Community Integrated Management Plan

A’ana Alofi I East - Upolu

Implementation Guidelines 2018

Foreword

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

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

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

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

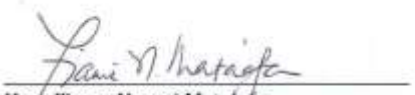
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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

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

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

Thank you



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

Participants in the Plan

The Community Integrated Management (CIM) Plan is a Partnership between the Government of Samoa and the villages within the plan. The Plan area starts from the ridge extending to the reef broadly covering four thematic areas; Infrastructure; Environment and Biological Resources; Livelihood and Food security; and Governance. Both partners have responsibilities for issues and solutions and the Plan gives an integrated approach to the provision of services and improvement of resilience now and in the future.

This Plan incorporates the Constituency of A'ana Alofi I East (Faleasiu)

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

Faleasiu Village (Leala'alii, Sapulu, Tauoo and Moamoa)

Sub- village **Leala'alii and Sapulu**

- Sauvao Ikapoti Maiava
- Ailua Sauvao
- Fesola'i Logo
- Sauvao Fusi
- Apulu Etuati

Sub-village Tauoo and Moamoa

- Lesu'i Hekiulasi
- Fe'agai Penoa
- Falealii Maselino
- Leaupepetele Saua
- Fe'agai Kilifi

The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of A'ana Alofi I East (Faleasiu Village) 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 Guideline
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
NISP	National Infrastructure Strategic Plan
NRW	Non-Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme
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 A'ana Alofi I District (Faleasiu) 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 (IG)

2.1 Purpose of the Implementation Guidelines

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

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

Column 1: Indicates the issues or problem identified during the CIM Plan consultation and site assessments

Column 2: Solutions – these are the interventions/ solutions identified by the CIM Plan team and activities undertaken by the responsible government ministry or corporation as well as the district/village as indicated to address the issue in column 1;

Column 3: "Other benefits", where one solution indicated in Column 2, will provide benefits to other items;

Column 4: Provides guidance on how the solution is to be implemented and noting the relevant government action plan, policy, code of ethics, regulation or act to follow by the responsible government agency or district/village during implementation of the solution;

Column 5: Provides an overall summary of how the solution being implemented supports or achieve the objectives or goals set-forth in the relevant government sector plans and linking them up to the Strategy for the Development of Samoa.

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

2.2 Funding options to support CIM Plan Implementation:

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

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

2.3 Duration of the Plan

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

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

1. The CIM Plan full review will be undertaken every 10 years or decade;
2. Once implemented, the solutions will be monitored on a bi-annual basis for progress and updated every five years in accordance with the Strategy for the Development of Samoa;
3. Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators (KPI).

3. Description of A'ana Alofi I District Environment

3.1 Physical and Natural Resource Setting

The A'ana Alofi I District is located on the north western side of the island of Upolu east of Faleolo International Airport. The district is characterized by a gentle coastal plain with an exposed rocky shoreline sloping inland towards a mountainous backdrop.

A'ana Alofi I is divided into two constituencies making up of A'ana Alofi 1 West (Faleasiu) and A'ana Alofi 1 East (Fasito'outa). Within Fasito'outa the five sub-villages of Sali'oa, Matailiili, Satui, Avano and Lepale whereas Faleasiu is made up of four sub-villages of Lealaali'i and Sapulu, Tauo'o and Moamoa.

The coastline itself is largely exposed rock with minimal sand cover. The district is part of the largest continuous reef system in Samoa which stretches from Apia to Manono where it is also recorded with the highest diversity of fish species in Samoa though low coral species diversity. The higher species diversity for this particular reef stretch indicates there may be unique coral communities in the area which would explain the high diversity of fish. In the district the barrier reef ranges from 500-2000metres offshore and the lagoon is dominantly sand with scattered coral. There is one major reef break in the district, between the villages of Fasito'o-uta and Faleāsi'u, that influences tidal flows and sediment transport along the coast. The Samoa SOE, 2013 stressed that the possible presence of unique coral communities that are indicated by high fish species diversity in the north western Upolu (includes A'ana Alofi I) is critical information for the location and design of future management and conservation initiatives by the two ministries MNRE and MAF.

