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).

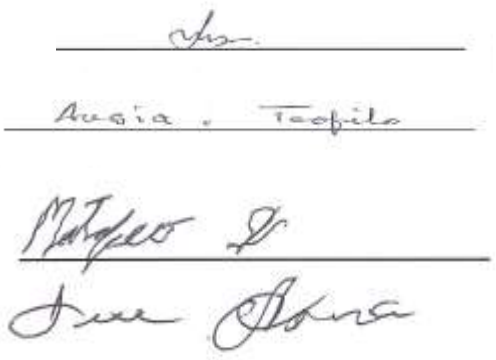
The village representatives participated in the preparation of this CIM Plan in partnership with the Government of Samoa.

Date of Signing: 15th June 2018

Representative:	**Signature:**
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	

Asaga Village

- Lualua Tautu Lualua
- 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
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
NISP	National Infrastructure Strategic Plan
NRW	Non- Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan

Glossary

Coastal Hazard Zones	Defined areas landward of the coast which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to four coastal hazard zones: ASCHs (areas sensitive to coastal hazards); CEHZs (coastal erosion hazard zones); CFHZs (coastal flood hazard zones) and CLHZs (coastal landslip hazard zones).
"Do Minimum"option	A Management option that involves continuing with the present maintenance and upgrading programme on and when required basis.
Emergency Management	To provide communities with skills, facilities and materials so that they may adapt, respond and recover more quickly in the event of emergencies.
Hazard	A source of potential harm or a situation with a potential to cause loss.
Infrastructure	Built structures and networks which support the national, regional or local community.
Lifeline infrastructure	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
Secondary infrastructure	Infrastructure that contributes to the every-day development of the community.
Implementation Guidelines	A document to guide land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defenses and works.
Issue	A specific concern regarding both cause and effect.
Land and Resource Use	The use of land and resources by the community for social, economic or other benefit (e.g. land use includes areas used for villages or crops, resource use includes activities such as sand mining, gravel extraction or fishing).
Monitoring	Process of measuring the effectiveness or impacts of projects and works against predicted standards, levels or outcomes.
Resilience	The ability to be adaptive, responsive and quick to recover.
Community Resilience	The ability for the community to be adaptive, responsive and quick to recover from the adverse effects of hazard.
Natural Resilience–	The ability of natural systems to be adaptive, responsive and quick to recover from natural processes or hazards.
Risk	The chance of something happening that will have an impact on objectives. It is measured in terms of consequence and likelihood. In the Community Integrated Management Plan context it is the likelihood that infrastructure, environment and biological resources and agricultural and marine resources (food security) will be subject to inland and coastal hazards and the potential for loss of property, life or land due to natural processes.
Stakeholders	Those people and organizations who may affect, be affected by, or perceive themselves to be affected by, a decision or activity. The term stakeholder may also include interested parties.
Strategy	Direction or course of action to achieve a define division.
Susceptibility	The degree to which infrastructure at risk is likely to be damaged by coastal hazards and how easy/difficult, expensive/cheap it is to replace. In the context of the CIM Plan the term susceptibility is equivalent to the term vulnerability as the Samoan phrase for both susceptibility and vulnerability is the same.
Vision	A desired destiny.

Livelihood	A livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).
Food access	Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).
Utilization	Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.
Stability	To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

1. Introduction to the CIM Plan

1.1 The Strategic Vision

The District 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, sociallyand 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 roads[1] 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 re-vegetate 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 areasis 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 1,474[2]; Asaga269[3], Lano695[4], and Pu'apu'a 510[5]. 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.

[1]Asaga Access Road (1), Lano Access Road (2) and Pu'apu'a Access Road (2)
[2]SBS 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 hospital[6] 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 School[7] 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 servers[8].

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

[6]MalietoaTanumafili II Hospital
[7]Lano Primary School; Asaga Primary School; Pu'apu'a Primary School
[8]Digicel 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 systems require maintenance and upgrade in high risk areas	Upgrade drainage and culverts in high risk areas on main North-West Coast Road especially at junctions of hazard zones access roads (Lano Access Road, Lano School Road and Asaga Road) exacerbating inland flooding and storm water surges affecting infrastructure, village homes and other assets- 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	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
Upgrade access/ work roadsto facilitate relocation of houses away from hazard zones	Assess and upgrade access roads (Lano School Road, Lano Access Road, Asaga Road and part of Pu'apu'a School Road) to facilitate relocation inland Implement regular drainage inspection and maintenance District to restrict rubbish dumping into waterways and conduct regular clearance of	Improveinfrastructureresilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters	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	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

