Community Integrated Management Plan

Alataua West District – Savaii

Implementation Guidelines 2018

Foreword

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

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

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

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

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

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

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

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

Thank you

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

Participants in the Plan

The CIM Plan is a Partnership between the Government of Samoa and the villages within the Plan area. The Plan area starts from the ridge extending to the reef broadly covering 4 sectors; Infrastructure; Natural Environment and Resources; Livelihood and Food security; and Village Governance. Both partners have responsibilities for issues and solutions and the Plan gives an integrated approach to the provision of services and improvement of resilience now and in the future.

This Plan incorporates the Faipule District of Alataua West (Tufutafoe, Neiafu and Falelima villages)

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

Date of Signing: 15th June 2018

Representative:	**Signature:**
Tufutafoe Village	
• Tuifaiga Filoimalo	
• Usu Esau	
• Tuimaualuga Faifili	
• Vaelua Seuula	
• Momoemausu Salasa	
Neiafu Village	
• Sese Laulu	
• Taatiti Tifi Laulu	
• Taatiti Setu	
• Moti Matalope	
Falelima Village	
• Savali Fa'alili	
• Fuiava Komesi	
• Tau'oa Silipi Burgess	
• Ioane Tia	
• Ula Aloivaopili	

The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Alataua Westas a Management Plan for the Implementation of the Community Integrated Management Strategy (CIMS).

The Ministry of Natural Resources and Environment, as lead organization of Government, on behalf of the participating Government Departments and Corporations, confirms the participation of the Government of Samoa in the preparation of this Community Integrated Management Plan and its adoption as a Management Plan for the implementation of the Community Integrated Management Strategy.

Ulu Bismarck Crawley
CHIEF EXECUTIVE OFFICER, MNRE

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Acronyms

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

Glossary

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

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

1. Introduction to the CIM Plan

1.1 The Strategic Vision

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

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

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

1.2 The Aim of the CIM Plan

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

1.3 Structure of the Plan

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

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

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

2. Implementation Guidelines

2.1 Purpose of the Implementation Guidelines

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

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

2.2 Duration of the Plan

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

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

2.3 Financing of the Plan

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

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

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

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

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

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

3. Description of Alataua West District

3.1 Physical and Natural Resource Setting

The District of Alataua West is located on the south-western end of Savaii and is in partial rain shadow. The coastal plateau varies between sandy beaches and rocky headland and cliffs. These high cliffs and rocky outcrops provide natural protection against wave action and rough seas. It has nearshore coral reefs and narrow lagoon, both of which support local consumption fishing activities. The landscape is mainly wet climate including small areas of dry season near the coast. Hills lead into steep lands and intervening valleys (Dews, 2016).

The villages of Alataua West include Tufutafoe, Neiafu[1] and Falelima. Some parts of these villages are located directly on the coast and are separated from each other by low headlands. A shallow reef is located about 200 metres offshore at Neiafu which gives some protection to the coastline, but both Falelima and Tufutafoe lack any significant reef protection. Neiafu-tai is a typical coastal village located on a depressed coastal sand plain that has been seriously affected by inundation. Some initial relocation[2] has occurred but further requests have been received for government assistance in relocating the remaining residents[3] of Neiafu-tai to new allotments on the hills behind Neiafu-tai (Townsend, 2016). A Neiafu Village Hazard Relocation Plan has been developed and will need to be read in conjunction with Best Solutions and the Hazard Maps/models (see District and village maps) within this CIM Plan.

Remnants of a rock evacuation shelter remain at Falelima in the area where the road is less than 5metres from the sea. The rockwallhad been damaged by king tides and coastal storm surges since the 2006 CIM Plan. The main national road network that runs all around Savaii; from the North Coast Road to the South West Coast Road,'meets' within this district. Part of the South West Coast Road that runs through Falelima sits no more than 5meters from the sea and has been labeled in the Vulnerability Assessment of the Samoa Road Network report (LTA, 2016) as 'medium severity' in the coastal hazard zone index. Other parts of Falelima are comprised largely of high cliffs and rocky outcrops that provide natural protection against wave action and rough seas.