Three distinct wetlands are present in the district**.** These include the mangrove forest in Avano and Salioa and a coastal marshland in Matailiili. In Faleāsi'u , coastal marshland is present in the sub-village of Sapulu. The wetlands have an important function as the main drainage point for the inland surface water as well as acts as filters forwater before it reaches the sea. The pipes which helped drain water out to sea are blocked because of the irregular cleaning of the pipes. This has created problems as the water isn't flushed out and remains still on land for some time emitting a foul smell to families around these areas. Because of this families have also resorted to reclaiming some of the wetlands with the intention of solving the issue however it has contributed to increased flood risks in and around the wetlands and also making the foul smell issue even worse.

The terrestrial biodiversity of the two districts is mostly secondary forest inland while along the coast is categorized with ornamentals and plantations. There is no native forest left in the district as the inland forests have become part of the coconut plantations since the late 1800's. The district is not within a Key Biodiversity Area according to the study conducted on Priority Sites for Conservation in Samoa: KBAs (2010). The terrestrial and marine environment are highly exposed and impacted by anthropogenic activities that has shaped the current outlook of the district. The village of Falesiu holds a water catchment area number 127 from the 145 catchment areas in Samoa. This catchment area is the source of water supply to most families in the village. The catchment area currently holds very limited water due to the open degraded fallow land from previous agricultural activities around the catchment area. Strong support for catchment area rehabilitation is needed to improve water storage in the catchment area.

3.2 Social and Economic Setting

The total population for A'ana Alofi I is 6,471 (2016, Census Preliminary Count) with the highest number in Faleasiu (A'ana Alofi I West) at 4,177 and most families reside along the coastal. The increase in inland roads has also seen a rise in number of households moving inland to be closer to their plantations and farmland as well as moving away from the coastal hazard zone.

The main road is considered an important part of the district's infrastructure. It is in good condition, but it is located within the hazard zone exposed to flooding and erosion with only meters from the high water mark. The main west-coast road is the lifeline asset of national importance, because it provides primary access to and from Apia, to the Faleolo International Airport, the Mulifanua wharf to Savai'i as well as district facilities and services including the healthcare, schools, churches and shops. From the main road, dirt work roads (access roads) to the village plantations and schools extend inland. Nine out of 10 roads (Sapulu, Lealaii, Moamoa-Faleasiu, Tauoo and Satui Fasitoouta) are sealed and under road maintenance program, indicated by MWTI. The water supply along these roads is intermittent. Electricity is supplied however there are no streetlights along access roads and bulbs need to be replaced along main roads. The majority of households in both villages of Faleasiu and Faleasiu

are supplied with metered water from the Samoa Water Authority with a remaining number of families reliant on rain water and water stored in water tanks as identified in the Village Profile, 2013 study by the MWCSD. There are no natural rivers in the district of A'ana Alofi I. The SWA piped network programme currently being implemented will ensure that all families inland of Faleasiu and Fasitoouta will have access to water by the end of 2018.

Small holder livestock farming are mainly Piggery and Poultry that are local breeds and free range, and more than 50 cattle farmers, they all contribute to the subsistence livelihood in the village whereby much of the livestock are used in traditional village activities and family matters such as funerals, weddings, church activities etc and some are for small commercial activities. Fishing is an important activity for Faleasiu with 159 households compared to 58 families in Fasitoouta (MWCSD: Village Profile, 2013)

About 60% of the land use is plantation, which is very much permanent agricultural installations, mostly of tree crops or areas of continued or repeated planting of coconuts and bananas. Closer to settlements are batches of land currently or recently cultivated with a mixture of herbaceous and tree crops such as root crops, taro, yams, cassava and breadfruit. Families also grow small patches of vegetables gardens for subsistence.