	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/MWTI/ MNRE/ District/ Village/Families/MWCSD***	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 measures for fords and bridges	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of all major rivers in district Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along estuaries and coastal streams 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 riverbanks from land clearing and developments ***Responsibility: MWTI/ LTA/MNRE/ District/ Village***	Minimise expenditure on damaged properties & personal assets Mitigatepotentialdamage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs 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 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 suitable areas for riparian vegetation Designation of the CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Draft NESP 2017-2021

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

	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***	electricity posts		
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure 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***	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) 10year 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	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with Implementation**	**Relevant Sector 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 riparian re vegetation	
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	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 landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ MAF/Villages***	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 mining Research on the impacts of sand mining Village consultation on sand mining policy and regulation ***Responsibility: MNRE/ Village***	Mitigatepotentialdamage fromcoastalerosion and floodingaccommodatingthehazard Safer villages, houses and roads Reduce impact from coastal erosion	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers	Draft Soil Resource Management Bill
Wetland restoration and protection	Continue ban of destructive fishing practices including sand mining and introduce village ban on rubbish dumping in wetland and coastal areas 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***	Maintains natural ecosystem connectivity Reduce inland & wetland flooding Reduce overland flooding from river channels	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 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	NESP 2017-2021 Community Sector Plan

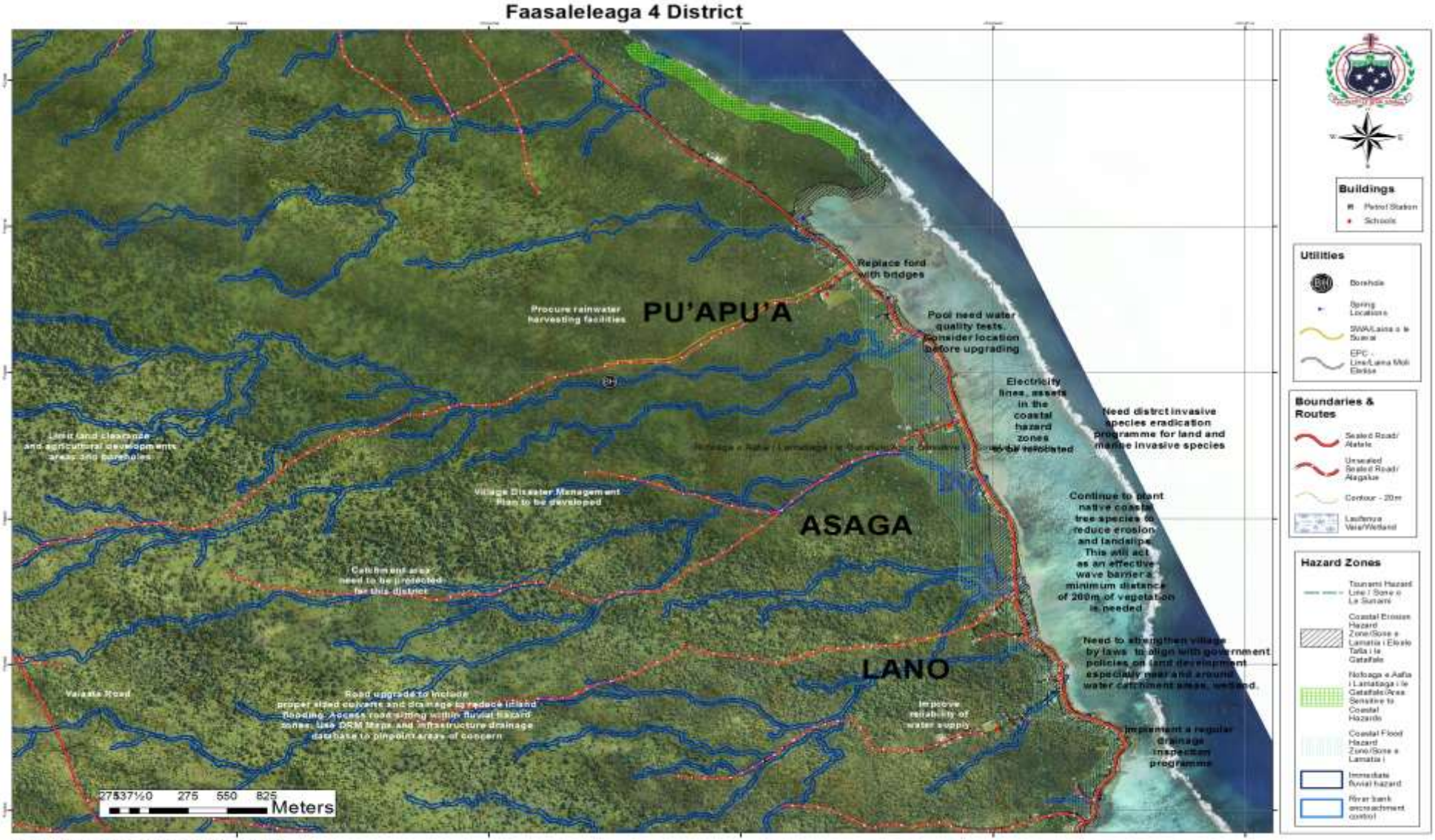
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Pest management; invasive species	Implement an eradication programme to eradicate, contain or exclude invasive species Replant with climate resilient 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) 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/ SROS***	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)
Food security: threatened by changes in climate and inadequate soil for planting	Promote and facilitate planting of root crops (i.eyams, sweet potato)which are more resilient to cyclones, droughts and floods Promote agro-forestry and mixed planting	Maintains natural ecosystem Builds resilience of community livelihood and	MAFtoprovidetrainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness oncropdiversificationto	AgricultureSectorPlan 2016-2021 Community Engagement Plan Two Million Tree Strategy 2015-2020