Alataua West has a small area of wetland in Tufutafoe that has come under threat from settlements inland.Inland areas have been slowly transformed into settlement areas to accommodate previously coastal dwelling populations. These settlements are not just from Tufutafoe, there are also populations of two sub-villages of Falealupo (Avata and Vaotupua) residing quite closely to the inland areas of Tufutafoe. And where people have moved, planting of food crops and raising of domestic animals follow. The map of Tufutafoe shows several fluvial zones where homes have been built within or near the riverbank encroachment control zones. Contaminants from agricultural activities and developments from inland where people have movedwill eventually flow into the lowland coastal area where the wetland is located.Cocoa and coconut plantations are common features of the lowland landscape of these districts and most of the native tree species have either disappeared altogether or will soon be (Reti, 2016).

The main road is an important part of the district's infrastructure. It lies 'inland' but deviates back to the coastline just after the junction at Neiafu-tai and Neiafu-uta. It is in good condition, although at certain places lack appropriate drainage. The main road provides easy access to other work roads, schools, churches and village buildings, including the neighbouring districts. The main South Coast Road is considered a lifeline access as it is part of the national road network connecting the East (from Salelologa Wharf) to the West (to Falealupo) and back around to the North. When the Mali'oli'o River or Lano Bridge is impassable during heavy rains and flash flooding, residents on the Northern and Western side of Savaii take the long drive through the South Coast Road to reach families in the Northern and Western parts of Savaii.

This district has 4 other roads within the national network; Neiafu Road, Tufutafoe Link Road, Neiafu-uta Access Road and the Falelima School Road. Approximately 2.8km of the Tufutafoe Link Road (links to Falealupo and Neiafu Roads) was upgraded early 2016. The Neiafu-uta access road is sealed however shows signs of surface wear out, pot holes, damaged road sides and edges[4]. This access road services not only residents of Neiafu-uta but also leads to the SWA borehole located further inland of Neiafu-uta.

The Tufutafoe Link Road and Neiafu Roads are lifeline access for residents of Neiafu-tai and Tufutafoe who reside in the coastal area. About 500metres of the Neiafu Road that runs through Neiafu-tai has major structural damages (damaged road edges/sides; major cuts, poor surface sealing etc) having not been upgraded nor maintained since the 2006 CIM Plan. An inland road is proposed within this CIM Plan but is reliant on availability of land and

[1]Includes Neiafu-uta and Neiafu-tai
[2]601 now reside in Neiafu-uta
3Population 307
[4]MWTI road inspection report 2016

agreement of landowners. There are several other tracks within this district that is used by the villages to access their plantations and also used by families who have moved further inland. Some families in Falelima have moved inland and the only access to these households is through 3 unpaved tracks. The tracks are not connected but are 'linked' through walking tracks behind the village.A sand track follows the coast from Tufutafoe to Falealupo District which is sometimes used as an alternative access between the two villages. The track is also used to access tourist and scenic attractions in Tufutafoe and Falealupo. This track is at extreme risk from coastal hazards however is not considered a climate change adaptation priority for upgrading at its current location.

Although there are no visible streams or rivers within this district, there is a catchment area within the hinterlands of Alataua West.The lack of any major rivers limit the impact of upland development on low lying areas, but compounds drinking water woes of the residents.Although no rivers run through the district, each village is still susceptible to flooding from coastal surges and storm water runoff exacerbated by inadequate road drainages and unsustainable land developments within or near river encroachment control zones. Some of the lands behind each coastal village are swampy and poorly drained.

The lowland forest of Alataua West had been heavily logged in the 1970s and only small remnants of the original species are scattered in these once rich forested areas. The original native species were replaced by plantations of exotic tree species funded by the government to sustain the timber industry. What little "pockets" of lowland forest that was left from large scale logging have been transformed into settlement areas to accommodate previously coastal dwelling population. And where people have moved, planting of food crops and raising of domestic animals followed. Some of the native plants and birds of Samoa are believed to be only found on the Alataua West and Vaisigano 1 upland forest area. The upland forests of Alataua West and the lava fields of Saleaula (including Matavanu crater) deserve special attention and could be Samoa's first "ridge to reef" conservation area. Cocoa and coconut plantations are common features of the lowland landscape of these districts and most of the native tree species have either disappeared altogether or will soon be (Reti, 2016).

Invasive species common to this district include the tinamoni (*Cinnamomum verum*); faapasi (*Spathodea companulata*); pulu mamoe (*Castilla elastica*); pulu vao (*Funtumia elastica*); fue lautetele (*Merremia peltata*) and vao migi or mint weed (Reti, 2016).

Sand mining remains an issue although several bans have been put in place to control such activities. There is evidence of recent efforts to protect coastal areas from erosion and flooding through tree planting initiatives.