3.3 Climate Risk and Resilience:

There is an urgent need for communities to understand the changes in Samoa's climate and future projection. A study has been completed in 2011[1] which summarizes changes in Samoa's climate at present and in the future, from 1990 -2030 up to 2090. The assessment showed that: Samoa's temperature will increase with very hot days; more extreme rainfall days expected; there would be a decrease in number of tropical cyclone but increase in intensity; sea level rise will continue and ocean acidification is increasing in Samoa's water threatening coral reef ecosystems and marine biodiversity.

2002 CIM Plan for Aana Alofi I, mapped out all vulnerable areas along the coast and the lowland coastal areas The identifying them as hazard zones given the exposure to natural disasters, climate change and extreme events causing flooding and erosion. It is the coastal area where most of the population for Fasito'outa and Faleasiu reside, and where many of the government infrastructure, village developments and family businesses are located. While the coastal areas and infrastructure are the lifeline of the district in terms of commuting to town, wharf and airport, for this CIM Plan update the broader landscape hazards, climate risks and likely responses to increase resilience were considered.

Coastal Hazards and Risks: The Coastal Hazard Mapping by BECA in 2000 showed that A'ana Alofi I District coastal area has a High Coastal Sensitivity Index, and has changed noticeably over the last several decades. The coastline in front of both Fasito'outa and Faleasiu has receded by up to 10metres from its 1954 location.

While the erosive forces continue along the coast, some of this coastline has been reclaimed for residential and business development exposing them to the coastal erosion hazard zones. Such reclamations also change the current circulation and sand balance along the shore and near-shore areas. This in turn places greater erosion or flooding pressure elsewhere along the coastline, and can lead to near-shore waters not being adequately flushed by tidal variations and wave actions. There are also the direct pollution impacts from reclamations themselves, or effluent, polluted run-off or other wastes coming directly from the developments.

The government asset such as the existing west coast road is located within the hazard zones – either within cyclone, flood or tsunami risk areas. The existing water supply and electricity lines are also located in these hazards zones, some of which are nominated as of high risk category. All families within the hazard zones have property inland which they used for plantations. Some families have moved inland since the tsunami and Cyclone Evan. While 100% of the dwellings and buildings within the coastal hazard areas have electricity supply, over 60% of the inland homes do not have access to electricity.

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. The characterization of the landscape was also used for inputs to livelihood and food security issues. The influence of the hydro-geology can be recognized with streams disappearing into lava tubes,

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

fractured geology or 'sink holes'. Most of these waterways are ephemeral streams: only flowing during rainfall events. Inland fluvial and geomorphological features were considered in the first ever mapping of all flowing and ephemeral streams and waterways. Land slope classes, with elevation, landscape and landform features were used to identify prospect hazard areas.

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 land cover and land use practices, enables the identification of options to address water security issues.

3.4 Livelihoods and Food Security

Food security risks are also compounded from climatic changes to rainfall and temperature. Information from the MET Office was instrumental in determining the levels of risk about the landscape, especially in likely drought prone areas. The incidence of alien invasive species (IAS) is also a determinant of soil nutrient deficiencies (from natural causes or poor sustainable land management practices), changes to the micro-conditions of soils (e.g. drying out of topsoils after clearing), prospect instability and potential erosion risk (e.g. on steep slopes).