	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 theprolongedimpactsof 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	**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	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


Lower side of the wetland vulnerable to flooding


vulnerable household to erosion and flood hazards

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 the implementation	Relevant Sector Plans, National Strategies & Policies
Village houses, school, churches, government and other village assets in high risk hazard zones	Relocate outside of high risk hazard zones when building/infrastructure requires replacement Investmentswithintheha zardzones to adoptappropriatemitiga tionmeasures 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 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	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

	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	Assess and upgrade Pu'apu'a Road in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Implement regular drainage inspection and maintenance Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes Village 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/MWTI/MNRE/ District/ Village /Families/ MWCSD***	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	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of all major rivers in district Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along	Minimise expenditure on damaged properties & personal assets Mitigatepotential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs Implement Faasaleleaga 4 Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Draft NESP 2017-2021

	estuaries and coastal streams 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 developments ***Responsibility: MWTI/ LTA/MNRE/ District/ Village***		and designs 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 suitable areas for riparian re vegetation Designation of the CEHZ and 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	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 Plan 2017-2021 National Building Code National Policy for People with Disabilities

	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***			
Electricity supply	Provide undergroundlinesinthelongterm Install and connect power supply for inland residents Relocateoverheadlinestoamoreresilientlocationwhen being replaced 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***	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
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with Implementation**	**Relevant Sector Plans National Strategies & Policies**
Effluent and wastewater management systems	Introduce ban on latrines established in and around village pools and fluvial hazard zones Families in fluvial hazard zones to install proper	Increase adaptation during extreme weather events Improve infrastructure	Utilise Waste Management Act/Legislation to guide process of effecting the 'polluter pays' principle Review wastewater strategy/ legislation to	National Waste Management Strategy National Waste Management Policy NESP 2017-2021

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

	Responsibility: Village/ MAF/ CSSP			
Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)	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) ***Responsibility: CSSP/ NGOs/MNRE/Villages***	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
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with 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) practices Build the capacity of farmers to manage stray	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	Agriculture Sector Plan 2016-2021 Draft NESP 2017-2021 Samoa's National Invasive Species Action Plan (NISAP)

