

Community Integrated Management Plan

Lepa District



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. Fiamē 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 Lepa (Saleapaga & Lealatele, Lepa and Aufaga) District

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


Date of Signing 15 June 2018

Representatives


Signature

Saleapaga & Lealatele Village


- Mapuiniumamai Lopa Faaifo
- Salevalasi Aleki
- Pulemanufiu Solomona
- Faititili Salevao
- Palea Suavi



 Salevalasi



 Faititili Salevao



Lepa Village

- Vevesi Aumua
- Nonu Lua
- Miriama Tua
- Puletiuatoa Pulu
- Saunoagamalii Siaosi



 Nonu F. Lua







Aufaga Village

- Popo Petelu Papu
- Ailepata Mua
- Moa Kovati
- Leafa Sakalia
- Fata Leū Samuelu











The Government of Samoa adopts the Community Integrated Management Plan for the Alii and Faipule of Lepa (Saleapaga & Lealatele, Lepa and Aufaga) District as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

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



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

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

2.2 Funding options to support CIM Plan Implementation:

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

Similarly it is expected that funding support for the implementation of the updated revised CIM Plans during its 10 year lifespan, will be sourced from different development partners including the government of Samoa. All solutions and activities in the CIM Plans that have identified a government agency as the responsible agency for that particular action as outlined in the “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 Lepa District Environment

3.1 Physical and Natural Resource Setting

Lepa district is made of villages Aufaga, Lepa and Saleapaga on the South East of Upolu Island. The Lepa District has a steeper mid hinterland (elevation) with a more defined steep ridge of old volcanic cones as a backdrop. There are a number of incised gorges from early fluvial erosion assisted possibly by collapsed lava tubes. The mid to higher elevated areas do have fertile soils on relatively flat plateaus many of which have been formalized as farms some time ago (fenced off paddocks). There are ample opportunities to rejuvenate soils and production at the mid slopes, as well as to capitalize on better rural production using the higher elevated plateaus. Access via trafficable roads would be the key to improving economic opportunities and increasing resilience in terms of food and economic resilience. Given the high rates of recharge in the elevated areas sustainable land management practices will need to be implemented to ensure lower areas and lagoons are not polluted.

The coastal morphology for the area is similar to Lotofaga in that it is exposed barrier reef that is broken by steep lava cliffs which fall onto steep and narrow lava cliffs and a with narrow coastal plain. Much of the coral reefs along this coast were damaged by the 2009 tsunami, it is therefore not uncommon to find most of the growth in the reef populated by small corals. Aufaga village have all relocated inland, while in Lepa the majority of the families have also relocated inland apart from the main tulaga maota ma laoa (village meeting house). Since the tsunami of 2009, a vast majority of Saleapaga have relocated inland apart from the beach fale community and a few families that still live along the coastal area.

The terrestrial vegetation of the district is considered to be mostly mixed vegetation made up of parts dominated by fallow lands, plantations and cattle farms, coconut plantations, and interspersed with some remnants of lowland rainforests. The access roads to plantations have extended close to 500m. The upland forest to date has not been cleared although much of it was damaged by the cyclones of the 1990's, which the forests areas are now mixed with secondary forest trees and some exotic species.

Large watersheds dominate inland of the district with steep ravines populated by mixed native vegetation of tava and other rainforest trees as well as exotic tree species such as tamaligi, pulu trees and faapasi. Some of the fallow lands present in the district are from abandoned cattle farms and old plantations. Farmers seem to be moving further inland in search of fertile soils for plantations. The invasive trees and shrubs are present along the access roads throughout the district. *Spathodea campanulate* (African tulip) pulu vao *Funtumia elastica*; pulu mamoe *Castilla elastica* are the main invasive species found along the access roads and plantation area while the *Merremia peltata* is common both in cleared and forested areas.

Myna birds and red-vented bulbuls were found in abundance along the whole northern Savaii especially closer to settlements.

3.2 Social and Economic Setting

Lepa has a population of 1,538 people according to the 2016 National Census residing in the 3 villages and sub-villages. The 2009 tsunami saw most of the people from Lepa and Saleapaga move inland on higher grounds and away from the CEHZ and CFHZ, and only a few families and tourist operators remain in the coastal area.

The construction of the inland road which connects Aufaga to Lalomanu after the tsunami provides a lifeline infrastructure for families to connect to the main inland road network apart from the coastal main road network. This also supports opportunities for farming and agricultural production, and access to the District Hospital in Lalomanu village and the Police station. A two-point escape track/trails were constructed at Saleapaga behind tourism operation to provide egress in times of extreme events. The steep escarpment country and the aged

geology limits the ability to provide additional escape routes. The Samoa Tourism Authority were successful in providing a trial egress escape route, however given the constraints this only provided the track to a certain elevation. An initiative is to aim at finding other likely escape routes to build. Each village has its own primary school. The district secondary school is in the village of Lepa. In most places telephone and power lines follow the main road.

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 Main South-East Coast Road is important district infrastructure. It lies almost entirely within the Coastal Flood Hazard Zone (CFHZ) and the Coastal Erosion Hazard Zone (CEHZ), generally within a few meters of the sea along the east coast, with only a low revetment separating it from the coastal lagoon. Along the south coast the sea is generally 15 to 20 meters away, however, the road still lies within both hazard zones. The 2007 Lepa District CIM Plan mapped out all vulnerable areas along the coast and the lowland coastal areas identifying them as hazard zones given the exposure to natural disasters, climate change and extreme events causing flooding and erosion. There are changes in the catchment areas and land use hence the severe flooding downstream is caused by the concentrated flows from upland-catchment areas. As such the update of the CIM Plan considers a broader landscape hazards, climate risks and likely responses.

Coastal Hazards and Risks: According to Fepuleai (2017), the narrow coastal area between Aufaga and Lalomanu is a result of downthrown of up to 150m of the Lepa Fault to the south (Fig 1). The Lepa Fault could be still active and will generate rockfall hazard along this narrow coastal passage in the near future, indicates by an orange oval in Figure 2. More tsunami occurs in the area will damage the road infrastructure. There will be an increased in erosion activity if these thick deposits will be proposed to mine in the near future. A high content of bethic foraminifera in beach sand composition indicates, a present of deep sources that could correspond with collapsed seafloor at this part of the island.