4. A'ana Alofi I District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plan
Main Road West Coast Road (WCR)	The WCR project will rehabilitate: - main road from Vaitele tai to Faleolo International Airport includes- widen lanes, footpaths, closed drains and shoulders ***Responsibility*: *LTA / MWTI***	Improve infrastructure resilience Climate proof the road transport network.	LTA and MWTI should provide the design and close monitoring of road infrastructure development following the guidelines below Environmental Code of Practice - West Coast Road (2012), LTA Environmental and Social Safeguard policy Review of National Road Standards in Samoa (2016) MWTI Identify funding/budget requirements and implementation programme for construction and development Select road alignment in consultation with villages National Infrastructure Strategic Plan (NISP) 2011 Assess whether an EIA or an Environmental Management Plan (EMP) Programme drainage in budget and work programme Prepare assessment of road drainage systems Prepare a local education programme on need for keeping drainage systems clean Vulnerability Assessment of the Samoa Road Network (2017)	Community Integrated Management Strategy, August 2015: Transport Sector Plan 2014-2019
Inland access road parallel to WCR - Fasito'outa	Provide an alternative inland route along the coast but outside of the hazard zone linking and integrating inland roads in Faleasiu to Fasitoouta: Approximate length of road: 4.9km Approximate cost: $T947,150.00 Best Cost Ratio: 3.4 ***Responsibility: LTA / MWTI***	Reduce vulnerability in the long-term from exposure to coastal hazard zone if the WCR inland route is to be upgraded. Reduce ongoing maintenance cost for infrastructure along the coast. Avoid hazard by relocating of key infrastructure away from coast.		
Clear blocked drainage	Maintenance of road side drains and regular inspection of drainage system; ***Responsibility: MWTI / LTA***	Reduce impact from flooding		

Electricity in hazard zones	Provision for underground electricity line installation as part of WCR project Implement the installation of power supply for residents inland and streetlights along the access roads ***Responsibility: EPC/MWTI***	Safeguard electricity lines during time of storms and extreme events – natural disasters. Reduce vulnerability and avoid accidents due to fallen electricity posts.	EPC to installed underground electricity lines during the WCR project Coordinate distribution networks to avoid overloading poles and contributing to line failures	Samoa Energy Sector Plan 2017-2020 Development of a Renewable Energy and Energy Efficiency Framework, 2016
Main water distribution network / Piped water to families living inland	Improve water supply system to connect all families. Chlorination of water supply WCR project will also upgrade coastal water piped network ***Responsibility: Samoa Water Authority / LTA /MWCSD/MoH/*** ***MNRE-WRD/EPC/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- SWA piped water network from Alafa'alava to Lepale (Fasitoouta) is co-financed by PPCR-ECR project Implementation plan to address leak detection and pressure management works as part of the NRW (Non-Revenue Water) reduction program Implementation of the SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water.	Community Integrated Management Strategy, August 2015 Water and Sanitation Sector Plan 2016-2020
Environment & Natural Resources	**Best Solution**	**Other Benefits**	**Guidelines to assist Implementation**	**Relevant Sector Plans**
Marine Environment needs protection and management	Strengthen monitoring and evaluation of fisheries reserves Maintain existing reserves (3) and if possible, include additional fishery reserves for the other sub-villages ***Responsibility: MAF / MNRE / village***	Increase marine species diversity including fish species and coral reef ecosystem Improve coral communities increase chances of less or no coral bleaching	Maintenance of marine reserve and protected area requires community consent and government approval along with biological surveys. Fisheries Division to advice villages on the Community-based Fisheries Management Program (CBFMP) – Develop Village Fisheries Management Plans NBSAP 2015-2020	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021

