Community Integrated Management Plan

Fa’asaleleaga 2 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.

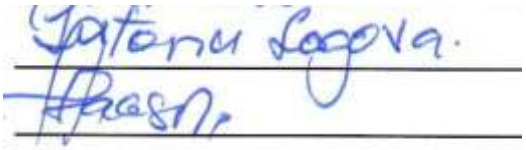
This Plan incorporates the Faipule District of Fa'asalele'aga 2 (Tapueleele, Sapapalii, Eveeve/Vaimaga, Fusi-Fuifatu/Safotulafai, Fatausi, Fogapoa/Tuasivi villages).

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

Date of Signing: 15 June 2018

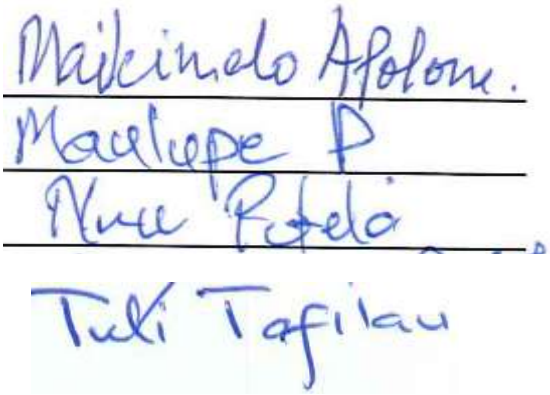
Representatives	Signatures
Tapueleele Village	
• Manua Urale Finai	
• Vaimoa Lene Finai	
• Iakopo Tuaaopepe	
• Siatu Tuaaopepe	
Sapapali'i Village	
• Foluena Foeituese Mapu	
• Puefua Sale	
• Salaa Elisara	
• Vitoria Salima	
• Mauafu Taveli	
Eveeve/Vaimaga Village	
• Oloapu Faasolo	
• Ili Ili Lopeta	
• Folemaa Okesene	

- Tutonu Logo
- Selepa Oloapu



Fusi/Fuifatu/Safotulafai Village(s)

- Mailei Malo Apolone
- Maulupe Peti
- Nuu Petelo
- Tuli Tofilau

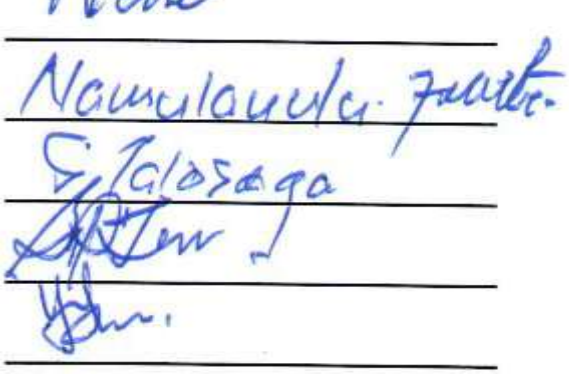


Fatausi Village

- Tuilagi Vaefaga
- Oloipola Vasa
- Sally Lupe
- Oloipola Sefo
- Senerita Kolose

Fogapoa/Tuasivi Village

- Namulauulu Uene
- Namulauulu Fereti
- Seigafo Talosaga
- Su Pa'i Tonise
- Fesilafai Su Atonio



The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Fa'asalele'aga 2 as a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

The Ministry of Natural Resources and Environment, as lead organization of Government, on behalf of the participating Government 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
CC	Climate Change
CCA	Climate Change Adaptation
CDCRM	Community Disaster & Climate Risk Management
CEP	Community Engagement Plan
CHZ	Coastal Hazard Zone
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flooding Hazard Zone
CIM	Community Integrated Management (Plan) or (Strategy)
CLHZ	Coastal Landslip Hazard Zone
COEP	Code of Environmental Practice
CSO	Civil Society Organization
CSSP	Civil Society Support Programme
DSP	District Sub Project
EbA	Ecosystem based Adaptation
ECCCR	Enhancing Coastal Community Climate Resilience
ECR	Enhancing Climate Resilience
EMP	Environmental Management Plan
EPC	Electric Power Corporation
ERN	Emergency Radio Network
HCSI	High Coastal Sensitive Index
IAS	Invasive Alien Species
IG	Implementation Guideline
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Programme
NBSAP	National Biodiversity Action Plan
NDMP	National Disaster Management Plan
NESP	National Environment Sector Plan
NISP	National Infrastructure Strategic Plan
NRW	Non Revenue Water
PA - KO	Priority Area - Key Outcome
PUMA	Planning Urban Management Agency
PPCR	Pilot Programme Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Programme Global Environment Facility Small Grants Programme
WB	World Bank
WCR	West Coast Road
WMP	Watershed Management Plan
WSSP	Water Sanitation Sector Plan

Glossary

"Coastal Hazard Zones	Defined areas landward of the coast which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to four coastal hazard zones: ASCHs (areas sensitive to coastal hazards); CEHZs (coastal erosion hazard zones); CFHZs (coastal flood hazard zones) and CLHZs (coastal landslip hazard zones).
"Do Minimum"option	A Management option that involves continuing with the present maintenance and upgrading programme on and when required basis.
Emergency Management	To provide communities with skills, facilities and materials so that they may adapt, respond and recover more quickly in the event of emergencies.
Hazard	A source of potential harm or a situation with a potential to cause loss.
Infrastructure	Built structures and networks which support the national, regional or local community.
Lifeline infrastructure	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
Secondary infrastructure community.	Infrastructure that contributes to the every-day development of the
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 2 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 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 the proposed 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-GEF SGP.

- **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 2 District

3.1 Physical and Natural Resource Setting

Fa'asaleleaga 2 District is located on the eastern edge of Savaii about 10km north from the wharf at Salelologa. Along the coast of the Fa'asaleleaga 2 District, a series of rocky headlands have formed as the base rock meets the edge of the lagoon (Reti, 2016). The Fa'asaleleaga 2 villages of Sapapalii, Fusi-Fuifatu /Safotulafai, Eve'eve/Vaimaga, Fatausi and Fogapoa/Tuasivi are located alongside the coastline with no distinct geographical boundaries. Only the village of Tapuele'ele is isolated and located about 10km inland. The underlying base of the district is very porous volcanic or basaltic rock allowing free draining to the extent that river and stream valleys run dry much of the year. However, flash floods occasionally occur, flooding certain areas along the main road at least twice a year (Reti, 2016). The District of Fa'asaleleaga 2 is characterised by broad plains sloping down to the coast from steep inland mountains. The main mountains in this area are volcanic cones including Mt. Misimala, Mt. Vaiala, Mt. Vaiolo, Mt. Afutina and Mt. Masa. There is little sand along the shoreline of Fa'asaleleaga2 district, with most shore areas composed of fragmented rock remnants presenting a hard coast eroding at an average rate of 0 – 0.2 m per year. The water in the lagoons is at most times murky due mainly to heavy sedimentation during rainy seasons. In some villages of Fa'asaleleaga 2, green algaeare evident along the shoreline indicating high nutrient and sedimentation from inland activities in these areas. The coastal plateau is low lying and hence is sensitive to tidal surge and water drainage issues. The tidal surges may impact coral reefs by exposing some live corals to direct sunlight.

The Vai'a'ata Landfill is located further inland of this district and sits within the fluvial hazard zone, making the neighbouring villages vulnerable to potential leachate and contamination of water supply. There is also evidence of illegal rubbish dumping in riverbanks which connect to the nearby Vaitolo Stream. The district of Fa'asaleleaga 2 has six access roads[1] and form part of Samoa's national road network with Fatausi Road connected to the main North West Coast Road and the rest connected to the main South East Coast Road. These roads are within the LTA Zone 2 and 3 Routine Road Maintenance[2]programme. There are several fords in this district including the main one at Sapapali'i which is considered a major national infrastructure, as not only is it part of the national road network, it is also a major connectivity and lifeline accessinfrastructure that connects the residents from the Northern and Western parts of Savaii to the Eastern partwhich contains the Salelologa Wharf and Salelologa Township. Vai'aata although not considered a village of Fa'asaleleaga 2, is a critical part of the infrastructure within this district as it is the inland alternate route for Savaii if the East Coast Road were cut off due to coastal erosion, flooding or during an extreme event.