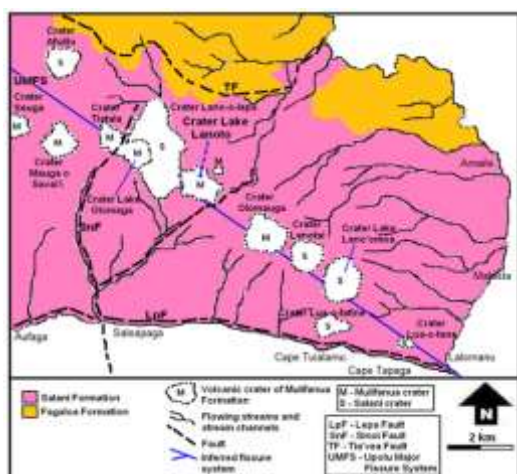


Figure 1 Geology of the easternmost part of Upolu, with the Lepa Fault expanding from Lepa to Lalomanu Aleipata Itupa i Luga. High risk coastal landslide hazard.

Map credit: Aleni Fepuleai, 2017

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

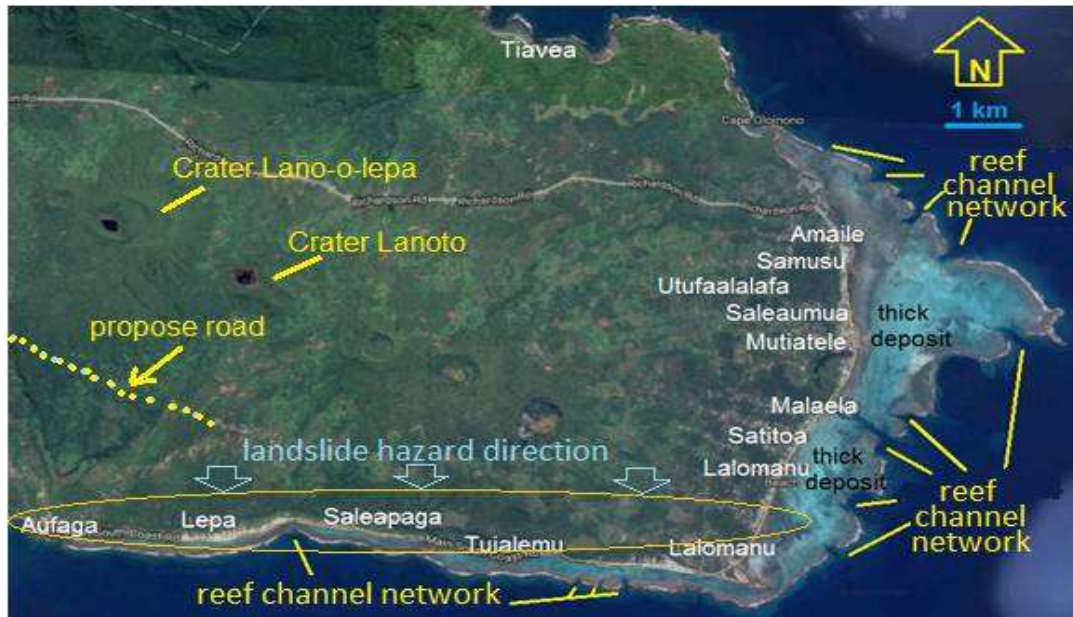


Figure 2 Coastal section between Aufaga of Lepa District to Lalomanu Aleipata Itupa I Luga as shown in the orange oval the most vulnerable area susceptible to generate landslide and rockfall during an earthquake. Blue arrows indicate the landslide direction and yellow lines shows reef channel associated with coastal erosion.

Map and description credit to: Aleni Fepuleai, 2017

Inland Hazards and Risks: Due to the narrow coastal passage between Aufaga and Lalomanu (Figure 2) highly vulnerable to rockfall hazard and tsunami, it is recommended to construct a new road (yellow dots) to the south of Saleapaga (ibid). This proposed new road will be part of Saleapaga connecting it to Lalomanu existing road (build after the tsunami) and will have the new extension to connect to Vavau. This proposed new road will provide an escape route in the event that the coastal passage between Aufaga and Lalomanu collapsed in the future, however resilience infrastructure already put in place such as the proposed new road direction will enable the regular flow of transportation and it will not block access from Aleipata-Itupa I Luga to Lepa district.

Overall activities such as coastal replanting in several sections, rebuilds of reef resilience and sustain the extension in marine habitats of the area, will help in erosion reduction. Groundwater resource is needed to be sustained through good management between villages and governments. Crater Lanoto'o Lake (behind Saleapaga) is a good source of water and does not necessarily indicate that water is not drinkable. Colour can be removed by typical water filters, however slow sand filters can remove colour.

Communities live along narrow coastal areas like those between Aufaga and Lalomanu (Figure 2) are very vulnerable to tsunami in the near future, relocation is highly recommended. Seismic study is a better option to determine the activity along the interconnection of fault and fissure network in the area, where predicted to be a high potential vent zone. This will also provide valuable information for landslide and rockfall hazards in the Lepa district, Aleipata-Itupa-I-Luga district and Aleipata-Itupa-I-Lalo district.

4. Lepa District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Ford crossing Vaigalu	Elevate ford crossing into a bridge to reduce coastal erosion	Improved rate of recovery Reduce potential for flooding in village areas	LTA / MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system through application of:	Community Integrated Management Strategy, August 2015 Transport Sector Plan 2014-2019
Drainage	<p>Address drainage system issues by: Implementing proper routine maintenance of existing culverts drainage channels on roadside and ensure surface runoff is properly channeled to the ocean;</p> <p>Installed new properly sized outlets and drainage channels resulting from inland development</p> <p>Implement district/village drainage/ culvert clean-up and awareness program</p> <p>Responsibility: MWCSD / District / Village / MWTI and LTA</p>	<p>Safer village houses and roads</p> <p>Improved safety community and resilience</p>	<p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work program</p> <p>Prepare assessment of road drainage systems</p> <p>Prepare a local education programme on need for keeping drainage systems clean</p>	
Coastal Water Source (Sināsina spring)	<p>Restore and capture the water flowing from Sināsina spring – for domestic use</p> <p>Responsibility: MWTI / MNRE / District / village</p>	Back-up water supply alternative for water shortage in the district	<p>MWTI to provide design in the restoration of the Sināsina spring that follows existing development guidelines: Environmental Social Safeguard Policy</p> <p>National Infrastructure Strategic Plan (NISP) 2011 Development Consent from PUMA on design of natural spring</p>	<p>Water and Sanitation Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>