Wetland Habitats: herbaceous marshland Mangrove Forest	Rehabilitate the freshwater spring inland and mangrove as a protected wetland WCR to install a proper drain pipe or box culvert to facilitate the proper drainage of the wetland into the sea ***Responsibility: MNRE / LTA / MWTI / District & Village***	Improve resilience of natural ecosystem to adapt to climate change and variability Increase biological diversity of species under conservation management	Develop a management plan for the wetland Establishment of the wetland conservation site should be guided by legal and institutional framework on biodiversity NBSAP 2015-2020 Environmental Management Bill 2013 National Parks and Reserves Act 1974 Waste Management Act 2011 Protection of Wildlife Regulation 2004	National Environment Sector Plan 2017-2021
Sand mining for commercial and domestic use affecting the marine and coastal environment	Assess and identify sustainable sources of sand for domestic and commercial use Village, government and the private sector to collaborate on designated areas for sand mining Strengthen sand mining monitoring and enforcement Mass media awareness on sustainable sand mining practices Develop sand mining regulation ***Responsibility: MNRE / Village***	Improve the sustainable management of sand as a natural resource Minimize impacts of coastal inundation and erosion Reduce impact to natural coastal protection mechanism via control of scale and site of extraction	Secure relevant permits before any sand mining occurs Incorporate environmental and social safeguards concerns including consultations with any affected community For access to sites, obtain written consents from Alii Faipule and landowners. Alii Faipule and landowner provide consent Develop sand mining regulation Follow existing MNRE guidelines for sand mining or extracting such as: PUMA Act 2004 Lands and Survey Environment Act 1989 (draft) |Sand Mining Policy 2001 Draft Soil Resource Management Bill, 2018 NAP Sustainable Land Management Plan 2015-2019	National Environment Sector Plan 2017 - 2021

Restore catchment areas	Develop and implement Faleasiu Watershed Management Plan ***Responsibility: MNRE / MWTI / Villages***	Improve resilience of watershed areas Village benefit from improved water sources	MNRE-DEC, WRD and Forestry Division to provide advice such as: Awareness and government support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project NBSAP 2015-2020 Forestry Restoration Operational Plan 2016-2020 Two Million Tree Planting Strategy 2015-2020 Forestry Management Act 2011 National Water Resources Management Strategy 2007-2017 National Water Resources Management Strategy 2007-2017 Water Resources Management Regulations 2013	Water and Sanitation Sector Plan 2016-2020
Livelihood & Food Security	**Best Solution**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests : Promote and facilitate planting of root-crops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods. Promote agro-forestry and mixed planting including fruit trees species to	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 seasons Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security Strengthen partnership	Agriculture Sector Plan 2016-2020

