Community Integrated Management Plan

Falelatai and Samatau 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 Falelatai and Samatau (Falevai and Samai, Matautu, Pata, Samatau and Siufaga villages).

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

Date of Signing: 22nd June 2018

Representatives	Signatures
Falevai and Samai Village	
• Salu Maafi	
• Fasavalu T. Toai	
• Lupematasila Faasao Ailao	
• Salu Tala Sila	
• Sila Fue Talagaiga	
Matautu Village	
• Lupe Matasila Faamanu	
• Misa Felavatai Gagae	
• Anae Toni Leutele	
• Line Peau	

Pata Village

- Maanaima Laau
- Aulele Fosi
- Faamelea Tiafau
- Fiu Sione Talafa
- Taiivao Faaliga

Samatau Village

- Manoo Tautai
- Togia Tuutagalevao
- Fagaea Ausage
- Teleiai Enosa
- Fetinai Teleiai

Siufaga Village

- Mealamu Misa
- Taefu Molapo'a
- Taefu Sione
- Otesa Faalavaai Tony
- Merita Nanai

The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Falelatai and Samatau 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
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 Program
DSP	District Sub Project
EbA	Ecosystem based Adaptation
ECCCR	Enhancing Coastal Community Climate Resilience
ECR	Enhancing Climate Resilience
EMP	Environmental Management Plan
EPC	Electric Power Corporation
ERN	Emergency Radio Network
HCSI	High Coastal Sensitive Index
IAS	Invasive Alien Species
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
MoH	Ministry of Health
MNRE	Ministry of Natural Resources and Environment
MWCSD	Ministry of Women Community and Social Development
MWTI	Ministry of Work Transport and Infrastructure
NAP	National Action Program
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 Program Climate Resilience
R2R	Ridge to Reef
SIAM	Samoa Infrastructure Asset Management
SOE	State of Environment
SWA	Samoa Water Authority
UNDP-GEF SGP	United Nations Development Program Global Environment Facility Small Grants Program
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 program 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 these to fall commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources)
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 in security). 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* (areas sensitive to coastal hazards); *CEHZs* (coastal erosion hazard zones); *CFHZs* (coastal flood hazard zones) 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 land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defenses and works.
Issue	A specific concern regarding both cause and effect.
Land and Resource Use	The use of land and resources by the community for social, economic or other benefit (e.g. landuse 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

Introduction to the CIM Plan

The Strategic Vision

The District Community Integrated Management (CIM) Plan for Falelatai and Samatau 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).***

The Aim of the CIM Plan

The aim of the CIM Plan is to help communities and government improve 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.

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.

Implementation Guidelines

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.

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.

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 Program 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).

1. Description of Falelatai and Samatau District

Physical and Natural Resource Setting

The Faipule District of Falelatai and Samatau is located at the south-western end of the island of Upolu. The district is characterized as low lying areas with several slow moving streams forming numerous inland wetland areas. A number of small pockets of mangrove areas are scattered throughout the district, some are heavily degraded as a result of road construction, family gardens and being used as dumping grounds of household wastes. The coastal areas have extensive coral reefs, mangroves and wetlands.

The five villages of the district include Samatau, Siufaga, Pata, Matautu, Falevai and Samai. Low-lying environment of the district gradually rises to hills in the North. With the exception of Falevai and Samai, where steep headlands have formed to the east, there are no significant sized bays. The steep topography also results in overland streams passing through the villages of Falevai and Samai. A mangrove area at Falevai has been accorded informal conservation status by the village as it is used as a crab sanctuary where villagers can harvest crab for subsistence use and for selling at the Apia market.

The coast is exposed to the south and large areas of land are available further inland for relocation. At Samatau, the wetland area behind the village is the main factor restricting relocation options for infrastructure. There are also wetlands located inland behind Falevai, and in the coastal areas at Samai and Siufaga, Pata. In some parts of the District, the low-lying nature of the land leads to an absence of any fast flowing rivers or streams and instead there are numerous inland wetland areas. Breaks in the reef are well formed at distance between 500m and 1kilometre from the shore.

The nearest hospital is the Leulumoega District Hospital. Seven schools are located in the district of Falelatai and Samatau, 3 Pre-schools[1] and 4 Primaries[2]. There are 16 churches in the district distributed among villages, 5 situated in Samatau, 5 in Siufaga, 3 is at Pata and Matautu with 3 churches. Beaches along the coast are made up of a mixture of fine coral sand and unbroken, dead coral. The greatest deposits of readily accessible sand are located at the tip of a spit bordering the Siufaga and Pata wetlands. This spit serves to shelter the wetland from the south west. A road has been constructed along the spit, through the wetland to enable access to the sand.

There is evidence of erosion at numerous locations along the coast, particularly between reclamations. Most of the reclamations are protected by rock facing; however, many of the beaches themselves are not protected. Drainage and flooding are a problem in all villages.

Plantation and agricultural areas are generally located inland from the villages. More land is available uphill especially at Matautu towards Lefaga district. Coconut plantations dominate agriculture development in the district and flooding from upland streams often cause problems for infrastructure and homes along the coast. The remaining secondary forests are found at the hills of Matautu Falelatai bordering the Lefaga district to the west. These forests are spared from development only because of the difficult terrain in which they exist.

