Community Integrated Management Plan

Fa'asalele'aga 4 District - Savaii



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 CIM Plan is a Partnership between the Government of Samoa and the villages within the Plan area. The Plan area starts from the ridge extending to the reef broadly covering 4 sectors; Infrastructure; Natural Environment and Resources; Livelihood and Food security; and Village 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 Faipule District of Fa'asalele'aga 4 (Pu'apu'a, Lano and Asaga villages).

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

Date of Signing: 15th June 2018

Representative:

Pu'apu'a Village

- Peseta Lutelu
- · Faaloto Sile
- Pa'u Pae
- · Aiiloilo Gasologa
- Fa'avae Vala'au

Lano Village

- Lauiula Pulega
- Malaeulu Amoni
- Vui Pale
- Vui Luao
- Iiga Poufa
- Laifai Fa'auā

Signature:

Faavae Vakiau

Laniula. Pulaga

Vici Throng Vara

LAZFAI

Asaga Village

• Lualua Tautu Lualua

Ausia Testila

• Ausialemanaia Aifai Teofilo

Matafeo Ioapo

• Ausialemanaia Iese

The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Fa'asalele'aga4as 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 Departments 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.

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
МоН	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
S.I.D.I GEI DGI	Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan
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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.

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).

Access by individuals to adequate resources (entitlements) for acquiring Food access 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 of food through adequate diet, clean water, sanitation and health care to Utilization 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.

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.

Stability

1. Introduction to the CIM Plan

1.1 The Strategic Vision

The District Community Integrated Management (CIM) Plan for Fa'asalele'aga 4 District has been prepared as part of the Government of Samoa's Adaptation Fund - *Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project*. The CIM Plan is one of the primary means of implementing the CIM Strategy, which was formally approved by the Government of Samoa in February, 2001 and updated in 2015 as providing the Strategic direction for enhancing the resilience of community livelihoods, infrastructure, environment and natural resources using a holistic and integrated ridge-to-reef approach. The Strategy has as its central vision:

Resilience – Community Livelihoods, Infrastructure, Environment and Natural Resources to Climate Change and Natural Disasters

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, 2015).

1.2 The Aim of the CIM Plan

The aim of the CIM Plan is to help communities and government improves resilience by identifying actions and solutions considered as best approach to issues identified. Not all the solutions may be actioned immediately but the plan will ensure that issues and options are identified for the long-term improvement in resilience of community livelihoods, infrastructure, and environment and resource systems.

The CIM Plan will:

- 1. Improve the community's awareness of all hazard risks from the ridge to the reef;
- 2. Enable the community as well as providers of services and physical, financial, and technical support in all climate prone sectors, to reduce inland and coastal hazard risks in villages;
- 3. Enable the community and government service providers of infrastructure services, livelihoods, environment and natural resources to better adapt, respond and recover from cyclones.

1.3 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 in preparing 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. The participants of the CIM Plan preparation process are acknowledged in the Implementation Guidelines.

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines

The Implementation Guidelines describe the solutions proposed that will increase the resilience of the villages in the Plan area and the ways these solutions can be implemented. The solutions are presented for various livelihoods, infrastructure, environment and natural resources items that have moderate to low resilience. Where one solution will provide benefits to other items of livelihoods, infrastructure, environment and natural resources these "Other Benefits" are also noted. Implementation is considered to be the joint responsibility of both the villages and the government in partnership. The government is responsible for the provision of national and district "Public", infrastructure and public goods and benefits derive from environmental services and natural resources , while villages are responsible for local and community infrastructure and livelihoods related actions. The responsibility for implementing the proposed actions is also defined. Solutions for both District and Village level issues related to livelihoods, infrastructure, environment and natural resources respectively, and the responsibility of both partners, should be considered together as they combine to provide for the integrated management of all community development initiatives.

The solutions for village level interventions related to livelihoods, infrastructure, environment and natural resources will usually be the responsibility of the Village Council and Families in the village to implement. Advice and resources may be available from the Government to assist the village in implementing these solutions. In most situations these solutions will also provide benefits to both village and district infrastructure and resources and environmental goods that are shared between villages. These solutions should be considered an integral part of strengthening communityresilience at both levels.

2.2 Duration of the Plan

The CIM Plan is *reviewed* every 10 years but during the Plan period, the solutions implemented will be *monitored* on a five (5) yearly basis to ensure theproposed solutions are effective and are actually improving resilience. The 5 yearly monitoring of the new CIM Plan is aligned with the 5 year review of **the key national planning and programming** strategy for Samoa: the *Strategy for the Development of Samoa* (SDS). The new CIM Plan recognizes some solutions are likely to take longer than 5 years, whilst others may take up to 10 years to implement due to the complexity of planning process, funding and budgeting programming required to implement these solutions.

Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators.

2.3 Financing of the Plan

Implementation of best solutions is the collective effort of all identified responsible agencies, civil society organizations, donor partners **and** district and village communities themselves. Funding will be sourced through several mechanisms recognizing the Government of Samoa's programmatic approach to tackling climate change impacts on its development progress. While every effort has been made to identify priority actions needed to build the resilience of Samoa and its communities, the Government also recognizes that not all actions identified can be financed at once. Implementation of best solutions will be undertaken strategically and over time in line with available funding and, **if** determined a priority CCA activity that will actually build the resilience of communities and Samoa as a whole. Criteria of determining priority CCA best solutions for financing are:

- proposed development is in general accordance with the objectives of the CIM Strategy 2015;
- development is specifically recommended in the CIM Plan
- number of people that will benefit from the development, i.e. population benefit
- development will provide *life sustaining* support for communities
- minimum or neutral environmental effects
- development will improve resilience
- development will achieve speedy recovery
- development will reduce risk
- also identified as a priority in other Sector Plans or National Strategies

During the development of the new CIM Plans, the World Bank funded Pilot Programme for Climate Resilience EnhancingClimateResilienceforCoastalResourcesandCommunities (PPCR ECR) prepared two (2) key documents:

- ➤ Community Engagement Plan(CEP)- the guidelines provided in the CEP is an excellent capacity building tool that can be used by CSO's and village communities themselves to aid development of small grant proposals to existing small grant funding mechanisms like CSSP and the UNDP-GEFSGP.
- ➤ **District Sub Project (DSP)** the guidelines provided in the DSP targets single districts or multi-district projects with a large number of beneficiaries.

Noting Samoa's programmatic approach to CC and CCA, these key documents are fundamental in guiding development partners, implementing agencies and other stakeholders on the most effective way of resourcing and supporting climate change adaptation projects at the village and district levels. These village and district level CCA projects actually achieve the majority of key indicators in various Sector Plans, subsequently achieving key national indicators contained in the *Strategy for the Development of Samoa* (SDS).

3. Description of Fa'asalele'aga 4 District

3.1 Physical and Natural Resource Setting

Fa'asalele'aga 4district is located at the north-eastern side of Savai'i between the districts of Fa'asalele'aga 3 and Gaga'emauga 1. The villages of Fa'asalele'aga 4 include; Asaga, Lano and Pu'apu'a. The entire district comprises of customary land and has a total of 5 access roads¹ whose current standards are ranked as very poor and are situated within the CEHZ and CFHZ. The mainNorth West Coast Roadin this district closely follows the coastline and provides access to services such as local schools, shops, tourist accommodation, as well as facilities in adjacent districts, such as the Malietoa Tanumafili II Hospital at Tuasivi. It is located almost entirely within the Coastal Erosion and Coastal Flooding Hazard zones but is a critical lifeline access infrastructure connecting this part of Savaii to the most western part of Savaii and as well to the East towards the Salelologa Wharf and Township area.

Along the coast of the Faasaleleaga districts, a series of rocky headlands have formed as the base rock meets the edge of the lagoon. The most prominent of these are at Salelavalu, Fatausi/Fogapoa, Tuasivi and Puapua (Reti, 2j016). There are a number of estuaries scattered within the Fa'asalele'aga4 district. These water outlets run vein like through the villages before entering the ocean. Although there are no major rivers in the district the estuaries can overrun due to heavy rain and cause flooding around the area. There is only one borehole situated further inland in the village of Pu'apu'a.

Land use in the Fa'asalele'aga 4 District is dominated by plantations whilst the other remaining lands are utilized for vegetable gardens, pig farms, cattle farms as well as poultry farms. There are also tourism facilities and accommodations within this district. Wetlands are situated along the coast of Lano and Asaga and due to its nature sit within the CFHZ and immediate fluvial hazard zones. These wetland areas currently protect coastal assets and reduce erosion around areas where the wetlands are situated, but have been threatened by human activities; clearance to make way for structures and homes, agricultural developments and rubbish dumping. Flooding of the wetland during heavy rain causes damage to the water pools and bridge on the main road at Pu'apu'a, and the situation is likely to continue or increase as the wetlands are coming under intense pressure from land clearing and village development. The wetlands at Lano village are also threatened by a hotel development that will see the filling or reclamation of the wetland for building construction. Poor design and construction of drainage along the main road from Salelologa to Puapua is contributing to the demise of many wetlands and mangrove vegetation in all Fa'asaleleaga districts.