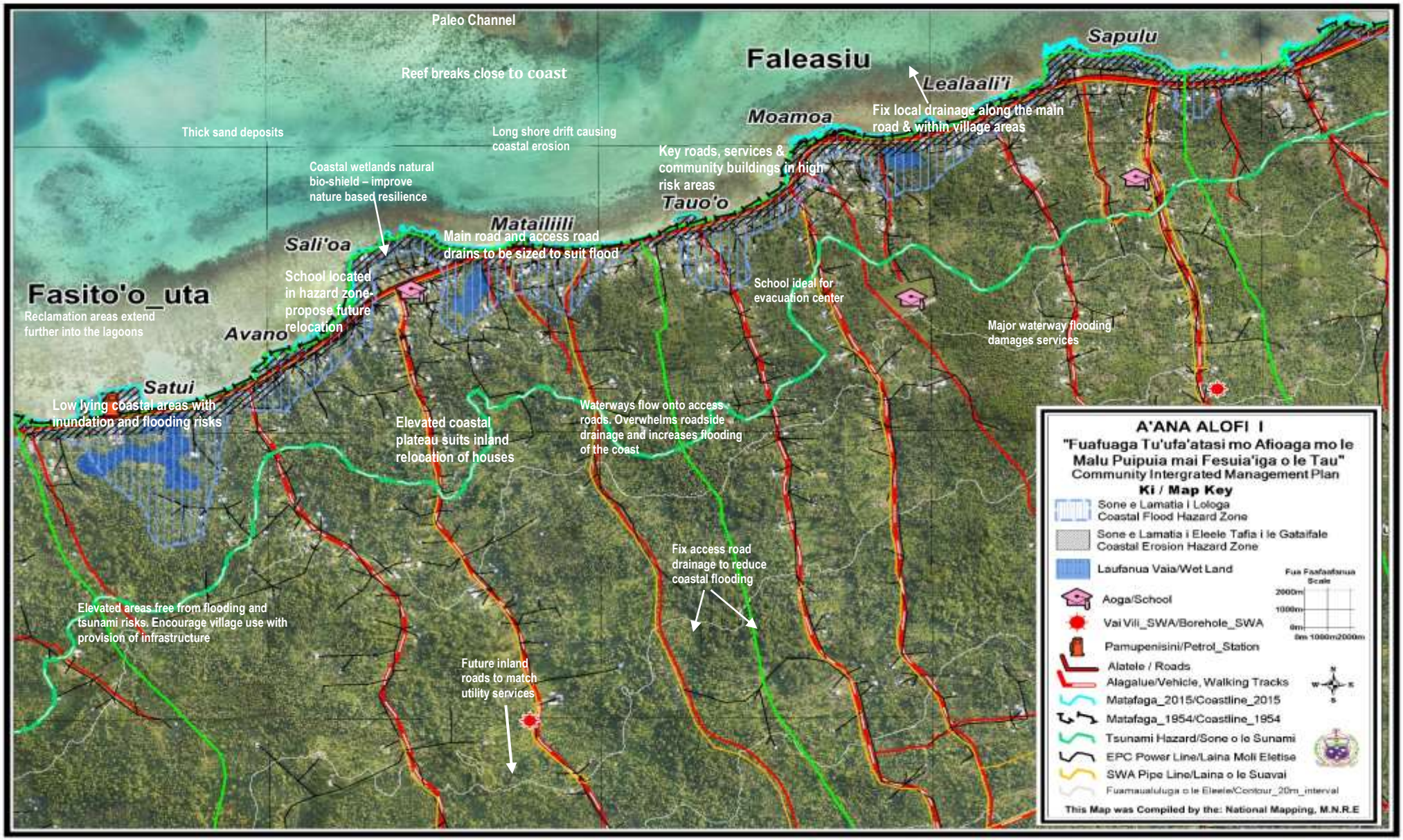
	reduce crop vulnerability to pests and diseases. Diversify into other climate resilient species cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones Implement Sustainable Land management practices Implement integrated pest management programmes ***Responsibility: MAF/CSSP/WIBDI/Farmers Association/ METI/ SBEC / UNDP-GEF-SGP/MNRE / villages***		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	Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility: MAF / village***		Improve existing marine reserve and encourage expanding to other nearby sub-villages Community-Based Fisheries Management Plan	Agriculture Sector Plan 2016-2020

Governance	**Solutions/ Issues**	**Comment**
Strengthen village governance to support CIM Plan implementation ***Responsibility: MWCSD/Village***	Village By Laws District Plans Sustainable Village Plans	This is seen through village activities in landuse planning for public infrastructural resilience (schools, hospitals, churches etc)

Disaster Management Planning ***Responsibility: MNRE-DMO / MWCSD / District***	Develop a village climate and disaster emergency plan Need to installed emergency evacuation signs	District has completed its CDCRM training and the Emergency Radio Network is through Tafua Upolu. National Disaster Management Plan 2017-2021 Community Development Sector Plan 2016-2021
Village Drainage Clean up	Undertake village inspection of culverts along inland / main roads; Implement district/village drainage/ culvert clean-up and awareness program Conduct village site inspection of culverts and drainage clearance to avoid clogging from debris and rubbish Prepare a local education programme on need for keeping drainage systems clean Women's committee monitor hygiene and clean-up program Village beautification committee to monitor clean-up program for drainage and culverts ***Responsibility: Village / MWCSD***	Improved rate of recovery Reduce potential for flooding in village areas Safer village houses and roads Improved safety community and resilience

