Community Integrated Management Plan

Lefaga and Falease'ela District – Upolu

Implementation Guidelines 2018

Foreword

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

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

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

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

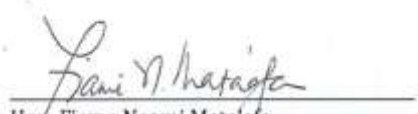
We wish to acknowledge the significant contributions of our District and Village communities and our key government partner stakeholders and implementing agencies, in particular:

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

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

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

Thank you



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

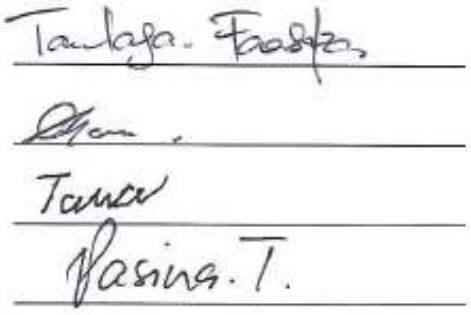
Participants in the Plan

The 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 Lefaga and Falease'ela (Matafa'a, Falease'ela, Safa'ato'a, Tafagamanu, Savaia, Matautu and Tanumalala villages)

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

Date of Signing: 15th June 2018

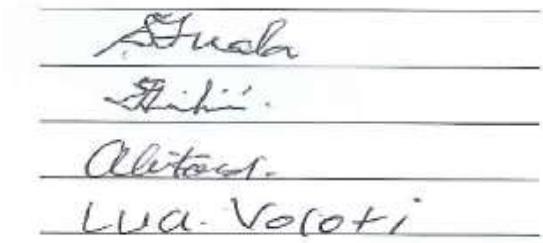
Representatives:	**Signatures:**
Matafa'a Village	
• Taulaga Fa'asipa	
• Samaila Filia	
• Taua Pati Sulu'ape	
• Pasina Tia'i Sulu'ape	
Falease'ela Village	
• Toleafoa Ken Va'afusuaga Poutoa	
• Vaela'a Molio'o Toleafoa Poutoa	
• Leulua'i Sanele Mata'ia	
• Lalagā Fa'amelea	
• Alalagā Falaniko Petelo	

Safa'ato'a Village

- Finau Ta'ape Trood
- Valasi Tauā
- Masinalupe Tusipa
- Periti Vesi Otto
- Samasoni Alatasi Masina

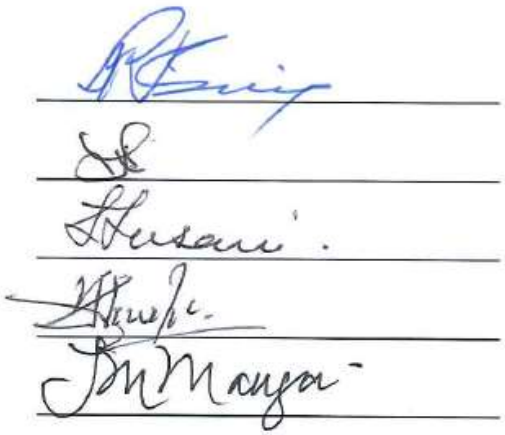
Tafagamanu

- Sauaso Tuala
- Talalelei Ti'iti'i
- Ali'itasi Po'ata Popole
- Lua Voloti Kilifi



Savaia Village

- Tusani Reti
- Tenari Lupematasila
- Tusani Samotu
- Malama Ti'iti'i
- Tusani Matāvai Mauga

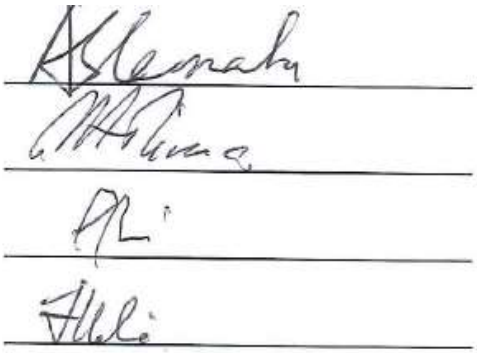


Gagaifoolevao Village

- Iputau Letupu Felise
- Tafesilafa'i Malaesilia
- Faumuinā Soonalole
- Vaofusi Sio
- Faumui Iiga Tanielu

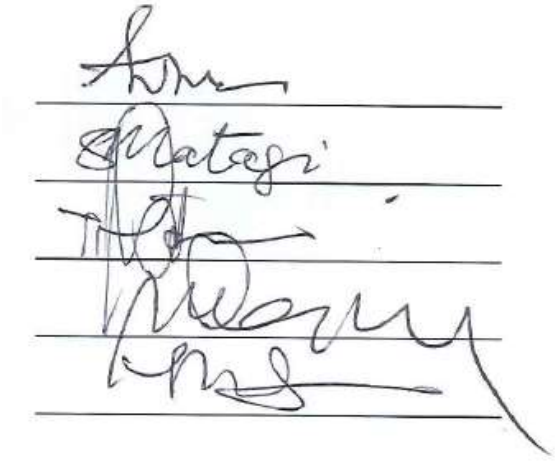
Matautu Village

- Saesese Lova
- Lemalu Sami
- Lemalu Ailima
- Ape Liuatiga



Tanumalala Village

- Leota Matarena Seumanu
- Sioi Matagi
- Motuga Matagi
- Saena Miti Ngau Chun
- Faumuina Esera



The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Lefaga and Falease'ela 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
SOER	State of Environment Report
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

"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.
Food Security	Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life
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 appears on an 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)
Food availability:	The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)
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
Utilization:	Utilization of food through adequate diet, clean water, sanitation and healthcare 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.
Hazard	A source of potential harm or a situation with a potential to cause loss.
Hazard Zones	Defined areas 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 six hazard zones: *ASCHs* (areassensitivetocoastalhazards); *CEHZs* (coastal erosion hazard zones); *CFHZs* (coastalfloodhazardzones) and *CLHZs* (coastal landslip hazard zones) *CIHZ* (coastal inundation hazard zones) - Coastal Inundation 0 to 15mASL – immediate coastal inundation hazard zone - Coastal Inundation 15 to 20mASL – 5-metre uncertainty buffer on the immediate coastal inundation hazard zone (due to potential LiDAR inaccuracies) - Coastal Inundation 20 to 50mASL – additional hazard zone for the purpose of assessing/planning the location of tsunami protection infrastructure beyond the 0-20mAmSL contour. Please note tsunami risk includes 0-20mASL, so tsunami hazard zones need to include the 0-15mASL and 15-20mASL polygons as well as the 20-50mASL polygon - Coastal Inundation 50 to 55mASL – 5-metre uncertainty buffer on the tsunami infrastructure hazard zone (due to potential LiDAR inaccuracies) *IFHZ* (immediate fluvial hazard zone) within the steep banks of the river gorges - River bank encroachment control – 5m buffer on either side of river banks - Watershed management riparian zone – 20m buffer on either side of the river banks

Infrastructure	Built structures and networks which support the national, regional or local community
Lifeline infrastructure:	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
Secondary infrastructure:	Infrastructure that contributes to the every-day development of the community.
Implementation Guideline:	A document to guide landuse and resource practices to achieve specified goals, Objectives and policies and provide a framework for the implementation of defenses and works.
Issue	A specific concernregardingbothcause 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).
Livelihood	Livelihood refers to a person or group's "means of securing the necessities -food, water, shelter and clothing- of life".
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

1. Introduction to the CIM Plan

1.1 The Strategic Vision

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

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

The CIM Plan takes this vision and provides the practical tools with which the communities and the government, in partnership, can implement the Strategy. To be resilient is to be adaptive, responsive and quick to recover so that communities are environmentally, socially and economically sustainable (CIM Strategy, 2015).

1.2 The Aim of the CIM Plan

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

The CIM Plan will:

1. Improve the community's awareness of all hazard risks from the ridge to the reef;

2. Enable the community as well as providers of services and physical, financial, and technical support in all climate prone sectors, to reduce inland and coastal hazard risks in villages;

3. Enable the community and government service providers of infrastructure services, livelihoods, environment and natural resources to better adapt, respond and recover from cyclones.

1.3 Structure of the Plan

The CIM Plan consists of two parts each serving a separate and distinct purpose.

- ***Plan Development,*** which describes the process undertaken in preparing the CIM Plan in conjunction with representatives of the Communities involved, the Government and other stakeholders with interests in the Plan area.

- ***Implementation Guidelines***, which describes the Plans and Actions recommended as outcomes of the process, together with the partner responsible for implementing these outcomes. The participants of the CIM Plan preparation process are acknowledged in the Implementation Guidelines.