At Fa'asaleleaga 2, cattle farming dominate the upland areas and these are often in close proximity of catchment areas, boreholes, rivers and waterways. Few large trees are left (mainly as shade for cattle) scattered within the grazed paddocks providing an indication of the original species found in these areas. They include ifi (*Inocarpusfagifer), aoa (Ficusobliqua),* asitoa (*Syzygiuminolhylloides)* and magaui (*Garuga floribunda).* Secondary forest species comprise mainly of fuafua (*Kleinhoviahospita)*, pulumamoe (*Castillaelastica)*, puluvao (*Funtumiaelastica*), mosooi (*Canangaodorata),* and laupata (*Macarangaharveyanna).* In some areas of Fa'asaleleaga 2, the *faapasi* has dominated all other vegetation types and have formed homogenous stands in previously cultivated plots of land (Reti, 2016).

The ecosystem of the district is under intense pressure from human activities especially in the upland areas.The upland areas of Fa'asaleleaga 2, 3 and 4 all lead to the inland village of Tapuele'ele in Fa'asaleleaga 2. The health of these upland areas is vulnerable to the impacts of activities of the Tapueleele 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 roads to and from communities downhill.There is also the danger of contaminants travelling through these flooded rivers onto neighbouring lands and districts. The lowland areas of Fa'asaleleaga2 are highly disturbed and in many cases have been transformed into a mix of coconut and taro plantations. Taro under coconut plantations appear to be the common practice used on flat and moderately sloped lands and cattle grazing near rivers and streams pose threat to coastal areas and lagoons (Reti, 2016).

[1]Fatausi Road, Sapapali'i Road, Tapueleele Road, Vai'aata Road, Vaiola College Road and Quarry Road
[2]Source: LTA Samoa Infrastructure Asset Management Database

Livelihood is predominately mixed plantations crops on higher slopes away from the coastal fringe. Houses are concentrated along the coastal areas. The areas just back from the coastal fringe support household gardens and small livestock but are subject to flooding as a result of poor drainage.The agricultural ecosystem is made up of mainly wet climate including small areas with moderate dry season on the coastal fringe. This leads into gently sloping rolling landscape without deep gorges. The inland section is a landscape dominated by broad sloping ridges separated by deep gorges. The mountain landscape areas to the inland region of the district support forests with a range of volcanic deposits (Dews, 2016).

3.2 Social and Economic Setting

The Fa'asaleleaga 2 District currently has a population of 2,670; Tapueleele 302, Sapapalii 896, Eveeve/Vaimaga 514, Fusi-Fuifatu/Safotulafai 251, Fatausi 205 and Fogapoa/Tuasivi 502. Of the total 2,670; total male 1,389 and female 1,281[3]. Development is mostly scattered along or near the South East Coast Road. The four schools located in Fa'asaleleaga 2 district include Sapapali'I Primary School, St. Theresa Primary School, Safotulafai Primary School and Vaiola College.

The catchment areas services 3 SWA boreholes in this district which services Fa'asaleleaga 2 as well as neighbouring districts of Faasaleleaga 3 and 4. Water supply is mainly from SWA pipelines however, there are also freshwaterpoolsfound inallvillages. These pools that are important as they can act as backup water supply during extreme events but the two easily accessible pools at Eve'eve/Vaimaga and Sapapali'i are on the coast and are at high risk of impact from coastal hazards. Fatausi's fresh water pool is also near the coast and is currently being repaired and strengthened to improve resilience. The Malietoa Tanumafili II Hospital is located in this district and sits within the Coastal Flooding Hazard Zone (CFHZ) in Tuasivi. While there are other hospitals located around Savaii, the Malietoa Tanumafili II Hospital is generally known as the 'major' hospital in Savaii with similar services to that of the main national hospital at Moto'otua in Upolu, and is therefore a critical infrastructure providing essential services to the whole of Savaii.

The district has requested the assistance of EPC to install streetlights at access roads especially in areas where there is a vast distance between houses. Streetlights are not a climate change adaptation priority but it can come in useful during extreme events and villages need to evacuate further inland during night time. There is concern on the low clearance of high voltage power lines on the main road and access roads. During extreme events, this would be extremely dangerous for the residents as well as the traveling public. The access roads are generally outside of the coastal hazard zones however, overflow from blocked or non-existent drains is adding to flooding at lower areas (near main road & coast). Overflows and storm water runoff is exacerbated by people cutting down trees/forests further inland. The culverts and drainage should be improved on the village roads to remove ponding water and storm water runoff from the road and its surroundings during heavy downpour (Tokalauvere, 2017).

The nearshore area appears to be impacted from increased nutrients from untreated household waste entering the lagoon from all the shoreline communities. Cattle grazing are an important land-use with cattle farms utilizing most of the cool sloping plains on both sides of the Vaia'ata Road. However, these agricultural developments put the water supply at risk of contaminants. The District is home to a large number of churches with the Sapapali'i Congregation Christian Church of national historical significance. There are also employment opportunities at the local tourist facility; Le Rosalote Guest Fales, local shops, the Tuasivi Hospital as well as at nearby tourist facilities, businesses, schools and government departments at the neighbouring Fa'asaleleaga 1, 3 and 4 districts.

Fa'asaleleaga 2 district is ranked 2nd in terms of the highest weekly income per person when averaged. The average income per person per week is $51,88. But Fa'asaleleaga 2 is also the 2nd highest ranked with the number of families without access to electricity. This is out of 12 districts surveyed in Savaii[4]

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'asaleleaga 2. There are 214 buildings

[3]SBS Village Directory Census 2016 preliminary count
[4]Community Disaster & Climate Risk Management household survey: final report

located in the Tsunami shore exclusion zone (red zone) and relocation should be considered. The Malietoa Tanumafili II Hospital at Tuasivi and the Secondary School are two of the most high risk buildings that need to be relocated away from the red zone.

Fa'asaleleaga 2 district has a total area of 4, 992 hectares. The Tsunami shore exclusion zone covers about 32 hectares of the total district area. The watershed management riparian buffer covers 778 hectares, leaving 4182 hectares in the "safe" zone. Therefore about **83%** of the total area of the district is safe from coastal inundation and fluvial hazards.The village of Tapuele'ele is unique for it is isolated and located about 10 km inland. Even though this village is not subjected to coastal hazards like the rest in the district, it however faces other issues that will make it more vulnerable during drastic climatic conditions (Tokalauvere, 2017).

The North Coast Road, from Fusi; the junction with Vaiaata Road, to the junction with the PatameaRoad (just south of the Mali'o'lio River) has been identified as being located in a coastal hazard area prone to sea level rise, storm surves and coastal erosion. Almost half of the length is at such risk, either MajorHazard or Medium Hazard. The length identified as a major hazard is very close to the coast and is barely above current sea levels. With a continuing rise in sea level much of the area will be inundatedwith sea water with seasonal high tides[5]. Storm surges and sea level rise may influence the productive capacity of the coastal households. Loss and or major alteration of upland forest areas will impact on the water flows and forest fires may become more common as temperatures increase and rain periods are less frequent and more intense.

The Vaiaata Landfill is located too close to the Vaitolo stream and is affecting this secondary water source for the district and illegal disposal of rubbish is occurring outside of the landfill area. Contamination of the Vaitolo stream is a concern for the population downhill as there is potential for leachate to travel downriver and put health of the villagers at risk.