Pu'apu'a is one of the rare villages within the Fa'asaleleaga districts where there is still coastal vegetation. The majority have little vegetation left due mainly to land filling and beach erosion. In addition sand mining occurs in Asaga near the bridge mouth, and in Lano and Pu'apu'a along the coast.

The lowland forest of Puapua has been seriously affected by commercial logging in the past years and efforts to revegetate the area have seen the introduction of exotic plantation tree species such as eucalyptus, *cordia* and *terminalia*, amongst others. These plantations have since been abandoned following devastation by cyclones Ofa and Val in the 1990s. These abandoned plantations could potentially be made economically viable again but may require significant investment to better manage and market the products (Reti, 2016).

The upland areas of Faasaleleaga 2, 3 and 4 all lead to the inland village of Tapuele'ele in Faasalele'aga 2. The health of these upland areas vulnerable to the impacts of activities of the Tapuele'ele community. Land clearing for agriculture development has encroached onto high grounds and the high rainfall often experienced in these upland areas can cause flash flooding which in turn affects access roadsto and from communities downhill.

3.2 Social and Economic Setting

Fa'asalele'aga 4 District currently has a population of 1,474²; Asaga269³, Lano695⁴, and Pu'apu'a 510⁵. Of the total 1,474, total male is773, female 701. The total number of households is 109. Developments are scattered across the inland and coastal areas of Fa'asalele'aga4.

¹Asaga Access Road (1), Lano Access Road (2) and Pu'apu'a Access Road (2)

²SBS Village Directory 2016-Census 2016 Preliminary Count

³ Female 143; Male 123

⁴ Female 328; Male 367

⁵ Female 227; Male 283

Primary services such as water and power generally follow the main road and are available for most of the families along the coast while the access to families inland is sporadic. From the main road, work roads to the village plantations extend inland. They are generally unsealed except where they provide access to a school. Electricity is absent along these roads however they run up the Lano work road to serve the water reservoir further inland. The pump stations serve all 3 villages with water. Overall, 217 families have metered water with a few who have water tanks as water supply sources. Only a small number of families have no running water.

The nearest hospital⁶ is located at Tuasivi. The district supports a number of primary schools. The closest secondary school is Saipipi College located in the Fa'asalele'aga III district. Each village has a Government type Primary School⁷ with the Lano Primary School approved as aevacuation shelter. The majority of the district population uses mobile phones the population of phone users is divided disproportionately between two mobile servers⁸.

There is one culturally important heritage site located in this district at Lesolo Point in Pu'apu'awhich is associated with good fishing. Approximately 120 acres of land in Pu'apu'a have been leased to the Samoan Government for a potential hotel development initiative.

The cash economy of Fa'asalele'aga IV is dominated by traditional work including subsistence farming and with some cattle farming inland. More reliance is placed on fishing as opposed to plantation work due to the limited top soil over lava rock. Some inland clearance is occurring for plantations in Pu'apu'aandLano. Non-traditional work is associated with tourism including the operation of tourist fales in Lano. There is a desire to develop tourism further in Pu'apu'aandAsaga.

The average income that an individual in Fa'asalele'aga receives a week equals to \$34.06 with a surplus income of \$7.36. Fa'asalele'aga4 has the third highest percentage of their income sourced from Salaries with 31.9%. They are also ranked as the third highest for income sources from Business Activities with 10.25%.

3.3 Climate Risk and Resilience

The use of LiDar mapping data, hydrologist and geomorphologist data and findings for this district has helped determine inland and coastal hazard zones and high risk areas for Fa'asalele'aga4. The immediate risks for some areas of Fa'asalele'aga4 District are coastal erosionand fluvial hazards.

The district has a total area of 9,997 hectares. The area covering Tsunami shore exclusive zone is 59 hectares, which is 0.62% of the total area of the district. The district has about 383 buildings with 91 located within the Tsunami shore exclusive zone. Approximately 89 buildings are located both in Tsunami evacuation zone red and the Coastal Flood hazard zone. The area covered by the Tsunami evacuation zones and fluvial hazard zones 1,889 hectares, leaving about 81% of the district area safe from these hazards.

Houses that are built in a flood prone area need to ensure they are resilient to extreme events and must be raised above flood level. All village houses, churches, schools and tourist fales in Lano, Asaga and Pu'apu'a are within the CFHZ and CEHZ thus the majority of these buildings need to relocate as opportunities arise. If existing foundations must remain where they are it should be reinforced. Restriction must be placed on construction of new buildings in these coastal hazard zones or building foundations are to be above flood level hazard. Designing of appropriate drainage systems can lessen coastal inundation by allowing the free flow of rainwater runoff to stream outlets. The river channel ought to be maintained and cleared to avoid blockages and flooding and potential evacuation shelters need to be securely established away from Hazard Zones. Drainage is an ongoing problem thus regular drainage inspection programmes should be agreed toso that maintenance is undertaken frequently. Village by-laws need to be strengthened to align with government policies on development especially near and around water catchment areas and wetlands.

Fish do not have a proper passage for migration as wetlands are still affected by waste water and rubbish dumping inland. Septic waste disposal in Lano needs to be improved to reduce contamination of wetlands and pools during heavy rains and spread of water-borne diseases. Village houses located in CFHZ within Asaga are high enough though village gets flooded when neighboring village (Lano) river overruns its riverbanks. There is still rubbish and debris in

⁶MalietoaTanumafili II Hospital

⁷Lano Primary School; Asaga Primary School; Pu'apu'a Primary School

⁸Digicel and Bluesky

roads which exacerbates flooding and pooling in village lands and near houses. Encouraging villages to undertake regular cleaning around drainage and culverts can be a first minor step in minimizing coastal inundation. Crops and plantations are affected by African snails, myna birds and diseases.

Invasive species proliferate due to cows and pigs which roam freely inland and around houses. The majority of the waste is effluent from domestic animals. Villages need to fence domestic animals in areas away from storm water runoff, river mouth and village pool.

4. Fa'asalele'aga 4 District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Drainage	Upgrade drainage and	Improves	Use existing information	CIM Strategy 2015
systems require)	climate	for guidance but not	
maintenance	areas on main North-	resilience of	limited to:	TSP2014-2019 Goal 2
and upgrade in	West Coast Road	infrastructure	"Vulnerability Assessment of	KO 1
high risk areas	especially at junctions of	resilience and	the Samoa Road Network	
	hazard zones access	rate of	(2017)"; "Review of	Community Sector
	roads (Lano Access	response and	National Road Standards in	Plan
	Road, Lano School Road and Asaga Road)	recovery to natural hazards	Samoa (2016)"; "Samoa	
	exacerbating inland	and disasters	Code of Environmental	
	flooding and storm	and disasters	Practice (2007)"	
	water surges affecting	Minimises		
	infrastructure, village	national	Undertake a Cost Benefit	
	homes and other assets-	disaster	Analysis to weigh options	
	in accordance with	recovery	for funding	
	Vulnerability Assessment	expenditure on	Incorporate environmental	
	of the Samoa Road	damaged	and social safeguards	
	Network	properties,	concerns in the design and	
	recommendations	public and	undertake consultations	
		private assets	with affected communities	
	Implement national			
	standards for culverts		Apply for necessary	
	and drains to facilitate the overland flow of		permits as required by law	
	storm water and reduce		Heli hdd	
	flooding		Utilise hazard maps and	
	nooung		Geomorphologist Infrastructure Drainage	
	Implement regular		Database to inform designs	
	drainage inspection and		Database to inform designs	
	maintenance		Develop Integrated	
			Catchment Strategy and	
	Responsibility: LTA		Flood Management Plan for	
	/MWTI/MWCSD		Faasaleleaga 4 District	
	/Village/ Families			
Upgrade access/	Assess and upgrade	Improveinfrast	Undertake a Cost Benefit	CIM Strategy 2015
work roadsto	access roads (Lano	ructureresilien	Analysis to weigh options	ТСD2014 2010 С1 2
facilitate relocation of	School Road, Lano	ce and rate of	for funding	TSP2014-2019 Goal 2 KO 1
houses away	Access Road, Asaga Road and part of	recovery		KU I
from hazard	Pu'apu'a School Road)	Improve	Incorporate environmental	Community Sector
zones	to facilitate relocation	preparedness	and social safeguards	Plan
	inland	and readiness	concerns in the design and undertake consultations	
		response to	with affected communities	Vulnerability
	Implement regular	natural	with affected communities	Assessment of the
	drainage inspection and	disasters	Apply for necessary	Samoa Road Network
	maintenance		permits as required by law	(2016) and Road
		Reduce impact		Network Adaptation
	District to restrict	from coastal	Utilise hazard maps and	Strategy, LTA
	rubbish dumping into	erosion and	Geomorphologist	
	waterways and conduct	natural	Infrastructure Drainage	
	regular clearance of	disasters	Database to inform designs	