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines

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

The solutions for village level interventions related to livelihoods, infrastructure, environment and natural resources will usually be the responsibility of the Village Council and Families in the village to implement. Advice and resources may be available from the Government to assist the village in implementing these solutions. In most situations these solutions will also provide benefits to both village and district infrastructure and resources and environmental goods that are shared between villages. These solutions should be considered an integral part of strengthening community resilience 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 Enhancing Climate Resilience for Coastal Resources and Communities (PPCR ECR) prepared two (2) key documents:

- Community Engagement Plan (CEP)-the guidelines provided in the CEP is an excellent capacity building tool that can be used by CSO's and village communities themselves to aid development of small grant proposals to existing small grant funding mechanisms like CSSP and the UNDP-GEFSGP

- District Sub Project (DSP) – the guidelines provided in the DSP targets single districts or multi-district projects with a large number of beneficiaries.

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

3. Description of Lefaga and Falease'ela District

3.1 Physical and Natural Resource Setting

Lefaga and Falease'ela are located at the south western side of Upolu between the districts of Falelatai and Safata. The coastal plateau of Lefaga and Falease'ela has extensive coral reefs, mangroves, wetlands and areas of residence positioned close to the coastal main road. Inland from the shoreline the landscape is dominated by broad sloping ridges separated by deep gorges with moderately deep soils. Further inland the terrestrial is subjugated by gently inclined creases but without profound gorges. The higher areas are described as having moist soils throughout the year with no definite dry season. The average annual rainfall varies and Lefaga and Falease'ela District being situated at the south west coast receive above the national average for rainfall (Dews, 2017).

The western end of the district is characterised by a steep coastline with limited flat land, whereas further east a broad plain has formed to a width of 3 km, sloping down to the coast from steep inland mountains. A large river and its tributaries pass through the steepest part of the district at Falease'ela, before forming a meandering river closer to the coast (Dews, 2017).

The villages of Lefaga and Falease'ela include Matafa'a, Safa'atoa, Tafagamanu, Savaia, Falease'ela, Gagaifoilevao, Matautu and Tanumalala. Several parts of these villages are located directly on the coast and are separated from each other by low headlands. Safa'ato'a Access Road, Matautu Road, Gagaifoilevao Road, Savaia Road and Tafagamanu Road are in various stages of poor to very poor condition and in need of an upgrade. All 5 roads are observed to have structural and surface damages, major potholes and damaged edges.

To the west of the district, Cape Mulitapuili provides a sheltered headland which has fostered the formation of two main mangrove ecosystems where the Matafa'a and Falease'ela rivers enter the coast. Other mangrove areas are also located along the coastline in this region and are under the district's protection. To the east the coastline is generally sandy shores between rocky headlands, while west of Savaia rocky outcrops dominate and sandy beaches are less common. The lagoon varies from 1km in width at Lefaga Bay to 300m in width at Matautu. On the western boundary of the District, towards Cape Mulitapuili, there is no reef and the area is susceptible to landslips.

A number of reclamations have been constructed, particularly to the west in Matafa'a where flat land is scarcer. Some smaller mark reclamations have also been built in Savaia, Tafagamanu and Falease'ela. The district has one of the oldest established marine reserves located in Savaia (1997) which focuses on the conservation of giant clams (Reti, 2017).

Plantation and agricultural activities dominate the upland areas of the district with coconut and taro plantations being the main crops. These agricultural estates are located both inland and towards the coast from the Main South Coast Road. Although the Lefaga and Falease'ela District is cultivated with various crops, the soil type at the locale is not apt to all harvest with taro, banana and breadfruit having the highest suitability and coconuts and cocoa being moderately low. Further inland some taro plantations are resulting in ground instability on account of the steep nature of land. At high grounds of Falease'ela is a designated water catchment area although it is still open to land clearing by village communities nearby. This catchment serves the entire district and would require a coordinated effort by the locality to ensure its protection in the years ahead (Reti, 2017).

Land use in Lefaga and Falease'ela District is a combination of mixed crops, forests, plantations and grasslands. The highest or most common use for land is plantations at 27% (1022 hectares) with the other 72.5% (2826 hectares) divided disproportionately amongst forests, secondary forests and mixed crops. The remaining lands are covered with overgrown shrubs (Dews, 2017).

Invasive species that are common to this district include tamaligiuliui (Albizziachinensis); merremia vine (Merremiapeltata); fa'apasi (Spathodiacampanulata); vaomigi (Hiptiscapitata); vaolapiti(Solannommammosum); vaopinati (Sennatora); lusina(Leucaenaleucocephala); vaopovi (Pennisetumpurpureum); vilitaliga (Clerodendrumquadriloculare); puluvao (Funtumia elastic) and Losa Honolulu. Lefaga district also reports increased incidence of crown of thorn invasion along with a number of previously unseen algae plums in their coastal waters.

3.2 Social and Economic Setting

The total population for Lefaga and Falease'ela District is 4,214. Falease'ela with 1,0511; female 514 and male 537, Tafagamanu 3502, Gagaifoilevao 5853, Matafa'a 1814, Matautu 9725, Safa'ato'a 576 6, Savaia 3407 and Tanumalala 1598

Developments are dispersed across the Lefaga and Falease'ela District along its coast and further inland. Road and drainage systems have been improved however regular drainage maintenance and upgrade need to be implemented. SWA water supply systems now reach the Safata and Tanumalala area but there remain a few families in Lefaga with no access to water. There are village reservoirs in this district; the most well known one is at Falease'ela and a smaller version at Safa'ato'a. Tanumalala being located further away from the SWA water intake at Falease'ela suffers from shortage of water with residents sometimes enduring up to 3months of no water supply. All roads - except Falease'ela and Safa'ato'a have been upgraded. These district infrastructures are crucial as they provide access to essential services such as the hospital, airport, wharves and other services available at neighbouring districts.

Cash economy of the village is dominated by traditional work. The majority of residents are largely sustained by plantation work, mixed cropping, cattle farms, livestock and fishing. Census (2011) indicated that the population of 15 years and over with the skills in fishing in Lefaga and Falease'ela ranged from 433-681 (lowest category within the 2011 census for Samoa) (Reti, 2017). An eco-tourism business exploiting Falease'ela's environment offers eco-tours, water fall activities, outrigger canoe rides as well as hosting groups of visitors for cultural and swimming activities. At least 30 unemployed youths are working for these small businesses. The district had giant clam farms with dates of establishment ranging from 1997 - 2013 but Savaia is the only remaining village with a well-established and operational giant clam marine reserve. While these reserves offer protection for marine sea life they also serve as one of the village's sources of income.

Lefaga and Falease'ela is estimated to have 6 tourist developments9, 5 churches, 4 primary schools10, 2 community houses, approximately 107 households and a number of small markets and retail shops. The nearest hospital is located in Leulumoega. The majority of these developments sit with high risk hazard zones being located in both the fluvial, coastal erosion and coastal flooding zones. Liua le Vai o Sina is a popular swimming destination for locals as well as tourists. This district also plays host to very popular tourist destinations; Matareva and Return to Paradise. Lefaga and Faleaseela have also been featured in the popular Survivor series with several seasons having been filmed on these beaches and coastal areas.

All villages with the exception of Falease'ela and Tanumalala have developed village bylaws and the district is very active in its environmental protection and conservation programmes.

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 Lefaga and Falease'ela. The immediate risks for some areas of Lefaga and Falease'ela are from coastal inundation, beach erosion and fluvial hazards.

Lefaga and Falease'ela District have a total area of 7,990 hectares. The tsunami shore exclusive zone covers about 69 hectares of the total district area. The watershed management riparian bugger zone covers 2,336 hectares therefore leaving 5,585 hectares in the "safe" zone. This mean approximately 70% of the district is safe from coastal inundation and fluvial hazards.

[1] SBS Village Directory 2016: preliminary census count
[2] Female 168; Male 182
[3] Female 284; Male 301
[4] Female 88; Male 93
[5] Female 486; Male 486
[6] Female 270; Male 306
[7] Female 157; Male 183
[8] Female 75, Male 84
[9] Return to Paradise Resort,Lalotalie River Retreat,Faimafili Village Resort andMatareva Beach
[10] Falease'ela Primary School, Safa'ato'a Primary School, Savaia Primary School and Matautu-Lefaga Primary School

Due to the variation in landscape and topography, soil types, aspect to prevailing winds and the extent of development that has altered the land formation within the district, it is difficult to predict, with any precision, impacts from climate change within any given livelihood activity at the local level (Dews, 2017). There are some cases where revegetation in a low energy environment is required because deforestation of the coastal forest had led to direct exposure to wave action (Tokalauvere, 2017). Resilience is supported by maximizing crop and livestock production while not impacting on the natural ecosystem and the environmental serves derived from the ecosystem. Livelihoods and food security is dependent on plantation agriculture, small household plots as well as fishing (Reti, 2017).