[5]Vulnerability Assessment of the Samoa Road Network – LTA 2016

4. Fa'asaleleaga 2 District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Main South East Coast Road and part of North West Coast Road located in high risk hazard zones	Upgrade main South East Coast and parts of North West Coast Road to accommodate for hazard zones and in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Strengthen existing seawalls in 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:LTA /MWTI/MNRE/Villages/Families***	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 to inform location and designs Develop an Integrated Flood Management Plan for Faasaleleaga 2 District. 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. Road design standard to take account of forecast increased rainfall intensity Designation of the IFHZ, 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 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

			Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes	
Drainage systems require maintenance and upgrade in high risk areasof main South East Coast Road and North West Coast Road	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 Encourages coastal families to relocate inland Maintains lifeline access for all of Upolu 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 2 District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

Flood protection measures for fords and bridges	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of Sapapali' and neighbouring rivers (Mali'oli'o) 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 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 2 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 revegetation Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 NESP 2018-2022

Village houses, businesses, tourist facilities, village pool, 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 Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ Design infrastructure appropriately to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges Government and Village to liaise and collaborate on processes needed to protect riverbanks and coastline from land clearing and developments ***Responsibility:Village / Families/MWTI/ MNRE/ MWCSD***	Minimise expenditure on damaged properties and personal assets Mitigatepotentialdamage fromcoastalerosion and floodingaccommodatingthehazard Safer villages, houses and roads	Planning provisions to be guided by the PUMA Act 2004 Enforcement of National Building Code 2017 Encourage insurance of significant investments and assets within hazard zones Utilise updated hazard maps and Geomorphologist Drainage Infrastructure Database to inform policy development and possible relocation of assets Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 National Building Code

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 evacuationshelterassessment and mark on CIM Plan hazard maps Develop aVillageClimateDisasterManagementPlan(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 DisasterManagement Plan2017-2021 NationalBuildingCode National Policy for People with Disabilities
Electricity supply	Provide undergroundlinesinthelongterm	Maintain electricity supply at all times including natural disasters	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan

	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***	Avoid accidents from fallen 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 ***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	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan Health Sector Plan Village Fono Act(Amendment Bill 2016)

			monthly meetings to monitor progress of village programs and responsibilities	
Vaiaata Landfill	Relocate landfill to a secure and isolated area away from fluvial hazard zone or implement mitigation measures to reduce contamination of rivers ***Responsibility: MNRE/ Contractors/District***	Reduce water contamination	MNRE Waste Management to resolve contamination of Vaitolo stream MNRE Waste Management to conduct regular inspections and to enforce rubbish & waste management policies Regulate and monitor rubbish contractors regularly	NESP 2018-2022
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the 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 drainage action plans ***Responsibility: MNRE/ Villages***	Mitigate potential damage 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 watercourses based on flood risk to provide suitable areas for riparian revegetation	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
District Upland Forest and Catchment Areas	Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Adopt agro-forestry and community tree farming practices instead of clear felling as is	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination	Develop Integrated Catchment Strategy and Flood Management Plan for Faasaleleaga 2 District. MNRE to develop zonation strategy for safe areas Develop an integrated land management plan with the aim of reducing any	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020 Village Fono Act (Amendment Bill 2016)

	practiced at present Encourage planting of indigenous species in conjunction with engineered water land drainage action plans Regulate developments around catchment area, SWA intake and boreholes in district Limit land clearance and agricultural development around SWA intake and boreholes Conduct campaign for public awareness and establish a "neighbourhood watch" agreement with district to monitor and report on illegal deforestation District/village to help promote the development of the agroforestry sector by encouraging relevant land use practice and where possible resolve any associated land disputes District to support SWA efforts at exploratory intakes and boreholes in district Continue ban of destructive fishing practices including sand mining and introduce village ban on rubbish dumping in waterways and watercourses (immediate fluvial hazard zones) Fence domestic and invasive animals to	of water supply Reduce impact from inland flooding Improve preparedness and readiness response to natural disasters Safer villages, houses and roads	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 and planting materials for village 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/village forestry programmes	CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan

	protect young trees ***Responsibility: MNRE/ SWA/MWCSD/ District /Village /CSSP***			
Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)	Village pools are currently in a poor location/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)
Mangrove area conservation	Continue existing mangrove protection programme Limit land clearance and agricultural developments around mangrove areas Continue to plant mangroves and other native species along coastal areas to reduce coastal erosion and landslips To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed Village to fence off domestic animals damaging mangrove areas	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 Reduce impact from inland flooding	MNRE DEC to provide technical assistance and backstopping in the development of a Mangrove Management Plan for Fa'asaleleaga 2 District Develop an integrated land management plan for Faasaleleaga 2 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	NESP 2018-2022 Community Engagement Plan Agriculture Sector Plan 2016-2021

	Responsibility: MNRE/MAF/ Village Council/CSSP/ UNDP-GEF SGP			
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	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 NESP 2018-2022 Samoa's National Invasive Species Action Plan (NISAP)

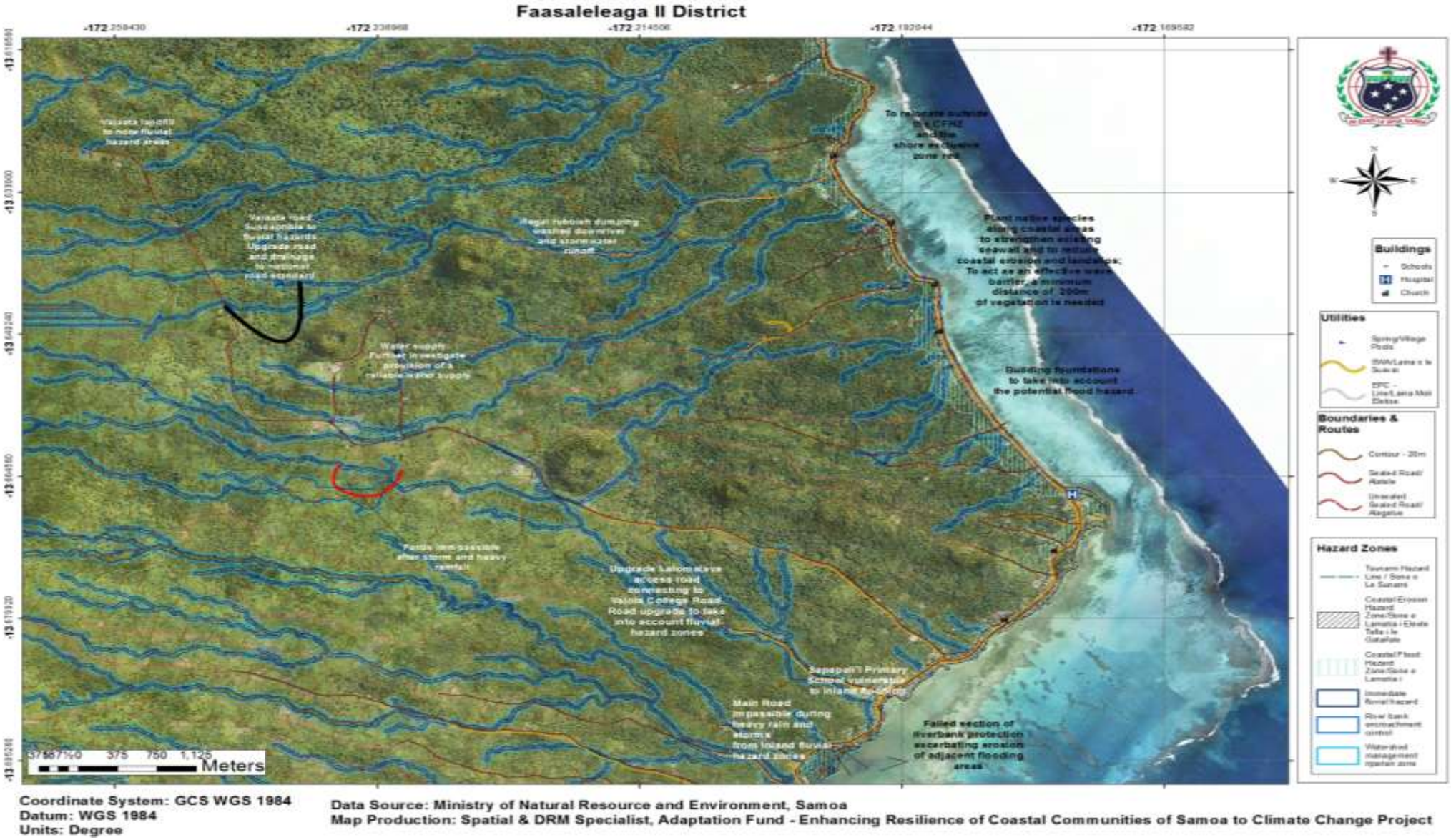
	Responsibility: Villages /District/ MNRE/MAF/ SROS			
Food security: threatened by changes in climate and inadequate soil for planting	Promote and facilitate planting of root crops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agro-forestry and mixed planting 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	MAFtoprovidetrainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness oncropdiversificationto 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	AgricultureSectorPlan2016-2021 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	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability	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

	Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages ***Responsibility: MWCSD /Village***	of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities		

Land clearance for agriculture purposes

Damaged causeway at entrance to Tapueleele

Fa'asaleleaga 2 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. Fogapoa/Tuasivi 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, tourist facilities, villages pools, 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 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***	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 2 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

Drainage systems require maintenance and upgrade in high risk areasof main South East Coast Road especially at junctions with access roads	Upgrade drainage and culverts at junction of South East Coast Road and access roads (Fogapoa Road, Fatausi Road and Fatausi School Road) exacerbating inland flooding- 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 Encourages coastal families to relocate inland Maintains lifeline access for all of Upolu 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 2 District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
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	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

	made available Families to limit building and developments near electricity posts ***Responsibility:EPC/ MWTI/ Village/ Families***			
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 ***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 Health Sector Plan Village Fono Act(Amendment Bill 2016)

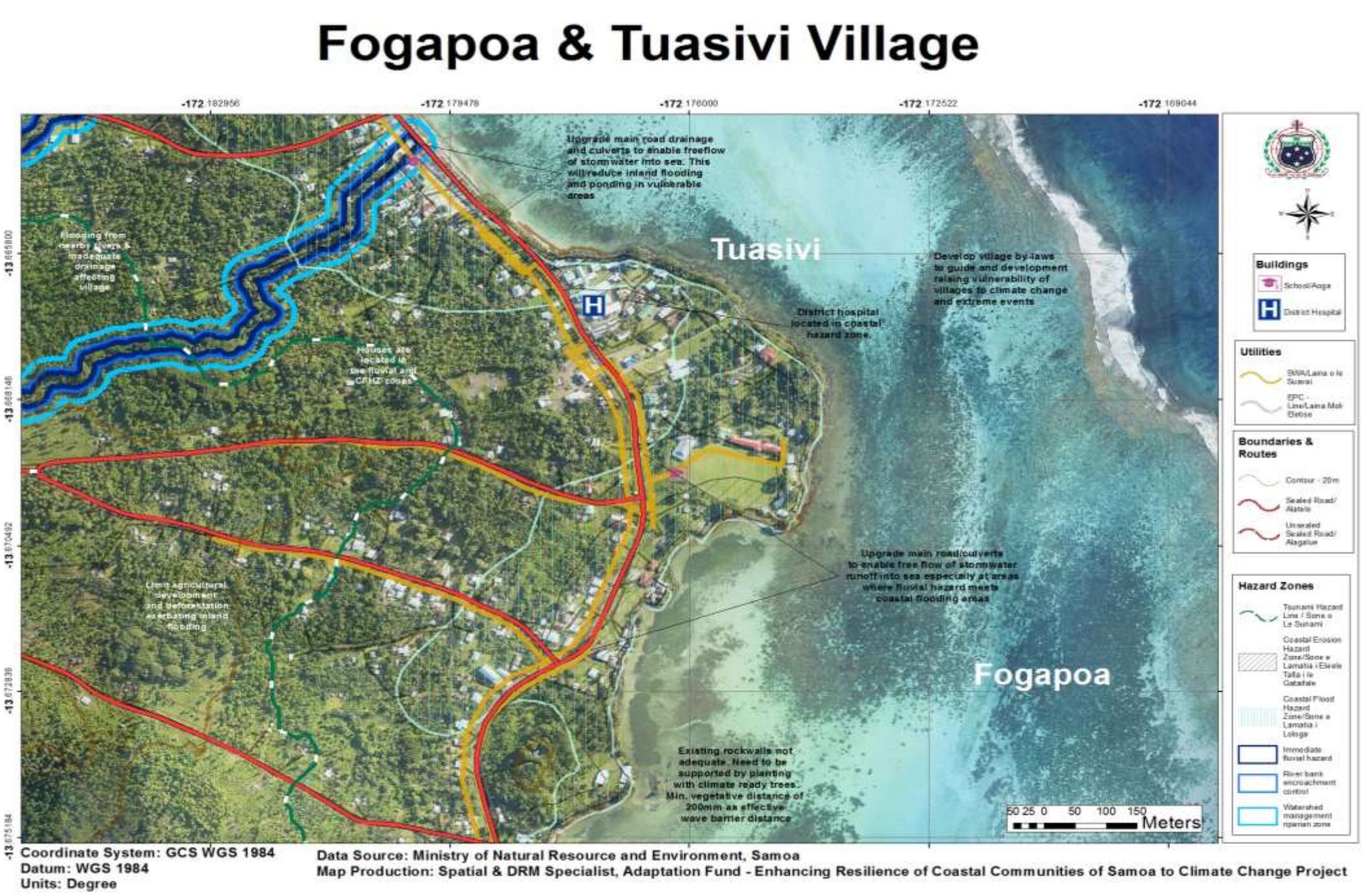
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Marine reserve	Assess the state of the coral reef and lagoon ecosystems in Fogapoa/Tuasivi whether suitable for marine reserve Conduct awareness programmes of marine resources ***Responsibility: MAF, MNRE-DEC/Village***	Support food security and healthy diets Promotes sustainability of fish stocks Facilitates coral re-growth and coral reef restoration	MAF Fisheries to support implementation and provide technical backstopping and monitoring	NESP 2018-2022
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)

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
School ***Responsibility: Village/MESC***	Put down 2-storey building and replace with single storey	Indirectly related to CR however school is located in hazard zone (CFHZ) and is also affected from inland flooding due to inadequate drainage and culverts on roads

Family initiative to protect from coastal erosion

Fogapoa/Tuasivi 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. Fatausi Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, Churches, School and private residences 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 flooding and storm water surges ***Responsibility:Village / Families /MWTI/ MNRE/ MWCSD***	Minimise expenditure on damaged properties and personal assets Safer villages, houses and roads Increases awareness for insurance	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 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	CIM Strategy 2015 National Building Code
Drainage systems to be improved in high risk areas on main South-East Coast Road especially at junctions with Access road	Assess and upgrade culverts on main South East Coast road especially at junction with Fatausi Access - in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations	Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters	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*	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