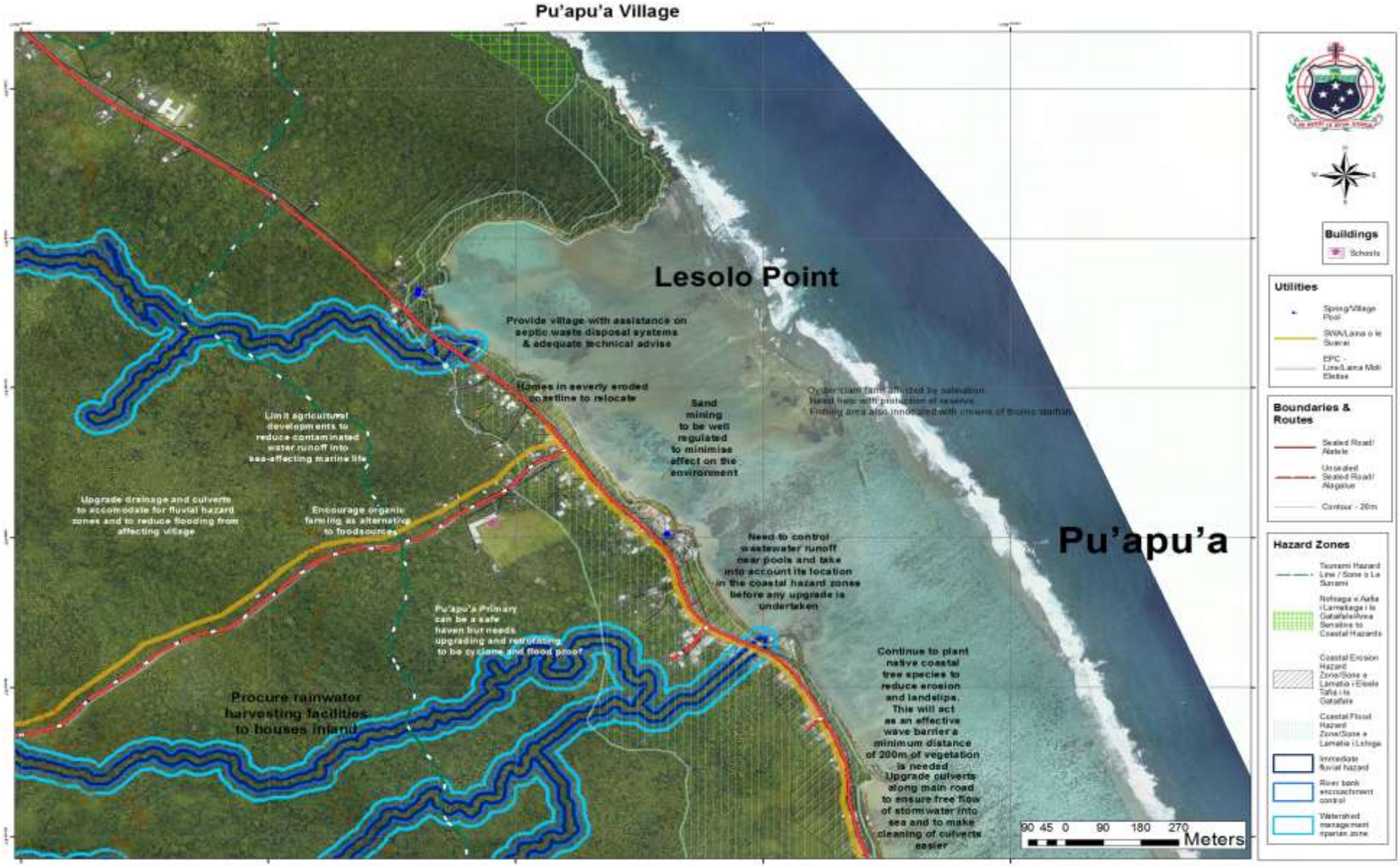
	animals (pigs, cattle) that are contaminating water sources Conduct pilot site trials for climate ready plant varieties District to fence domestic animals ***Responsibility: Villages /District/ MNRE/MAF/ SROS***		Village to manage pig/cattle population (compounds, in particular around water supplies) 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

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	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


Village marine protected area


Rockwall section eroded by wave process

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

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, school, churches, government and other village assets 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 land use 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***	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

Upgrade access/ work roadsto facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands	Assess and upgrade Lano Access Road and Lano School Road[9]in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Implement regular drainage inspection and maintenance Village 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/MWTI/MNRE/ District/ Village /Families/ MWCSD***	Improveinfrastructureresilience 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	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of all major rivers in district Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along estuaries and coastal streams Encourage planting of indigenous species in conjunction with	Minimise expenditure on damaged properties & personal assets Mitigate potential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs 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 Utilise environmental and social safeguards including EIAs in screening and designing	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Draft NESP 2017-2021

[9]Not in LTA RRM

	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 riverbanks from land clearing and developments ***Responsibility: MWTI/ LTA/MNRE/ District/ Village***		infrastructure facilities Include in budget programming CBA, design and construction MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian re vegetation Designation of the CEHZ and 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 aVillageClimateDisaster ManagementPlan(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	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

	approved schools or churches outside hazard zones and designate as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***			
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 Families to limit building and developments near electricity posts ***Responsibility:EPC/ MWTI/ Village/ Families***	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
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the Implementation**	**Relevant Sector Plans, National Strategies & Policies**
Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)	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 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***	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 Update Village bylaws to include managing and maintaining village natural resources	CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan
Soft coastal protection measures	Plant native species along coastal areas to strengthen existing	Soft coastal protection measures will	Develop an integrated land management plan for Faasaleleaga 4 district	Two Million Tree Planting Strategy 2015-2020