Agriculture livelihoods are limited to areas of fertile soil on the lower slopes. This agriculture area is above the influence of any sea level rise impacts. Water surface flows will be altered by climate change and local adaption through the maintenance of the upper level forests will be important. There are only small areas that have suitable soil fertility.Invasive species common to this district include the ava-tonga(*Piper methysticum*); faapasi (*Spathodiacampanulata*); the large leaf merremia vine (*Merremiapeltata*); and tamaligiuliui or silk tree (*Albizziachinensis*).

The narrow flat coastal plateau has small areas of houses positioned close to the coast main road and coastline. Inland from the coast, the landscape is dominated by broad sloping ridges separated by deep gorges with moderately deep soils. Further inland the landscape is dominated by gently sloping ridges but without deep gorges. The higher areas are described as having moist soils throughout the year with no pronounced dry season.

The main district infrastructures include the main road with drainage culverts and the ford at Samai. Seawalls exist along parts of the coast. The main high voltage electricity lines in the villages generally follow the Falelatai Coast Road. Local overhead electricity lines are located along coastal roads and footways between houses and serve a high number of houses. The water supply comprises a local water supply based at Samai, which include three reservoirs

[1]Manumailagi Pre-school, Samatau Pre-school, Pata Pre-school.
[2]Samatau Primary school, Siufaga Primary, Pata Primary school and Falelatai Primary school.

and serves the village of Samai, Falevai, Matautu and Pata. The remainder of the District is served by SWA. In general a 100mm galvanised pipe follows the inland side of the Falelatai Coast Road and from this 25mm PVC pipes provide connection to individual houses. There are regular water supply problems in the district, particularly during dry periods.

Social and Economic Setting

The Falelatai and Samatau District currently has a population of 3026; Falevai and Samai 548, Matautu 376, Pata 487, Samatau 979 and Siufaga 636. Of the total 3026, total male is 1490, female 1536. Apia has a strong social and economic influence on villages in the District with many residents commuting to jobs in Apia on a daily basis.

Primary services such as water, power and telephone generally follow the Falelatai coast road and are vulnerable to extreme events. There are two SWA boreholes in this district; one located near Samatau and one within Samatau. Telephone coverage is provided by both Digicel and BlueSky

The District of Falelatai is dominated by plantations and mixed cropping as well as cattle and small livestock. Because of its steep slopes, crop suitability in this district is very high for the major food crops such as coconut, cocoa, breadfruit and fruits such as lemon[3]. Most are small scale and associated with household subsistence.

The main economic activities significant to the district are employment in the capital (Apia) as well as employment opportunities at a supermarket in the district and tourist facilities in the neighbouring district of Aiga I le Tai. A number of small stores are located throughout the district in each of the villages. Village activities are dominated by plantation work on the tops of the headlands and inland hills as well as fishing. At Siufaga commercial sand mining contributes to the local economy and a tourist resort is being established adjacent to the sand mining area.

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 Falelatai and Samatau. The immediate risks for some areas of Falelatai District are coastal landslips and fluvial hazards.Certain coastal area of Falelatai is eroding at a much faster rate due to human influence. Sand mining is a major contributor to such cause

As majority of the district infrastructure is situated within both the CFHZ and CEHZ; relocation options can be considered. Building foundations can be raised at a higher level. There is a need for access roads to be upgraded since many people have moved and relocated inland, improvements in utilities facilities such as water and power should also be considered as to help and facilitate those inland.

Food security risks are also compounded from climatic changes to rainfall and increased surface temperatures. The incidence of alien invasive species (IAS) is also a determinant of soil nutrient deficiencies (from natural causes or poor sustainable land management practices) and affects regeneration of indigenous species which may change the entire biodiversity of the district (Reti, 2016). The conservation of upland forests will be critical to maintaining ecosystem services that are essential to livelihoods and food security. Livelihoods depend on household gardens around the houses and plantations further inland on the upper slopes. Due to most of the agriculture being away from the coast the impacts from storms and sea level rise on agricultural development is low for this district. Impact from extended periods of dry conditions will impact household crops. Impacts from change in climatic conditions will result in an increase in forest fires being more likely. Varied rainfall will create conditions that will require farmers to diversify crops and management of pests (Dews, 2016).

[3]Samoa Agricultural Census 2015

2. Falelatai and Samatau District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Drainage systems to be improved in high risk areas of main Aana West Coast Road especially atjunctions of hazard zones (IFHZ, CEHZ, CFHZ and Tsunami shore exclusive zone) and access roads exacerbating inland flooding and storm water surges affecting infrastructure, village homes and other assets	Assess and upgrade culverts on main Aana West Coast Road especially at junctions with access roads (Siufaga Access Road, Tufutavae Access Road, Pata Road, Samai Access Road)sitting within combined hazard zones (IFHZ, CEHZ, CFHZ and tsunami shore exclusive zone and in accordance with*Vulnerability Assessment of the Samoa Road Network* recommendations Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding Implement regular drainage inspection and maintenance ***Responsibility: LTA /MWTI/MWCSD /Village/ Families***	Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters Encourages coastal families to relocate inland Maintains lifeline access for all of Upolu Minimises national disaster recovery expenditure on damaged properties, public and private assets	Use existing information for guidance but not limited to: *"Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa Code of Environmental Practice (2007)"* Undertake a Cost Benefit Analysis to weigh options for funding Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities Apply for necessary permits as required by law Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs Develop Integrated Catchment Strategy and Flood Management Plan for Falelatai & Samatau District Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
Access/ work roads require maintenance and upgrade as it exacerbates flooding and encourage relocation of houses away from hazard zones	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	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, CEHZ and CFHZ as an "at risk" zone with appropriate landuse	National Disaster Management Plan 2017-2021 CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan