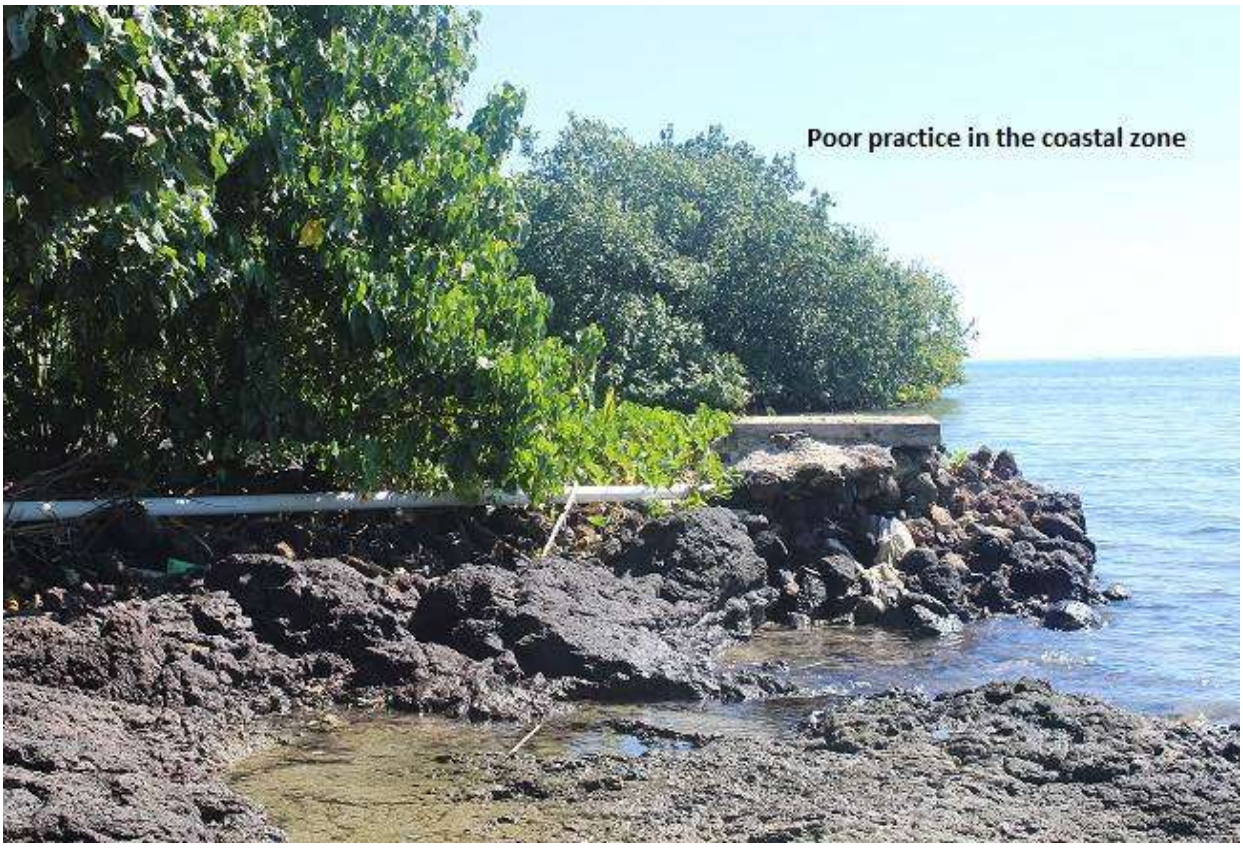
	Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding Implement regular drainage inspection and maintenance ***Responsibility: LTA/ MWTI/MWCSD /Village / Families***	Encourages coastal families to relocate inland Maintains lifeline access Minimise national disaster recovery expenditure on damaged properties, public and private assets	*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 2 District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	
Upgrade access/ work roads as potential alternate emergency route for Tuasivi Hospital	Assess feasibility of upgrading Fogapoa and Fatausi Roads to be used by Tuasivi Hospital ambulance to connect to Vaia'ata Road Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands Implement regular drainage inspection and maintenance Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish	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	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Develop an Integrated Flood Management Plan for Faasaleleaga2 District. 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. Road design standard to take	National DisasterManagement Plan2017-2021 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

	behind homes Village to regulate developments near and around road shoulders of all access roads Enforce environmental safeguards ***Responsibility: LTA/ MWTI/ MNRE/ District/ Village /Families/CSSP***	public assets	account of forecast increased rainfall intensity Designation of the IFHZ, 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 Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes	
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 ***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 Village Fono Act(Amendment Bill 2016)
Natural Resource and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Soft coastal protection measures	Plant native species along coastal areas to strengthen existing seawall and to	Soft coastal protection measures will	Develop an integrated land management plan for Faasaleleaga 2 district	Two Million Tree Planting Strategy 2015-2020

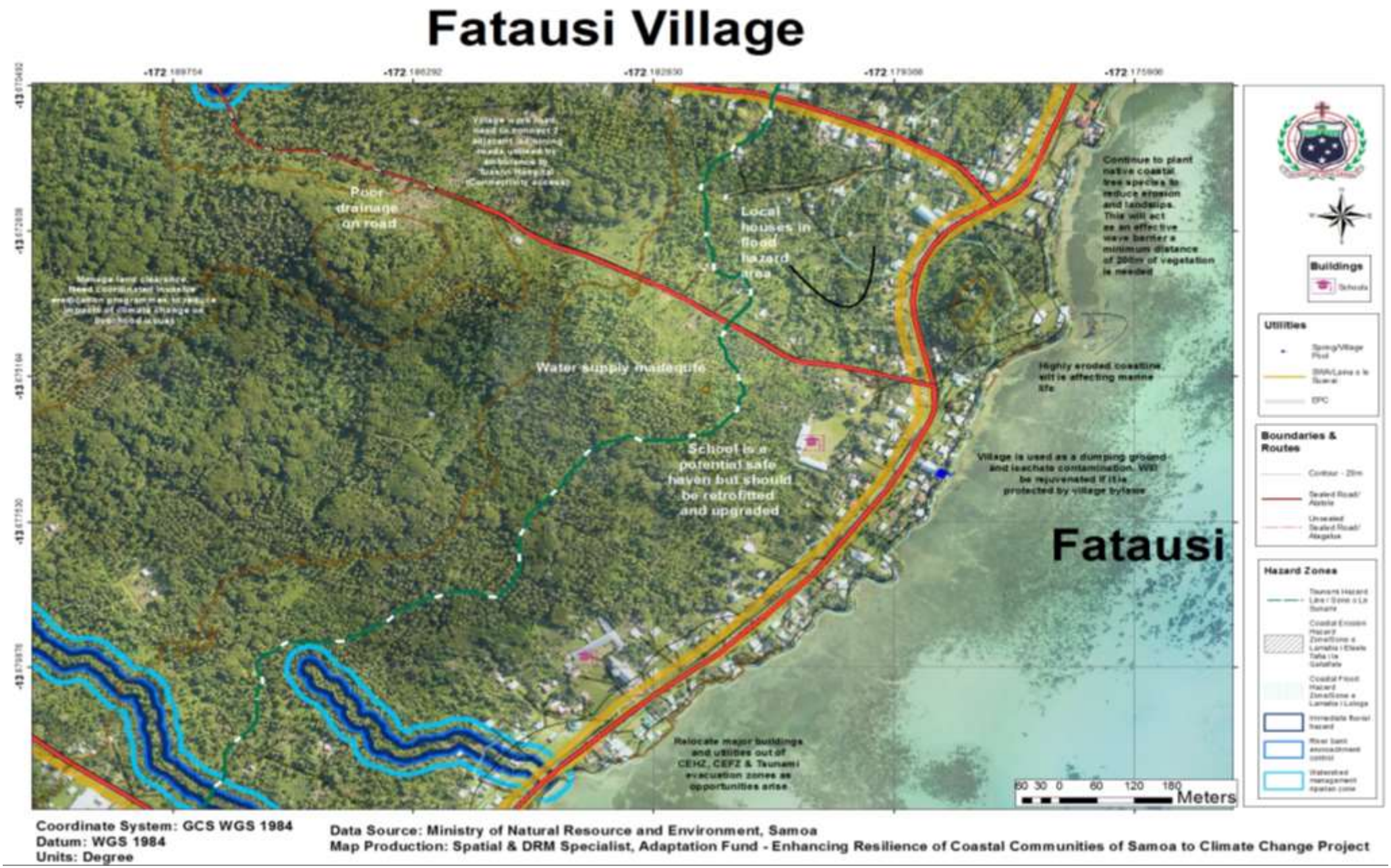
needed for most vulnerable areas	reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ 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
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	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	Agriculture Sector Plan 2016-2021 NESP 2018-2022 Samoa's National Invasive Species Action Plan (NISAP)

	District to fence domestic animals ***Responsibility: Villages /District/ MNRE/MAF/ SROS***		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


Coastal Erosion


Poor practice in the coastal zone

Fatausi 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. Fusi-Fuifatu/Safotulafai Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Village houses, Churches, School and private residences 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 flooding and storm water surges ***Responsibility:Village / Families /MWTI/ MNRE/ MWCSD***	Minimise expenditure on damaged properties and personal assets Safer villages, houses and roads Increases awareness for insurance	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 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	CIM Strategy 2015 NESP 2018-2022 National Building Code
Access Road : upgrade to national standards	Upgrade both Safotulafai and Fusi-Fuifatu work roads movement of residents and also to access evacuation shelter Upgrade to include	Improve infrastructure resilience and rate of recovery Improve preparedness and	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Develop an Integrated Flood Management Plan for	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector

	adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands 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/CSSP***	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	Faasaleleaga2 District. 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 IFHZ, 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 Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes	Plan
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	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

	and developments near electricity posts ***Responsibility:EPC/ MWTI/ Village/ Families***			
Natural Resources & Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Marine reserve	Assess the state of the coral reef and lagoon ecosystems in Fusi-Fuifatu/Safotulafai whether suitable for marine reserve Conduct awareness programmes of marine resources ***Responsibility: MAF, MNRE-DEC/Village***	Support food security and healthy diets Promotes sustainability of fish stocks Facilitates coral re-growth and coral reef restoration	MAF Fisheries to support implementation and provide technical backstopping and monitoring	NESP 2018-2022
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 2 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
Village Upland Forest and Catchment Areas	Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Adopt agro-forestry and community tree farming practices instead of clear felling as is practiced at present Encourage planting of indigenous species in	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	Develop Integrated Catchment Strategy and Flood Management Plan for Faasaleleaga 2 District. 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 MNRE Forestry to advice	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020 Village Fono Act (Amendment Bill 2016) CIM Strategy 2015 Water and Sanitation