To be able to have a resilient agricultural system communities require access to clean water, conservation of soil nutrients, access to suitable crop varieties, a wide range of crop and livestock activities as well as market outlets to support markets. Local adaptation to small scale agriculture will be aided by the fact most household crops can be seasonal and fast growing hence local production can be flexible with new species introduction. Small commercial rural production will require medium term planning that includes water management, soil conservation and use of climate resilient species and establishment of secure markets. The conservation of the upland forests will be a major contribution to climate change adaptation. The conditions of the upland ecosystems directly influence the livelihoods of communities downstream. The ecological service of the upland forest areas can be sustained through sustainable forest management including replanting.

Local overhead telephone and electricity lines are located along seaside sections of the Falelatai-Lefaga Road, coastal access roads and between homes. These lines fall within both the CFHZ and CEHZ with the exception of the High Voltage electricity lines that generally follow the Main South Coast Road. Overhead lines are at high risk and susceptibility as they are exposed to strong wind effects and providing underground lines is likely to increase the resilience of the communities in these areas. The Matafa'a village relies on a single water source located in the coast and whilst it is prone to flooding, the majority of the village resides in this area. The water source is continuously contaminated by runoff from nearby cattle pastures and population growth and unsustainable land management practices (use of toxic chemicals in farming and fishing) contribute to the deterioration of the eco system. Climate change and its variability exacerbate these conditions. Increase in rainfall and extreme droughts have resulted in poor water quality and with no regular supply of clean water the village faces health problems, dwindling river fauna, diminished productivity of agriculture and livestock and degradation of land and soil.

There are a number of culverts draining the Falelatai-Lefaga Road and inland areas towards the lagoon however some of these are clogged and need maintenance. The culverts are generally within the IFHZ, CEHZ and CFHZ and need to be maintained regularly to carry sediment to the lagoon and minimize flooding. The location and state of the culverts contribute to high risk and susceptibility of the road along the coast. Drainage rehabilitation will help alleviate the pressure of inland flooding in most places but will need to be done in a coordinated fashion with district and village responsibilities in banning developments in riverbank encroachment control zones, reduction in agricultural activities and other developments in upland forests and illegal dumping of domestic rubbish into waterways.

4. Lefaga and Falease'ela District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Aana West Coast Road, Fagalei Pass (Lefaga-Falelatai link road): Drainage systems to be improved in high risk areas of Aana West Coast Road, Fagalei Pass[11] (Lefaga-Falelatai link road) connectivity road (lower catchment areas, near rivers and streams)	Continue to assess and upgrade culverts on main and 'access' roads in district especially at junctions with access roads sitting within combined hazard zones exacerbating inland flooding and storm water surges (IFHZ, CEHZ, CFHZ)– 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/MNRE/MWCSD /Village***	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	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design 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)"* Develop Integrated Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela District Undertake a Cost Benefit Analysis to weigh options for funding Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan
Relocation of 'main' coastal road from Falease'ela to Savaia[12]	Continue to investigate potential for coastal road to be relocated inland away from coast District, villages and families to resolve land issues ***Responsibility: Villages /LTA/MWTI /MNRE /Village***	Improve infrastructure resilienc e and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

[11]Area identified as high severity to landslides in LTA Vulnerability Assessment of the Samoa Road Network report
[12]Region identified as medium severity to coastal hazards in LTA Vulnerability Assessment of the Samoa Road Network report. Overlaying every 10 years recommended in report

		from coastal erosion and natural disasters Maintains lifeline access for Lefaga & Faleaseela Safer villages, houses and roads	Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Access/ work roads require maintenance and upgrade as it exacerbates flooding and to encourage relocation of houses away from high risk hazard zones	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff Construct roadside drainage ditches where needed ***Responsibility:LTA/MWTI/ MNRE/ District/***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to 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 land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	National Disaster Management Plan 2017-2021 TSP 2014-2019 Goal 2 KO 1
Village houses, churches, Schools and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and	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	CIM Strategy 2015 National Building Code

	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 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***		relocation purposes Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Flood protection measures for fords and bridges: replacement of concrete slab at Falease'ela crossing	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of Falease'ela Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along estuaries and coastal streams 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 Maintains lifeline access for all of Upolu 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 Lefaga & Falease'ela Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities 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.	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

			Designation of the IFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones and as potential escape routes	Construct roadside drainage ditches where needed Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff 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/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to 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 land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	National Disaster Management Plan 2017-2021 TSP 2014-2019 Goal 2 KO 1
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting systems for vulnerable families as a short term solution District to support SWA efforts at exploratory boreholes in district District and villages to support SWA efforts at protecting and conserving boreholes, intakes and	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 and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilise hazard maps and	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan

	catchment areas ***Responsibility: SWA/ MWCSD/ MNRE / District/ Village/ CSSP***		Geomorphologist findings to inform location and designs	
Electricity supply	Provide underground lines in the long term Install and connect power supply for inland residents Relocate overhead lines to a more resilient location when being replaced Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available Families to limit building and developments near electricity posts ***Responsibility: EPC/ MWTI/ Village/Families***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Falease'ela, Matafa'a, Safa'ato'a, Matautu, Savaia Wetland/ Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce 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 foraging in wetland areas	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Lefaga & Falease'ela District Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district	Draft NESP 2017-2021 Community Engagement Plan

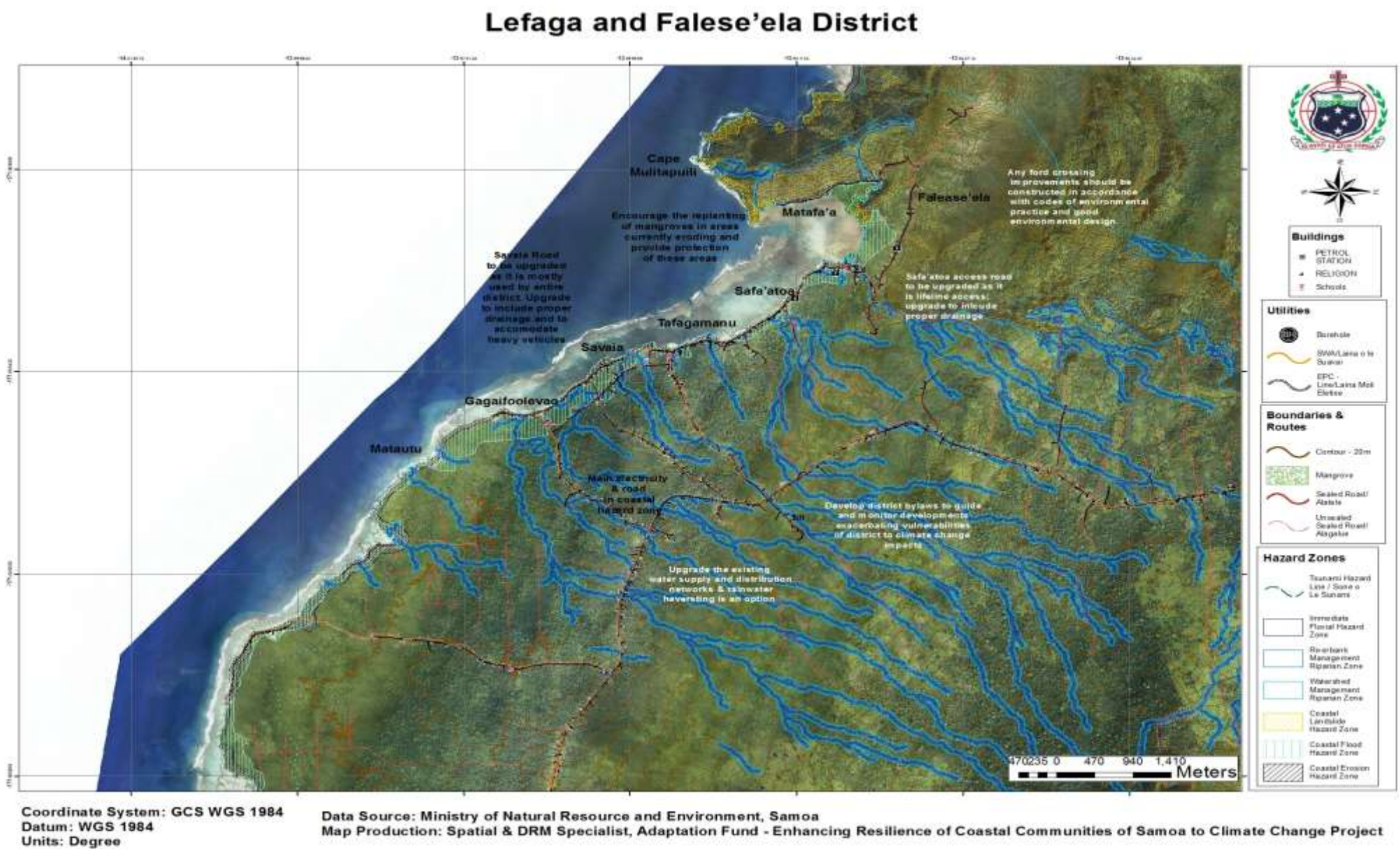
	Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI			
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Protection of catchment areas	Promote and support agro-forestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020