Environment & Natural Resources	Best Solution	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Water Catchment / Forest	<p>Replanting or allow of natural regrowth along riparian areas</p> <p>Restored the water catchment area to support the Sinsina natural spring</p> <p>Develop a district wide (Lepa) integrated watershed and forest management plan that can cover forests, craters, and watershed areas</p> <p>Responsibility: MNRE / District</p>	<p>Increase biodiversity of forest ecosystem</p> <p>Improve ecological resilience of forest area</p> <p>Reverse land degradation</p> <p>Increase number of plants to reach the 2million tree planting goal</p>	<p>MNRE – Forestry and Environment and Conservation Division to work with district / village to implement national action plans that addresses reforestation programs and biodiversity such as:</p> <p>NBSAP 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>National Water Resource Strategy 2007-2017</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	National Environment Sector Plan 2017-2021
Livelihood & Food Security	Best Solution	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Disturbed forests and plantation areas / invasive pests	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>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</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>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</p>	Agriculture Sector Plan 2016-2020

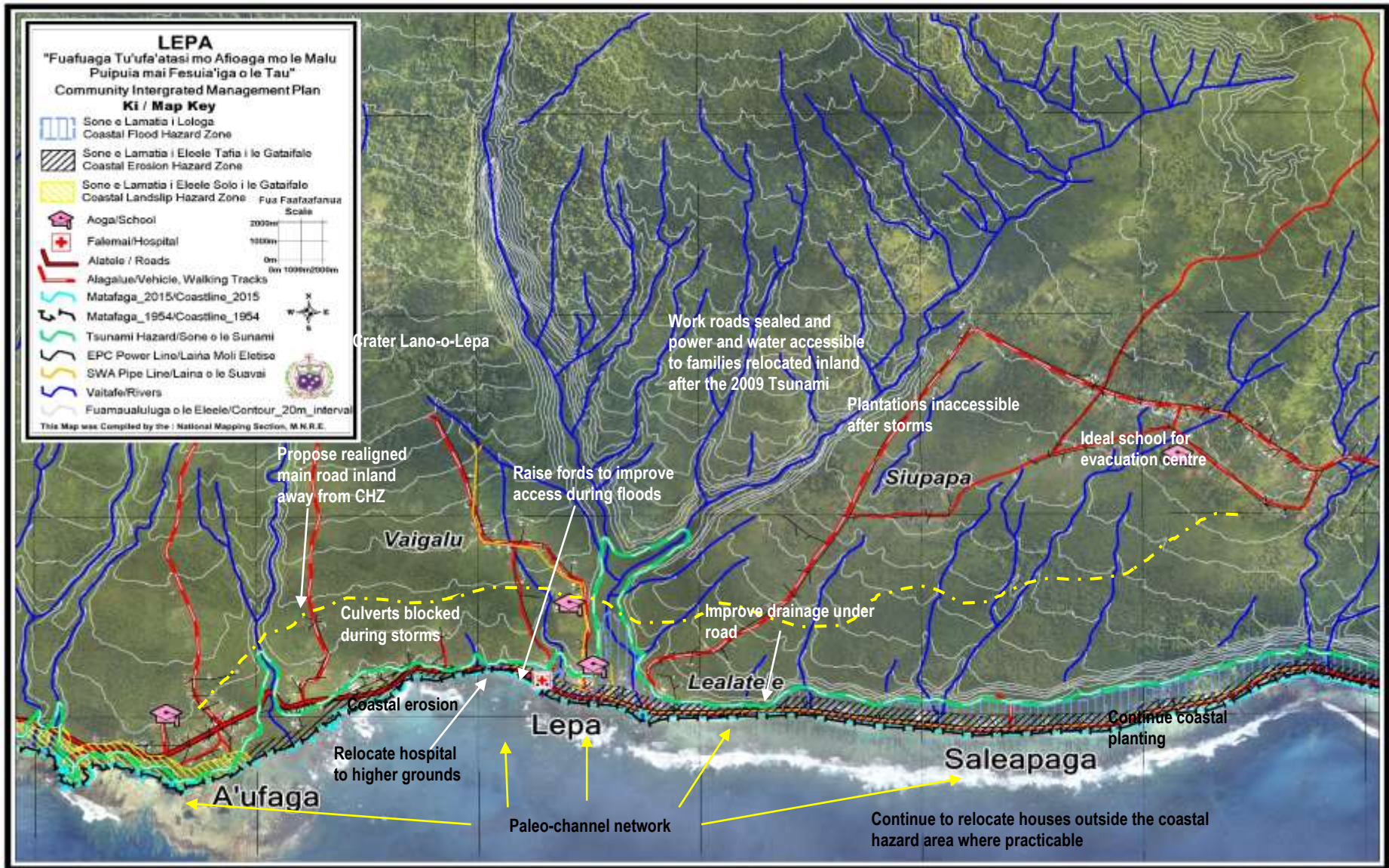
	<p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p>Responsibility: MAF MNRE /villages</p>		<p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Governance	Solutions/ Issues	Guidelines to assist Implementation	Comment
District /Village By-laws	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial</p> <p>Implement CIM Plan 2018-2028</p> <p>Responsibility: Village / MWCS D</p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>



Lepa CIM Plan District Consultation 2017

Lepa District Map



4.1 Saleapaga / Lealatele Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House</p>	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as:</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p>Responsibility: Village/Families / MWTI</p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Village voluntary relocation should follow the following guidelines:</p> <p>Application of National Building Code 2002</p> <p>PUMA Act 2004</p> <p>Application of the National Building Code (2016) and permit compliance</p>	<p>CIM Strategy (2015)</p>
<p>Drainage</p>	<p>Address drainage system issues by:</p> <p>Implementing proper routine maintenance of existing culverts drainage channels on roadside and ensure surface runoff is properly channeled to the ocean;</p> <p>Installed new properly sized outlets and drainage channels resulting from inland development</p> <p>Implement district/village drainage/ culvert clean-up and awareness program</p> <p>Responsibility: MWCS D / Village / MWTI and LTA</p>	<p>Improved rate of recovery</p> <p>Reduce potential for flooding in village areas</p> <p>Safer village houses and roads</p> <p>Improved safety community and resilience</p>	<p>MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system through application of:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work program</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>