Other CIM Plan Issues Identified	Comment
Seawall - this was considered but not a preferred solution. Proposed seawall to a 20 year design standard for Faleasiu: Approximate length: 800m and 3m height Approximate cost: $T483,840.00 Benefit cost ratio: 1.3 ***Responsibility: LTA / MWTI / District***	The WCR project will not fund a new seawall, however it will support replenishment of existing seawalls and raising of some sections that are most vulnerable. There is a need to: - investigate feasibility of this option - need for a seawall where government assets are to be protected - provide a short term option for residents along the coast and in the long term relocate to higher grounds

Aana Alofi I East District Map



4.1 Faleasiu Village (Leala'alii, Sapulu, Tauoo and Moamoa) Interventions

Infrastructure	Best Solutions	Other Benefits	Guideline to assist Implementation	Relevant Sector Plans
Village infrastructure in CEHZand/or CFHZ include: Households Schools Churches Businesses: Women's Committee House	Relocate outside hazard zones Investments within the hazard zone adopt appropriate mitigation measures Raise building foundations at a level that takes into account the CFHZ in the vicinity ***Responsibility: Village/Families / MWTI/MNRE/MWCSD***	Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding or accommodating the hazard.	Application of National Building Code 2002 PUMA Act 2004	Application of the National Building Code (Draft Sept 2016) and permit compliance CIM Strategy (2015)
Water availability to all families	Extend distribution of piped water network coverage: Established the borehole at Sapulu-Faleasiu ***Responsibility: SWA / villages***	Improve piped water access to all sub-villages with limited water supply	FY16/17 - Phase:1 Distribution network to feed Sapulu residents downstream of borehole Environmental and Social Safeguard Policies apply MoH Water Quality Standards SWA 10 Year Investment Plan (2016)	CIM Strategy 2015 Water and Sanitation Sector Plan 2016-2020
Moamoa Road Works / Access Road	Extend the access road in Moamoa further inland ***Responsibility: LTA/Village***	Improved work roads provide opportunity for village people to move inland	Identify funding/budget requirements and implementation programme for construction and development. Review of National Road Standards in Samoa (2016) Environmental and Social Safeguard Policy	Transport Sector Plan 2014 - 2019

			National Infrastructure Strategic Plan (NISP) 2011 Code of Environmental Practice - PUMA (2007) Vulnerability Assessment of the Samoa Road Network (2017)	

Other CIM Plan Issues and Solutions Identified

Infrastructure	Solutions/ Issues	Comment
Primary School Building - Sapulu	Identified as the Evacuation Shelter/ cyclone shelter during time of disasters or emergencies ***Responsibility: MNRE/MWTI/MESC***	The Primary School building is located within the hazard zone and therefore an alternative building such as a church or community house further inland needs to be identified as another option
Natural Springs Sapulu well / natural spring Vai Matamea	Conduct water quality tests for the Vaisilika spring to confirm if it is suitable for human consumption. ***Responsibility: MoH / Village / MNRE***	The well is in disrepair having a broken pump, and filled with litter from years of neglect and lack of use. Village is interested in reviving the well but MOH tests should determine if water is potable.
Tufu water spring and Fogalesogi water spring inland	Natural spring located within the coastal area is accessible and used for drinking when the tide is out.	The coastal spring is permanently inundated and in the sea. Further investment to try and resurrect this natural spring is not a climate resilience option.
	Tufu natural spring is now covered by the existing seawall Fogalesogi water spring is sluggish water and inactive, the water is not flowing. ***Responsibility: MoH / Village / MNRE***	Both springs supported the sub-village of Tauoo in the past when there were limited or no piped water. Currently the springs are not in use, one is infested with mosquito breeding ground (Fogalesogi) and the other (Tufu) is buried under the seawall. Not a climate resilience option.
Waste Management	There is excessive waste around the coastline and around residential areas. Effective community waste management is required. Waste Management Act 2010 ***Responsibility: MNRE / village***	Poor waste management practices are observed including waste dumping in backyards and along the coast. Drainage are blocked by waste, with wastewater flooding residential areas.