	Responsibility: MNRE/ /SWA/District/Village/ CSSP/GEF-SGP			
Sand/rock mining (commercial) and sand/rock extraction (domestic): rivers and riverbanks	Identify alternative sustainable sources of sand for domestic use Research the impacts of sand mining Village consultation on sand mining policy and regulation Village and government to collaborate closely on designated areas for sand/rock mining Raise awareness and support of sustainable land use practices ***Responsibility: MNRE/ Village/Families***	Mitigate potential damage from coastal erosion and flooding accommodating the hazard Safer villages, houses and roads Reduce impact from coastal erosion Economic benefit for village from sustainable sand mining activities	MNRE to continue to identify specific sites for inshore/ inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers Utilise Sui o Nu'u monthly meetings to monitor progress of CIM Plan activities	Draft Soil Resource Management Bill
Flood protection measures (soft solution to support flood protection measures for infrastructure)	Conduct riparian replanting along river channels and watercourses Encourage planting of indigenous species in conjunction with engineered water land drainage action plans Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas ***Responsibility: MNRE/ Villages***	Mitigate potential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Implement Lefaga & Falease'ela West 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
Soft coastal protection measures needed for most vulnerable areas	Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa Togatogo are known to have greater resilience to natural disasters and	Soft coastal protection measures will support and strengthen existing and new infrastructure	Develop an integrated land management plan for Lefaga & Falease'ela West district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	NESP 2017-2021 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan

	changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ MAF/Villages***	along the coast Reduce impact from coastal erosion and natural disasters Implements an Ecosystem Based Approach	MAF to assist in establishment of pilot sites to trial climate ready plant varieties MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops	2016-2020
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (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 promote ecological stability, soil protection and 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/village***	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial Develop an integrated land management plan with the aim of reducing any	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

			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

Lefaga and Falease'ela 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. Matafa'a Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Parts of Main roads: exposure to **extremely high risk**[13] hazard zones	Continue to upgrade, widen roads, upsize ocean outfalls and improve drainage systems atidentified areas to increase regulation of water flow and reduce flooding onto roads in extremely high risk hazard zones in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Implement regular drainage inspection and maintenance 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***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Maintains lifeline access for all of Upolu 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 Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1
Drainage systems to be improved in high risk areas exacerbating inland flooding	Assess and upgrade culverts and cross drainage on main East Coast Road especially at junctions with access roads sitting within combined hazard zones– in accordance with	Improves infrastructure resilience and rate of response and recovery to	Use existing information for guidance but not limited to: *"Vulnerability Assessment of the Samoa Road Network (2017)";*	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector

[13]Extremely high risk is where there is a combination of 4 hazard zones. High risk areas is where there is a combination of 2 or 3 hazard zones

and storm water surges affecting infrastructure, village homes and other assets	*Vulnerability Assessment of the Samoa Road Network* recommendations Introduce new and widen existing culverts in wetland areas to improve tidal flow and fish passage in the wetland area Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding Implement regular drainage inspection and maintenance District to regulate developments near and around waterways and drainage connecting to main East Coast Road ***Responsibility: LTA /MWTI/MWCSD/ District/Village/ Families***	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	*"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 Lefaga & Falease'ela District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	Plan
Village houses, churches, government assets and road located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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	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	CIM Strategy 2015 National Building Code

	flood prone areas 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***		Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	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
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting systems for vulnerable families as a short term solution District to support SWA efforts at exploratory boreholes in district District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas ***Responsibility: IWS/ SWA/ MWCSD/ MNRE / District/ Village/ CSSP***	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contaminatio n of water supply Reduce impact from inland flooding	Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilise hazard maps and Geomorphologist findings to inform location and designs	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan

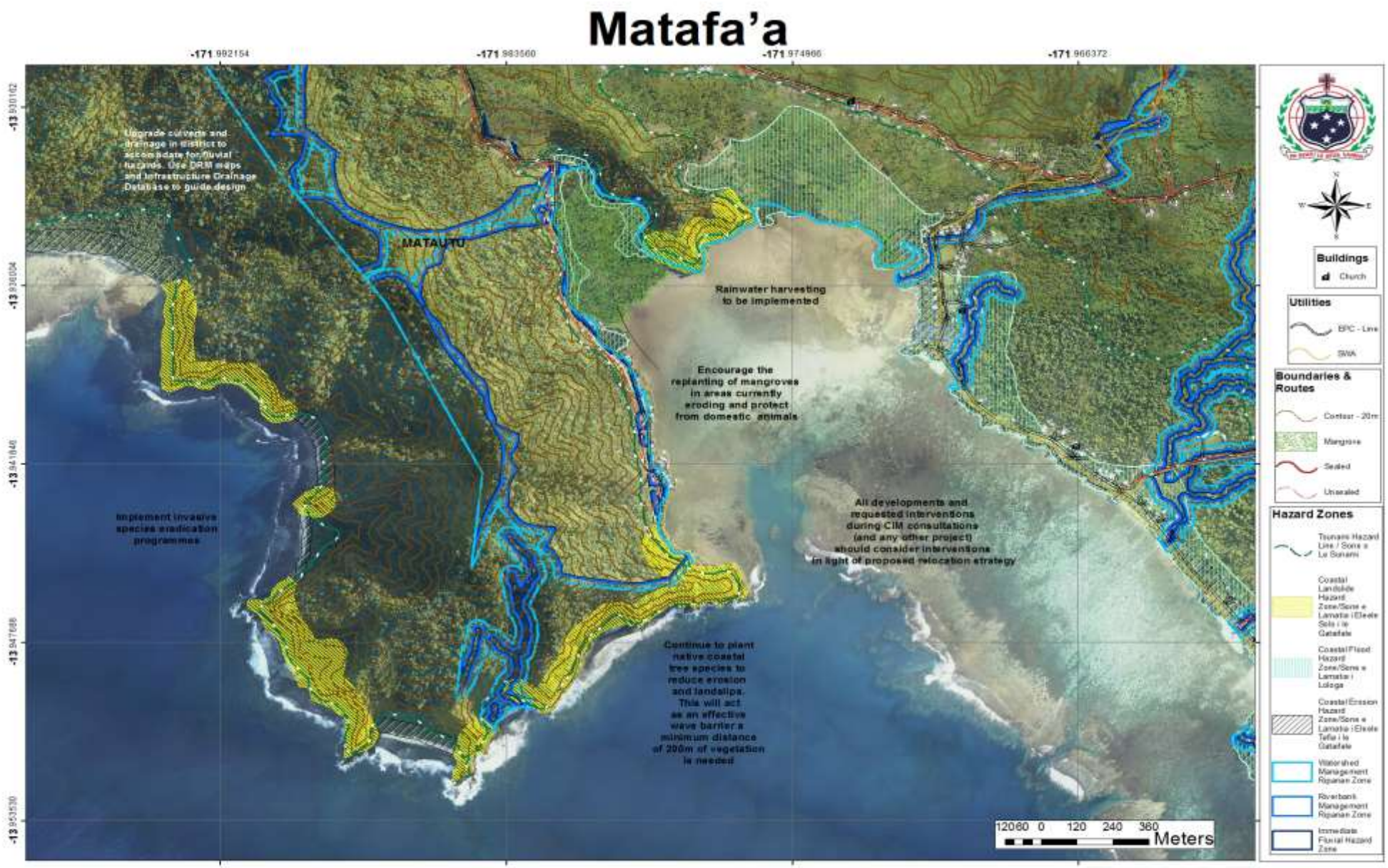
Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Matafa'a Wetland/ Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce 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 ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	Develop an integrated land management plan for Lefaga & Falease'ela district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Implement wetland and mangrove protection programme Identify funding /budget requirements and implementation programme for establishment of protected areas in district	Draft NESP 2017-2021 Community Engagement Plan
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 Lefaga & Falease'ela West 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	NESP 2017-2021 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