			<p>Prepare assessment of road drainage systems</p> <p>Prepare a local education programme on need for keeping drainage systems clean</p>	
Electricity Supply	<p>Install and connect power supply for inland residents</p> <p>Install streetlights along the roads where needed for community safety.</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Responsibility: EPC / MWTI / Villages</p>	<p>Maintain electricity supply at all times including during natural disasters.</p> <p>Avoid accidents from fallen electricity posts.</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p> <p>EPC to installed electricity lines to reach families residing inland and streetlights</p> <p>Consider energy efficiency developments for communities using renewable energy guided by existing framework –</p> <p>Development of a Renewable Energy and Energy Efficiency Framework, 2016</p>	Samoa Energy Sector Plan 2017-2022
Emergency Management / Evacuation Shelter	<p>Identify schools and churches outside of the CEHZ and CFHZ as Evacuation Shelters and include in the DMO program for retrofitting</p> <p>Prepare a District Emergency Response Plan identifying resources needed for the Evacuation Shelter</p> <p>Prepare signs in English and Samoan to be erected throughout the District identifying actions in the event of emergencies including a location map of nearest emergency facilities and Evacuation Shelter</p>	<p>Improve preparedness of district for climate change and extreme events</p> <p>Improve resilience and ability to respond</p>	<p>MNRE-DMO monitoring program for all existing Evacuation Shelter places should follow these guidelines:</p> <p>Application of National Building Code 2002</p> <p>PUMA Act 2004</p> <p>Identify safe location on CIM Plan maps for Evacuation Shelters</p>	National Disaster Management Plan 2017-2021

	<p>Implement the Community Disaster Climate Risk Management Plan for district and village</p> <p>Responsibility: MNRE / District / village</p>			
Inland access road	<p>Consider an inland emergency access road from the Aleipata link road</p> <p>Include roadside drains when implementing the access road</p> <p>Responsibility: LTA / village</p>	<p>Fast rate of recovery</p> <p>Improve resilience of infrastructure to provide alternative routes in the event that the Lepa Fault above the coastal area collapse (as predicted)</p> <p>More lives saved</p>	<p>raise awareness about potential hazard risk area through guidance from:</p> <p>Implementation of the CDCRM and Gen2 CIM Plan for Lepa District</p> <p>National Infrastructure Strategic Plan 2011</p>	<p>Transport Sector Plan 2014-2019</p> <p>National Disaster Management Plan 2017-2021</p>
Water	<p>extend piped water network to families residing further inland on higher grounds</p> <p>Consider assessment for potential to drill a borehole</p> <p>Responsibility: SWA / village</p>	<p>Improve access to clean water</p>	<p>SWA to provide advice to the village on potential for them to extend piped water network</p>	<p>Water and Sanitation Sector Plan 2016-2020</p>
Escape tracks	<p>Upgrade existing escape track and to extend the track up to the hill</p> <p>Responsibility: village MNRE/MWTI/</p>	<p>Improve escape routes for evacuation</p> <p>More lives saved</p>	<p>STA MNRE and MWTI to provide sound advice to community on possibility of extending existing escape routes</p>	<p>National Disaster Management Plan 2017-2021</p>

Environment & Natural Resources	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Marine Reserve	<p>Established fishery reserves and include tourism activities such as snorkeling</p> <p>Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p>	<p>MAF-Fisheries division and MNRE - DEC to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan NBSAP 2015-2020</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>

	<p>Implement all activities under the village Fisheries Management Plan</p> <p>Implement program to remove crown of thorns from inshore area and protect seaweed</p> <p>Enforce Fisheries By-Laws</p> <p>Responsibility: MAF / MNRE / Village</p>	<p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>Update village Fisheries Management Plan</p>	
<p>Forest Loss (loss of indigenous forest due to cyclone damages and land clearance)</p>	<p>Replanting of native tree species in open fallow lands</p> <p>Rehabilitate fallow land and degraded area</p> <p>Implementation of replanting program for village of native tree species</p> <p>Implement replanting of coastal vegetation along the coastal area</p> <p>Protect the ridge rainforest extending from Saleapaga to Lalomanu</p> <p>Responsibility: MNRE / village</p>	<p>Reverse land degradation</p> <p>Improve coastal and inland biodiversity</p>	<p>MNRE-Forestry Division to provide advice to community on reforestation / restoration program by providing tree seedlings for planting.</p> <p>2016-2020 National Forestry Plan</p> <p>NBSAP 2015-2020 NAP – Sustainable Land Management Plan 2015-2019</p> <p>NBSAP 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Two million Tree Planting Strategy 2015-2020</p> <p>Forestry Management Act 2011</p>	<p>National Environment Sector Plan 2017-2021</p>
<p>Sand mining for commercial and domestic use affecting the marine and coastal environment as well as terrestrial resources</p>	<p>Assess and identify sustainable sources of sand for domestic and commercial use</p> <p>Village, government and the private sector to collaborate on designated areas for sand mining</p>	<p>Village gains benefit from sand mining activities</p> <p>Reduce impact to natural coastal protection mechanism via control of scale and site of extraction</p>	<p>Follow existing MNRE guidelines for sand mining or extracting such as:</p> <p>MNRE monitoring of sand extraction operations</p> <p>Secure relevant permits before any sand mining occurs</p>	<p>National Environment Sector Plan 2017 - 2021</p>

	<p>Extractive industries (mining) monitored and corrected in the riverbank and coastal fringe</p> <p>Strengthen sand mining monitoring and enforcement</p> <p>Mass media awareness on sustainable sand mining practices</p> <p>Develop sand mining regulation</p> <p>Responsibility: MNRE / District & Village</p>	<p>Improve village resource management and sustainable development</p> <p>Minimize impacts of coastal inundation and erosion</p> <p>Improve the sustainable management of sand as a natural resource</p>	<p>Incorporate environmental and social safeguards concerns including consultations with any affected community</p> <p>Village environmental management plans established including annual monitoring systems</p> <p>For access to sites, obtain written consents from Alii Faipule and landowners.</p> <p>Lands and Survey Environment Act 1989</p> <p>Consideration of EIA assessment of impact prior to any extraction</p> <p>PUMA Act 2004</p> <p>NAP – Sustainable Land Management Plan 2015-2019</p> <p>(draft) Sand Mining Policy 2001</p> <p>Draft Soil Resource Management Bill 2018</p>	
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Livelihood and Food Security	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Disturbed forests and plantation areas / invasive pests	Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.	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	Agriculture Sector Plan 2016-2020