3.2 Social and Economic Setting

The Alataua West District currently has a population of 1,754; Tufutafoe 434, Neiafu 908[5] and Falelima 412. Of the total 1,754, total male is 950, female 804[6]. Development is mostly scattered along or near the main national road which lies away from the coast, with the exception of Falelima. Developments in this village run ribbon like in parallel with the main South-west Coast Road.

Primary services such as water, power and telephone generally follow the main road and are vulnerable to extreme events. There is one SWA borehole in this district located at Neiafu-uta.The lack of major rivers and the low rainfall in this district not only compounds access to drinking water, it also creates difficulties for residents who are considering planting alternative food crops (vegetable gardens) and fruit trees for subsistence living.

The cash economy of the District is dominated by traditional work. The majority of residents are largely sustained by plantation work, cattle farms and fishing with only a small minority benefiting from historical sites located within Tufutafoe. There are 3 primary schools[7] in this district and a number of small shops throughout the area.

3.3 Climate Risk and Resilience

The use of LiDar mapping data, hydrologist and geomorphologist data and findings for this district has helped determine inland and coastal hazard zones and high risk areas for Alataua West. The immediate risks for some areas of Alataua West are from coastal inundation, storm surges and fluvial hazards. Some areas are located within the tsunami red zone. The roads in Falelima and Tufutafoe/Falealupo are ranked as medium high in the in the coastal hazard index[8].

[5]Neiafu-uta 601, Neiafu-tai 307

[6] SBS Village Directory Census 2016 preliminary count

[7]Falelima Primary School, Tufutafoe Primary School and Neiafu Primary School

[8] LTA/SMEC. 2016. Vulnerability assessment of the Samoa road network

The district has a total area of 4,994 hectares. The area covering Tsunami evacuation zone is 309.5 hectares, which is 6.2% of the total area of the district. The district has about 330 buildings; approximately 155 of those are located within the Tsunami evacuation zone orange. About 69 buildings are located both in Tsunami evacuation zone and the Coastal Flood hazard zone.These buildings are to be relocated as opportunities arise. If the buildings must remain where they are, they should be reinforced and as well raise building foundation to be above flood hazard level.Restriction should be placed on construction of new buildings in these coastal hazard zones.The area covered by the Tsunami evacuation zones and fluvial hazard zones is 1,336.74 hectares, leaving about 73% of the district area safe from these hazards (Tokalauvere, 2017).

Beach replenishment should be encouraged in all three villages as beach erosion is quite evident. There is a beachrock running parallel to the shores of Neiafu-tai; LiDar imagery and visual inspection shows that significant damage to the coast has occurred over the last 13 years which proves coastal erosion has occurred over the years (Townsend, 2016). Re-vegetation in a low energy environment is also a solution for areas along the coast that has been eroded.

Rainwater harvesting is evidently a well accepted, effectively universal practice for the scattered population of Alataua West. Since the idea is already well accepted in the district, continuation with this practice would appear to be the most logical recommendation for any rural water supply scheme.Stored rainwater should therefore be regarded as one of the primary sources for drinkable water in the Alataua West district. Clearly, the more rainwater harvesting that can be developed in the area, the less demand needs to be placed on more conventional piped SWA water supplies sourced from the locally, extremely sensitive, aquifer (Tokalauvere, 2017).

Of the 3 primary schools in this district, two (Tufutafoe and Neiafu Primary Schools) are within safe zones. The Falelima Primary School however is located within the tsunami evacuation zone yellow which means it could be considered a safe haven for cyclones but will need to be monitored closely as it sits close to fluvial hazard zones.

The South Coast Road is susceptible to flooding due to a combination of inadequate drainage and culverts and overland developments near waterways and riverbank encroachment control areas. The District Map and the Drainage Infrastructure Database[9] systematically identifies the location, design and more importantly, the condition of drainage infrastructure in this district that is in critical need of maintenance and/or upgrade works. Drainage rehabilitation will help alleviate the pressure of inland flooding in most places but will need to be done in a coordinated fashion with district and village responsibilities in banning developments in riverbank encroachment control zones, reduction in agricultural activities and other developments in upland forests and illegal dumping of domestic rubbish into waterways.

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).