needed for most vulnerable areas	seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ MAF/Villages***	support and strengthen existing and new infrastructure along the coast Reduce impact from coastal erosion and natural disasters Implements an Ecosystem Based Approach	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	Restoration Operational Plan 2016-2020 Forestry Management Act 2011
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 drainage action plans ***Responsibility: MNRE/ Villages***	Mitigatepotentia ldamage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Implement Faasaleleaga 2 Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs MNRE to zone hazard areas along major water courses based on flood risk to provide suitable areas for Replanting re vegetation	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
Sand/rock extraction (domestic): coastline, rivers and riverbanks	Identify alternative sustainable sources of sand/rocks for domestic use Research the impacts of sand mining Village consultation on sand mining policy and regulation Village and government to collaborate closely on designated areas for sand/rock mining Raise awareness and support of sustainable land use practices ***Responsibility: MNRE/ Village/Families***	Mitigate potential damage from coastal erosion and flooding accommodating the hazard zones and for safer villages, houses and roads Reduce impact from coastal erosion Economic benefit for villagefrom sustainable sandminingacti vities	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers Utilise Sui o Nu'u monthly meetings to monitor progress of CIM Plan activities	Village Fono Act (Amendment Bill 2016) Draft Soil Resource Management Bill

Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with 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) 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/ SROS***	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	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


Sand field as a result of deposition process


Eroded concrete ford access to village farm lands

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 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 flooding and storm water surges ***Responsibility:Village / Families /MWTI/ MNRE/ MWCSD***	awareness for insurance	assets within hazard zones Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	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 Primary School grounds Implement regular drainage inspection and maintenance Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes	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	Utilise Hazard maps 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 programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Update and register Asaga 1998 Village bylaws to	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan PUMA Act LTA Act Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA NESP 2017-2021 Community

	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 proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility:LTA/MWTI/ MNRE/ District/ Village /Families/MWCSD***	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
Flood protection measures for fords and bridges	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of all major rivers in district Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along estuaries and coastal streams 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	Minimise expenditure on damaged properties & personal assets Mitigatepotentialdamage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs 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 Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities Include in budget programming CBA, design and construction MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian re vegetation	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1

	on processes needed to protect riverbanks from land clearing and developments ***Responsibility: MWTI/ LTA/MNRE/ District/ Village***		Designation of the CEHZ and 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 Plan 2017-2021 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 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 Families to limit building and developments near electricity posts ***Responsibility:EPC/ MWTI/ Village/ Families***	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
Natural Resources and Environment	**BestSolutions**	**Benefits**	**Guideline to assist with the Implementation**	**Relevant Sector Plans National Strategies & Policies**
Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)	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. 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***	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 Update Village bylaws to include managing and maintaining village natural resources Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities	CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan Village Fono Act (Amendment Bill 2016)
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 landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and	Soft coastal protection measures will support and strengthen existing and new infrastructure	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	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

	changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ MAF/Villages***	along the coast Reduce impact from coastal erosion and natural disasters Implements an Ecosystem Based Approach	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	Forestry Management Act 2011
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 drainage action plans ***Responsibility: MNRE/ Villages***	Mitigatepotentia ldamage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	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 MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian re vegetation	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
Sand/rock extraction (domestic): coastline, rivers and riverbanks	Identify alternative sustainable sources of sand/rocks for domestic use Research the impacts of sand mining Village consultation on sand mining policy and regulation Village and government to collaborate closely on designated areas for sand/rock mining Raise awareness and support of sustainable land use practices ***Responsibility: MNRE/ Village/Families***	Mitigate potential damage from coastal erosion and flooding accommodating the hazard zones for safer villages, houses and roads Reduce impact from coastal erosion Economic benefit for villagefrom sustainable sandminingacti vities	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers Utilise Sui o Nu'u monthly meetings to monitor progress of CIM Plan activities	Village Fono Act (Amendment Bill 2016) Draft Soil Resource Management Bill
Wetland restoration and protection	Continue ban of destructive fishing practices including sand mining and introduce village ban on rubbish dumping in wetland and coastal areas	Maintains natural ecosystem connectivity Reduce inland & wetland flooding	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	NESP 2017-2021 Community Sector Plan

	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**	**Guideline to assist with 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)

	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/ SROS***		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	
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	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

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


Protection rock wall collapse


rubbish dump by the cross road culvert

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