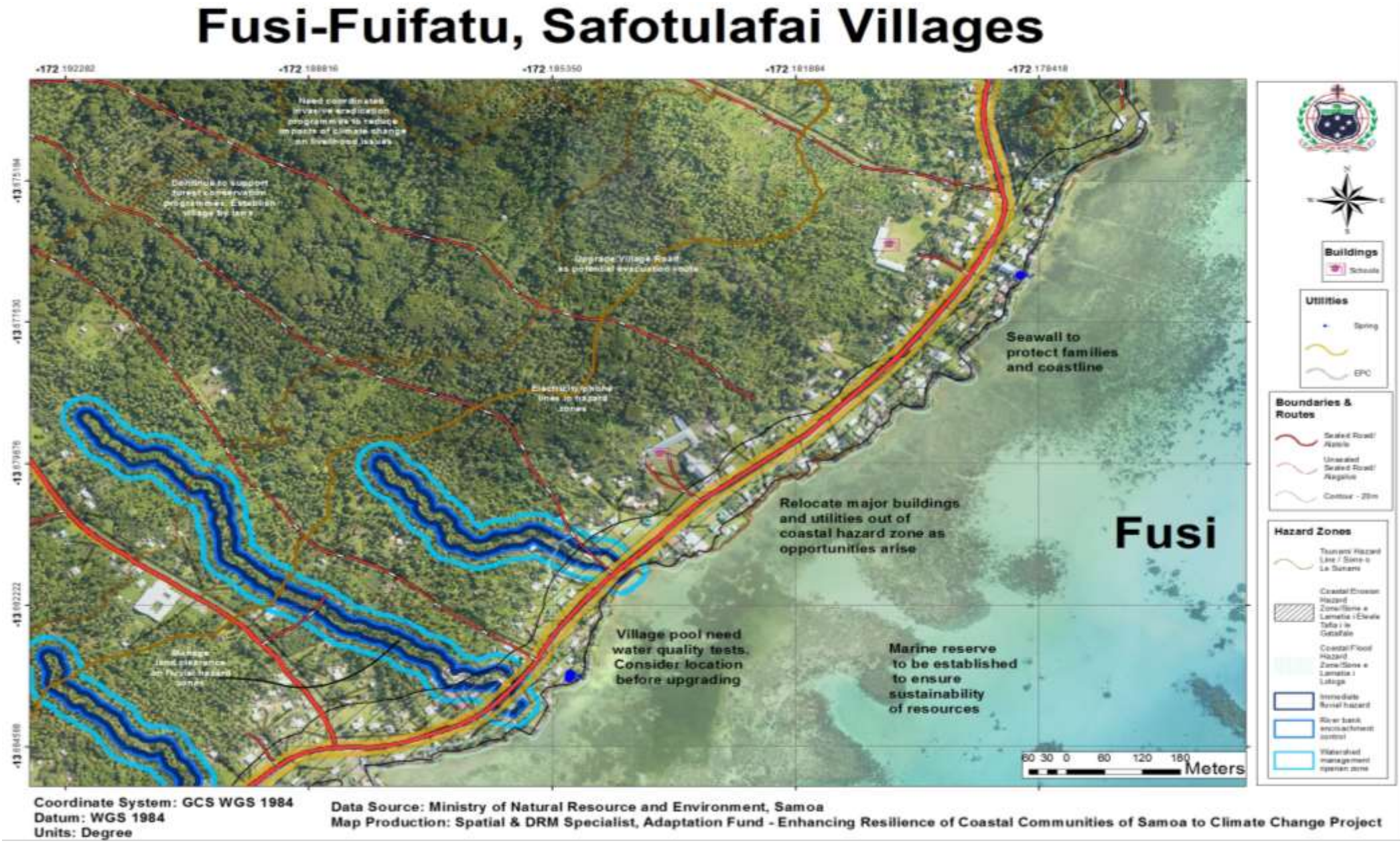
	conjunction with engineered water land drainage action plans Regulate developments around catchment area, SWA intake and boreholes in district Limit land clearance and agricultural development around SWA intake and boreholes Conduct campaign for public awareness and establish a "neighbourhood watch" agreement with district to monitor and report on illegal deforestation District/village to help promote the development of the agroforestry sector by encouraging relevant land use practice and where possible resolve any associated land disputes District to support SWA efforts at exploratory intakes and boreholes in district Fence domestic and invasive animals to protect young trees ***Responsibility: MNRE/ SWA/MWCSD/ District /Village /CSSP***	Improve preparedness and readiness response to natural disasters Safer villages, houses and roads	on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village 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/village forestry programmes	Sector Plan Community Engagement Plan
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	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans	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	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021

	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***	and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	


Septic tank on the water


Community spring pool

Fusi-Fuifatu/Safotulafai Village Map



8. 'Eveeve/Vaimaga Village Interventions

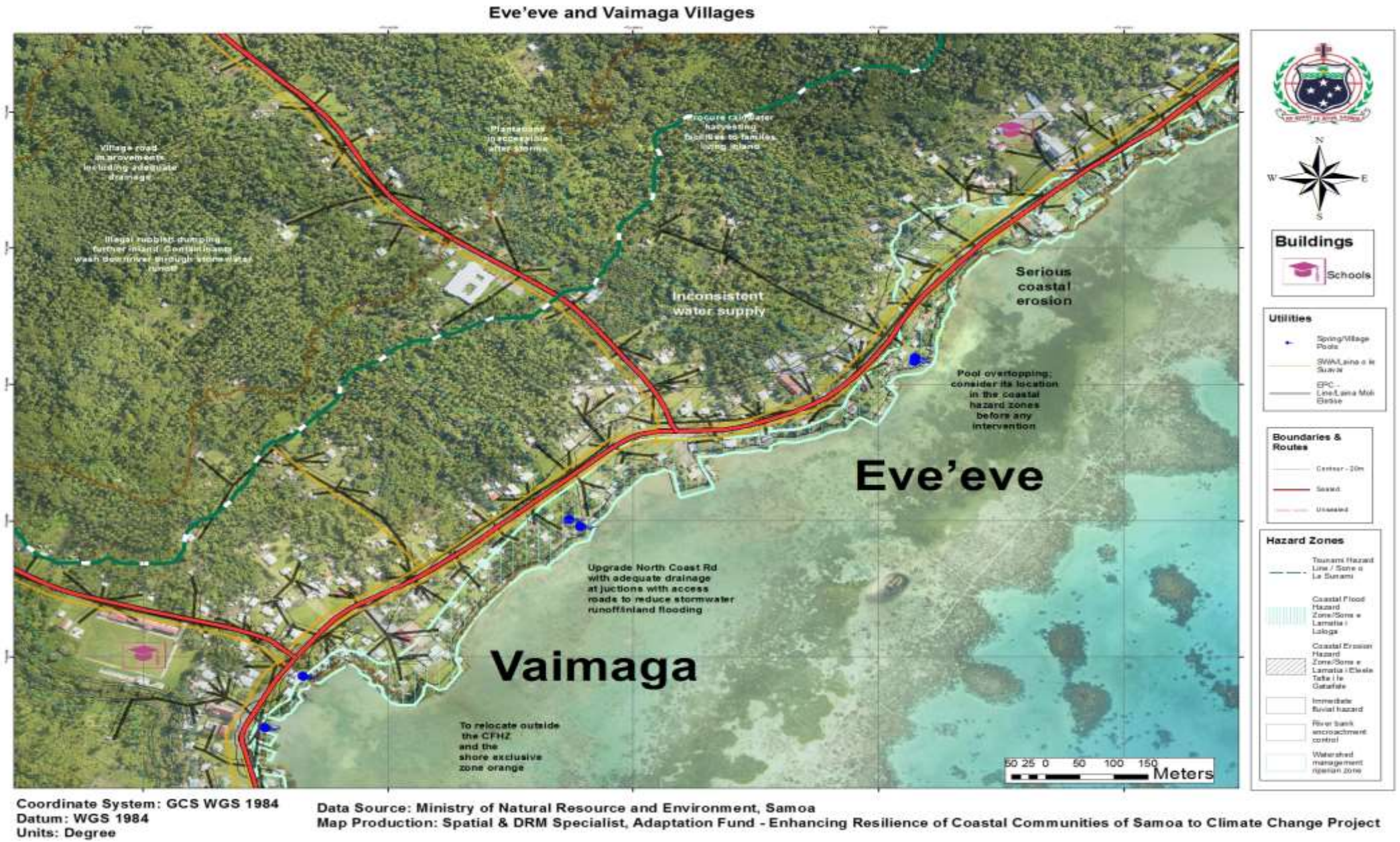
CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Access Road : upgrade to national standards	Upgrade both Eveeve/Vaimaga work roads movement of residents and also to access evacuation shelter Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands 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/CSSP***	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 to inform location and designs Develop an Integrated Flood Management Plan for Faasaleleaga 2 District. 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 IFHZ, 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 Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
Natural Resources & Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Soft coastal protection measures	Plant native species along coastal areas to strengthen existing seawall and to	Soft coastal protection measures will	Develop an integrated land management plan for Faasaleleaga 2	Two Million Tree Planting Strategy 2015-2020