	rubbish behind homes District to regulate developments near and around road shoulders of all access roads Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent. Responsibility:LTA/MW TI/ MNRE/ District/	Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties and public assets		
Village assets, tourist facilities, schools, churches and government assets located in high risk hazard zones	Relocate outside of high risk hazard zones when building/infrastructure requires replacement Investments within the hazard zones to adopt appropriate mitigation measures. Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ Families and village to limit building and developing on natural overland flow paths exacerbating inland	Minimise expenditure on damaged properties & personal assets Mitigate potential damage from coastal erosion and flooding accommodating the hazard Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters Safer villages, houses and roads	Develop an Integrated Catchment and Flood Management Strategy for Faasaleleaga 4 District. MNRE to develop zonation strategy for safe areas Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs Enforcement of National Building Code 2017 Encourage insurance of significant investments and assets within hazard zones Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	National Building Code CIM Strategy 2015

	flooding and storm water surges			
	Where reclamations are			
	proposed, Government and district to manage			
	processes by requiring			
	villagers to get the			
	appropriate permits and			
	consent			
	 Responsibility: Village /			
	Families /MWTI/ MNRE			
Flood protection		Minimise	Conduct a full catchment	CIM Strategy 2015
measures for		expenditure on	management, drainage	O.
fords and	Upgrade all crossings	damaged	analysis and geotechnical	TSP2014-2019 Goal 2
bridges		properties &	engineering survey and	KO 1
	Upgrade or repair	personal assets	use its recommendations	
	riverine embankment	3.41.1	to inform location and	Draft NESP 2017-
	protection work	Mitigatepotenti	designs	2021
	upstream of all major rivers in district	aldamage from inland flooding	Implement Faasaleleaga 4	
	TIVELS III UISTITUT	imanu noouing	Integrated Catchment	
	Ensure river channel	Reduce	Strategy and Flood	
	upstream is cleared and	flooding of built		
	maintained regularly	up areas	conjunction with hazard	
			Maps and Geomorphologist	
	Construct levees to	Safer villages,	Drainage Infrastructure	
	reduce flooding along	houses and	Database to inform location	
	estuaries and coastal streams	roads	and designs	
	streams		Utilise environmental and	
	Encourage planting of		social safeguards including	
	indigenous species in		EIAs in screening and	
	conjunction with		designing infrastructure	
	engineered water land		facilities	
	drainage action plans		Include in budget	
	In tall a last and a		Include in budget programming CBA, design	
	Install advisory edge		and construction. Bridge	
	markers and depth markers to warn vehicle		and road designs to take	
	and pedestrians at all		account of forecast changes	
	crossings		in sea level rise and local	
			flooding from increased	
	Government and Villages		rainfall intensity	
	to liaise and collaborate		MNRE to zone hazard areas	
	on processes needed to		along major watercourses	
	protect riverbanks from		based on flood risk to	
	land clearing and developments		provide suitable areas for	
	acvelopinello		riparian vegetation	
	Responsibility: MWTI/			
	LTA/MNRE/ District/		Designation of the CEHZ and	
	Village		CFHZ as an "at risk" zone	
			with appropriate landuse	
			planning controls and	
			restrictions	

Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuation shelter assessment and mark on CIM Plan hazard maps Develop a Village Climate Disaster Management Plan (VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter Responsibility: MNRE /DMO/MWTI/Village /CSSP/Council of Churches/MWCSD	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan2017-2021 National Building Code National Policy for People with Disabilities
Electricity supply	Provide underground lines in the long term Install and connect power supply for inland residents Relocate overhead lines to a more resilient location when being replaced	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan

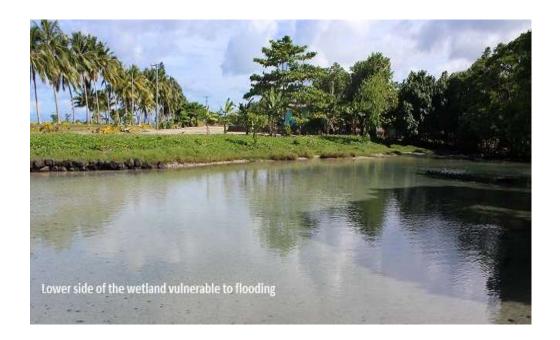
Reticulated water supply, quality and network to be improved	Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available Families to limit building and developments near electricity posts Responsibility:EPC/ MWTI/Village/ Families Extend the water supply to families inland with no access to water Procure rainwater harvesting rainwater harvesting rainwater harvesting systems for vulnerable families as a short term solution District and villages to support SWA water rationing programs during times of drought District to support SWA efforts at exploratory boreholes in district Responsibility: SWA /MNRE/ District /Villages/ CSSP	electricity posts Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply Reduce impact from inland flooding	Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016) 10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilize Hazard Maps and Geomorphologist findings to inform location and design Utilize Sui o Nu'u monthly meetings to monitor progress of village programs and responsibilities	
Natural	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
Resources and Environment			Implementation	Plans, National Strategies & Policies
Flood protection measures (soft solution to support hard infrastructural intervention)	Conduct riparian replanting along river channels and watercourses Encourage planting of indigenous species in conjunction with engineered water land	Mitigate potential damage from inland flooding Reduce flooding of built up areas	Implement Faasaleleaga 4 Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

	drainage action plans Responsibility: MNRE/ Villages	Safer villages, houses and roads	MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for	
District Upland Forest	Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland forest area Conduct campaign for public awareness and establish a "neighborhood watch" agreement with district to monitor and report on illegal deforestation District/village councils to help promote the development of the agroforestry sector by encouraging relevant land use practice and where possible resolve any associated land disputes Government, district and villages to monitor, report and apply penalty on offenders Responsibility:MNRE/ District/Village/CSSP	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	riparian re vegetation Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Develop a Forestry Conservation Programme/ Implementation Plan for Fa'asaleleaga 4 District Develop and register District/Village bylaws to include penalizing illegal deforestation in district lands Utilise Sui o Nu'u monthly meetings to monitor progress of district/villageforestry programmes	Forestry for Sustainable Development Policy NESP 2017-2021
Soft coastal protection measures needed for most vulnerable areas	Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and	Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast Reduce impact from coastal erosion and natural disasters Implements an Ecosystem Based Approach	Develop an integrated land management plan for Faasaleleaga 4 district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area MAF to assist in establishment of pilot sites to trial climate ready plant varieties MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020 Forestry Management Act 2011