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


Improve drainage and access road to Matafaa


Agricultural development on hills

Matafa'a Village Map



Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

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

6. *Falease'ela Village Interventions*

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Access/ work roads require maintenance and upgrade as it exacerbates flooding and encourage relocation of houses away from high risk hazard zones	Construct roadside drainage ditches where needed Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff 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/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to 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 land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	National Disaster Management Plan 2017-2021 CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan
Village houses, churches and overnment assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones	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,	CIM Strategy 2015 National Building Code

	Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas 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***		CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Flood protection measures for fords and bridges: replacement of concrete slab at Falease'ela crossing	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of Falease'ela Ensure river channel upstream is cleared and maintained regularly Construct levees to reduce flooding along estuaries and coastal streams 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 Maintains lifeline access for all of Upolu 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 Lefaga & Falease'ela Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities 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 as an "at risk" zone with appropriate landuse planning controls and	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

			restrictions	
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting systems for vulnerable families as a short term solution District to support SWA efforts at exploratory boreholes in district District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas ***Responsibility: IWS/ SWA/ MWCSD/ MNRE / District/ Village/ 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 and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilise hazard maps and Geomorphologist findings to inform location and designs	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan

Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Falease'ela Wetland/ Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce 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 ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	Develop an integrated land management plan for Lefaga & Falease'ela district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Implement wetland and mangrove protection programme Identify funding /budget requirements and implementation programme for establishment of protected areas in district	Draft NESP 2017-2021 Community Engagement Plan
Flood protection measures (soft solution to support flood protection measures for infrastructure)	Conduct riparian replanting along river channels and watercourses Encourage planting of indigenous species in conjunction with engineered water land drainage action plans Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas ***Responsibility: MNRE/ Villages***	Mitigate potential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Implement Lefaga & Falease'ela West 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	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants Develop an integrated land management plan with the aim of reducing any unnecessary actions that	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan

	ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	flooding	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	2016-2020
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village / CSSP/GEF-SGP***	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020
Sand/rock mining (commercial) and sand/rock extraction (domestic): rivers and riverbanks	Identify alternative sustainable sources of sand for domestic use Research the impacts of sand mining Village consultation on sand mining policy and regulation Village and government to collaborate closely on	Mitigate potential damage from coastal erosion and flooding accommodating the hazard Safer villages, houses and roads Reduce impact from coastal erosion	MNRE to continue to identify specific sites for inshore/ inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining	Draft Soil Resource Management Bill

	designated areas for sand/rock mining Raise awareness and support of sustainable land use practices ***Responsibility: MNRE/ Village/Families***	Economic benefit for village from sustainable sand mining activities	Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers Utilise Sui o Nu'u monthly meetings to monitor progress of CIM Plan activities	
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 Lefaga & Falease'ela West 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	NESP 2017-2021 Two Million Tree Planting 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**
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

	Conduct pilot site trials for climate ready plant varieties ***Responsibility: MAF/ MNRE/village***		establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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

Ford access at Liua le Vai o Sina stream

Newly upgraded ford

Falease'ela Village Map

7. Safa'ato'a Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Relocation 'main' coastal road from Falease'ela to Savaia[14]	Continue to investigate potential for coastal road to be relocated inland away from coast District, villages and families to resolve land issues Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: Village /Families***	Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Maintain lifeline access and connectivity for Central Business Area Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	UtiliseHazard Maps and Geomorphologist Drainage Infrastructure Database Develop a Lefaga/Faleaseela Integrated Catchment Strategy and Flood Management Plan in conjunction with Geomorphologist Drainage Infrastructure Database findings Utilize environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela West district Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 Community Sector Plan
Access / work roads require maintenance and upgrade as it exascerbates flooding, encourage relocation of houses away from high risk hazard zones and act as escape route during extreme events	Assess and upgrade access/work roads as potential escape routes Construct roadside drainage ditches where needed Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff Village to regulate developments near and around road shoulders of	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Safer villages, houses and roads Minimise national disaster	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs 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 Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls	National Disaster Management Plan 2017-2021 CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan

[14]Region identified as medium severity to coastal hazards in LTA Vulnerability Assessment of the Samoa Road Network report. Overlaying every 10 years recommended in report

	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/ Villages /Families***	recovery expenditure on damaged properties and public assets	and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	
Village houses, church, Safa'ato'a Primary School and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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 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
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as **short term solution** Enforce environmental safeguards where reclamations are proposed.	Reduce impact from inland flooding on coastal areas Mitigate potential damage from coastal erosion and flooding	Planning provisions to be guided by the Planning and Urban Management Act 2004 Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for	NESP 2017 - 2021

	Government and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: MNRE/ Village***	accommodating the hazard Safer villages, houses and roads	relocation purposes Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting systems for vulnerable families as a short term solution District to support SWA efforts at exploratory boreholes in district District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas ***Responsibility: IWS/SWA/ MWCSD/ MNRE / District/ Village/ 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 and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilise hazard maps and Geomorphologist findings to inform location and designs	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan

Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Safa'ato'a Wetland/ Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce 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 foraging in wetland areas ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	MNRE DEC to provide technical assistance and backstopping in the development of a Wetland Management Plan for Lefaga & Falease'ela District Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district	Draft NESP 2017-2021 Community Engagement Plan
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments,	Reduced risk of slips and erosion Improve	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West	Water Sector Plan Community Engagement Plan

	and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village/ CSSP/GEF-SGP***	resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Restoration Operational Plan 2016-2020
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 Lefaga & Falease'ela West 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	NESP 2017-2021 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Village pool located in high risk hazard zones	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: MoF-CSSP/ MNRE/Villages/ NGOs***	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 Community Engagement Plan

Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (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 promote ecological stability, soil protection and 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/village***	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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.	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
Pest management; invasive plants and animals	Implement an eradication programme to eradicate, contain or exclude invasive species Implement an inventory of	Maintains natural ecosystem	Develop an integrated land management plan for Lefaga & Falease'ela district with the aim of reducing any unnecessary actions that may adversely	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan

	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 ***Responsibility: Villages /District/ MNRE/MAF/ SROS***	Builds resilience of community livelihood and food security	affect the natural habitats and ecosystems of the area MAF to raise awareness of farmers on impacts to water flows from poor livestock management 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 Training for farmers on pests management particularly affecting fruit trees and crops	(NISAP)
Governance	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages ***Responsibility: MWCSD /Village***	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021

Village wetland, a raising ground for domestic pigs

Upgrade access road

Safa'ato'a Village Map

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

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

8. *Tafagamanu Village Interventions*

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Relocation of 'main' coastal road from Falease'ela to Savaia[15]	Continue to investigate potential for coastal road to be relocated inland away from coast District, villages and families to resolve land issues ***Responsibility: Villages /LTA/MWTI /MNRE /Village***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Maintains lifeline access for Lefaga & Faleaseela Safer villages, houses and roads	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
Access/ work roads require maintenance and upgrade as it exascerbates flooding, encourage relocation of houses away from high risk hazard zones	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff Construct roadside drainage ditches where needed ***Responsibility:LTA /MWTI/ MNRE/ District/***	Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters Encourages coastal families to relocate inland 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	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

[15]Region identified as medium severity to coastal hazards in LTA Vulnerability Assessment of the Samoa Road Network report. Overlaying every 10 years recommended in report

			Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs Develop Integrated Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela District	
Village houses, churches and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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 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
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as **short term solution** Enforce environmental safeguards where reclamations are proposed. Government	Reduce impact from inland flooding on coastal areas Mitigate potential damage from coastal erosion and flooding accommodating the hazard	Planning provisions to be guided by the Planning and Urban Management Act 2004 Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes	NESP 2017 - 2021

	and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: MNRE/ Village Council/CSSP/ NGO/ UNDP-GEF SGP***	Safer villages, houses and roads	Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

	Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP			
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village/ CSSP/GEF-SGP***	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

	Implement Sustainable Land Management (SLM) practices Conduct pilot site trials for climate ready plant varieties ***Responsibility: MAF/ MNRE/village***	natural disasters	and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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	
Pest management; invasive plants and animals	Implement an eradication programme to eradicate, contain or exclude invasive species Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken Conduct education and awareness programmes on the impacts of invasive species Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices Build the capacity of farmers to manage stray	Maintains natural ecosystem Builds resilience of community livelihood and food security	Develop an integrated land management plan for Lefaga & Falease'ela district 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 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 Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)

	animals (pigs, cattle) that are contaminating water sources ***Responsibility: Villages /District/ MNRE/MAF/ SROS***			
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