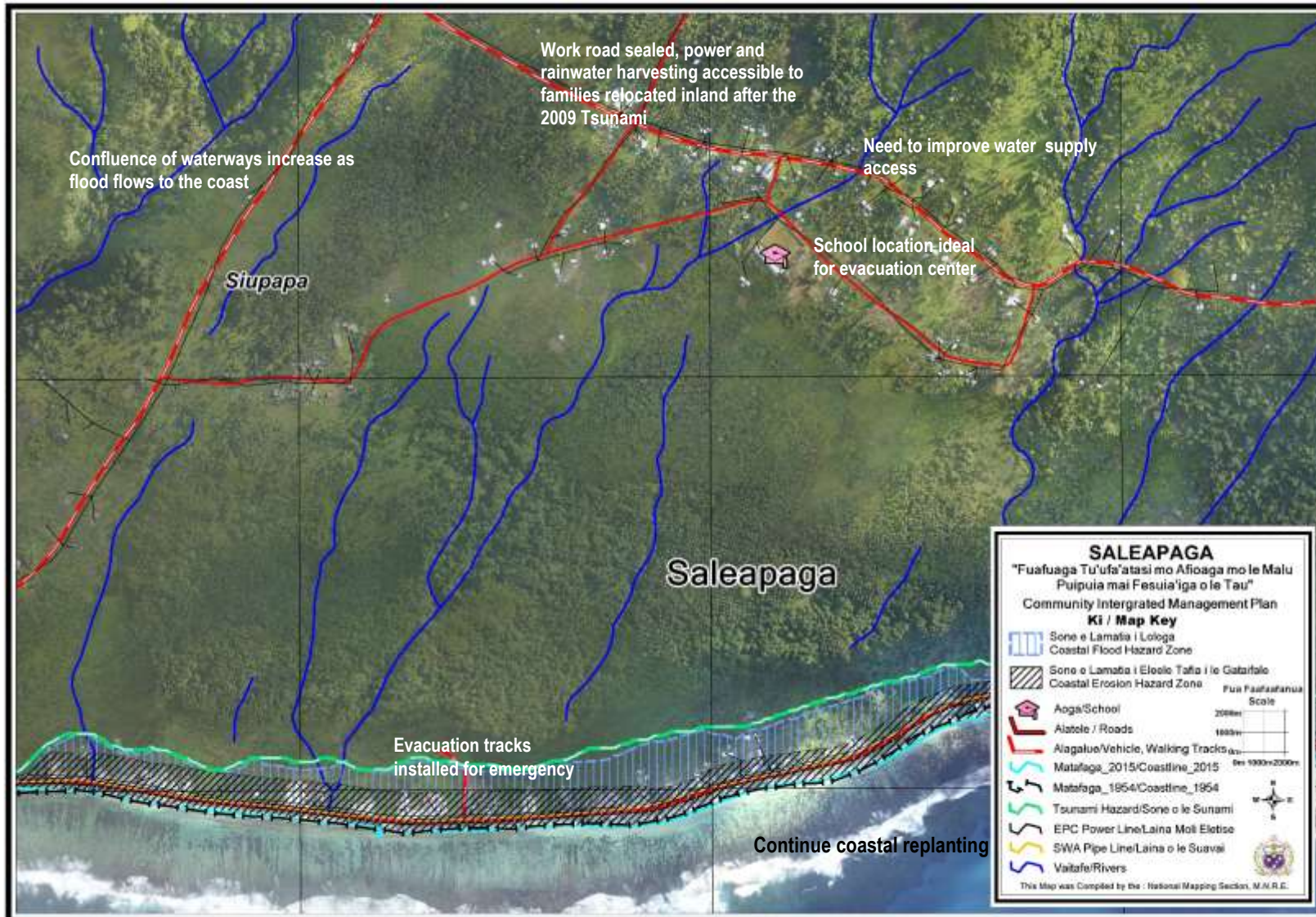
	<p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p>Responsibility: MAF MNRE /villages</p>		<p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>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</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
District /Village By-laws	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial;</p> <p>Implement the CIM Plan for 2016-2028</p> <p>Village has strong governance system in place and program: Banned outsiders from fishing in the village inshore fishing area</p> <p>Responsibility: Village / MWCS D</p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>



Staircase provided for the escape route behind houses on the coast at Saleapaga Village for tourist evacuation

Saleapaga/Lealatele Village Map



4.2 Lepa Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House</p>	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as:</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p>Responsibility: Village/Families / MWTI/MWCSD</p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Village voluntary relocation should follow the following guidelines:</p> <p>Application of National Building Code 2002</p> <p>PUMA Act 2004</p> <p>Application of the National Building Code (2016) and permit compliance</p>	<p>CIM Strategy (2015)</p>
<p>Access road</p>	<p>Extend sealing of access road inland from Lepa (Aufaga) to Lalomanu</p> <p>Include drainage in the design of the access road extension</p> <p>Request other service infrastructure</p> <p>Responsibility: LTA / MWTI / village</p>	<p>Improve rate of recovery</p> <p>Increase number of families relocate to higher grounds</p> <p>Increase opportunities to utilize land for farming</p> <p>More lives saved during times of emergency</p>	<p>Construction of access roads should be guided by government requirements as stated in the following policies, strategies and action plans:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>

			Programme road safety activities into budget and work programme	
Drainage	<p>Address drainage system issues by :</p> <p>Implementing proper routine maintenance of existing culverts drainage channels on roadside and ensure surface runoff is properly channeled to the ocean;</p> <p>Installed new properly sized outlets and drainage channels resulting from inland development</p> <p>Implement district/village drainage/ culvert clean-up and awareness program</p> <p>Responsibility: MWCS D / Village / MWTI and LTA</p>	<p>Improved rate of recovery</p> <p>Reduce potential for flooding in village areas</p> <p>Safer village houses and roads</p> <p>Improved safety community and resilience</p>	<p>MWTI to provide advice and guidance using the following documents and work programme to support the management of drainage system through application of:</p> <p>Environmental and Social Safeguard policy</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Programme road safety activities into budget and work program</p> <p>Prepare assessment of road drainage systems</p> <p>Prepare a local education programme on need for keeping drainage systems clean</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>
Rainwater harvesting systems (water tanks)	Rainwater harvesting immediate action, supported by the installation of water tanks for the families residing inland without access to water for consumption.	Improve community adaptive capacity to respond to climate change impacts	Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system.	Water and Sanitation Sector Plan 2016-2020