Sand mining	Continue ban on sand	Mitigatonotonti	MNRE to continue to	Draft Soil Resource
sanu mining	mining	Mitigatepotenti aldamage	identify specific sites for	Management Bill
		fromcoastaleros	inshore/inland sustainable	u.u.gement Din
	Research on the impacts	ion and	sand/rock mining to meet	
	of sand mining	floodingaccom	demand without	
		modating the haz	compromising riverbanks	
	Village consultation on	ard	,	
	sand mining policy and	C C 111	Undertake assessments of	
	regulation	Safer villages, houses and	identified sites	
		roads	Undertake consultation	
	Responsibility: MNRE/	Toaus	with villages affected by	
	Village	Reduce impact	proposed sand/rock mining	
		from coastal	, ,	
		erosion	Develop and register	
			District bylaws to include	
			managing and monitoring	
			domestic sand/rock mining	
Wetland	Continue ban of	Maintains	of rivers Develop an integrated	NESP 2017-2021
restoration	destructive fishing	natural	land management plan	14LJ1 2U1/-2U21
and protection	practices including sand	ecosystem	with the aim of reducing	Community Sector
P	mining and introduce	connectivity	any unnecessary actions	Plan
	village ban on rubbish	-	that may adversely affect	
	dumping in wetland and	Reduce inland	the natural habitats and	
	coastal areas	& wetland	ecosystems of the area	
	Limit land alcourage and	flooding	MNDE Forestructo adviso	
	Limit land clearance and agricultural developments	Reduce	MNRE Forestry to advice on appropriate species,	
	around wetland areas	overland	depth and density of	
		flooding from	planting and provide	
	Fence domestic animals to	river channels	seedlings for different	
	reduce contamination in		vegetation types suitable to	
	wetlands		the habitats (coastal	
	Enfance Materials of		lowlands) and planting	
	Enforce Watershed Management Riparian		materials for village	
	Zone and regulate			
	developments around the			
	wetlands			
	Conduct regular			
	inspections of the swamp/wetland			
	vegetation to monitor			
	health of vegetation			
	Increase buffer distance			
	between wetland and sea			
	to reduce potential for			
	saltwater inundation			
	Responsibility: MNRE/			
	Village/MWCSD			
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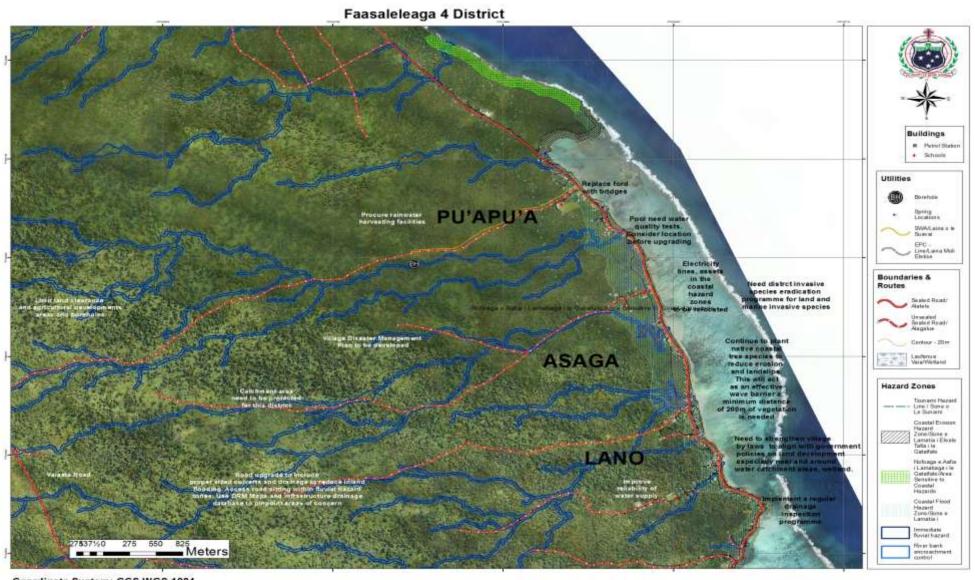
Livelihood and	Best Solutions	Benefits	Guideline to assist with	Relevant Sector Plans,
Food Security			the implementation	National Strategies &
				Policies
Pest .	Implement an	Maintains	Develop an integrated land	
management;	eradication programme	natural	management plan with the	Plan 2016-2021
invasive species	to eradicate, contain or	ecosystem	aim of reducing any	Draft NESP 2017-
	exclude invasive species	Builds	unnecessary actions that may adversely affect the	2021
	Replant with climate	resilience of	natural habitats and	2021
	resilient native species	community	ecosystems of the area	Samoa's National
	resment native species	livelihood and	0000,0001110 01 0110 01 00	Invasive Species
	Implement an inventory	food security	MAF to raise awareness of	Action Plan (NISAP)
	of invasive species and		farmers on impacts to water	
	include information on	Reduce forest	flows from poor livestock	
	their past, present and	loss and land	management	
	potential future	clearance		
	distribution, as well as		MAF to assist in	
	impacts and possible		establishment of pilot sites	
	actions that can be taken		to trial climate ready plant	
	Conduct education and		varieties	
	awareness programmes		MNRE Forestry, DEC and	
	on the impacts of invasive		MAF to collaborate on	
	species		supply of climate resilient	
	op seed		crops	
	Implement the Integrated		•	
	Pest Management		MNRE, MAF and SROS to	
	Programme		implement aggressive,	
			nationwide invasive	
	Implement Sustainable		species eradication	
	Land Management (SLM)		programme based on	
	practices		inventory of invasive species and conduct	
	Build the capacity of		campaign on public	
	farmers to manage stray		awareness accordingly	
	animals (pigs, cattle) that		awareness accordingly	
	are contaminating water		Village to manage	
	sources		pig/cattle population	
			(compounds, in particular	
	Conduct pilot site trials		around water supplies)	
	for climate ready plant			
	varieties		Training for farmers on	
	District to force domestic		pests management	
	District to fence domestic animals		particularly affecting fruit trees and crops	
	aiiiiiais		trees and crops	
	Responsibility: Villages			
	/District/ MNRE/MAF/			
	SROS			
Food security:	Promote and facilitate	Maintains	MAFtoprovidetrainings,	AgricultureSectorPlan
threatened by	planting of root crops	natural	awareness raising and	2016-2021
changes in	(i.eyams, sweet	ecosystem	support in supply of	C
climate and	potato) which are more	-	nursery trees, technology	Community Engagement Plan
inadequate soil	resilient to cyclones,	Builds	and infrastructure	Engagement Plan
for planting	droughts and floods	resilience of	MAF to provide trainings	Two Million Tree
	Promote agro-forestry	community	and awareness	Strategy 2015-2020
	and mixed planting	livelihood and	oncropdiversificationto	5614665y 2015-2020
<u> </u>	and mined planting		3.101 opairei sinicationito	1

	including fruit trees species to reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices Conduct pilot site trials for climate ready plant varieties Responsibility: MAF/ MNRE/villages/CSSP	food security Improve preparedness and readiness response to natural disasters	suit theprolongedimpacts of climatechange suchas droughtor rainyseasons MAF to assist in establishment of pilot sites to trial climate ready plant varieties Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	Restoration Operational Plan 2016- 2020
Governance	MNRE/villages/CSSP Best Solutions	Benefits	Guideline to assist with	Relevant Sector
dovernance	2654 50144.0115	Benefits	the implementation	Plans, National Strategies & Policies
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages Responsibility: MWCSD /Village	Strengthen implementatio n of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	Village Fono Act (Amendment Bill 2016) Community Sector





Fa'asaleleaga 4 District Map



Coordinate System: GCS WGS 1984

Datum: WGS 1984 Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

5. Pu'apu'a Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
min astructure	Dest Bolucions	Belletits	the implementation	Plans, National
			the implementation	Strategies & Policies
Village houses,	Relocate outside of high	Minimise	Develop an Integrated	National Building
school,	risk hazard zones when	expenditure on	Catchment and Flood	Code
churches,	building/infrastructure	damaged	Management Strategy for	douc
government and	S,	properties &	Faasaleleaga 4 District.	CIM Strategy 2015
other village	requires replacement	personal assets	MNRE to develop zonation	diri bulutegy 2015
assets in high	Investmentswithintheha	personal assets	strategy for safe areas	
risk hazard	zardzones to	Mitigate potential	strategy for safe areas	
zones	adoptappropriatemitiga	damage from	Utilise hazard maps and	
	tionmeasures	coastal erosion	Geomorphologist Drainage	
		and flooding	Infrastructure Database to	
	Conduct awareness	accommodating	inform designs	
	raising campaign on	the hazard		
	flood resilient building		Enforcement of National	
	practices and designs	Improve recovery	Building Code 2017	
	for at risk communities	to create more	8	
	living in and near high	resilient villages	Encourage insurance of	
	risk hazard zones		significant investments and	
		Improve	assets within hazard zones	
	Design infrastructure to	preparedness and		
	take into account the	readiness	Designation of the IFHZ,	
	immediate hazard	response to	CEHZ and CFHZ as an "at	
	zones; for example,	natural disasters	risk" zone with	
	raise floor levels of		appropriate landuse	
	houses in flood prone	Safer villages,	planning controls and	
	areas	houses and roads	restrictions	
	Develop landuse			
	planning and			
	development controls to			
	restrict developments			
	within high risk hazard			
	zones such as CEHZ and			
	CFHZ			
	Families and village to			
	limit building and			
	developing on natural			
	overland flow paths			
	exacerbating inland			
	flooding and storm			
	water surges			
	Where reclamations are			
	proposed, Government			
	and district to manage			
	processes by requiring			
	villagers to get the			
	appropriate permits and			
	consent			

	Responsibility: Village / Families /MWTI/ MNRE			
Upgrade access/work roads to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands	Pu'apu'a Road in accordance with	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties and public assets	Utilise Hazard maps and Geomorphologist Drainage Infrastructure Database Develop an Integrated Flood Management Plan for Lano. MNRE to develop zonation strategy for safe areas Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 Community Sector Plan Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
Flood protection measures for fords and bridges		Minimise expenditure on damaged properties & personal assets	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1
	protection work upstream of all major rivers in district Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along	Mitigatepotential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	designs Implement Faasaleleaga 4 Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location	Draft NESP 2017- 2021