Improve road and drainage network


Upgrade access road to upper Tafagamanu village

Tafagamanu 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. Savaia Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Savaia Road: Access/ work roads require maintenance and upgrade as it exacerbates flooding, encourage relocation of houses away from high risk hazard zones and act as escape route during extreme events	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff Construct roadside drainage ditches where needed. ***Responsibility:LTA/MWTI/ MNRE/ District/***	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 Minimize national disaster recovery expenditure on damaged properties and public assets	Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities UtilizeHazard Map Hazard maps and Geomorphologist Drainage Infrastructure Database Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
Drainage systems to be improved in high risk areas	Continue to assess and upgrade culverts on main and access roads in district to facilitate the overland flow of storm water and reduce flooding - in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Introduce culverts in wetland areas to improve tidal flow and fish passage in the wetland area Implement regular drainage inspection and maintenance Village to conduct regular drainage and waterway clearance	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	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design 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)"* Develop Integrated Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela District Undertake a Cost Benefit Analysis to weigh options	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan

	behind homes Government to regulate developments and illegal rubbish dumping near and around waterways and drainage connecting to East Coast Road ***Responsibility: LTA/ MWTI/MNRE/MWCSD /Village/ Families***		for funding Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	
Village houses, churches, School and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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 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

Slipway	Upgrade slipway to cater for village fishing canoes ***Responsibility: Village /CSSP***	Builds resilience of community livelihood and food security Improve preparedness and readiness response to natural disasters	Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities	NESP 2017 - 2021 Community Engagement Plan
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Savaia Wetland/ Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	MNRE DEC to provide technical assistance and back stopping in the development of a Wetland Management Plan for Lefaga & Falease'ela District Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district	Draft NESP 2017-2021 Community Engagement Plan

	Village to fence off domestic animals foraging in wetland areas ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***			
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020

	with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village / CSSP/GEF-SGP***			
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 Lefaga & Falease'ela West 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	NESP 2017-2021 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Marine reserve: giant clam disease	Implement an eradication programme to eradicate, contain or exclude invasive 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 ***Responsibility: Villages /District/ MNRE/MAF/ SROS***	Maintains natural ecosystem Builds resilience of community livelihood and food security	Develop an integrated land management plan for Lefaga & Falease'ela district 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 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 Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)

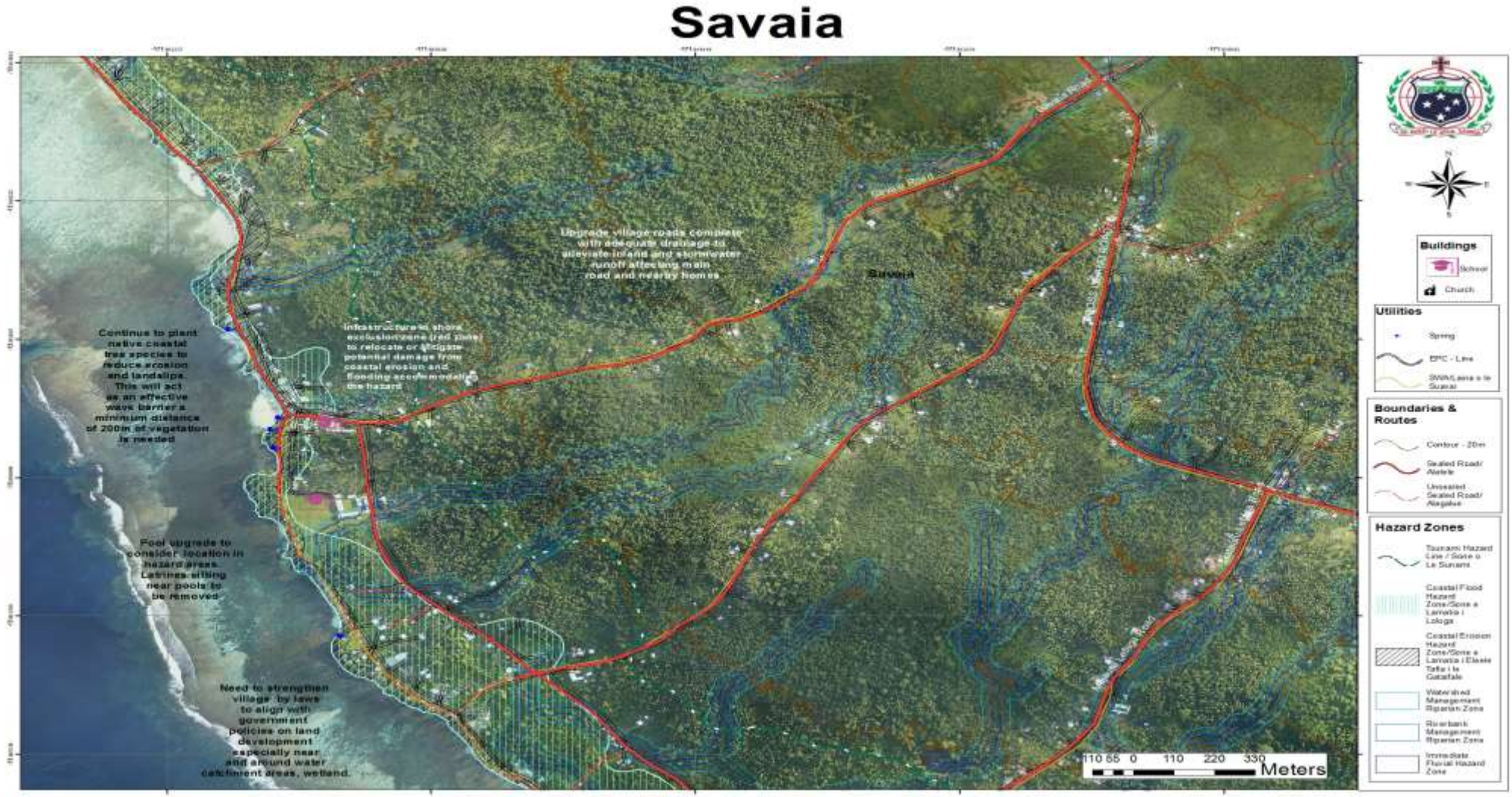
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (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 promote ecological stability, soil protection and 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/village***	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

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


New concrete access to sea


Savaia protected area

Savaia 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

10. Gagaifoolevao Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Gagaifoolevao Road Access/ work roads require maintenance and upgrade as it exacerbates flooding, encourage relocation of houses away from high risk hazard zones and act as escape route during extreme events	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff Construct roadside drainage ditches where needed ***Responsibility: LTA/ MWTI/ MNRE/ District/***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to 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 land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	National Disaster Management Plan 2017-2021 CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan
Dranage systems to be improved in high risk areas	Continue to assess and upgrade culverts on main and 'access' roads in district especially at junctions with local roads sitting within combined hazard zones exacerbating inland flooding and storm water surges (IFHZ, CEHZ, CFHZ)– 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	Improves 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	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

	reduce flooding Implement regular drainage inspection and maintenance ***Responsibility:LTA/ MWTI/MNRE/ MWCSD /Village / Families/***		permits as required by law Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	
Village houses, churches, School and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Village to seek lands to migrate to due to expanding CEFZ and CFHZ Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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 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

Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Gagaifoolevao Wetland/ area conservation	Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce 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 ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	Develop an integrated land management plan for Lefaga & Falease'ela district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Implement wetland and mangrove protection programme Identify funding /budget requirements and implementation programme for establishment of protected areas in district	Draft NESP 2017-2021 Community Engagement Plan
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting	Protects and enhance local species diversity Reduced risk of slips and erosion	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants Develop an integrated land management plan with the	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020

	including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	Reduce impact from inland flooding	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	Restoration Operational Plan 2016-2020
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village / CSSP/GEF-SGP***	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020
Village pool located in high risk hazard zones	Village pool is currently in a poor state with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs	Increase adaptation during drought periods Improve health and sanitation	Utilise Hazard Maps and Geomorphologist findings to inform location and design MNRE Water & Sanitation to conduct water testing and analysis of village	CIM Strategy 2015 Community Engagement Plan

	Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works) ***Responsibility: MoF-CSSP/ MNRE/Villages***	Reduce contamination of water supply	pool prior to any intervention UpdateVillage bylaws to include managing and maintaining village natural resources	
Marine reserve: giant clam	Assess feasibility of recreating a marine reserve for village as backup, alternative food supply Village to restock marine reserve with suitable species Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction Research improved inshore fishery resources that are resilient to climate change Village to provide fencing for domestic animals to prevent waste contaminating marine reserve ***Responsibility: MNRE /MAF/ Village /CSSP/ UNDP-GEF SGP***	Protects and enhance local species diversity Maintains natural ecosystem Builds resilience of community livelihood and food security	MAF and MNRE DEC and CC to provide technical assistance and backstopping in the assessment and establishment of a marine reserve for village 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 Village to seek funding to establish marine reserve MAF to raise awareness of farmers on impacts to water flows from poor livestock management	Draft NESP 2016-2020 Community Engagement Plan Agriculture Sector Plan 2016-2021
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

	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/village***		supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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	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

	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***	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	

Village effort to reduce health hazard from badly sealed road

Gagaifo marine protected area

Gagaifoolevao 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

11. Matautu Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Matautu Roads 1 & 2 (coastal and inland): Access/ work roads require upgrade and maintenance as it exacerbates flooding, encourage relocation of houses away from high risk hazard zones and act as escape route during extreme events	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff Construct roadside drainage ditches where needed ***Responsibility: LTA/ MWTI/ MNRE/ District/***	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 Lefaga & Falease'ela 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 TSP2014-2019 Goal 2 KO 1 Community Sector Plan Community Engagement Plan
Drainage systems to be improved in high risk areas	Continue to assess and upgrade culverts on main and 'access' roads in district especially at junctions with local roads sitting within combined hazard zones exacerbating inland flooding and storm	Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters Encourages	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*	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

	water surges (IFHZ, CEHZ, CFHZ)– 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 Introduce culverts in wetland areas to improve tidal flow and fish passage in the wetland area Implement regular drainage inspection and maintenance ***Responsibility:LTA/ MWTI/***	coastal families to relocate inland Maintains lifeline access for all of Upolu Minimises national disaster recovery expenditure on damaged properties, public and private assets	*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	
Village houses, churches and government assets located in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ 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 Families and village to limit building and developing on natural overland flow paths	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

	exacerbating inland flooding and storm water surges ***Responsibility: Village / Families /MWTI/ MNRE/ MWCSD***			
Electricity supply	Install and connect power supply for inland residents Install streetlights along the roads where needed for community safety Relocate overhead lines to a more resilient location when being replaced Provide underground lines in the long term Install and connect to solar power supply if made available ***Responsibility: EPC /MWTI/ Villages***	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
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuation shelter assessment and mark on CIM Plan hazard maps Develop a Village Climate Disaster Management Plan (VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRM program Install relevant signs to guide the community on emergency response	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan 2017-2021 National Building Code National Policy for People with Disabilities NISP 2011 KESO 5

	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***			
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as **short term solution** Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: MNRE/ Village***	Reduce impact from inland flooding on coastal areas Mitigate potential damage from coastal erosion and flooding accommodating the hazard Safer villages, houses and roads	Planning provisions to be guided by the Planning and Urban Management Act 2004 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	NESP 2017 - 2021
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Matautu Wetland/ Mangrove area conservation	Village to clean out toxic algae bloom found in mangrove area Undertake an assessment of tidal flow necessary to maintain a healthy natural environment Limit land clearance and developments adjacent to wetland areas Continue to plant native species along coastal areas to reduce erosion	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply Reduce impact from inland flooding	DEC to provide technical assistance to clean out toxic algae Develop an integrated land management plan for Lefaga & Falease'ela district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Implement wetland and mangrove protection programme	Draft NESP 2017-2021 Community Engagement Plan

	and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed Village to fence off domestic animals ***Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI***			
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 Lefaga & Falease'ela West 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	NESP 2017-2021 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
District Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Marine reserve: giant clam	Village to restock marine reserve with suitable species	Protects and enhance local species diversity	MAF and MNRE DEC and CC to provide technical assistance and backstopping	Draft NESP 2016-2020

	Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction Research improved inshore fishery resources that are resilient to climate change Village to provide fencing for domestic animals to prevent waste contaminating marine reserve ***Responsibility: MNRE /MAF/ Village /CSSP/ UNDP-GEF SGP***	Maintains natural ecosystem Builds resilience of community livelihood and food security	in the assessment and establishment of a marine reserve for village 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 Village to seek funding to establish marine reserve MAF to raise awareness of farmers on impacts to water flows from poor livestock management	Community Engagement Plan Agriculture Sector Plan 2016-2021
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and 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/village***	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

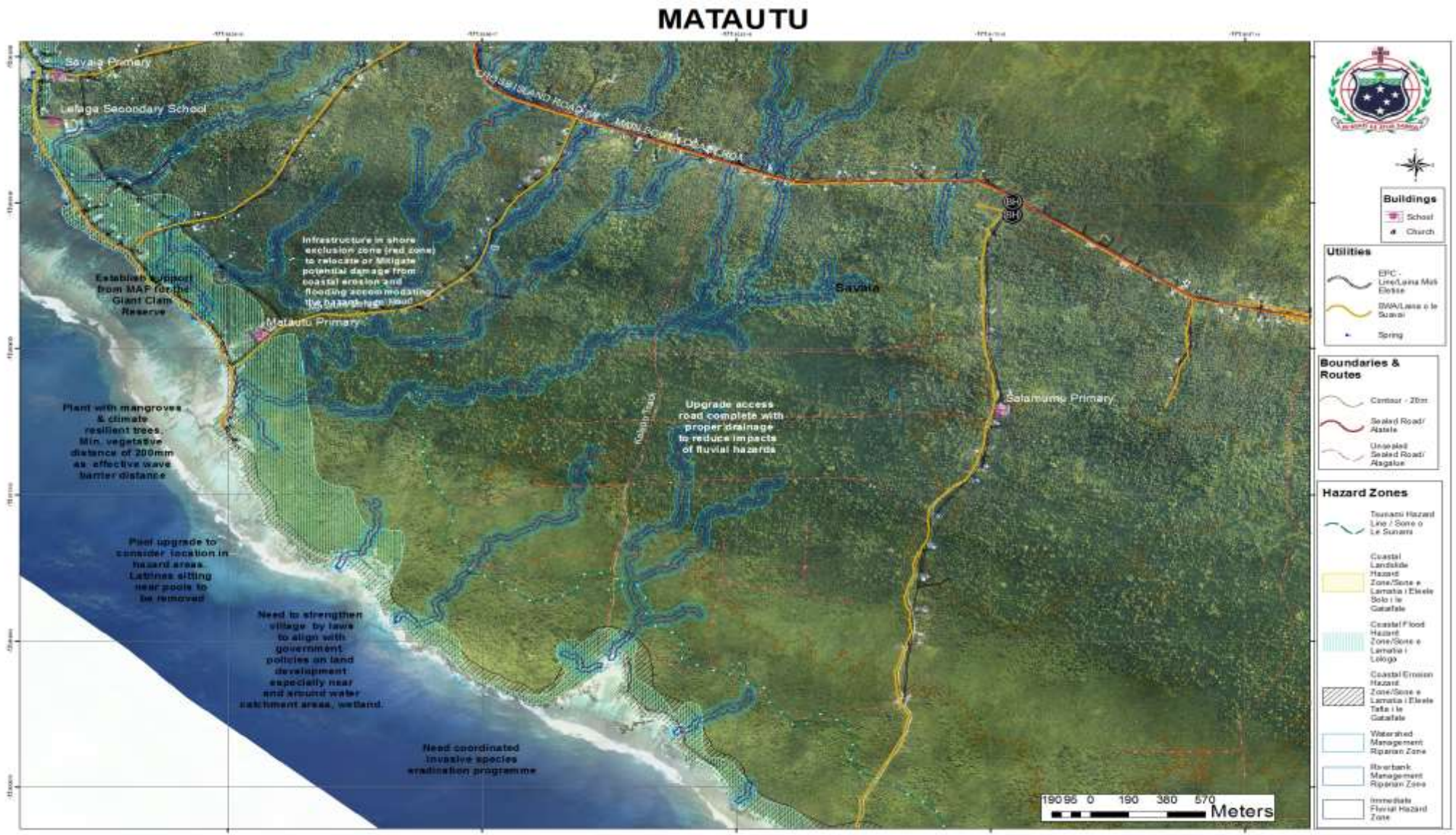
			advice, seedlings and planting material for village/families as a trial Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
Pest management; invasive plants and animals	Implement an eradication programme to eradicate, contain or exclude invasive 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 ***Responsibility: Villages /District/ MNRE/MAF/ SROS***	Maintains natural ecosystem Builds resilience of community livelihood and food security	Develop an integrated land management plan for Lefaga & Falease'ela district 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 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 Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)