	Responsibility: CSSP / MWCS / village		National Water Resources Management Strategy 2007-2017	
Electricity Supply	<p>Install and connect power supply for inland residents</p> <p>Install streetlights along the roads where needed for community safety.</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Responsibility: EPC / MWTI / Villages</p>	<p>Maintain electricity supply at all times including during natural disasters.</p> <p>Avoid accidents from fallen electricity posts.</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p> <p>EPC to installed electricity lines to reach families residing inland and streetlights</p> <p>Consider energy efficiency developments for communities using renewable energy guided by existing framework –</p> <p>Development of a Renewable Energy and Energy Efficiency Framework, 2016</p>	Samoa Energy Sector Plan 2017-2022
Natural Spring (Sinasiona)	<p>Restore the Sinasiona spring by capturing water from small waterfalls</p> <p>Improve structure for capture water</p> <p>Conduct water quality testing for drinking water</p> <p>Responsibility: MWTI / Village / MNRE / CSSP / MOH</p>	<p>Improve water supply back-up during drought period or when natural disaster strikes</p>	<p>MNRE / MWTI to provide guidance to community for maintenance of coastal spring bathing and drinking water by application:</p> <p>Environmental Social Safeguard policy</p> <p>NBSAP 2015-2020</p> <p>National Water Resource Strategy 2007-2017</p>	National Environment Sector Plan 2017-2021

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Seawall	<p>Village request to raise the height of the existing seawall build as part of the Tsunami recovery to prevent coastal inundation</p> <p>Responsibility: MWTI / LTA / Village</p>	<p>Seawall is not a priority investment for the PPCR-ECR project and request by the community to increase height of seawall requires a feasibility assessment by LTA or MWTI.</p>

Ford replace with bridge	Village request to raise the ford at Vaigalu and build a bridge to avoid road blockage when it floods. Responsibility: MWTI / LTA / village	The ford at Vaigalu usually floods during high tide and heavy rain when more water is brought down from upper stream area, and this stopping the tracking. This would be a costly investment, however inland road access can be used as an alternative road to take when it floods along the coastal main road.
Water	Monitor water quality Responsibility: MOH/SWA	Village raised water quality issue for SWA and MOH awareness

Environment & Natural Resources	Best Solutions and Other Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Water Catchment (Lepa)	<p>Conduct an assessment of the natural water source / watershed area inland</p> <p>Develop a management plan for the Watershed Area</p> <p>Conduct water testing for quality of water</p> <p>Responsibility: MNRE / village</p>	<p>Improve ecological resilience of watershed area</p>	<p>MNRE-DEC, WRD and Forestry Division to provide advice such as:</p> <p>Awareness and government support in supply of nursery trees, for replanting</p> <p>Community to request through Forestry Division MNRE seedlings under their 2million tree replanting project</p> <p>NBSAP 2015-2020</p> <p>National Forestry Plan 2016-2020</p> <p>National Water Strategy Plan 2007-2017</p>	<p>National Environment Sector Plan 2017-2021</p> <p>Water and Sanitation Sector Plan 2016-2020</p>
Marine / Fisheries Reserve	<p>Re-established a fishery reserves</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement program to remove crown of thorns from inshore area</p> <p>Village request for restocking with clams and seagrape for breeding and consumption and protect fish</p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>National Environment Sector Plan 2017-2021</p>

	<p>Implement coral gardening</p> <p>Responsibility: MAF / Village</p>			
<p>Forest Loss (loss of indigenous forest due to cyclone damages and land clearance)</p>	<p>Replanting of native tree species in open fallow lands</p> <p>Rehabilitate fallow land and degraded area</p> <p>Implementation of replanting program for village of native tree species</p> <p>Implement replanting of coastal vegetation along the coastal area</p> <p>Responsibility: MNRE / village</p>	<p>Reverse land degradation</p> <p>Improve coastal and inland biodiversity</p>	<p>MNRE-Forestry Division to provide advice to community on reforestation / restoration program by providing tree seedlings for planting.</p> <p>2016-2020 National Forestry Plan</p> <p>NBSAP 2015-2020 NAP – Sustainable Land Management Plan 2015-2019</p> <p>NBSAP 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Two million Tree Planting Strategy 2015-2020</p> <p>Forestry Management Act 2011</p>	<p>National Environment Sector Plan 2017-2021</p>
<p>Waste Management</p>	<p>Need regular rubbish collection to collect rubbish from families</p> <p>Village conduct waste awareness program and clean-up regularly</p> <p>Responsibility: Village</p>	<p>Improve hygiene and sanitation</p> <p>Reduce impact of vector borne diseases</p>	<p>MNRE-DEC to provide guidance and support to village through implementation of action plan such as:</p> <p>Waste Management Policy 2012</p> <p>Waste Management Act 2010</p> <p>NBSAP 2015-2020</p>	<p>National Environment Sector Plan 2017-2021</p>
<p>Coastal replanting</p>	<p>Implement replanting of the coastal area with coastal vegetation</p> <p>Responsibility: MNRE / MAF-Fisheries /village</p>	<p>Improve natural barriers and resilience of coastal area reduce coastal erosion</p>	<p>MNRE – Forestry to provide guidance and advice coastal vegetation for replanting</p> <p>NBSAP 2015-2020</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	

Livelihood and Food Security	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Disturbed forests and plantation areas / invasive pests</p>	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p> <p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases.</p> <p>Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p>Responsibility: MAF MNRE /villages</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>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</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p> <p>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</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p>	<p>Agriculture Sector Plan 2016-2020</p>

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

Village Governance	Best Solutions Proposed	Guidelines to assist Implementation	Comments
District /Village By-laws	<p>Implement district / village by-laws for community to follow and include protection of natural resources both marine and terrestrial;</p> <p>Implement the CIM Plan for 2016-2028</p> <p>Village has strong governance system in place and program: Women’s program on vegetable gardening to promote healthy living</p> <p>Village committee assess families on: Cleanliness and collecting rubbish and putting them on the rubbish stand for collection</p> <p>Village committee conduct site assessment for hygiene especially outdoor activities</p> <p>Women representative allowed to sit in village council/matai meeting to report on social issues affecting families As well as women’s committee project that support village development.</p> <p>Responsibility: Village / MWCS D</p>	<p>MWCS D to provide assistance to district /village in developing by-laws</p> <p>Community Development 2016-2021</p>	<p>Support the development of district / village by-laws that can guide governing structure of village and the implementation of government and non-government programs including CIM Plans.</p>