estuaries and coastal streams Utilise environmental and social safeguards including EIAs in conjunction with engineered water land drainage action plans Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and developments and designs Utilise environmental and social safeguards including EIAs in screening and designing including EIAs in screening and designing infrastructure facilities Include in budget programming CBA, design and construction. Bridge and road designs to take account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian
Encourage planting of indigenous species in conjunction with engineered water land drainage action plans Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and develonments Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities Include in budget programming CBA, design and construction. Bridge and road designs to take account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
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Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and developments programming CBA, design and construction. Bridge and road designs to take account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
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markers to warn vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and road designs to take account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and developments account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
vehicle and pedestrians at all crossings Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and developments account of forecast changes in sea level rise and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
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Government and Villages to liaise and collaborate on processes needed to protect river banks from land clearing and developments and local flooding from increased rainfall intensity MNRE to zone hazard areas along major watercourses based on flood risk to provide
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collaborate on processes needed to protect river banks from land clearing and developments MNRE to zone hazard areas along major watercourses based on flood risk to provide
needed to protect river banks from land clearing and developments areas along major watercourses based on flood risk to provide
banks from land clearing and developments watercourses based on flood risk to provide
and developments flood risk to provide
and developments flood risk to provide
Responsibility: MWTI/ re vegetation
LTA/MNRE/ District/
Village Designation of the CEHZ
and CFHZ as an "at risk"
zone with appropriate
landuse planning controls
and restrictions
Evacuation Assess and/or select Improve resilience Enforcement of National Disaster
Shelter and a location for either an of public Building Code 2017 Management Pla
connected existing or new infrastructure 2017-2021
escape route evacuation shelter, Utilise hazard maps and National Building
INDEPORT OF THE INCIDING COLD OCCUSE TO THE PROPERTY TO THE PROPERTY OF THE PR
emergency routes to the shelter preparedness to inform location and Code
propared to the second
National Follows
i copie with
1/1540111055
mark on CIM Plan
hazard maps
Develop a Village
Climate Disaster
Management Plan
(VCDMP)
Conduct trainings for
People With Disabilities
(PWDs) on emergency
and disaster response
strategies
Implement
CDCRMprogram
Install relevant signs to
guide the community on

	T			, ,
	emergency response			
	procedures and to			
	locations of evacuation			
	shelters			
	TA71 1.1			
	Where no suitable			
	houses exist, build			
	emergency shelter(s)			
	outside the hazard zones			
	Retrofit identified and			
	approved schools or			
	churches outside			
	hazard zones and			
	designate as evacuation			
	shelter			
	Responsibility: MNRE			
	/DMO/ MWTI/Village			
	/CSSP/Council of			
	Churches/MWCSD			
Electricity	Provide	Maintain	Monitor distribution	EPC Strategic Plan
supply	undergroundlinesinthel	electricity supply	networks to avoid	
	ongterm	at all times	overloading poles and	
		including natural	contributing to line	
	Install and connect	disasters	failures	
	power supply for inland			
	residents	Avoid accidents		
	Relocateoverheadlinesto	from fallen		
	amoreresilientlocationw	electricity posts		
	hen being replaced			
	8 IF			
	Install streetlights along			
	the roads where needed			
	for community safety			
	Install and connect to			
	solar power supply if			
	made available			
	Families to limit			
	building and			
	developments near			
	electricity posts			
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
	Responsibility:EPC/			
	MWTI/ Village/			
	Families			
Natural	Best Solutions	Benefits	Guideline to assist with	Relevant Sector Plans
Resources and			Implementation	National Strategies &
Environment Effluent and	Introduce han an latrice	Increase	Htiliaa Waata Managamaat	Policies National Waste
Effluent and wastewater	Introduce ban on latrines established in and	Increase adaptation during	Utilise Waste Management Act/Legislation to guide	Management Strategy
management	around village pools and	extreme weather	process of effecting the	management strategy
systems	fluvial hazard zones	events	'polluter pays' principle	National Waste
3,0001113		3,01100	position pays principle	Management Policy
	Families in fluvial hazard	Improve	Review wastewater	
	zones to install proper	infrastructure	strategy/legislation to	NESP 2017-2021

	septic waste disposal systems Conduct campaign for	resilience and rate of recovery Improve health	include role of Village/District bylaws Update and register 1998	Pu'apu'a Village Bylaws
	public awareness of ban and establish a "neighbourhood watch"	and sanitation Reduce	Pu'apu'a Village bylaws to include regulating developments and latrines	
	agreement with district to monitor and manage introduced policies	contamination of water supply	around catchment areas and areas susceptible to flooding	
	Government, district and villages to monitor, report and apply penalty on offenders		Utilise Hazard maps and Geomorphologist findings for planning purposes	
	Responsibility:MNRE/ MWCSD/ District/Village		Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management	
Flood protection measures (soft solution to support hard	Conduct riparian replanting along river channels and watercourses	Mitigatepotential damage from inland flooding	Implement Faasaleleaga 4 Integrated Catchment Strategy and Flood Management Plan in	Two Million Tree Strategy 2015-2020 Restoration
infrastructural intervention)	Encourage planting of indigenous species in conjunction with engineered water land	Reduce flooding of built up areas Safer villages, houses and roads	conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs	Operational Plan 2016-2020
	drainage action plans Responsibility: MNRE/ Villages		MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian re vegetation	
Marine Protected Area and inshore	Village to restock marine reserve with suitable species	Protect coral reefs and inshore fisheries	MAF Fisheries to support implementation and provide technical	Agriculture Sector Plan 2016-2021
fishery resources	Collect and dispose of crown-of-thorns	Protect marine biodiversity	backstopping and monitoring	Community Engagement Plan
	(alamea) on a regular basis to prevent major outbreaks	Protects and enhance local species diversity	Develop Village Bylaws to include management of natural resources (spring pools, marine	
	Continue to ban the use of dynamites, herbal poisons (avaniukini), chemicals and other unsustainable fishing methods including sand mining and extraction	Sustains ecosystem services and functions	reserve, forest etc)	
	Enforce village bylaws on ban on rubbish dumping in coastal areas			

	Responsibility: Village/ MAF/ CSSP			
(coastal erosion and flooding from fluvial	Village pool is currently in a poor location with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works)	Increase adaptation during drought periods Improve health and sanitation Reduce contamination of water supply	Utilise Hazard Maps and Geomorphologist findings for planning purposes MNRE Water & Sanitation to conduct water testing and analysis of village pool prior to any intervention UpdateVillage bylaws to include managing and maintaining village natural resources	CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan
	Responsibility: CSSP/ NGOs/MNRE/Villages			
Livelihood and Food Security	Best Solutions	Benefits	the implementation	Relevant Sector Plans, National
	- ,			Strategies & Policies
Pest	Implement an	Maintains	Develop an integrated	Agriculture Sector
management;	eradication programme to eradicate, contain or	natural	land management plan with the aim of reducing	Plan 2016-2021
invasive species	exclude invasive species	ecosystem	any unnecessary actions	Draft NESP 2017-
	exclude invasive species	Builds resilience	that may adversely affect	2021
	Replant with climate	of community	the natural habitats and	2021
	resilient native species	livelihood and	ecosystems of the area	Samoa's National
	P	food security	,	Invasive Species
	Implement an inventory	J	MAF to raise awareness of	Action Plan (NISAP)
	of invasive species and	Reduce forest	farmers on impacts to	, ,
	include information on	loss and land	water flows from poor	
	their past, present and	clearance	livestock management	
	potential future			
	distribution, as well as		MAF to assist in	
	impacts and possible		establishment of pilot sites	
	actions that can be taken		to trial climate ready plant varieties	
	Conduct education and		varieties	
	awareness programmes		MNRE Forestry, DEC and	
	on the impacts of		MAF to collaborate on	
	invasive species		supply of climate resilient	
			crops	
	Implement the			
	Integrated Pest		MNRE, MAF and SROS to	
	Management Programme		implement aggressive,	
	Implement Coat - to - lel		nationwide invasive	
	Implement Sustainable		species eradication	
	Land Management (SLM) practices		programme based on inventory of invasive	
	practices		species and conduct	
	Build the capacity of		campaign on public	
	farmers to manage stray		awareness accordingly	
<u> </u>				