[9]GWP Consultants LLP/MNRE, 2016

4. Alataua West District Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Main North Coast Rd: exposure to high risk hazard zones (inundation, fluvial and tsunami shore exclusive zone)	Investigate relocating main road inland (approx length 2km) from the coast as **long term solution** for high risk hazard area in Falelima where road sits less than 5mtrs from the tsunami shore exclusive zone, the immediate inundation and fluvial zones. Area also identified in *Assessment of the Samoa Road Network* and *Road Network Adaptation Strategy* as medium severity from coastal hazards Where reclamations, sand mining or other major coastal works are proposed Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: LTA /MWTI/ MNRE/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties and public assets	Undertake a Cost Benefit Analysis to weigh options for funding Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities Apply for necessary permits as required by law Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
Neiafu Road-new road to facilitate relocation of coastal community	Investigate upgrading old "logging" road above the cliff behind existing Neiafu-tai area, to facilitate resettlement of Neiafu-tai residents. Approx length of road-2km. Where reclamations, sand mining or other major coastal works are proposed Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: LTA /MWTI/ MNRE/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparednessand readiness responseto natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged	Undertakefurtherconsultatio nwithvillageandprepareEIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design PrepareEIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan [Draft] Samoa Relocation Strategy 2016 and Neiafu Village Hazard Zone Relocation Plan

		properties, public and private assets		
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	Upgrade Tufutafoe Road, Neiafu-uta access road and Falelima School Road to national road standards where necessary Enforce environmental safeguards Where reclamations, sand mining or other major coastal works are proposed Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: LTA /MWTI/ MNRE/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	Undertake further consultation with village and prepare EIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design Prepare EIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
Village houses, school, churches, government and other village assets in high risk hazard zones	Relocate outside of high risk hazard zones when building/infrastructure requires replacement Investmentswithintheha zardzones to adoptappropriatemitiga tionmeasures Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas Develop landuse planning and development controls to restrict developments within high risk hazard	Minimise expenditure on damaged properties & personal assets Mitigate potential damage from coastal erosion and flooding accommodating the hazard Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters Safer villages, houses and roads	MNRE to develop zonation strategy for safe areas Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs Enforcement of National Building Code 2017 Encourage insurance of significant investments and assets within hazard zones Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	National Building Code CIM Strategy 2015

	zones such as CEHZ and CFHZ Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: Village / Families /MWTI/ MNRE***			
Drainage systems require maintenance and upgrade in high risk areasof main North Coast Road especially at junctions of Access Rd	Upgrade drainage and culverts on main south-west coast road and junctions of access roads (Tufutafoe Link Road, Neiafu Road, Neiafu-uta access road, Falelima School Road) in accordance with *Vulnerability Assessment of the Samoa Road Network* recommendations Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding Implement regular drainage inspection and maintenance ***Responsibility: LTA /MWTI/MWCSD /Village/ Families***	Improves climate resilience of infrastructure resilience and rate of response and recovery to natural hazards and disasters Minimises national disaster recovery expenditure on damaged properties, public and private assets	Use existing information for guidance but not limited to: *"Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa Code of Environmental Practice (2007)"* Undertake a Cost Benefit Analysis to weigh options for funding Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities Apply for necessary permits as required by law Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan
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	Improve resilience of public infrastructure Improve preparedness and readiness	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National DisasterManagement Plan2017-2021 NationalBuildingCode National Policy for

	Conduct evacuationshelterassessment and mark on CIM Plan hazard maps Develop aVillageClimateDisasterManagementPlan(VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***	response to natural disasters		People with Disabilities
Electricity supply	Provide undergroundlinesinthelongterm Install and connect power supply for inland residents Relocateoverheadlinestoamoreresilientlocationwhen being replaced Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available Families to limit building and	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