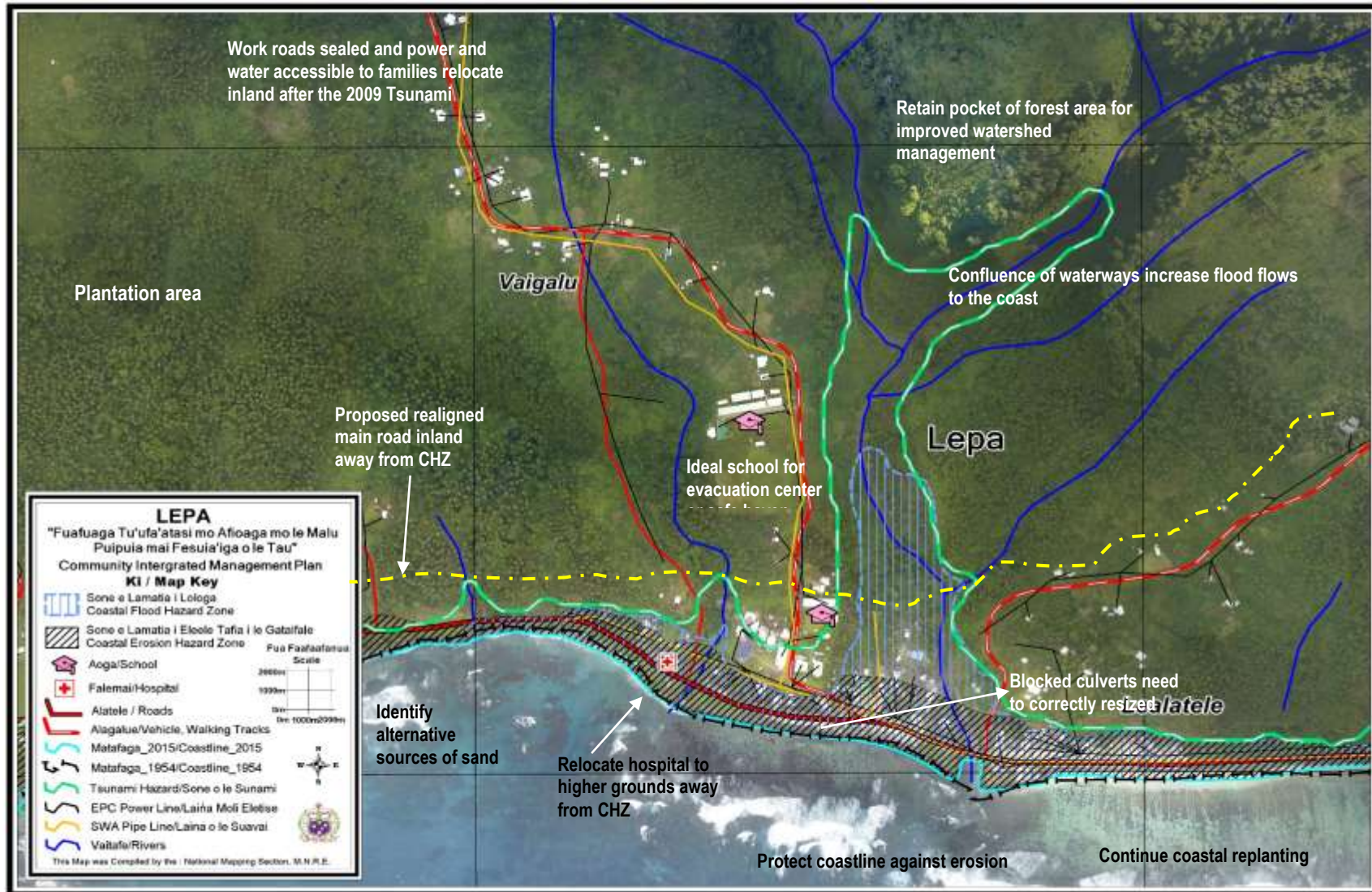


Sinasina natural spring on the coastal area Lepa Village



Lepa community pool site of restoration project to protect Sinasina natural spring

Lepa Village Map



4.3 A'ufaga Village Interventions

Infrastructure	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Village infrastructure in hazard zones include: Households Schools Churches Businesses, Women's Committee House</p>	<p>Relocate outside hazard zones</p> <p>Investments within the hazard zone adopt appropriate mitigation measures such as:</p> <p>Raise building foundations at a level that takes into account the CFHZ in the vicinity</p> <p>Responsibility: Village/Families / MWTI/MWCSD</p>	<p>Reduce cost in ongoing maintenance mitigate potential damage from coastal erosion and flooding accommodating the hazard.</p>	<p>Village voluntary relocation should follow the following guidelines:</p> <p>Application of National Building Code 2002</p> <p>PUMA Act 2004</p> <p>Application of the National Building Code (2016) and permit compliance</p>	<p>CIM Strategy (2015)</p>
<p>Access road</p>	<p>Extend sealing of access road inland</p> <p>Include drainage in the design of the access road</p> <p>Request other service infrastructure included such as: Proper roadside drainage included Piped water network and Electricity lines</p> <p>Responsibility: LTA / EPC /MWTI / village</p>	<p>Improve rate of recovery</p> <p>Increase number of families relocate to higher grounds</p>	<p>Construction of access roads should be guided by government requirements as stated in the following policies, strategies and action plans:</p> <p>Environmental and Social Safeguard policy</p> <p>National Infrastructure Strategic Plan (NISP) 2011</p> <p>Samoa Code of Environmental Practice (2007)</p> <p>Review of National Road Standards in Samoa (2016)</p> <p>Vulnerability Assessment of the Samoa Road Network (2017)</p>	<p>Community Integrated Management Strategy, August 2015</p> <p>Transport Sector Plan 2014-2019</p>