	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***	damaged properties and public assets	planning controls and restrictions Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Falelatai & Samatau district	
Upgrade or relocate part of main Aana West Coast Road and Falelatai Loop Road sitting in high risk hazard zones	Investigate potential for relocating Aana West Coast Road inland in areas where road sits less than 5mtr from coastline in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Assess and upgrade main Aana East Coast Road and Falelatai Loop Road to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main lifeline and connectivity road District to regulate developments near and around road shoulders of main national road 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 Falelatai & Samatau 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

Flood protection measures for fords and bridges	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of all rivers in district 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 Falelatai & Samatau 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 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
Village houses, churches and government assets located in 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	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

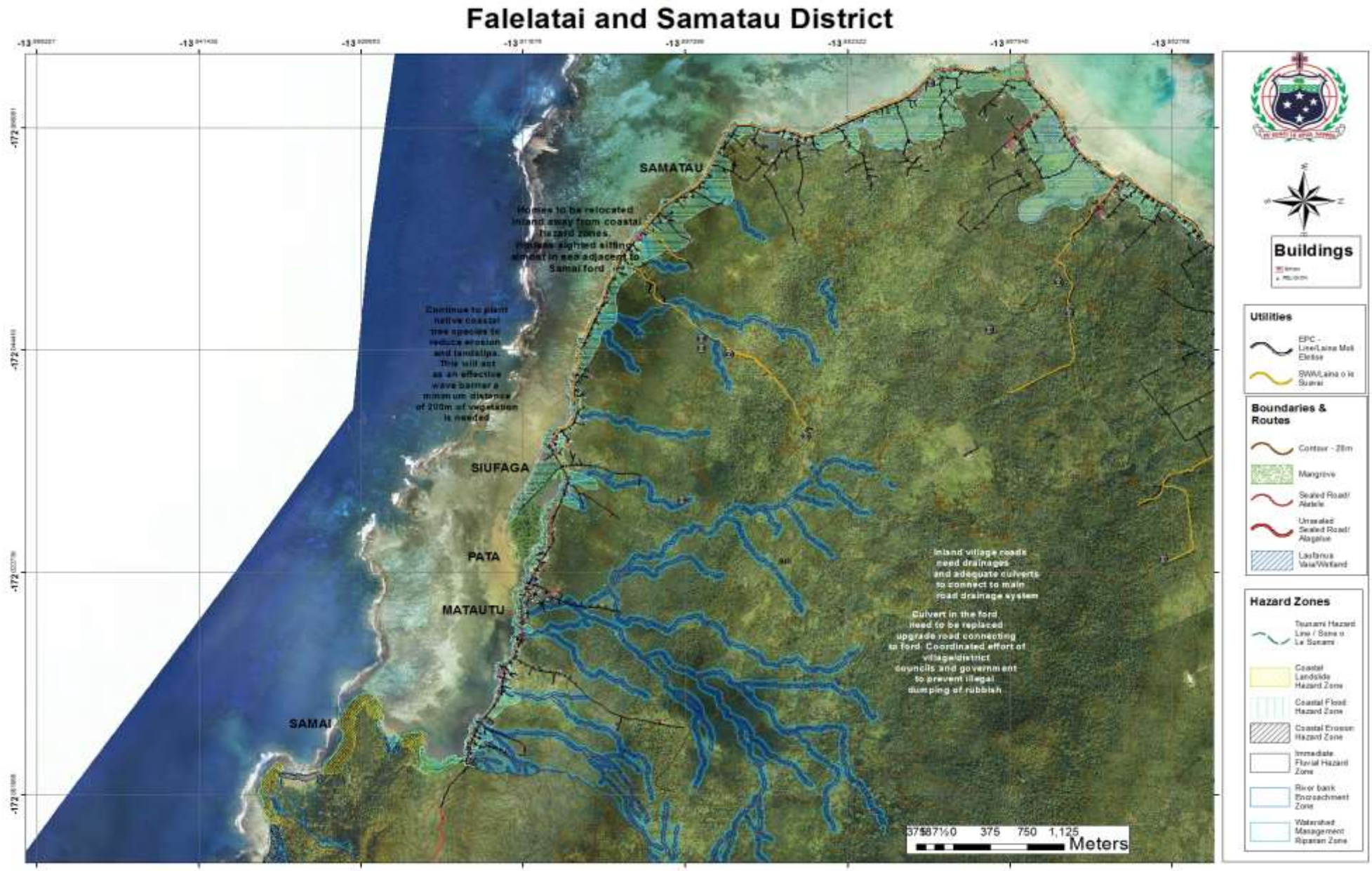
	Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges ***Responsibility: Village / Families /MWTI/ MNRE/ MWCSD***			
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess 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 procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan 2017-2021 National Building Code National Policy for People with Disabilities

Electricity supply	Provide underground lines in the long term Install and connect power supply for inland residents Relocate 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 ***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 Upland Forest	Continue program 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 Program 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,	Reduced risk of slips and erosion Improve resilience of catchments Improve preparedness and readiness response to natural disasters	Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Vaimauga West District Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper	Water Sector Plan Community Engagement Plan Restoration Operational Plan 2016-2020

	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***	Reduce contamination of water supply	catchment areas	
Sand mining (commercial) and sand extraction (domestic)	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 Vaimauga 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