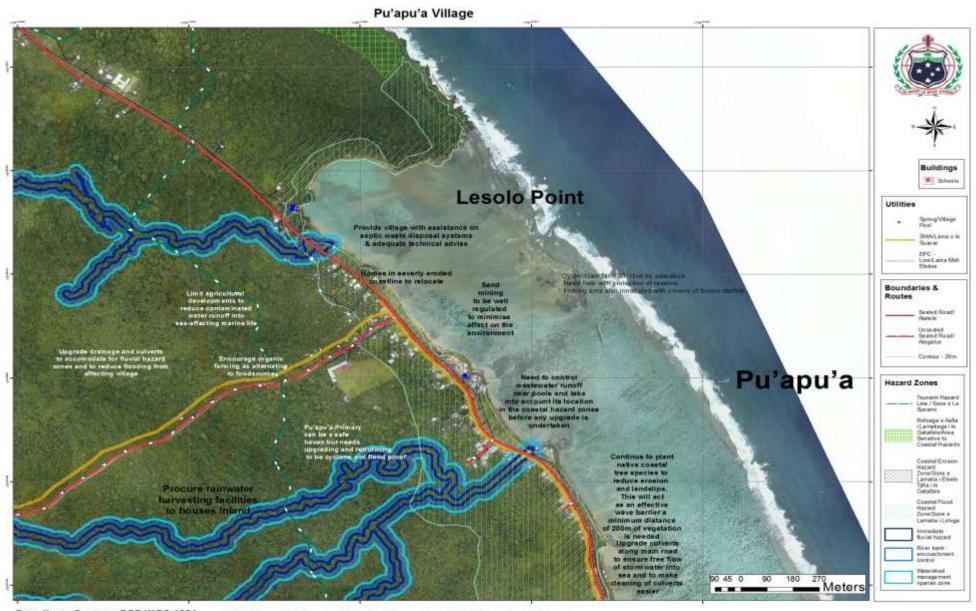
	. 16.	ı		T T
	animals (pigs, cattle) that are contaminating water sources Conduct pilot site trials for climate ready plant varieties District to fence domestic animals *Responsibility: Villages* /District/ MNRE/MAF/ SROS		Village to manage pig/cattle population (compounds, in particular around water supplies) Training for farmers on pests management particularly affecting fruit trees and crops	
Food security: threatened by changes in climate and inadequate soil for planting	Promote and facilitate planting of root crops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agro-forestry and mixed planting including fruit trees species to reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices Conduct pilot site trials for climate ready plant varieties Responsibility: MAF/MNRE/villages/CSSP	Maintains natural ecosystem Builds resilience of community livelihood and food security Improve preparedness and readiness response to natural disasters	MAF to provide trainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness on crop diversification to suit the prolonged impacts of climate change such as drought or rainy seasons MAF to assist in establishment of pilot sites to trial climate ready plant varieties Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	Agriculture Sector Plan2016-2021 Community Engagement Plan Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages Responsibility: MWCSD /Village	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021





Pu'apu'a Village Map



Coordinate System: GCS WGS 1984 Datum: WGS 1984

Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa
Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

6. Lano Village Interventions

CIM Plan Solutions

Infractructure	Best Solutions	Benefits	Guideline to assist with	Polovant National
Infrastructure	Dest Solutions	Denents	the implementation	Relevant National, Sector Plans and Strategies
*****	7.1	3.61	D 1 1 1	
Village houses,	Relocate outside of high	Minimise	Develop an Integrated	National Building
school, churches,	risk hazard zones when	expenditure on	Catchment and Flood	Code
government and	building/infrastructure	damaged	Management Strategy for	
other village	requires replacement	properties &	Faasaleleaga 4 District.	CIM Strategy 2015
assets in high		personal assets	MNRE to develop zonation	
risk hazard	Investments within the		strategy for safe areas	
zones	hazard zones to adopt	Mitigate		
	appropriate mitigation	potential	Utilise hazard maps and	
	measures	damage from	Geomorphologist Drainage	
		coastal erosion	Infrastructure Database to	
	Conduct awareness	and flooding	inform designs	
	raising campaign on	accommodating	3 - 3 - 3	
	flood resilient building	the hazard	Enforcement of National	
	practices and designs for		Building Code 2017	
	at risk communities	Improve		
	living in and near high	recovery to	Encourage insurance of	
	risk hazard zones	create more	significant investments and	
	113K Huzuru zones	resilient villages	assets within hazard zones	
	Design infrastructure to	resilient villages	assets within hazaru zones	
	take into account the	Improve	Designation of the IFHZ,	
	immediate hazard	preparedness	CEHZ and CFHZ as an "at	
		and readiness	risk" zone with	
	zones; for example, raise floor levels of houses in			
		response to natural disasters	appropriate landuse planning controls and	
	flood prone areas	ilaturai uisasters	restrictions	
	Davidon land was	Cafanyillagaa	restrictions	
	Develop land use	Safer villages,		
	planning and	houses and roads		
	development controls to			
	restrict developments			
	within high risk hazard			
	zones such as CEHZ and			
	CFHZ			
	Families and village to			
	limit building and			
	developing on natural			
	overland flow paths			
	exacerbating inland			
	flooding and storm water			
	surges			
	0			
	Where reclamations are			
	proposed, Government			
	and district to manage			
	processes by requiring			
	villagers to get the			
	appropriate permits and			
	consent			
	Responsibility: Village /			
	Families /MWTI/ MNRE			

Upgrade access/	Assess and upgrade	Improveinfrastr	Utilise Hazard maps and	CIM Strategy 2015
work roadsto	Lano Access Road and	uctureresilience	Geomorphologist	
facilitate the	Lano School Road ⁹ in	and rate of	Drainage Infrastructure	Community Sector
overland flow of	accordance with	recovery	Database	Plan
storm water	Vulnerability	т	Danalan an Internated	77 1 1 1114
exacerbating	Assessment of the	Improve	Develop an Integrated	Vulnerability
river overruns, and to reduce	Samoa Road Network recommendations	preparedness and readiness	Flood Management Plan for Lano. MNRE to develop	Assessment of the Samoa Road Network
flooding onto	recommendations	response to	zonation strategy for safe	(2016) and Road
main roads and	Implement regular	natural disasters	areas	Network Adaptation
village lands	drainage inspection and	naturai disasters	areas	Strategy, LTA
vinage ianas	maintenance	Reduce impact	Develop an integrated	эн ассуу, шти
		from coastal	land management plan	
	Village to regulate	erosion and	with the aim of reducing	
	developments near and	natural disasters	any unnecessary actions	
	around road shoulders of		that may adversely affect	
	all access roads	Safer villages,	the natural habitats and	
		houses and	ecosystems of the area	
	Enforce environmental	roads		
	safeguards where		Include in budget	
	reclamations are	Minimise	programming CBA, design	
	proposed. Government	national disaster	and construction	
	and district to manage	recovery	Designation of the CEHZ	
	processes by requiring	expenditure on	and CFHZ as an "at risk"	
	villagers to get the	damaged	zone with appropriate	
	appropriate permits and consent	properties and public assets	landuse planning controls	
	Consent	public assets	and restrictions	
	Responsibility:LTA/MW			
	TI/MNRE/ District/		Develop and register	
	Village /Families/		Village bylaws to include	
	MWCSD		maintenance of drainages	
			and illegal rubbish	
			dumping into waterways	
Flood protection	Upgrade waterways	Minimise	Conduct a full catchment	CIM Strategy 2015
measures for	, i	expenditure on	management, drainage	
fords and	Upgrade all crossings	damaged	analysis and geotechnical	NISP2011 KESO 5
bridges		properties &	engineering survey and	
	Upgrade or repair	personal assets	use its recommendations	TSP2014-2019 Goal 2
	riverine embankment		to inform location and	KO 1
	protection work	Mitigate	designs	
	upstream of all major	potential	_ , ,	Draft NESP 2017-
	rivers in district	damage from	Implement Faasaleleaga 4	2021
	Enguno virron abannol	inland flooding	Integrated Catchment	
	Ensure river channel upstream is cleared and	Poduco floodina	Strategy and Flood Management Plan in	
	maintained regularly	Reduce flooding of built up areas	conjunction with hazard	
	mamameu regulariy	or built up areas	Maps and Geomorphologist	
	Construct levees to	Safer villages,	Drainage Infrastructure	
	reduce flooding along	houses and roads		
		22.20 aa 1 0aab	and designs	
1	estuaries and coastai			
	estuaries and coastal streams		3	
			Utilise environmental and	
	streams		Utilise environmental and	

⁹Not in LTA RRM

				T
	approved schools or			
	churches outside hazard			
	zones and designate as			
	evacuation shelter			
	Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD			
Electricity	Provide underground	Maintain	Monitor distribution	EPC Strategic Plan
supply	lines in the long term	electricity supply at all	networks to avoid overloading poles and	Er o ou acegie i ian
	Install and connect power supply for inland residents	times including natural disasters	contributing to line failures	
	Relocate over headlines to a more resilient location when being replaced	Avoid accidents from fallen electricity posts		
	Install streetlights along the roads where needed for community safety			
	Install and connect to solar power supply if made available			
	Families to limit building and developments near electricity posts			
	Responsibility:EPC/ MWTI/Village/			
	Families			
Natural	Best Solutions	Benefits	Guideline to assist with	Relevant Sector Plans,
Resources and Environment	Dest solutions	Benefits	the Implementation	National Strategies & Policies
Village pool	Village pool is currently in	Increase	Utilise Hazard Maps and	CIM Strategy 2015
located in high	a poor state with an	adaptation	Geomorphologist findings	
risk hazard zones	assessment needed for	during drought	for planning purposes	Water and Sanitation
(coastal erosion	options to either	periods		Sector Plan
and flooding from	rejuvenate or find a new	-	MNRE Water &	
fluvial	site depending on the	Improve health	Sanitation to conduct	Community
inundation, wave	location of springs	and sanitation	water testing and	Engagement Plan
impacts and			analysis of village pool	
storm surges)	Test the quality of the	Reduce	prior to any intervention	
	water source before any	contamination of		
	further investment on the	water supply	Update Village bylaws to	
	pool is undertaken (eg:		include managing and	
	fence/repair works)		maintaining village	
	Responsibility: CSSP/ NGOs/MNRE/Villages		natural resources	
Soft coastal	Plant native species along	Soft coastal	Develop an integrated	Two Million Tree
protection	coastal areas to	protection	land management plan for	Planting Strategy
measures	strengthen existing	measures will	Faasaleleaga 4 district	2015-2020

