding vehicles. ***Responsibility: LTA / MWTI / village***	This concern is more for the safety of school children when crossing the road.

Afugia access road inland Faleula village – requesting to tar sealed for use as escape route

Faleula Village Map



4.8 Aele fou Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road	Sealed access road to the rest of the village that connects it to the main road Toamua/Vaitele and upgrade to national road standards. Approximate length: 0.9km Approximate cost: $428,670.00SAT Best Cost Ratio:1.2 Sealed road to Primary School ideal for Evacuation Shelter given its inland location. ***Responsibility: LTA/MWTI/ village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market. Access road also assist in disaster management	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
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	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

	Install and connect to solar power supply if made available ***Responsibility: EPC/MWTI/Village***			
Evacuation Shelter	The location inland of the existing Primary School is ideal for designated Evacuation Shelter: Implement retrofitting school buildings that are suitable for emergency shelters 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. ***Responsibility: MWTI MNRE-DMO / MWCSD / Village***	Improve public facility used by communities for safety during times of natural disasters Improve survivors during natural disasters Improve adaptive capacity and resilience of community to respond to 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
Water (SWA)	Extension of piped water distribution network from Fuluasou distribution network to Aelefou area without water ***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,
Rainwater Harvesting	Implement the installation of rainwater harvesting systems for inland families without	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community

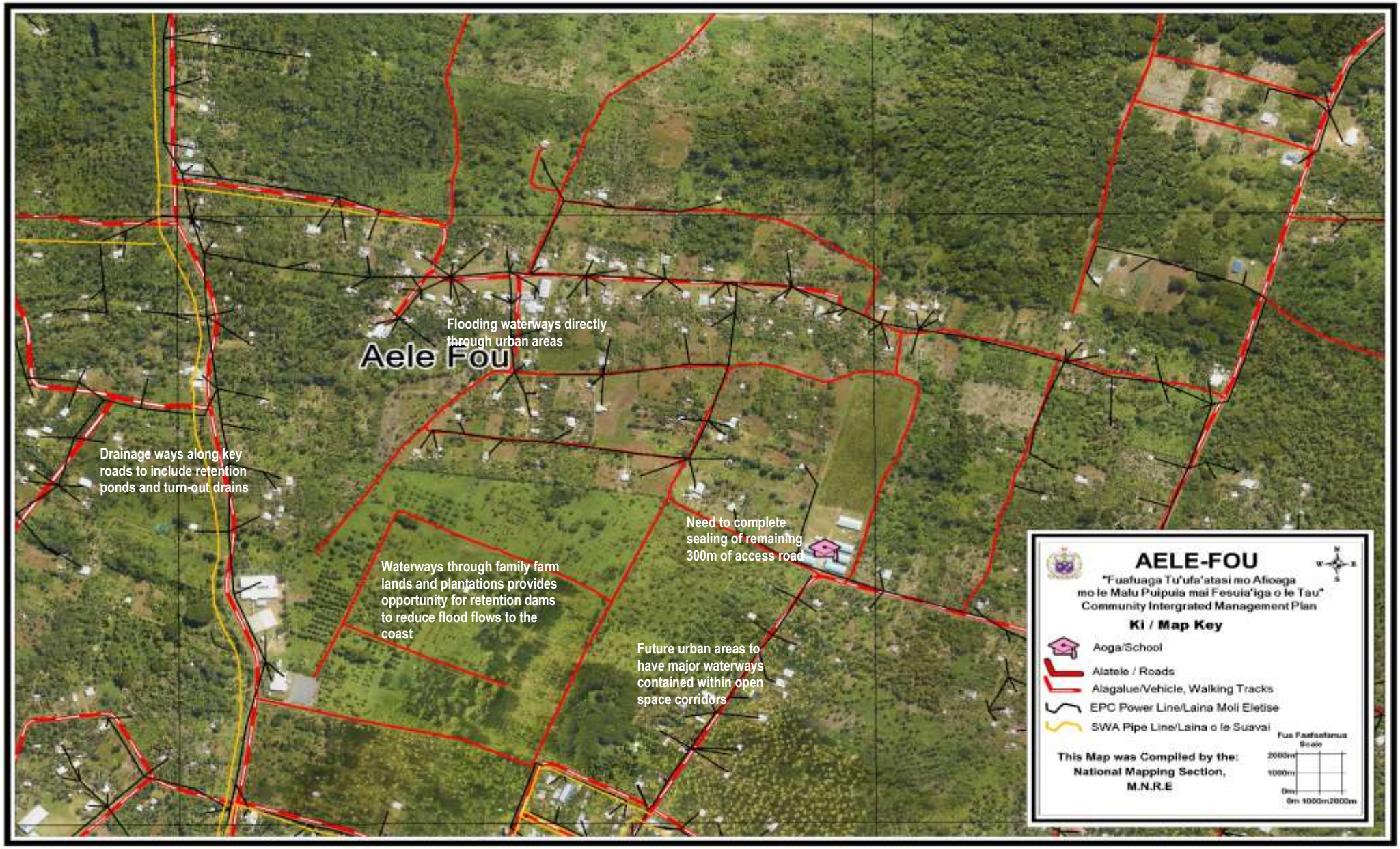
	access to water supply Test water quality ***Responsibility: village CSSP / MNRE / MoH/MWCSD/ UNDP-GEF SGP***			Development Plan 2016-2021