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

Falelatai and Samatau 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

3. Falevai and Samai Village Interventions

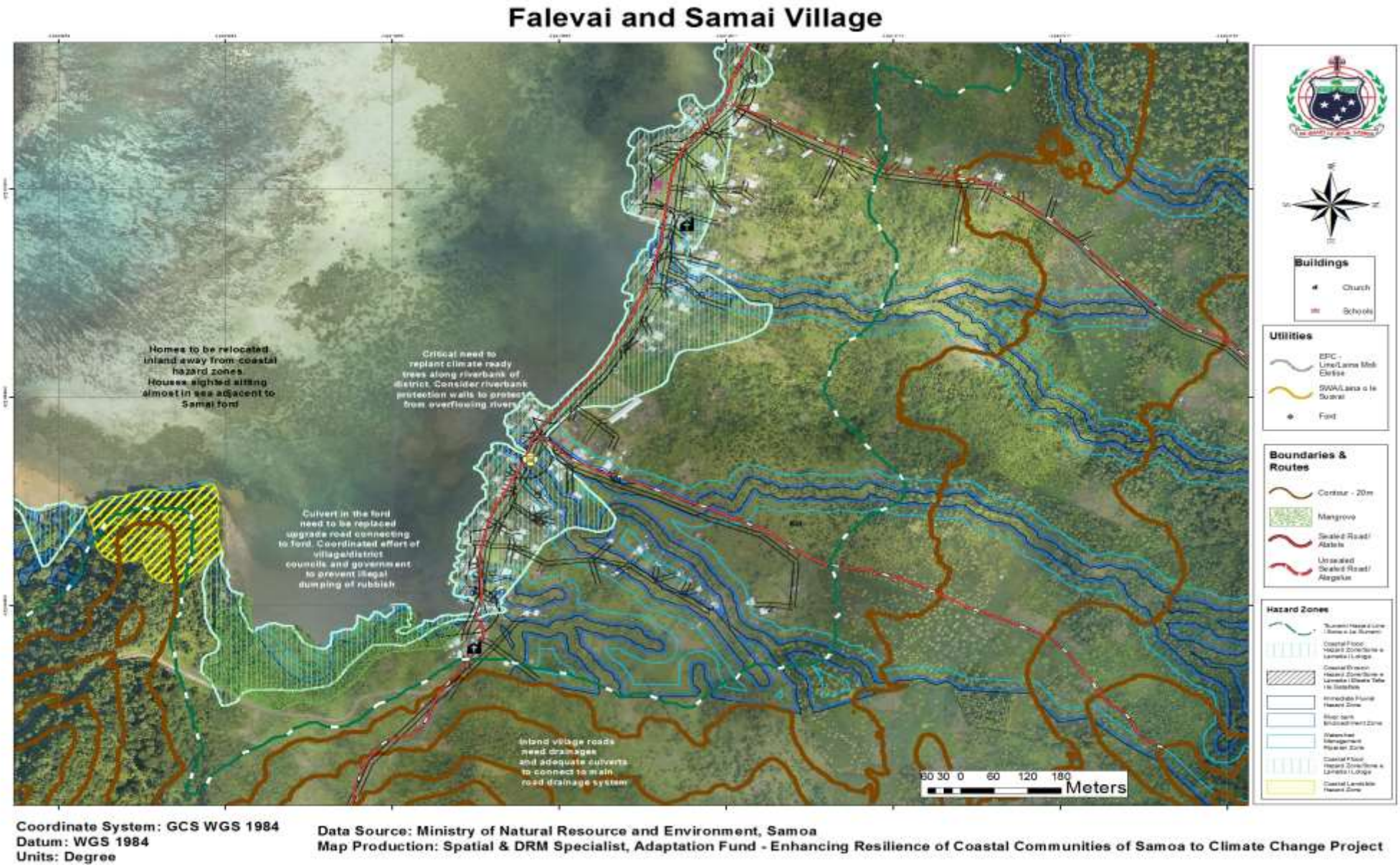
CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Village infrastructure located in high risk hazard zones; such as houses, schools, Churches, Businesses, Committee houses etc	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
Flood protection measures for Samai ford	Upgrade waterways Upgrade all crossings Upgrade or repair riverine embankment protection work upstream of Samai 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	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 Falelatai & Samatau 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	CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA

	Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments ***Responsibility: MWTI/ LTA/MNRE/ District/ Village***		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 restrictions	
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
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 Falelatai & Samatau District Identify funding /budget requirements and implementation program to continue protection of mangrove/wetland areas in district	Draft NESP 2017-2021 Community Engagement Plan
Governance	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes.	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of	Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021

	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***	communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	bylaws	

Falevai and Samai Village Map



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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

4. Matautu Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, churches and government assets located in high risk hazard ones	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
Drainage systems to be improved in high risk areas	Assess and upgrade culverts on most vulnerable parts of the local roadespecially at junctions with main Aana West Coast Road (Samatau Access Road, Siufaga Access Road, Tufutavae Access Road, Pata Road) and in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations	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	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	CIM Strategy 2015 NISP2011 KESO 5 TSP2014-2019 Goal 2 KO 1 Community Sector Plan

	Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding affecting infrastructure, village homes and other assets Implement regular drainage inspection and maintenance ***Responsibility: LTA/ MWTI/MWCSD /Village/ Families***	Upolu Minimises national disaster recovery expenditure on damaged properties, public and private assets	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 Falelatai & Samatau District	
Effluent and wastewater management systems	Introduce ban on latrines established in and around fluvial hazard zones Families in fluvial hazard zones to install proper septic waste disposal systems Implement district/ village drainage cleanup and awareness program Produce posters and village signs for public awareness ***Responsibility: MNRE/ MWCSD/ District/ Village***	Increase adaptation during extreme weather events Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply	Review wastewater strategy/ legislation to include role of Village/District bylaws Develop/Update and register District/Village bylaws to include regulating developments and latrines in IFHZ and areas susceptible to flooding Utilise Hazard maps and Geomorphologist findings to inform location Utilise Sui o Nu'u monthly meetings to monitor progress of village programs on waste management	National Waste Management Strategy
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Pest management; invasive plants and animals	Implement an eradication program 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 programs on the impacts of invasive species Implement the Integrated Pest Management	Maintains natural ecosystem Builds resilience of community livelihood and food security	Develop an integrated land management plan for Falelatai & Samatau 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 program based on inventory of invasive species and conduct campaign on public	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)

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


Upgrade drainage channel to the sea


Upgrade ford to improve accessibility during natural hazards

Matautu Village Map

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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. Pata Village Interventions

CIM Plan Solutions

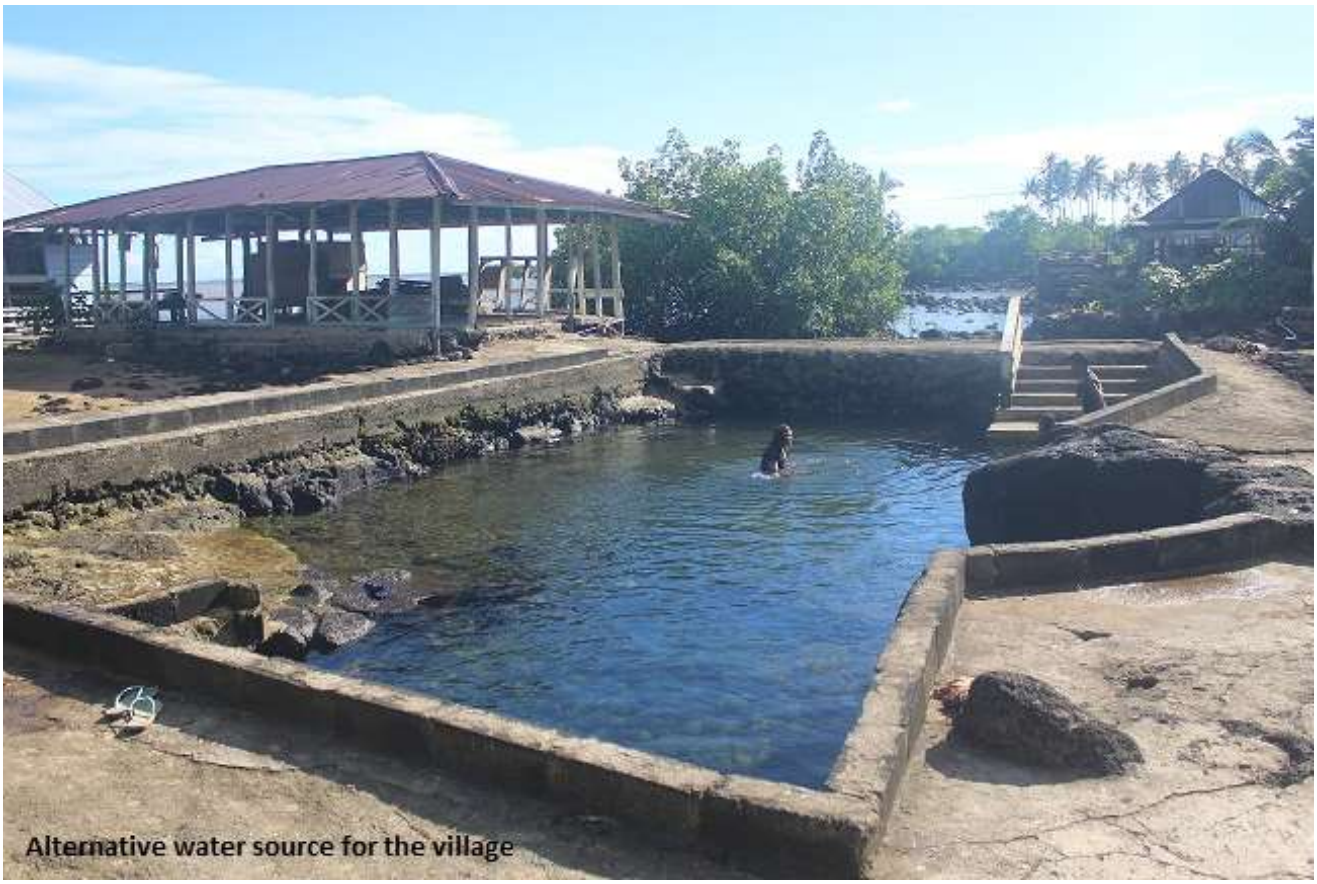
Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, Pata Primary School, church, and other government assets located in high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building 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
Access/ work roads require maintenance and upgrade as it exacerbates flooding onto main road	Assess and upgrade Pata Access Road especially in area sitting within fluvial hazard zone, to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters	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	National Disaster Management Plan 2017-2021 CIM Strategy 2015 TSP 2014-2019 Goal 2 KO 1 Community Sector Plan