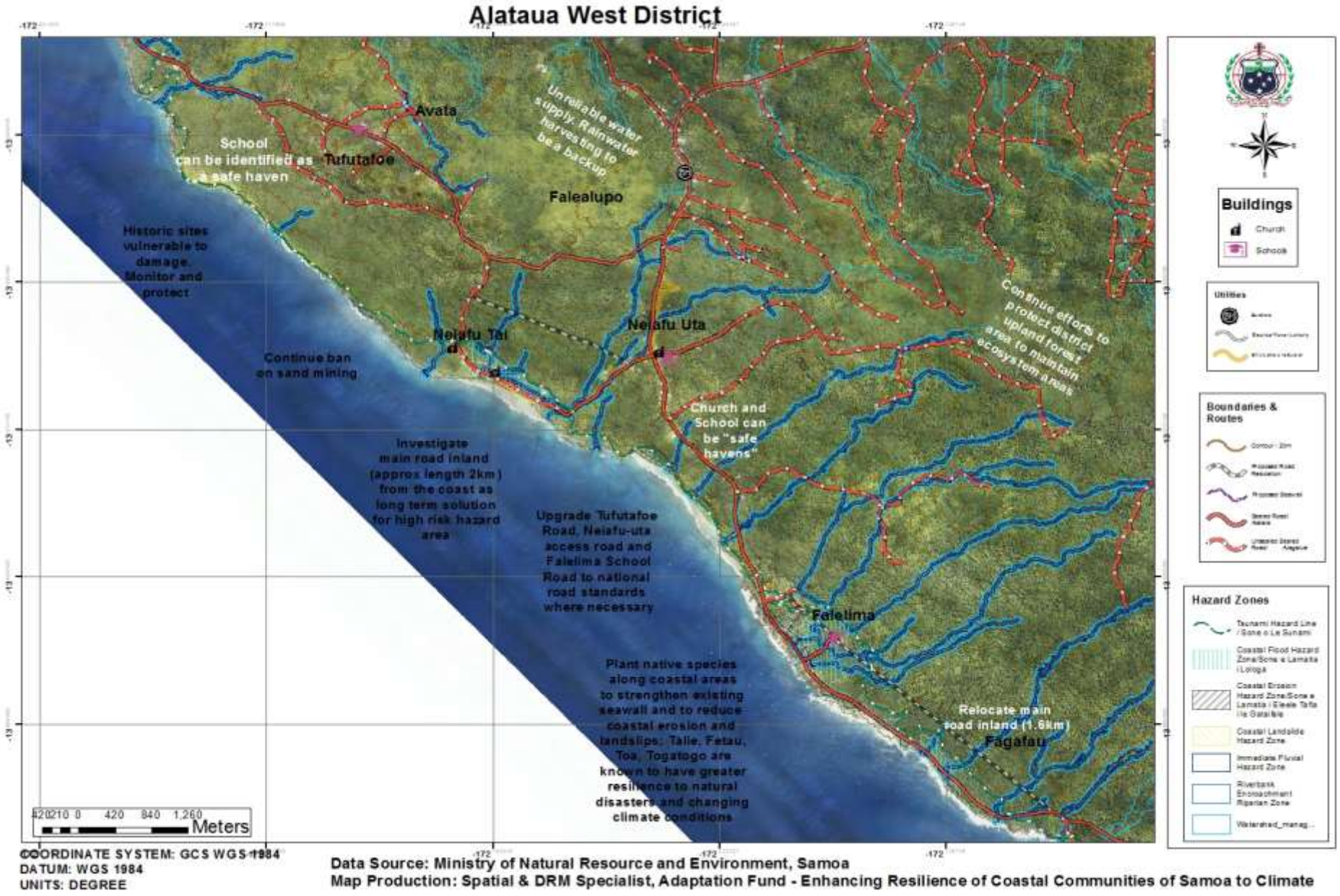
	developments near electricity posts ***Responsibility:EPC/ MWTI/ Village/ Families***			
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting rainwater harvesting systems for vulnerable families as a short term solution District and villages to support SWA water rationing programs during times of drought District to support SWA efforts at exploratory boreholes in district ***Responsibility: SWA /MNRE/ District /Villages/ CSSP***	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply Reduce impact from inland flooding	Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016) 10year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilize Hazard Maps and Geomorphologist findings to inform location and design	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan
Natural Resources and Environment	**BestSolutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
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 Alataua 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	Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020 Forestry Management Act 2011
Alataua West District Upland Forest	Formally declare Alataua Upland Forest a Key Protected Area (KBA) Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland forest area	Protects and enhance local species diversity Sustains ecosystem services and functions Reduce contamination of water supply	Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area Develop a Forestry Conservation Programme/ Implementation Plan for Fa'asaleleaga 4 District	Forestry for Sustainable Development Policy NESP 2017-2021

	Conduct campaign for public awareness and establish a "neighbourhood watch" agreement with district to monitor and report on illegal deforestation District/village councils to help promote the development of the agroforestry sector by encouraging relevant land use practice and where possible resolve any associated land disputes Government, district and villages to monitor, report and apply penalty on offenders ***Responsibility: MNRE / District/Village/CSSP***	Reduce impact from inland flooding	Develop and register District/Village bylaws to include penalizing illegal deforestation in district lands Utilise Sui o Nu'u monthly meetings to monitor progress of district/village forestry programmes	
Sand mining	Continue ban on sand mining Research on the impacts of sand mining Village consultation on sand mining policy and regulation ***Responsibility: MNRE/ Village***	Mitigatepotential damage fromcoastalerosion and floodingaccommodatingthehazard Safer villages, houses and roads Reduce impact from coastal erosion	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining Develop and register District bylaws to include managing and monitoring domestic sand/rock mining of rivers	Draft Soil Resource Management Bill
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	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	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