Other CIM Plan Issues and Solutions Identified

Infrastructure	**Issues**	**Comment**
Road Safety	Installed speed humps and streetlights in the village area ***Responsibility: LTA / MWTI***	Community expressed need for speed humps and streetlights to ensure safety of school children.

Aele fou Primary School - ideal location for Evacuation Shelter.

Aele Fou Village Map



4.9 Aleisa East Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road (Cecilia Rd or Tofiga Road and Amosa Road) Alafaalava Main Road	Tar sealed Tofiga (Cecilia) Road connecting to Tapatapao and Amosa Road to provide access for families residing in that area: Implement road safety measures for cross-island road Alafaalava road to Aleisa such as widening the road for two lanes and bridge. ***Responsibility: LTA/MWTI / Village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market. Access road also assist in disaster management	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 Fuluasou distribution network to Aleisa East area without water Test water quality ***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, SWA 10 Year Investment Plan (2016) to improve water supply network
Electricity Supply	Install and connect power supply for residents inland.	Maintain electricity supply at all times including during	Monitor distribution networks to avoid overloading poles and	Samoa Energy Sector Plan 2017-2020

	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***	natural disasters Avoid accidents due to fallen electricity posts.	contributing to line failures Development of a Renewable Energy and Energy Efficiency Framework, 2016	
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Test water quality ***Responsibility: CSSP UNDP-GEF SGP/ MWCSD/MNRE / MoH/village***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