	Implement regular drainage inspection and maintenance Village to restrict rubbish dumping into waterways and conduct regular clearance of rubbish behind homes Village to regulate developments near and around road shoulders of all access roads Enforce environmental safeguards Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent	Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties and public assets	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 Falelatai & Samatau district	
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: 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

Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Upland Forest	Continue program 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 Program 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 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 Vaimauga 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

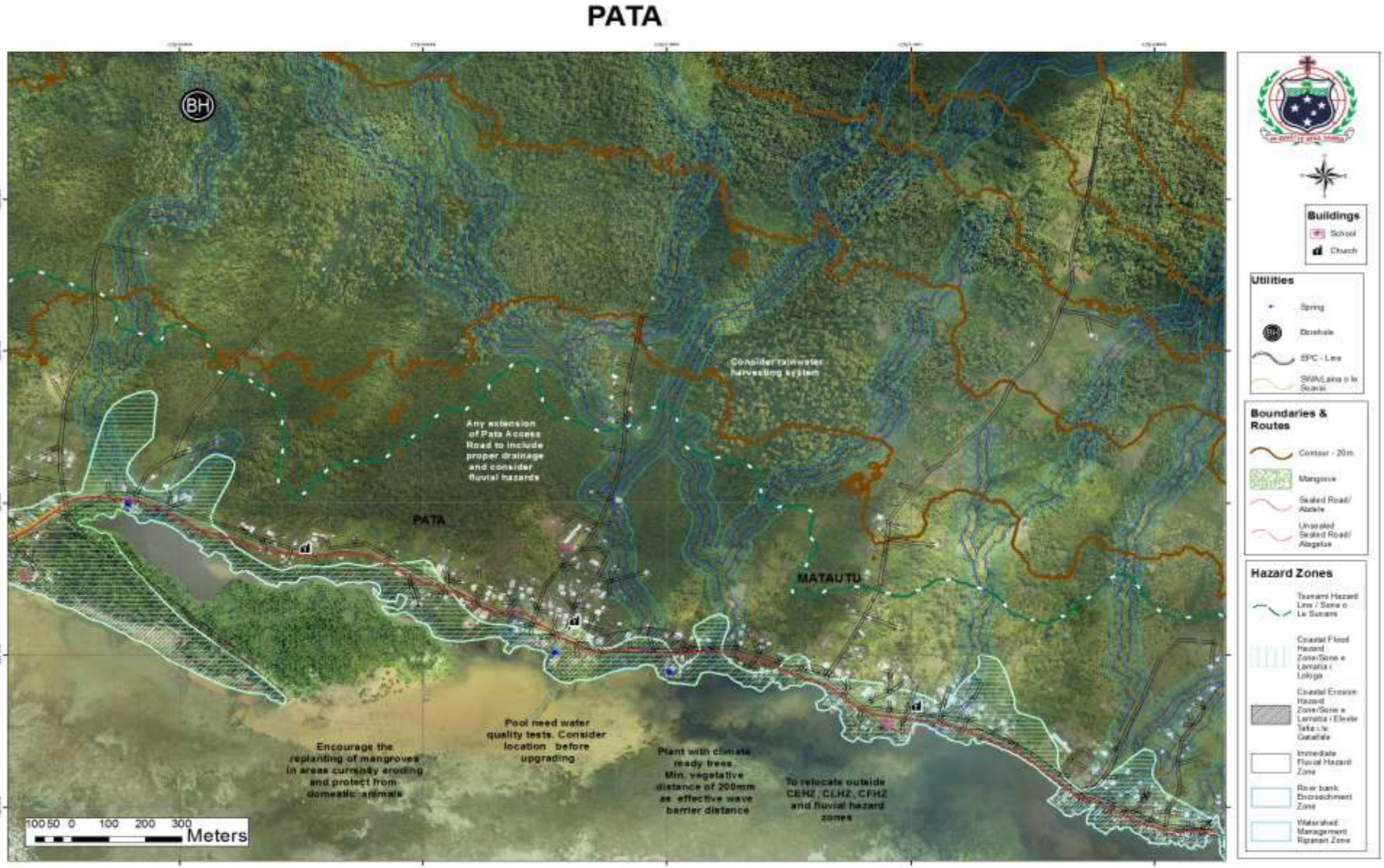
Village pool located in high risk hazard zones	Village pool is currently in a poor state with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs Test the quality of the water source before any further investment on the pool is undertaken (eg: 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 UpdateVillage bylaws to include managing and maintaining village natural resources Utilise Sui o Nu'u monthly meetings to monitor progress of village programs and responsibilities	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**
Pest management; invasive plants and animals	Implement an eradication program 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 programs on the impacts of invasive species Implement the Integrated Pest Management Program 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 Falelatai & Samatau 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 program 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