needed for most vulnerable areas	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	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	Restoration Operational Plan 2016-2020 Forestry Management Act 2011
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 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)
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Food security: threatened by changes in climate and inadequate soil for planting	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 Replanting of native forestry species of the	Maintains natural ecosystem Builds resilience of community livelihood and food security Improve preparedness and readiness response to natural disasters	MAFtoprovidetrainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness oncropdiversificationto suit theprolongedimpactsof climatechange suchas droughtor rainyseasons MAF to assist in establishment of pilot sites to trial climate	AgricultureSectorPlan 2016-2021 Community Engagement Plan Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

	upland forests to restore resilience and ecological function Conduct pilot site trials for climate ready plant varieties ***Responsibility: MAF/ MNRE/villages/CSSP***		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 MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
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

Eveeve/Vaimaga 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

9. Sapapali'i Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Village houses, school, tourist facilities, churches 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 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***	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 2 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

Coastline protection at most vulnerable area	Assess feasibility of constructing a seawall in area where village pool is located Research the impacts of sand mining Village consultation on sand mining policy and regulation Assess and strengthen part of seawalls in relevant areas to reduce vulnerability of road and other critical assets in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: MNRE/ Village /Families/ CSSP/MWTI***	Improve infrastructure resilience and rate of recovery Maintains natural ecosystem connectivity Reduce impact from coastal erosion Safer villages, houses and roads Minimise expenditure on damaged properties & personal assets	Develop and register Sapapali'i /Village bylaws to strengthen maintenance and regular inspections of seawalls Utilise Sui o Nu'u monthly meetings to monitor progress of village inspections and maintenance of seawalls	CIM Strategy 2015 Community Engagement Plan NESP 2018-2022 Draft Soil Resource Management Bill
Flood protection measures for fords and bridges	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of Sapapali'i 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 2 Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 NESP 2018-2022

	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***		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 revegetation Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Natural Resources & Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Mangrove area conservation	Limit land clearance and agricultural developments around mangrove areas Continue to plantmangroves and other native species along coastal areas to reduce coastal erosion and landslips To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed Village to fence off domestic animals damaging mangrove areas ***Responsibility: MNRE/MAF/ Village***	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 Reduce impact from inland flooding	MNRE DEC to provide technical assistance and backstopping in the development of a Mangrove Management Plan for Fa'asaleleaga 2 District Develop an integrated land management plan for Faasaleleaga 2 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	NESP 2018-2022 Community Engagement Plan

	Council/CSSP/ UNDP-GEF SGP			
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***	Mitigate potential damage 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 watercourses based on flood risk to provide suitable areas for riparian revegetation	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Food security: threatened by changes in climate and inadequate soil for planting	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 Replanting of native forestry species of the upland forests to restore resilience and ecological function 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	MAFtoprovidetrainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness oncropdiversificationt o 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 MNRE Forestry to advice on appropriate species, depth and density of planting and	AgricultureSectorPlan 2016-2021 Community Engagement Plan Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

			provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
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

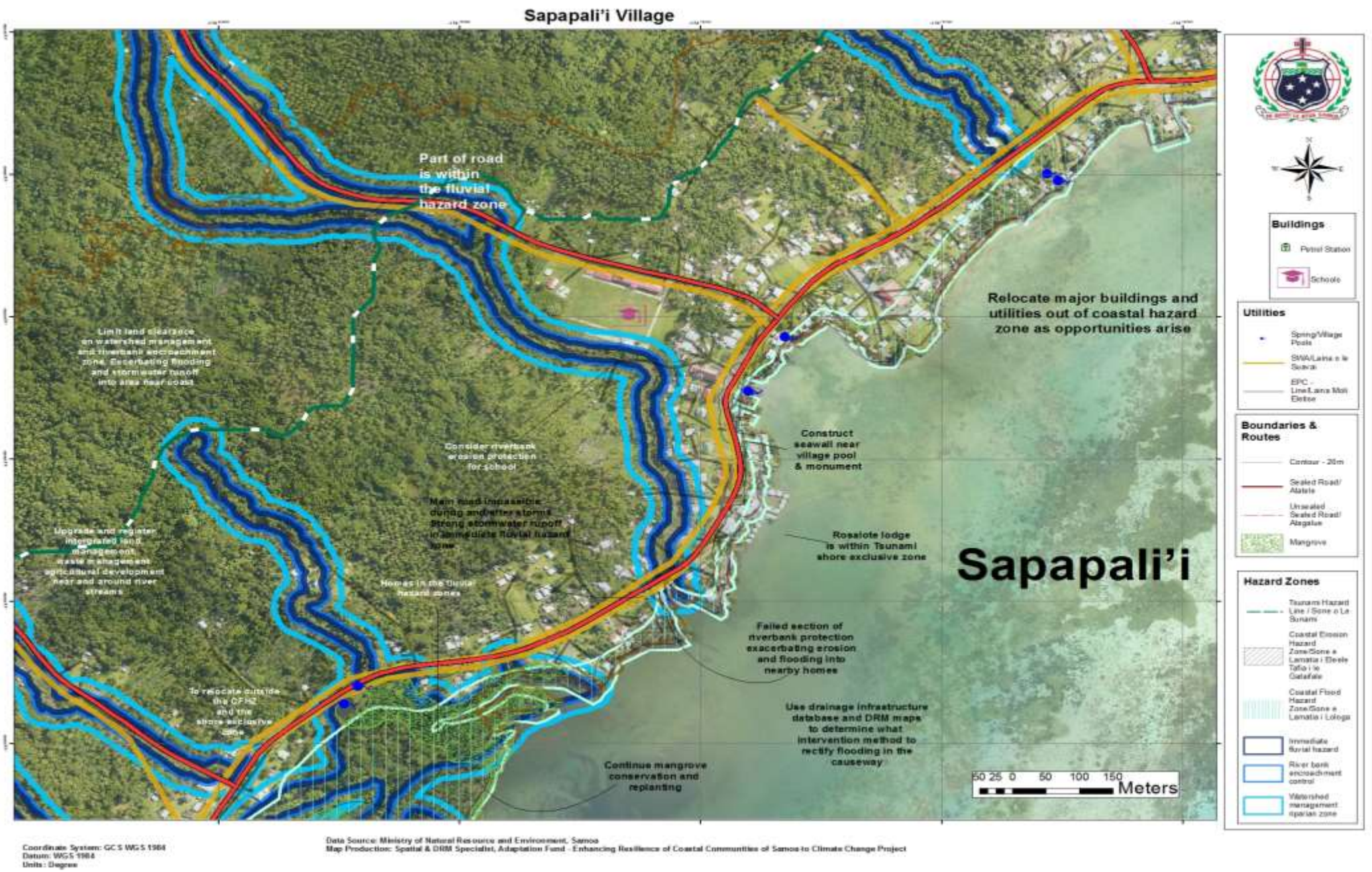
Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
School ***Responsibility: Village/MESC***	Upgrade Sapapalii Primary School to mitigate against potential damages from extreme events	Non CR issue. School also sits directly in fluvial hazard zone. Location to be considered before any upgrade is implemented