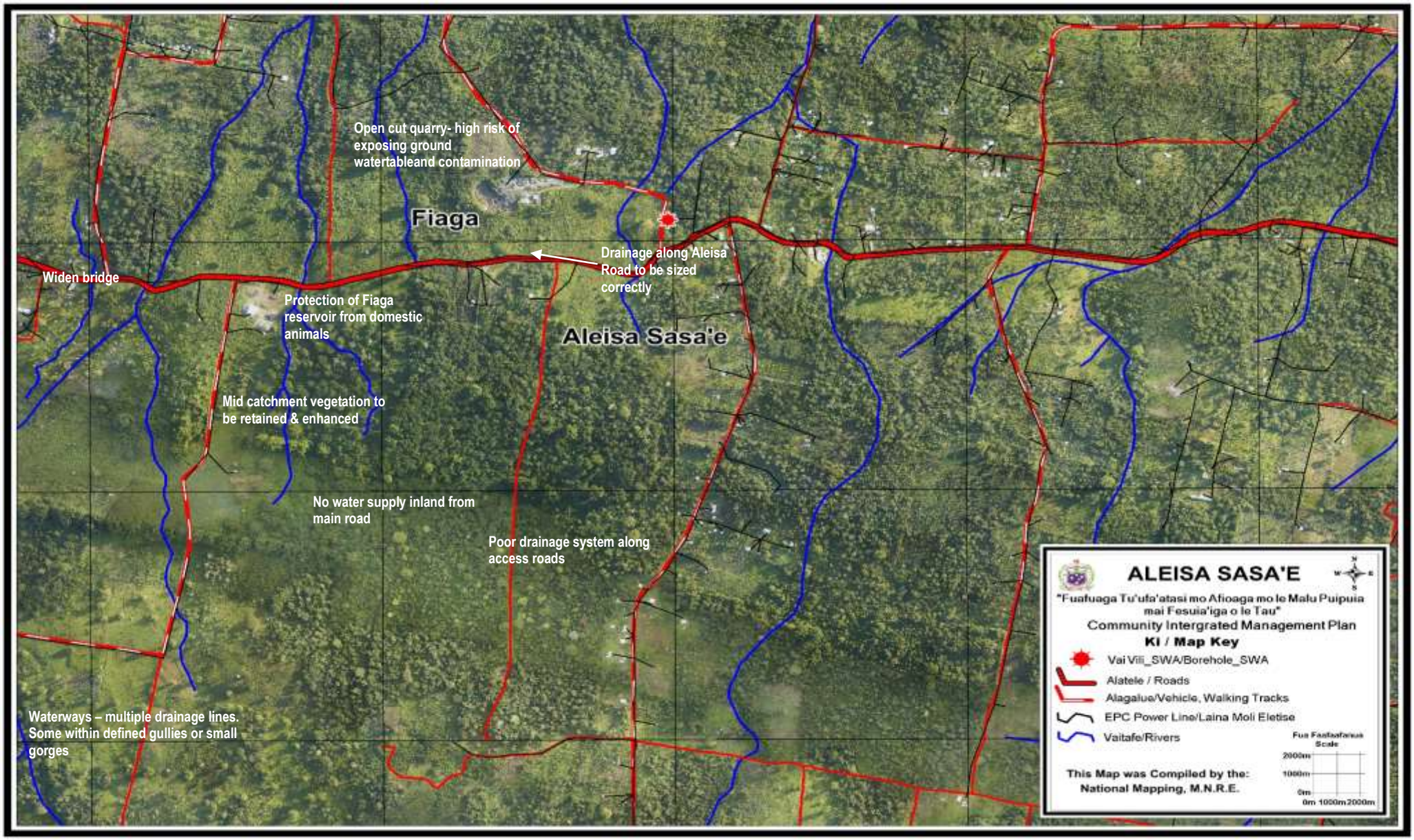
Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Water Catchment Area restoration	Protect water management system from impact of livestock/cattle farming by: Established water catchment system - with improved ways of managing water, Control and manage areas where livestock / cattle can move too and not further upland areas. Relocation of livestock and fencing	Water quality and availability: reduce impact on the catchment and disturbance downstream (health issues vector born, water quality issues) through reduction in muddy pond area through trampling by cattle and foraging from pigs. Restoration of native forests species increases	MAF- Agriculture sector to provide best practices management guidelines for the management of water that allows for levels of contamination to be kept to minimum. Adjustment to the natural water flows via engineering solution will be assessed taking into consideration any downstream impacts and resulting consequences to	Agriculture Sector Plan 2016-2020 Water and Sanitation Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

	Consultation with farmers and residents Replanting of native forest species for upland forest to restore the resilience and ecological functions of catchment area Consultation and awareness on replanting program ***Responsibility: MNRE / MAF / village / farmers***	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	local-crop production and livestock management. MNRE to undertake an Ecosystem-based Adaptation Approach for catchment area measures: Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project National Action Programme: To combat land degradation and mitigate effect of drought, 2015-2020 National Water Resources Management Strategy 2007-2017 NBSAP 2015-2020 Water Resources Act 2008 Forestry Restoration Operational Plan 2016-2020 MNRE-DEC to provide guidance on effective ways to remove invasive plants from watershed area National Invasive Species Action Plan 2008-2011 Two Million Tree Planting Strategy 2015-2020 Upper Watershed Conservation Policy	