Environment & Natural Resources	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Replanting /coastal restoration	Replant vegetation / littoral plants in coastal areas Encourage natural regeneration of coastal plants ***Responsibility: Village/ MNRE***	Protects coastline against normal wave action Maintains natural ecosystem connectivity Increase sand build up minimizing erosion	MNRE Forestry to advice on appropriate species, and provide seedlings for different vegetation types suitable to the habitats (coastal lowland area) and planting materials for villages that need them.	National Environment Sector Plan 2017-2021
Wetland / swamp area	Alleviate the overflow of water within the wetland area during rainy season by: Assess and Install appropriate drainage measures from wetlands into the sea and ensure regular maintenance Stop the dumping of rubbish into wetland Stop reclamation of wetlands ***Responsibility: MNRE/village***	Improve flow of water out into the sea from wetland will eliminate the foul smell that comes from the brackish water, supporting healthy environment for villages	West Coast Road, Upolu, Samoa ECOP (IPA, 2012) NBSAP 2015-2020	
Fisheries Reserve	Strengthen monitoring and evaluation of fisheries reserves Maintain existing reserves (3) and if possible, include additional fishery reserves for the other sub-villages ***Responsibility: MAF / MNRE / village***	Increase marine species diversity including fish species and coral reef ecosystem Improve coral communities increase chances of less or no coral bleaching	Community Based Fisheries management Plan (CBFMP) Village Plans and By-laws	Agriculture Sector Plan 2016-2020 National Environment Sector Plan 2017-2021
Water Catchment Area	Develop and implement Faleasiu Watershed Management Plan Water quality testing ***Responsibility: MNRE / MWTI / MoH /Villages***	Improve resilience of watershed areas Village benefit from improved water sources	National Action Programme (NAP) Water Resources Management Regulations 2013	Water and Sanitation Sector Plan 2016-2020

Sand mining for commercial and domestic use affecting riverbanks inland	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 Water and Sanitation Sector Plan 2016-2020

Livelihood and Food Security	**Best Solutions**	**Other Benefits**	**Guideline to assist Implementation**	**Relevant Sector Plans**
Disturbed forests and plantation areas	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests : Promote and facilitate planting of root-crops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods. Promote agro-forestry	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	Agriculture Sector Plan 2016-2020

	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***		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	Restock reefs and lagoons with marine species such as clams, trochus, seaweeds and others for domestic consumption. ***Responsibility*: *MAF / village***	Improve food security and healthy living and increase community resilience and adaptive response to climate change	Community-based Fisheries Management Plan Improve existing marine reserve and encourage expanding to other nearby sub-villages	Agriculture Sector Plan 2016-2020

Village Governance	Best Solutions	Guidelines to assist Implementation	Comments
Village bi-laws and institutional setting	Develop and enforce related by-laws to support implementation of CIM Plans ***Responsibility*: *MWCSD / MAF / MNRE* and *Villages***	Village Fono Amendment Bill 2016, allows the villages to have their own faiga faavae "refer Clause 5 Amendment". Fisheries Village By-Laws for Satui	The Amendment allows for the village to established their own governing constitution and have it registered with MWCSD and in this way village by-laws to manage community and public asset as we ll as natural resource management can be part of the village constitution.
Drainage clean-up	Undertake village inspection of culverts along inland roads; * maintenance of road side drains and regular inspection of drainage system; * Implement district/village drainage clean-up and awareness program ***Responsibility: MWCSD / Village / MWTI***	Reduce impact from flooding Waste Management Act2010	Village beautification committee to monitor drainage clean-up

Shallow drainage system and narrow culverts along the main road (West Coast Road) at Faleasiu (sub-village Sapulu) during rainy season it overflows and flood and most coastal residential area

Blocked culvert filled with rubbish dumped across the road limiting the flow of storm water into the sea and causing flooding - Faleasiu

Faleasiu Village Map