Sapapalii ford


Primary source of livelihood


Algae as a result of high sedimentation

Sapapalii Village Map



10. Tapu'ele'ele 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 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 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***	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 2 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 roads to reduce storm water overflow	Upgrade Tapueleele Access Road to facilitate the overland flow of storm water and reduce flooding onto main South East Coast road and further downhill into neighbouring villages	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Develop an Integrated Flood Management Plan for	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector

	Upgrade to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands 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/CSSP***	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	Faasaleleaga 2District. 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. Road design standard to take account of forecast increased rainfall intensity Designation of the IFHZ, 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 Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes	Plan
Flood protection measures for fords and bridges	Upgrade waterways Upgrade Tapueleele causeway Upgrade or repair riverine embankment protection work upstream 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	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 2 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	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 NESP 2018-2022

	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***		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 revegetation Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Water tank storage facility	Construct a large storage tank for the village at a high level that will be filled as required using powered pumps and from which the village can be gravity fed Extendthewatersupplytofamiliesinlandwithnoaccesstowater Procure rainwater harvesting systems for vulnerable families as a short term solution ***Responsibility:Village/ CSSP/NGOs***	Increase adaptation during drought periods Improve health and sanitation	UtiliseHzard Maps and Infrastructure Drainage Database to inform location and design Utilize the environmental and social safeguards including EIAs in screening and designing infrastructure facilities	Community Sector Plan CIM Strategy 2015
Natural Resources & Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the 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 drainage action plans ***Responsibility: MNRE/ Villages***	Mitigate potential damage 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 watercourses based on flood risk to provide suitable areas for riparian revegetation	Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

Illegal rubbish dumping	Government to monitor rubbish collection contractors and individuals dumping rubbish in Tapueleele lands Produce posters and village signs for public awareness Introduce ban on illegal rubbish dumping in district especially around fluvial hazard zones Conduct campaign for public awareness of district ban and establish a "neighbourhood watch" agreement with district to monitor and report on illegal dumping activities Government, district and villages to monitor, report and apply penalty on offenders ***Responsibility: MNRE/ District/ Village***	Improve health and sanitation Reduce leachate into environment and water supply Reduce contaminant from overland flooding entering sea	Utilise Waste Management Act/Legislation to guide process of effecting the 'polluter pays' principle Develop and register District/Village bylaws to include penalizing illegal rubbish dumping in district lands Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management	National Waste Management Strategy National Waste Management Policy NESP 2018-2022
District Upland Forest and Catchment Areas	Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Regulate developments around catchment area, SWA intake and boreholes in district Limit land clearance and agricultural development around SWA intake and boreholes Conduct campaign for public awareness and establish a "neighbourhood watch" agreement with district to monitor and report on illegal deforestation ***Responsibility: MNRE/ SWA/MWCSD/ District /Village /CSSP***	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Improve preparedness and readiness response to natural disasters	Develop Integrated Catchment Strategy and Flood Management Plan for Faasaleleaga 2 District. 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 MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village Develop and register District/Village bylaws to include penalizing illegal deforestation in district	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020 Village Fono Act (Amendment Bill 2016) CIM Strategy 2015 Water and Sanitation Sector Plan Community Engagement Plan

			lands Utilise Sui o Nu'u monthly meetings to monitor progress of district/village forestry programmes	
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 Economic benefit for villagefrom sustainable sandminingactivities	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
Protect and upgrade Aga o le Pe'a Village pool as an alternative water supply for inland residents	Test the quality of the water source before any investment on the pool is undertaken (eg: fence/repair works) ***Responsibility: CSSP/ NGOs/MNRE/Village***	Increase adaptation during drought periods Improve health and sanitation Reduce contamination of water supply	Utilise Hazard Maps and Geomorphologist findings to inform location and design 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
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	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of	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	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021

	to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages ***Responsibility: MWCSD /Village***	communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	bylaws	

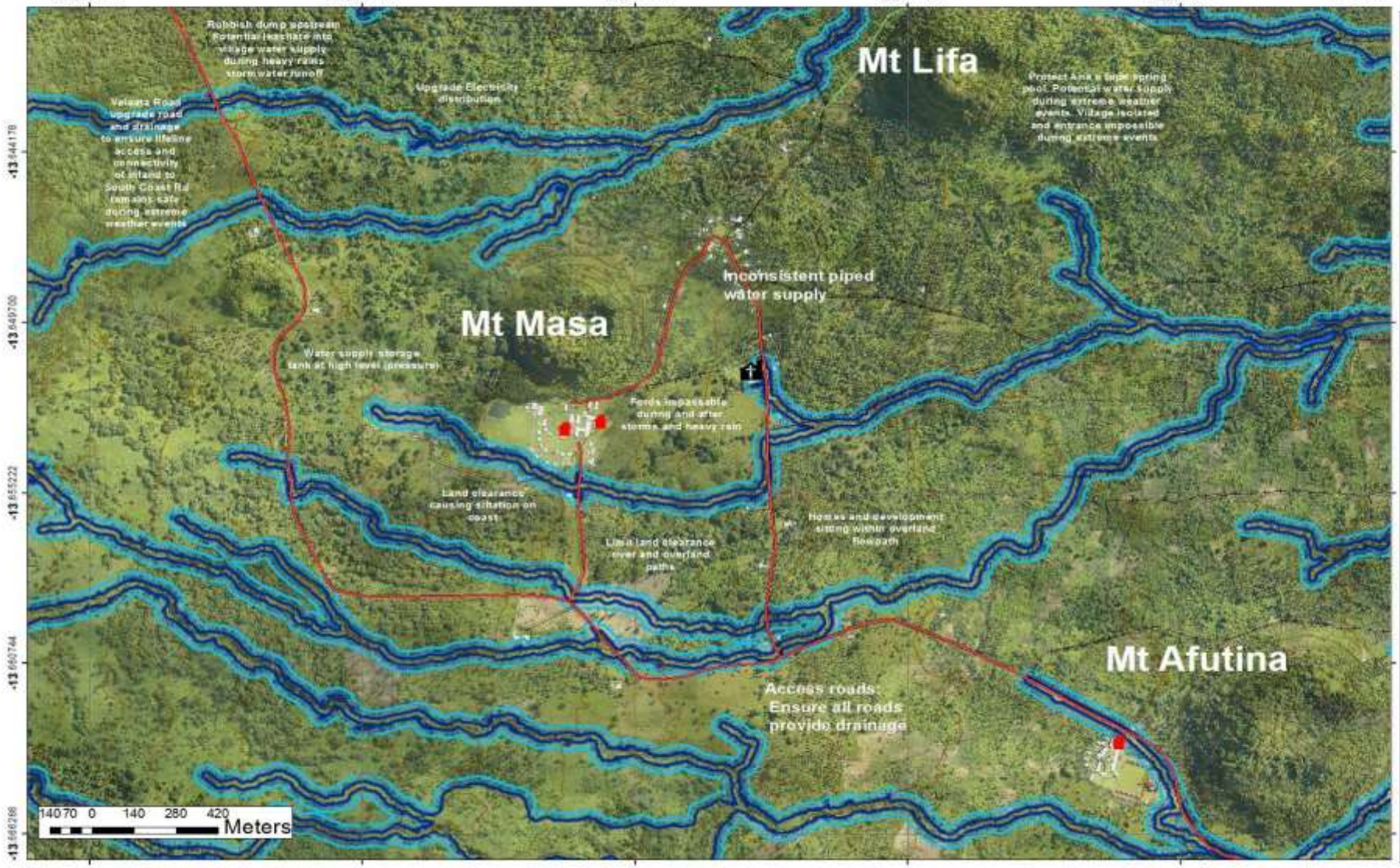

Aggregates extraction from the river channel for community developments


plantation access road crossing an alley

Tapuele'ele Village Map

Tapuele'ele Village

ADAPTATION FUND



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 Zones