		, ,		
	ll and to reduce	support and	with the aim of reducing	
	ll erosion and	strengthen	any unnecessary actions	Restoration
	ips; Talie, Fetau,	existing and	that may adversely affect	Operational Plan
	ogatogo are known	new	the natural habitats and	2016-2020
	e greater resilience ural disasters and	infrastructure	ecosystems of the area	Eamachur
	ing climate	along the coast	MAF to assist in	Forestry Management Act
condit		Reduce impact	establishment of pilot sites	2011
Condit	.10113	from coastal	to trial climate ready plant	2011
To act	as an effective	erosion and	varieties	
wave	barrier, a minimum	natural disasters	Varioties	
distan	ce of 200m of		MNRE Forestry, DEC and	
vegeta	ntion is needed	Implements an	MAF to collaborate on	
		Ecosystem Based	supply of climate resilient	
I =	nsibility: MNRE/	Approach	crops	
	<i>lillages</i> ıct riparian	Mitigatanatantia	Implement Faasaleleaga 2	Two Million Tree
•	ict riparian iting along river	Mitigatepotentia ldamage from	Integrated Catchment	Strategy 2015-2020
	els and	inland flooding	Strategy and Flood	3trategy 2013-2020
	courses	miana nooding	Management Plan in	Restoration
infrastructural	courses	Reduce flooding	conjunction with hazard	Operational Plan
	rage planting of	of built up areas	Maps and Geomorphologist	2016-2020
,	nous species in		Drainage Infrastructure	
	nction with	Safer villages,	Database to inform location	
I	eered water land	houses and roads	and designs	
draina	ige action plans		_	
			MNRE to zone hazard	
_	nsibility: MNRE/		areas along major water	
Villag	es		courses based on flood risk	
			to provide suitable areas	
			for Replanting re	
Conditional Identition	C	Militar	vegetation	77:11 E A .
	fy alternative nable sources of	Mitigate	MNRE to continue to	Village Fono Act
		potential damage from coastal	identify specific sites for inshore/inland	(Amendment Bill
, , ,	rocks for domestic	erosion and	sustainable sand/rock	2016)
coastline, rivers use and riverbanks		flooding	mining to meet demand	Draft Soil Resource
	rch the impacts of	accommodating	without compromising	Management Bill
	nining	the hazard zones	riverbanks	O
Janua 1	8	and for safer	Tiver buillio	
Village	e consultation on	villages, houses	Undertake assessments of	
	nining policy and	and roads	identified sites	
regula	ntion			
		Reduce impact	Undertake consultation	
	e and government	from coastal	with villages affected by	
	aborate closely on	erosion	proposed sand/rock	
	nated areas for		mining	
sand/	rock mining	Economic	D 1 1 .	
		benefit for	Develop and register	
	awareness and	villagefrom	District bylaws to include	
	rt of sustainable	sustainable	managing and monitoring	
land u	se practices	sandminingacti vities	domestic sand/rock mining of rivers	
Respon	sibility: MNRE/	VILLES	mining of fivers	
Village			Hailing Cook o Novice and and his	
Fillage	/ rummes	l	Office 2010 Mil II monthly	l l
riiage	/rummes		Utilise Sui o Nu'u monthly meetings to monitor	
Inage	/rummes		meetings to monitor progress of CIM Plan	

Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
management; invasive species R R R R R C In O In O In O In In O In In D In In D In	mplement an eradication programme to eradicate, contain or exclude invasive species. Replant with climate resilient native species and include information on their past, present and totential future distribution, as well as impacts and possible actions that can be taken according to the impacts of invasive species. Implement the Integrated Pest Management Programme in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. In the impacts of invasive species in the impacts of invasive species. The impact is the impact of invasive species in the impact of invasive species. In the impact of invasive species in the invasive spe	Maintains natural ecosystem Builds resilience of community livelihood and food security Reduce forest loss and land clearance	Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area MAF to raise awareness of farmers on impacts to water flows from poor livestock management MAF to assist in establishment of pilot sites to trial climate ready plant varieties MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly Village to manage pig/cattle population (compounds, in particular around water supplies) Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021 Draft NESP 2017-2021 Samoa's National Invasive Species Action Plan (NISAP)

Governance	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages Responsibility: MWCSD/Village	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	affecting water catchment areas and coastline	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021





Lano Village Map



Coordinate System: GCS WGS 1984 Datum: WGS 1984

Units: Degree

Data Source: Ministry of Natural Resource and Environment, Samoa
Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

7. Asaga Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Drainage systems require maintenance and upgrade in high risk areasof main North West Coast Road especially at junctions Asaga Access Rd	Upgrade drainage and culverts in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding Implement regular drainage inspection and maintenance Responsibility: LTA /MWTI/MWCSD /Village / Families	Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters Minimises national disaster recovery expenditure on damaged properties, public and private assets	Use existing information for guidance but not limited to: "Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa Code of Environmental Practice (2007)" Undertake a Cost Benefit Analysis to weigh options for funding Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities Apply for necessary permits as required by law Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs Develop Integrated Catchment Strategy and Flood Management Plan for Faasaleleaga 4 District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
Village houses, Churches, tourist facilities and other village assets located in high risk hazard zones	Relocate outside of high risk hazard zones when building/infrastructure requires replacement Investments within the hazard zones to adopt appropriate mitigation measures	Minimise expenditure on damaged properties and personal assets Safer villages, houses and roads Increases	Planning provisions to be guided by the Planning and Urban Management Act 2004 Enforcement of National Building Code 2017 Encourage insurance of significant investments and	CIM Strategy 2015 National Building Code

	Conduct awareness	awareness for	assets within hazard zones	
	raising campaign on flood	insurance		
	resilient building		Utilise hazard maps and	
	practices and designs for		Geomorphologist Drainage	
	at risk communities		Infrastructure Database to	
	living in and near high		determine safe areas for	
	risk hazard zones		relocation purposes	
	Design infrastructure to		Designation of the IFHZ,	
	take into account the		CEHZ and CFHZ as an "at	
	immediate hazard zones;		risk" zone with	
	for example, raise floor		appropriate landuse	
	levels of houses in flood		planning controls and	
	prone areas		restrictions	
	Develop landuse planning			
	and development controls to restrict developments			
	within high risk hazard			
	zones such as CEHZ and			
	CFHZ			
	Families and village to			
	limit building and			
	developing on natural			
	overland flow paths			
	exacerbating inland			
	flooding and storm water			
	surges			
	Responsibility:Village			
	/ Families /MWTI/			
Harmada access	/ Families /MWTI/ MNRE/ MWCSD	I	Helico Hannel mann and	CIM Christians 2015
Upgrade access/	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade	Improve	Utilise Hazard maps and	CIM Strategy 2015
work roads to	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in	infrastructure	Geomorphologist Drainage	
work roads to facilitate	/ Families /MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with	infrastructure resilience and	Geomorphologist Drainage Infrastructure Database to	CIM Strategy 2015 NISP2011 KESO 5
work roads to facilitate relocation of	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment	infrastructure resilience and	Geomorphologist Drainage	NISP2011 KESO 5
work roads to facilitate	/ Families /MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with	infrastructure resilience and rate of recovery	Geomorphologist Drainage Infrastructure Database to	
work roads to facilitate relocation of houses away	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road	infrastructure resilience and	Geomorphologist Drainage Infrastructure Database to inform location and design	NISP2011 KESO 5 TSP2014-2019 Goal
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations	infrastructure resilience and rate of recovery Improve	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI / MNRE / MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage	infrastructure resilience and rate of recovery Improve preparedness and readiness response to	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage and culverts on main North	infrastructure resilience and rate of recovery Improve preparedness and readiness response to	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage and culverts on main North West Coast Road near	infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage and culverts on main North West Coast Road near wetland to facilitate free	infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan PUMA Act
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE/ MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage and culverts on main North West Coast Road near wetland to facilitate free flow of stream into sea and	infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
work roads to facilitate relocation of houses away from hazard	/ Families / MWTI/ MNRE / MWCSD Assess and upgrade Asaga Access Road in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Install adequate drainage and culverts on main North West Coast Road near wetland to facilitate free flow of stream into sea and reduce flooding into Asaga	infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and	Geomorphologist Drainage Infrastructure Database to inform location and design Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Include in budget	NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan PUMA Act LTA Act
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	Village to regulate developments near and around road shoulders of all access roads Village to fix damaged causeway further inland to maintain plantation road accessibility Enforce environmental safeguards where reclamations are	properties and public assets	include maintenance of drainages and illegal rubbish dumping into waterways	Engagement Plan Village Fono Act (Amendment Bill 2016) Asaga Village Bylaws
	proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent **Responsibility:LTA/MW**			
	TI/ MNRE/ District/ Village /Families/MWCSD			
Flood protection	Upgrade waterways	Minimise	Conduct a full catchment	CIM Strategy 2015
measures for fords and bridges	Upgrade all crossings	expenditure on damaged properties &	management, drainage analysis and geotechnical engineering survey and	NISP2011 KESO 5
	Upgrade or repair riverine embankment	personal assets	use its recommendations to inform location and	TSP2014-2019 Goal 2 KO 1
	protection work upstream of all major rivers in district	Mitigatepotentia ldamage from inland flooding	designs Implement Faasaleleaga 4	
		S	Integrated Catchment	
	Ensure river channel upstream is cleared and	Reduce flooding of built up areas	Strategy and Flood Management Plan in	
	maintained regularly	Safer villages,	conjunction with hazard Maps and Geomorphologist	
	Construct levees to reduce flooding along estuaries and coastal streams	houses and roads	Drainage Infrastructure Database to inform location and designs	
	Encourage planting of indigenous species in conjunction with engineered water land		Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities	
	drainage action plans Install advisory edge markers and depth		Include in budget programming CBA, design and construction	
	markers to warn vehicle and pedestrians at all crossings		MNRE to zone hazard areas along major watercourses based on flood risk to	
	Government and Villages to liaise and collaborate		provide suitable areas for riparian re vegetation	