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

Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
Fencing of village lands inland to stop outsiders from logging /cutting down forest Responsibility: District/ Village	Procure and install fences around district/ village lands	Not a CR issue. Encourage district to utilise Village Bylaws as an 'income generating' activity to finance village specific projects such as procuring fencing material

Alataua West District Map




Main road need widening with street lights


Forest clearance for community development

4.1 Tufutafoe Village Interventions

CIM Plan Solutions

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

Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting rainwater harvesting systems for vulnerable families as a short term solution District and villages to support SWA water rationing programs during times of drought District to support SWA efforts at exploratory boreholes in district ***Responsibility: SWA /MNRE/ District /Villages/ CSSP***	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply Reduce impact from inland flooding	Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016) 10year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilize Hazard Maps and Geomorphologist findings to inform location and design Utilize Sui o Nu'u monthly meetings to monitor progress of village programs and responsibilities	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	Upgrade Tufutafoe Road to include adequate drainage to reduce inland flooding and storm water surges and ground water runoff. Investigate feasibility of upgrading work roads in Tufutafoe to link to proposed Falealupo relocation road. Work roads not in LTA RMIP Enforce environmental safeguards Implement regular drainage inspection and maintenance Village to regulate developments near and around waterways and drainage connecting to main Tufutafoe road	Improve preparedness and readiness response to natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties and public assets	Consult landowners about dedicating areas for road upgrades UtiliseHazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and design Include in budget programming CBA, design and construction	CIM Strategy 2015 National DisasterManagement Plan2017-2021 Community Sector Plan Vulnerability Assessment of the Samoa Road Network

	Whereareclamations, sand mining, extraction orothermajorcoastalworks areproposed,Governmenta ndvillagetomanageprocess esbyrequiringvillagerstoget theappropriatepermitsand consent ***Responsibility:LTA/MWT I/MWCSD/MNRE/District s/Villages /Families***			
Beach nourishment / offshore breakwaters	Investigate beach replenishment at critical locations along the beach as **long term alternative** option to protect coastal road and other assets against inundation, coastal erosion and natural disasters Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village to manage processes by requiring villagers to get the appropriate permits and consent *R**esponsibility: MNRE/ STA/ Village /Families***	Improve infrastructure resilience and rate of recovery Maintains natural ecosystem connectivity Reduce impact from coastal erosion Safer villages, houses and roads Minimise expenditure on damaged properties & personal assets	Undertake EIA Utilise recommendations of EIA and lessons learnt from Manase beach replenishment project to design beach replenishment to suit Vaisigano 2 district conditions Benefit cost analysis to include appropriate design loads and engineering design and supervision costs on top of capital work estimates	CIM Strategy 2015 PUMA Act NISP 2011 KESO 5 NESP 2017-2021 Tourism Sector Plan Vaisigano 2 District Plan
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuationshelterassess ment and mark on CIM Plan hazard maps Develop aVillageClimateDisasterM anagementPlan(VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National DisasterManagement Plan2017-2021 NationalBuildingCode National Policy for People with Disabilities

	Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***			
Natural Resources and Environment	**BestSolutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Coral reefs, lagoons and inshore fishery	Collect and dispose of crown-of-thorns (alamea) on a regular basis to prevent major outbreaks Ban the use of dynamites, herbal poisons (avaniukini), chemicals and other unsustainable fishing methods. ***Responsibility: Village Council, fishing households, MAF-Fisheries***	Protect coral reefs and inshore fisheries Protect marine biodiversity	MAF Fisheries to support implementation and provide technical backstopping and monitoring	Agriculture Sector Plan 2016-2021
Sand mining	Continue ban on sand mining Research on the impacts of sand mining Village consultation on sand mining policy and regulation ***Responsibility: MNRE/ Village***	Mitigate potential damage from coastal erosion and flooding accommodating the hazard Safer villages, houses and roads Reduce impact from coastal erosion	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining	Draft Soil Resource Management Bill