Alternative water source for the village


Sustainable coastal protection measures

Pata Village Map



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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. Samatau Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, chrches, government assets and road located in high risk area	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
Access/work roads require maintenance and upgrade as it exacerbates flooding onto Aana West Coast Road and to facilitate relocation inland	Upgrades to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands Install adequate drainage and culverts on main Aana West Coast Road to facilitate free flow of streams into sea and reduce flooding into Samatau Enforce environmental safeguards Where reclamations are proposed, Government and district to manage processes	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	National Disaster Management Plan 2017-2021 TSP 2014-2019 Goal 2 KO 1

	by requiring villagers to get the appropriate permits and consent ***Responsibility : LTA /MWTI/ MNRE/ District/ Village /Families***		EIAs in screening and designing built environment infrastructure projects for Falelatai & Samatau district	
Drainage systems to be improved in high risk areas especially at junctions of Aana West Coast road and Samatau access road	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 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***	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 Falelatai & Samatau 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 Falelatai & Samatau district Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1 Community Sector 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	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	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***		Utilise hazard maps and Geomorphologist findings to inform location and designs	
Natural Resources and Environment	**BestSolutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Upland Forest	Continue program 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 Program 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 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 Vaimauga 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
Soft coastal protection measures	Plant native species along coastal areas to strengthen existing seawall and to	Soft coastal protection measures will	Develop an integrated land management plan for Vaimauga West district with	NESP 2017-2021 Two Million Tree

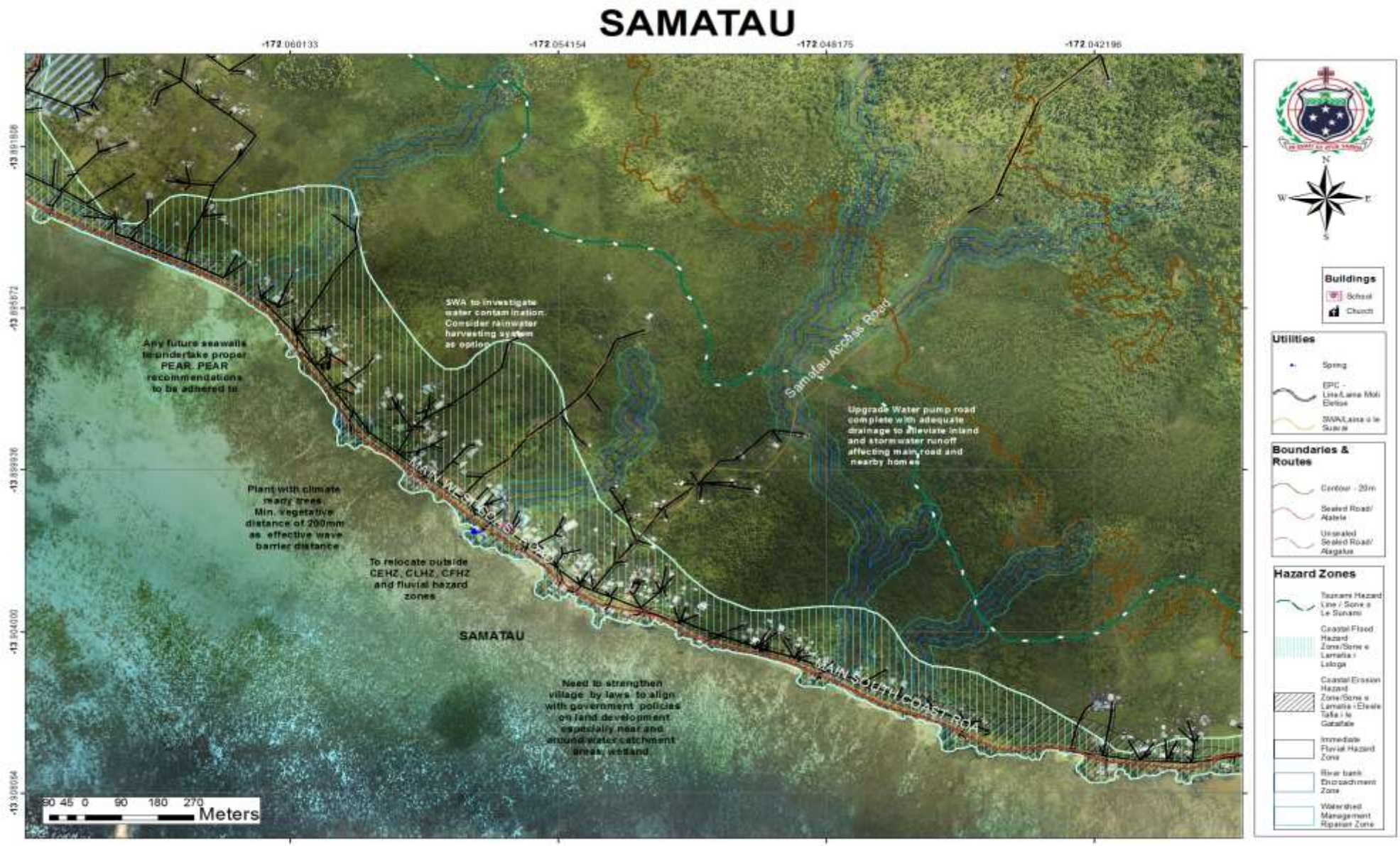
needed for most vulnerable areas	reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed ***Responsibility: MNRE/ MAF/Villages***	support and strengthen existing and new infrastructure along the coast Reduce impact from coastal erosion and natural disasters Implements an Ecosystem Based Approach	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	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

Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
School damaged by cyclones: need upgrading ***Responsibility: MESC/Village/DMO***	Assess safety of school as it is considered by village as safe haven.	Not a CR issue. Safety issue requires involvement of MESC, Samatau Village and DMO. School is located in hazard zone. DMO to assess feasibility of school as safe haven. Need to consider AF Hydrologist and Hazard Maps/models for guidance.
Extra streetlights near homes ***Responsibility: EPC / Village***	EPC and Village to resolve	Not a CR issue. Village mayor to collaborate with EPC. EPC CIMP team rep has recorded for EPC action


sand mining in coastal area


upgraded access loop road

Samatau Village Map



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

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

7. Siufaga Village Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, churches, government assets located in 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
Access/ work roads require maintenance and upgrade as it exacerbates flooding	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	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 Falelatai & Samatau district Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 NISP 2011 KESO 5 TSP 2014-2019 Goal 2 KO 1

Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Wetland protection	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 Falelatai & Samatau District Identify funding /budget requirements and implementation program to continue protection of mangrove/wetland 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 Vaimauga 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**
Pest management; invasive plants and animals	Implement an eradication program 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 programs on the	Maintains natural ecosystem Builds resilience of community livelihood and food security	Develop an integrated land management plan for Falelatai & Samatau 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	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)

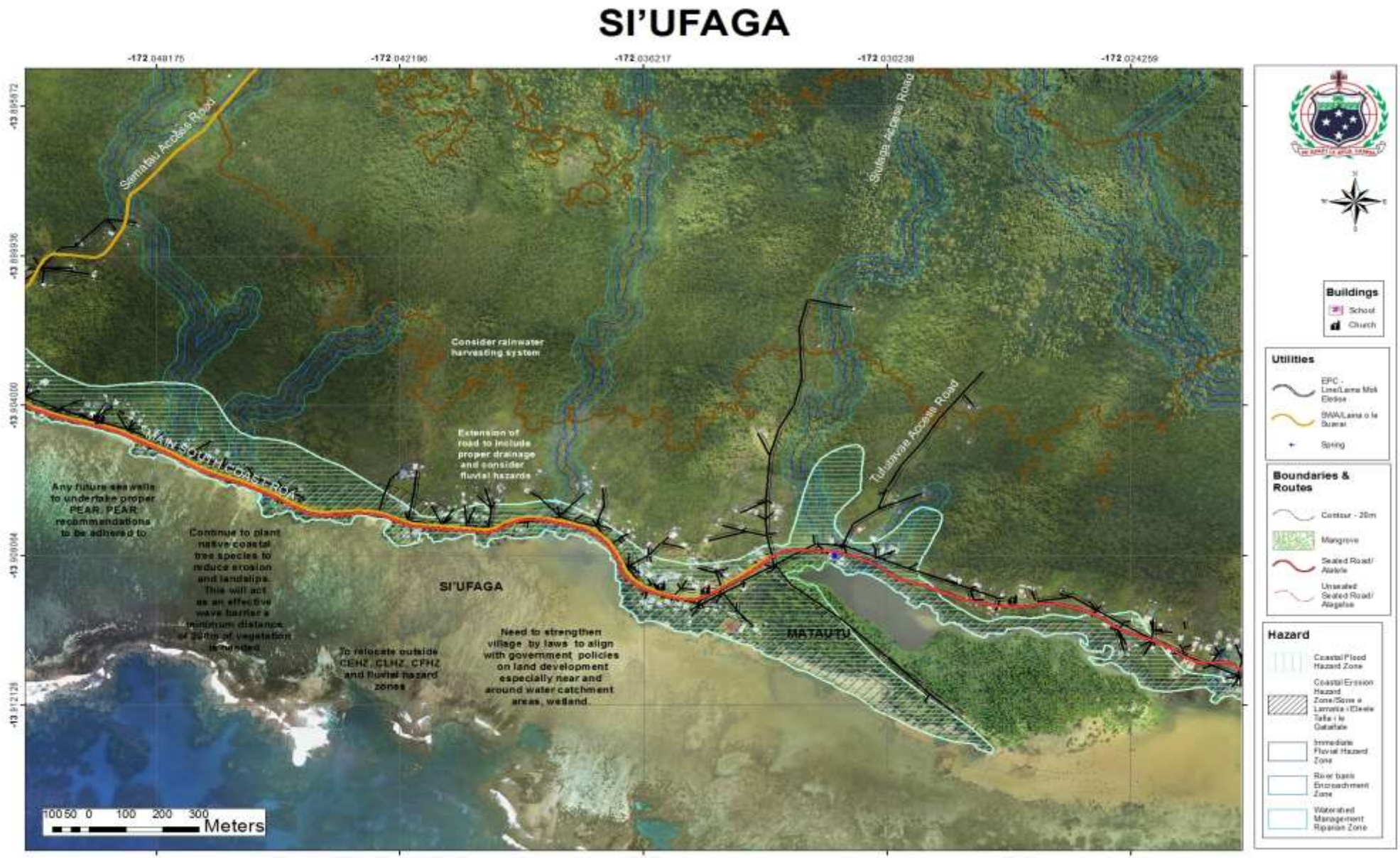
	impacts of invasive species Implement the Integrated Pest Management Program Implement Sustainable Land Management (SLM) practices Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources ***Responsibility: Villages /District/ MNRE/MAF/ SROS***		implement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

Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
Access Roads (2) to be tar sealed ***Responsibility: MWTI /Village***	Refer MWTI inspection reports for this area	Not a CR issue. MWTI to consult with Village on inspection report findings for this area


Siufaga Primary School in Hazard Zones_encourage relocation to safer area


wetland and mangrove conservation area

Siufaga Village Map



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Upolu AF Districts Overview Map of Coastal Inundation Zones