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


Old settlement at the coast


Low hanging electricity lines

Matautu 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

12. Tanumalala Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
West Cross Island Road: Drainage systems to be improved in high risk areas (fluvial hazard zones)	Continue to assess and upgrade culverts on main and 'access' roads in village especially at junctions with access roads sitting within fluvial hazard zones exacerbating inland flooding and storm water surges– culverts sizes to be 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/MNRE/MWCSD /District/Village***	Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters Maintains lifeline access for all of Upolu Minimises national disaster recovery expenditure on damaged properties, public and private assets	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform design 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)"* Develop Integrated Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela District Undertake a Cost Benefit Analysis to weigh options for funding Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1 Lefaga & Falease'ela District Development Plan
Access/ work roads (Tanumalala Access Roads 1&2, WSTEC Access Road) require maintenance and upgrade as it exacerbates flooding onto main West Cross Island Road	Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff 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	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs 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 Designation of the IFHZ as an "at risk" zone with appropriate landuse planning controls and	TSP 2014-2019 Goal 2 KO 1 Lefaga & Falease'ela District Development Plan

	requiring villagers to get the appropriate permits and consent Construct roadside drainage ditches where needed Assess and upgrade access roads where needed ***Responsibility :LTA /MWTI/ MNRE/ Village/ Families***	damaged properties and public assets	restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Lefaga & Falease'ela district	
Village houses, churches and government assets located in fluvial hazard zones	Relocate assets outside of hazard zones when re-building 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 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 as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 National Building Code Lefaga & Falease'ela District Development Plan
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting systems for vulnerable families as a short term solution District to support SWA efforts at exploratory boreholes in district	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply	Develop and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016)10 year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan Lefaga & Falease'ela District Development Plan

	District and villages to support SWA efforts at protecting and conserving boreholes, intakes and catchment areas in district ***Responsibility: SWA/ MWCSD/ MNRE / District/ Village/ CSSP***	Reduce impact from inland flooding	extension costs of water supply and procurement of rainwater harvesting systems Utilise hazard maps and Geomorphologist findings to inform location and designs	
Electricity supply	Strengthen power supply to accommodate for new and additional built infrastructure (village and business infrastructure) in village Install and connect power supply for inland residents Relocate overhead lines to a more resilient location when being replaced Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available Families to limit building and developments near electricity posts ***Responsibility: EPC/ MWTI/ Village/Families***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
District/Village Upland Forest	Continue programme by Forestry on replanting native forestry species of the upland forest Promote agro-forestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases Implement the Integrated Pest Management	Protects and enhance local species diversity Reduced risk of slips and erosion Reduce impact from inland flooding	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants 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,	Community Engagement Plan Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

	Programme Implement Sustainable Land Management (SLM) practices ***Responsibility: MNRE-WRD & Forestry/ District /Village/CSSP***		depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
Protection of catchment areas	Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area Replant catchment areas with local species such as tava, and poumuli ***Responsibility: MNRE/ /SWA/District/Village/ CSSP/GEF-SGP***	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters Reduce contamination of water supply	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Lefaga & Falease'ela District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020
Flood protection measures (soft solution to support flood protection measures for infrastructure)	Conduct riparian replanting along river channels and watercourses Encourage planting of indigenous species in conjunction with engineered water land drainage action plans Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas ***Responsibility: MNRE/ Villages/Families***	Mitigate potential damage from inland flooding Reduce flooding of built up areas Safer villages, houses and roads	Implement Lefaga & Falease'ela West 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
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and 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/village***	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial 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	Agriculture Sector Plan 2016-2021 Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020

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

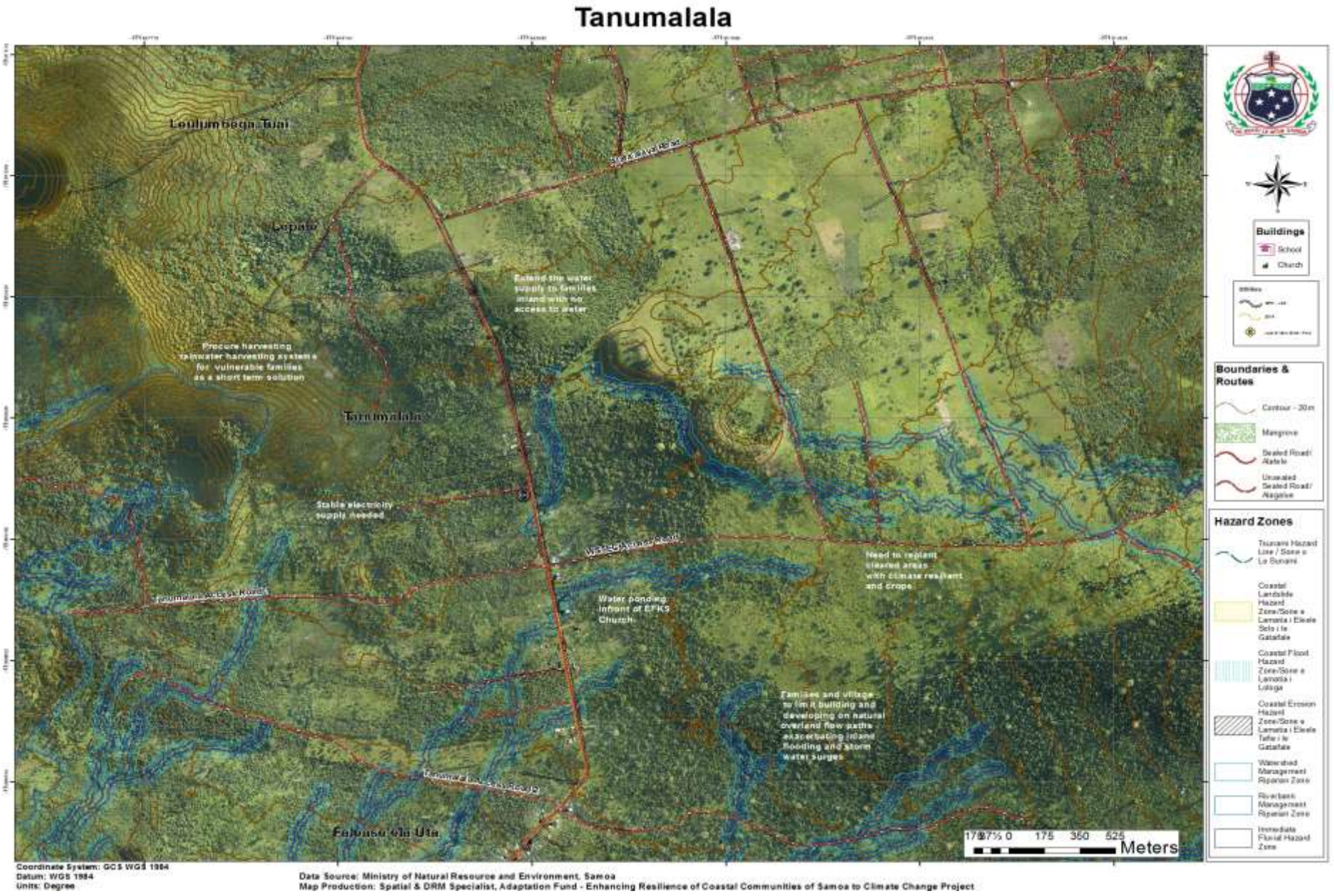
Non-CR issues raised during consultations	Proposed Solution	Comments
Road safety: road accidents caused by ponding water infront of EFKS Church ***Responsibility: LTA/MWTI***	Widen road and install proper drainage in area affected by fluvial hazard zone to avoid ponding on main road and causing road accidents	Related to CR drainage issue but this issue deals mainly with road safety which is covered under the MWTI and LTA strategic plans
Potential risk of residents from escaped prisoners at nearby Tanumalala Prison ***Responsibility: Samoa Prisons & Corrections Services (SPCS)***	SPCS to ensure safety of nearby residents through proper regulating, improvement and monitoring of safety policies to align with international standards of prisons and corrections services	Non-CR issue however village representatives deem it a crucial issue for long term monitoring purposes in relevant government plans

poorly upgraded Tanumalala Access Road

water ponded area during heavy rainfalls

Tanumalala Access Road 2 needing upgrade

Tanumalala Village Map



Upolu AF Districts Overview Map of Coastal Inundation Zones