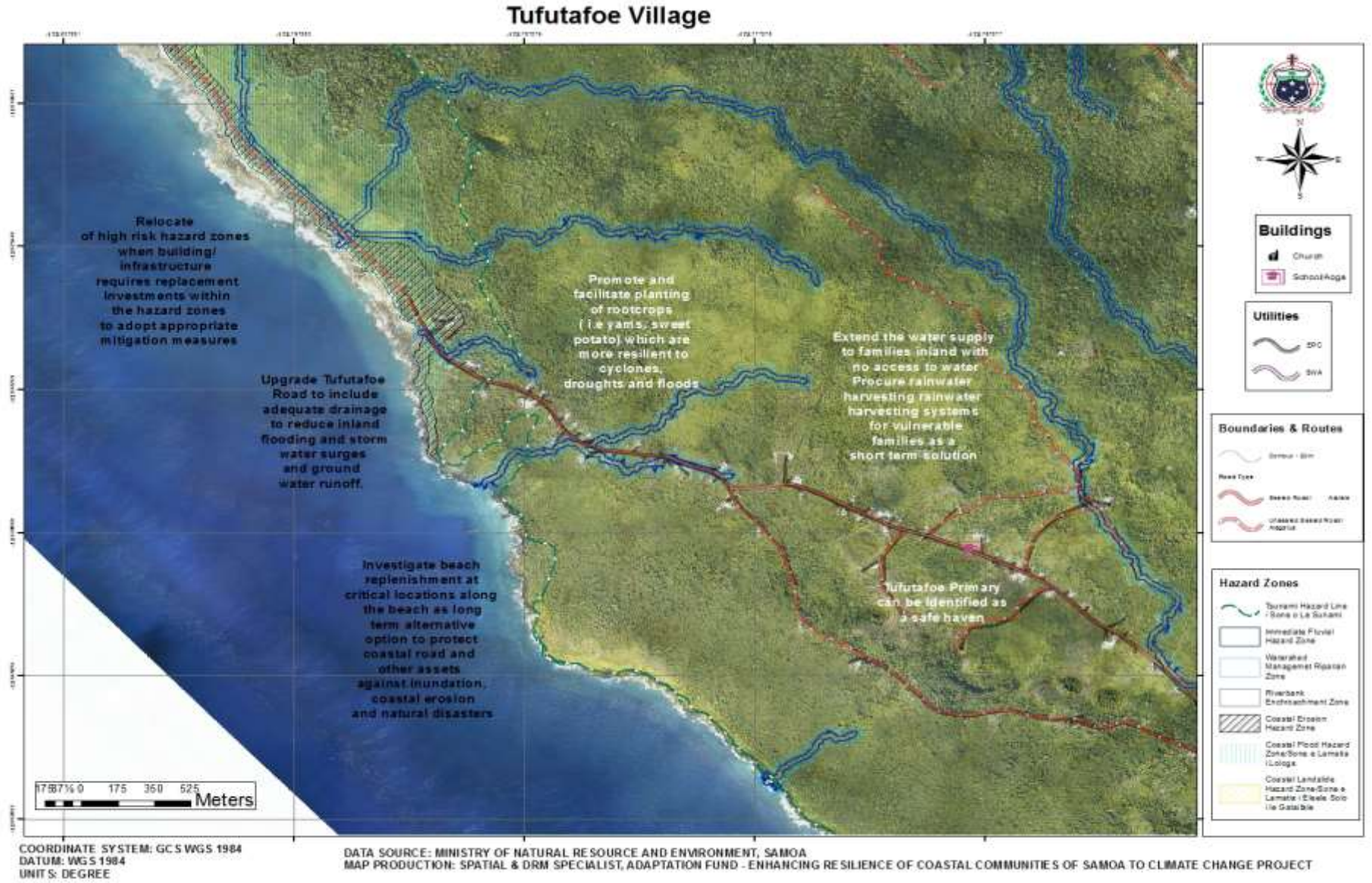
			Develop and register District bylaws to include managing and monitoring domestic sand/rock miningof rivers	
Livelihood and Food Security	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Pest management; invasive species	Implement an eradication programme to eradicate, contain or exclude invasive species Replant with climate resilient native species Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken Conduct education and awareness programmes on the impacts of invasive species Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources Conduct pilot site trials for climate ready plant varieties District to fence domestic animals ***Responsibility: Villages /District/ MNRE/MAF/ SROS***	Maintains natural ecosystem Builds resilience of community livelihood and food security Reduce forest loss and land clearance	Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area MAF to raise awareness of farmers on impacts to water flows from poor livestock management MAF to assist in establishment of pilot sites to trial climate ready plant varieties MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly Village to manage pig/cattle population (compounds, in particular around water supplies) Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021 Draft NESP 2017-2021 Samoa's National Invasive Species Action Plan (NISAP)