Evacuation Shelter and a	on processes needed to protect riverbanks from land clearing and developments *Responsibility: MWTI/LTA/MNRE/District/Village* Assess and/or select location for either an	Improve resilience of	Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Enforcement of National Building Code 2017	National Disaster Management Plan
connected escape route needed for emergency preparedness and response	existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuation shelter assessment and mark on CIM Plan hazard maps Develop a Village Climate Disaster Management Plan (VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD	public infrastructure Improve preparedness and readiness response to natural disasters	Utilise hazard maps and Geomorphologist findings to inform location and designs	National Building Code National Policy for People with Disabilities

Electricity supply	Provide underground lines in the long term Install and connect power supply for inland residents Relocate over headlines to a more resilient location when being replaced Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
	Families to limit building and developments near electricity posts Responsibility:EPC/ MWTI/ Village/ Families			
Natural Resources and	BestSolutions	Benefits	the Implementation	Relevant Sector Plans National Strategies &
Environment		-		Policies
(coastal erosion and flooding from fluvial inundation, wave	Village pool is currently in a poor state with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs.	Increase adaptation during drought periods Improve health and sanitation	Utilise Hazard Maps and Geomorphologist findings for planning purposes MNRE Water & Sanitation to conduct water testing and analysis of village	CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan
impacts and storm surges)	Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works) Responsibility: CSSP/NGOs/MNRE/Villages	Reduce contamination of water supply	pool prior to any intervention Update Village bylaws to include managing and maintaining village natural resources Utilise Sui o Nu'u monthly meetings to monitor	Village Fono Act (Amendment Bill 2016)
	, ,	0.0	progress of village programmes and responsibilities	m will m
Soft coastal protection measures needed for most vulnerable areas		Soft coastal protection measures will support and strengthen	Develop an integrated land management plan for Faasaleleaga 4 district with the aim of reducing any unnecessary actions that	Two Million Tree Planting Strategy 2015-2020 Restoration
vuinerable areas	Togatogo are known to have greater resilience to natural disasters and	existing and new infrastructure	may adversely affect the natural habitats and ecosystems of the area	Operational Plan 2016-2020

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	changing climate conditions	along the coast	MAF to assist in	Forestry Management Act
	Conditions	Reduce impact	establishment of pilot sites	2011
	To act as an effective wave	from coastal	to trial climate ready plant	2011
	barrier, a minimum	erosion and	varieties	
	distance of 200m of	natural disasters	varieties	
	vegetation is needed	naturai disasters	MNRE Forestry, DEC and	
		Implements an	MAF to collaborate on	
	Responsibility: MNRE/	Ecosystem Based	supply of climate resilient	
	MAF/Villages	Approach	crops	
Flood protection	Conduct riparian	Mitigatepotentia	Implement Faasaleleaga 4	Two Million Tree
measures (soft	replanting along river	ldamage from	Integrated Catchment	Strategy 2015-2020
solution to	channels and	inland flooding	Strategy and Flood	5trategy 2015 2020
support hard	watercourses	mana nooding	Management Plan in	Restoration
infrastructural	Watercoarses	Reduce flooding	conjunction with hazard	Operational Plan
intervention)	Encourage planting of	of built up areas	Maps and Geomorphologist	2016-2020
inter venterony	indigenous species in	or built up areas	Drainage Infrastructure	2010 2020
	conjunction with	Safer villages,	Database to inform location	
	engineered water land	houses and roads		
	drainage action plans	111111111111111111111111111111111111111		
			MNRE to zone hazard areas	
	Responsibility: MNRE/		along major watercourses	
	Villages		based on flood risk to	
			provide suitable areas for	
			riparian re vegetation	
Sand/rock	Identify alternative	Mitigate	MNRE to continue to	Village Fono Act
extraction	sustainable sources of	potential damage		(Amendment Bill
(domestic):	sand/rocks for domestic	from coastal	inshore/inland sustainable	2016)
coastline, rivers	use	erosion and	sand/rock mining to meet	•
and riverbanks		flooding	demand without	Draft Soil Resource
	Research the impacts of	accommodating	compromising riverbanks	Management Bill
	sand mining	the hazard zones		
		for safer villages,	Undertake assessments of	
	Village consultation on	houses and roads	identified sites	
	sand mining policy and			
	regulation	Reduce impact	Undertake consultation	
		from coastal	with villages affected by	
	Village and government	erosion	proposed sand/rock mining	
	to collaborate closely on			
	designated areas for	Economic	Develop and register	
	sand/rock mining	benefit for	District bylaws to include	
		villagefrom	managing and monitoring	
	Raise awareness and	sustainable	domestic sand/rock mining	
	support of sustainable	sandminingacti	of rivers	
	land use practices	vities	India Carata	
	Responsibility: MNRE/		Utilise Sui o Nu'u monthly	
	Village/Families		meetings to monitor	
	mage/1 annines		progress of CIM Plan	
			activities	
Wetland	Continue ban of	Maintains	Develop an integrated	NESP 2017-2021
restoration	destructive fishing	natural	land management plan	
and protection	practices including sand	ecosystem	with the aim of reducing	Community Sector
_	mining and introduce	connectivity	any unnecessary actions	Plan
	village ban on rubbish		that may adversely affect	
	dumping in wetland and	Reduce inland &	the natural habitats and	
	coastal areas	wetland	ecosystems of the area	
		flooding		

	Limit land clearance and agricultural developments around wetland areas Fence domestic animals to reduce contamination in wetlands Enforce Watershed Management Riparian Zone and regulate developments around the wetlands Conduct regular inspections of the swamp/wetland vegetation to monitor health of vegetation Increase buffer distance between wetland and sea to reduce potential for saltwater inundation Responsibility: MNRE/Village/MWCSD	Reduce overland flooding from river channels	MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats (coastal lowlands) and planting materials for village	
Livelihood and Food Security	Best Solutions	Benefits	the implementation	Relevant Sector Plans, National Strategies & Policies
Pest management; invasive species	Implement an eradication programme to eradicate, contain or exclude invasive species Replant with climate resilient native species Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken Conduct education and awareness programmes on the impacts of invasive species Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM)	Maintains natural ecosystem Builds resilience of community livelihood and food security Reduce forest loss and land clearance	Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area MAF to raise awareness of farmers on impacts to water flows from poor livestock management MAF to assist in establishment of pilot sites to trial climate ready plant varieties MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on	Agriculture Sector Plan 2016-2021 Draft NESP 2017- 2021 Samoa's National Invasive Species Action Plan (NISAP)

Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term	Guideline to assist with the implementation Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	Relevant Sector Plans, National Strategies & Policies Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021
	practices Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources Conduct pilot site trials for climate ready plant varieties District to fence domestic animals Responsibility: Villages /District/ MNRE/MAF/		inventory of invasive species and conduct campaign on public awareness accordingly Village to manage pig/cattle population (compounds, in particular around water supplies) Training for farmers on pests management particularly affecting fruit trees and crops	

Non-CR issues raised during	Proposed Solution	Comments
consultations		
New school	Build new school outside of hazard zone	Indirectly related to CR issue but village should
Responsibility:	and identify as evacuation centre/safe	seek assistance from government/donor with
Village/EPC	haven	education as a key priority in portfolio





Asaga Village Map



Coordinate System: GCS WGS 1984

Datum: WGS 1984 Units: Degree Data Source: Ministry of Natural Resource and Environment, Samoa
Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

Savaii AF Districts Overview Map of Coastal Inundation Zone