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

Aleisa East and Aleisa West CIM Plan consultation – August 2016

Aleisa East Village Map



4.10 Aleisa West Village Interventions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Access Road Alafaalava Main Road	Implement road safety measures for cross-island road Alafaalava road to Lefaga such as widening the existing bridge for improved access. ***Responsibility: LTA/MWTI / Village***	Improve resilience of public infrastructure More resilient to natural hazards quicker recovery in the event of cyclones Reliable access to plantations allows for reduced travel times to and from the village resulting in more efficient use of labour and allows for easy transportation of produce from farm to market. Access road also assist in disaster management	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	Land Transport Sector Plan 2016-2020
Water (SWA) access water supply to all families without water	Extension of piped water distribution network from Aleisa distribution network/reservoir to Aleisa West area without water Connect the pipeline from the Tapatapao Treatment Plant to Aleisa East through Laloanea Road and gravity feed down to rest of families residing in Aleisa East and Aleisa West ***Responsibility: SWA / 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 in hazard zones	Implement the installation of power supply for residents	Safeguard electricity lines during time of storms and extreme events – natural	EPC to installed underground electricity lines during the WCR	Samoa Energy Sector Plan 2017-2020

	inland and streetlights along the access roads ***Responsible: EPC/MWTI***	disasters. Reduce vulnerability and avoid accidents due to fallen electricity posts.	project Development of a Renewable Energy and Energy Efficiency Framework, 2016 Coordinate distribution networks to avoid overloading poles and contributing to line failures	
Rainwater harvesting	Implement the installation of rainwater harvesting systems for inland families without access to water supply Water quality testing ***Responsibility: village CSSP / MWCSD/MNRE / UNDP-GEF SGP / MoH***	Improve community resilience to climate change impacts – drought and extreme events	Conduct assessment to identify vulnerable families in village suitable for rainwater harvesting	Water and Sanitation Sector Plan 2016-2020 Community Development Plan 2016-2021

Environment & Natural Resources	**Best Solutions**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Invasive alien species (IAS)	Implement best practice in land clearance and maintenance to reduce spatial extent for IAS MAF extension officers/MNRE-DEC to train communities / farmers with tools that can assist them in the eradication, control and management of IAS ***Responsibility: MAF / MNRE / farmers / village***	Reduce impact on crops and improve productivity Improve biodiversity of forest and plantation areas by reduce existence of IAS	MNRE-DEC and MAF to provide advice to farmers and communities on how to use: Physical and biological means to eradicate, contain or exclude IAS. NBSAP 2015-2020	National Environment Sector Plan 2017-2021

Restoration Catchment area	Replanting of native forest species for upland forest to restore the resilience and ecological functions of catchment area Consultation with communities on catchment area ***Responsibility: MNRE / village / families***	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 2 million tree	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 Uplands Watershed Conservation Policy 2015 Two Million Tree Strategy 2015-2020 NBSAP 2015-2020 Water Resources Management Act 2008 Restoration Operational Forestry Plan 2016-2020 Forest Management Act 2011	National Environment Sector Plan 2017-2021 Water and Sanitation Sector Plan 2016-2020
Waste Management	Implement waste awareness program and village clean Install rubbish collection stands for waste disposal by families to be collected ***Responsibility: MNRE / Village / CSSP / UNDP-GEF SGP***	Improve community cleanliness Health living	MNRE-DEC to provide guidance to families on schedule of rubbish collection Village to seek funding support for waste program NBSAP 2015-2020 Waste Management Act 2010	National Environment Sector Plan 2017-2021

Livelihood and Food Security	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of root-crops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement Sustainable Land management practices Implement integrated pest management programmes ***Responsibility: MAF / CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	MAF CROP Division to support farmers through guidance and trainings from Agricultural experts and awareness programs on crop diversification to suit the prolonged periods of drought or rainy season Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership with farming NGO's such as the: Samoa Farmers Association; Samoa Federated Farmers Incorporated ; Women in Business Inc. and private sector to support rural farmers through training opportunities and marketing productivity Implementation of solutions are guided by the following: Draft Soil Resource Management Bill 2018 Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020	Agriculture Sector Plan 2016-2020

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

Aleisa East and West CIM Plan Consultation, August 2016

Aleisa West Village Map