			Programme road safety activities into budget and work programme	
Rainwater harvesting system (water tanks)	<p>Implement the installation of water tanks for families without access to water for consumption and domestic use</p> <p>Responsibility: CSSP / NGO/MWCSD / village</p>	<p>Improve community adaptive capacity to respond to climate change impacts</p> <p>Provide alternative water source for families</p>	<p>Conduct assessment of vulnerable families inland without access to water prior to approving rainwater harvesting system.</p> <p>National Water Resources Management Strategy 2007-2017</p>	Water and Sanitation Sector Plan 2016-2020
Electricity Supply	<p>Install and connect power supply for inland residents</p> <p>Install streetlights along the roads where needed for community safety.</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Responsibility: EPC / MWTI / Villages</p>	<p>Maintain electricity supply at all times including during natural disasters.</p> <p>Avoid accidents from fallen electricity posts.</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p> <p>EPC to installed electricity lines to reach families residing inland and streetlights</p> <p>Consider energy efficiency developments for communities using renewable energy guided by existing framework –</p> <p>Development of a Renewable Energy and Energy Efficiency Framework, 2016</p>	Samoa Energy Sector Plan 2017-2022

Other Solutions Considered or Further Issues Raised

Infrastructure	Solutions/ Issues	Comment
Economic Development Seawall to protect Seabreeze Resort	<p>Request to provide hard engineering protection of the Sea Breeze Tourist Resort (seawall)</p> <p>Responsibility: / Resort owner / village</p>	This request would not fit in with the PPCR-ECR objective. As a private resort any proposed works should be pursued by the operator. An EIA may be required and a Development Consent application would also need to be submitted to PUMA – MNRE for review.
Cover shelter for water reservoir	<p>Request for cover shelter for water reservoir under IWS</p> <p>Responsibility: MWCSD-IWS / village</p>	Community have yet to decide who will support their need for a cover shelter for the water storage reservoir to protect water from sunlight etc.

Environment & Natural Resources	Best Solutions and Other Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
Coastal replanting	<p>Implement replanting of the coastal area with coastal vegetation</p> <p>Responsibility: MNRE / MAF-Fisheries /village</p>	<p>Improve natural barriers and resilience of coastal area reduce coastal erosion</p>	<p>MNRE – Forestry to provide guidance and advice coastal vegetation for replanting</p> <p>NBSAP 2015-2020</p>	<p>NATIONAL ENVIRONMENT SECTOR PLAN 2017-2021</p>
Marine / Fisheries Reserve	<p>Expand on existing marine or fisheries reserve</p> <p>Restocking with giant clams and seagrapes</p> <p>Implement coral gardening</p> <p>Conduct training on village based monitoring programs for marine areas</p> <p>Implement the Fisheries Management Plan</p> <p>Implement program to remove crown of thorns / seaweed from inshore area</p> <p>Responsibility: MAF / Village</p>	<p>Reduce impact of land-based pollution</p> <p>Reduce impact of coral bleaching</p> <p>Improve resilience of coral reef ecosystem to combat climate change</p> <p>Reduce loss of marine habitats</p>	<p>MAF-Fisheries division to provide advice following existing guidelines:</p> <p>Community-based Management Fishery Plan</p> <p>NBSAP 2015-2020</p> <p>Update village Fisheries Management Plan</p>	<p>Agriculture Sector Plan 2016-2020</p> <p>NATIONAL ENVIRONMENT SECTOR PLAN 2017-2021</p>
Waste Management	<p>Need regular rubbish collection to collect rubbish from families</p> <p>Village conduct waste awareness program and clean-up regularly</p> <p>Request for rubbish bins to be installed on stands along the village</p> <p>Responsibility: Village</p>	<p>Improve hygiene and sanitation</p> <p>Reduce impact of vector borne diseases</p>	<p>MNRE-DEC to provide guidance and support to village through implementation of action plan such as:</p> <p>Waste Management Policy</p> <p>NBSAP 2015-2020</p>	<p>NATIONAL ENVIRONMENT SECTOR PLAN 2017-2021</p>

<p>Forest Loss (loss of indigenous forest due to cyclone damages and land clearance)</p>	<p>Replanting of native tree species in open fallow lands</p> <p>Rehabilitate fallow land and degraded area</p> <p>Implementation of replanting program for village of native tree species</p> <p>Implement replanting of coastal vegetation along the coastal area</p> <p>Responsibility: MNRE / village</p>	<p>Reverse land degradation</p> <p>Improve coastal and inland biodiversity</p>	<p>MNRE-Forestry Division to provide advice to community on reforestation / restoration program by providing tree seedlings for planting.</p> <p>2016-2020 National Forestry Plan</p> <p>NBSAP 2015-2020 NAP – Sustainable Land Management Plan 2015-2019</p> <p>NBSAP 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p> <p>Two million Tree Planting Strategy 2015-2020</p> <p>Forestry Management Act 2011</p>	<p>NATIONAL ENVIRONMENT SECTOR PLAN 2017-2021</p>
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Livelihood and Food Security	Best Solutions Proposed	Other Benefits	Guidelines to assist Implementation	Relevant Sector Plans
<p>Disturbed forests and plantation areas / invasive pests</p>	<p>Restore and utilize fallow lands closer to the village with plantations rather than clearing inland and upland forests</p> <p>Promote and facilitate planting of rootcrops (i.e yams, sweet potato which are more resilient to cyclones, droughts and floods.</p> <p>Implement sustainable land management practices.</p> <p>Implement integrated pest management programme</p>	<p>Improve food security and healthy living and increase community resilience and adaptive response to climate change</p>	<p>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</p> <p>Provide tools and planting materials to improve crop diversification and resilience – address pest issues etc. This will lead to improve food security</p>	<p>Agriculture Sector Plan 2016-2020</p>

	<p>Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases. Diversify into other cash crops and fruit trees i.e cocoa, coconut, lemon and plant in suitable areas outside hazard zones</p> <p>Implement a control program to manage invasive pests both flora and fauna impacting on plantations – crops.</p> <p>Responsibility: MAF MNRE /villages</p>		<p>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</p> <p>Implementation of solutions are guided by the following:</p> <p>Draft Soil Resource Management Bill 2018</p> <p>Samoa National Action Programme to combat Land Degradation and to mitigate effects of drought 2015-2020</p> <p>National Invasive Species Strategy and Action Plan 2008-2011</p> <p>2 Million Tree Planting Strategy 2015-2020</p>	
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Vaigalu ford crossing Lepa District – community request to replace ford with a bridge

Aufaga Village Map