Food security: threatened by changes in climate and inadequate soil for planting	Promoteandfacilitateplantingofrootcrops(i.eyams,sweet potato)whicharemoreresilient tocyclones, droughtsandfloods Promoteagro-forestryandmixedplantingincludingfruit treesspeciestoreducecrop vulnerabilitytopestsand diseases Implement the Integrated Pest Management Programme Implement Sustainable Land Management (SLM) practices Conduct pilot site trials for climate ready plant varieties ***Responsibility: MAF/ MNRE/villages/CSSP***	Maintains natural ecosystem Builds resilience of community livelihood and food security Improve preparedness and readiness response to natural disasters	MAFtoprovidetrainings, awareness raising and support in supply of nursery trees, technology and infrastructure MAF to provide trainings and awareness oncropdiversificationto suit theprolongedimpactsof climatechange suchas droughtor rainyseasons MAF to assist in establishment of pilot sites to trial climate ready plant varieties Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	AgricultureSectorPlan2016-2021 Community Engagement Plan Two Million Tree Strategy 2015-2020 Restoration Operational Plan 2016-2020
Governance	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages	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	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

	Responsibility: MWCSD /Village	communities		

Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
School Playing field/ground ***Responsibility:Village/MESC***	Establish playground/field for Tufutafoe Primary School	Not a CR issue

Tufutafoe Village Map



4.2 NeiafuVillage Interventions

CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, school, churches, government and other village assets in high risk hazard zones	Relocate outside of high risk hazard zones when building/infrastructure requires replacement Investmentswithinthehazardzones to adoptappropriatemitigationmeasures Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges Where reclamations are proposed, Government and	Minimise expenditure on damaged properties & personal assets Mitigate potential damage from coastal erosion and flooding accommodating the hazard Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters Safer villages, houses and roads	MNRE to develop zonation strategy for safe areas Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform designs Enforcement of National Building Code 2017 Encourage insurance of significant investments and assets within hazard zones Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions	National Building Code CIM Strategy 2015

	district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: Village / Families /MWTI/ MNRE***			
Neiafu Road-coastal area: exposure to hazard zones (inundation, fluvial and tsunami shore exclusive zone)	Investigate upgrading of old "logging" road above the cliff behind existing Neiafu-tai area, to facilitate resettlement of Neiafu-tai residents. Approx length of road-2km. Where reclamations, sand mining or other major coastal works are proposed Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: LTA /MWTI/ MNRE/ Villages/:TA/MWTI / MNRE/ Villages /Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	Undertake further consultation with village and prepare EIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design Prepare EIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan [Draft] Samoa Relocation Strategy 2016 and Neiafu Village Hazard Zone Relocation Plan
Beach nourishment / offshore breakwaters	Investigate beach replenishment at critical locations along the beach as **long term alternative** option to protect coastal road and other assets against inundation, coastal erosion and natural disasters Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village to manage processes by requiring villagers to	Improve infrastructure resilience and rate of recovery Maintainsnatural ecosystem connectivity Reduce impact from coastal erosion Safer villages, houses and roads Minimise expenditure on damaged properties & personal assets	Undertake EIA Utilise recommendations of EIA and lessons learnt from Manase beach replenishment project to design beach replenishment to suit Vaisigano 1 district conditions Benefit cost analysis to include appropriate design loads and engineering design and supervision costs on top of capital work estimates	CIM Strategy 2015 NESP 2017-2021 Tourism Sector Plan Alataua West District Plan

	get the appropriate permits and consent *R**esponsibility: MNRE/ STA/ Village /Families***			
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	Upgrade part of Neiafu Road (approx 500m) to connect to the proposed 'new' road to facilitate resettlement of Neiafu-tai residents Upgrade Neiafu-uta access road to national road standards where necessary. Roads under LTA Savaii Zone 7 RMIP Enforce environmental safeguards Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: LTA/ MWTI/ MNRE /MWCSD/ Villages /Families/Districts***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	Undertake further consultation with village and prepare EIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design Prepare EIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan [Draft] Samoa Relocation Strategy 2016 and Neiafu Village Hazard Zone Relocation 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 rainwater harvesting systems for vulnerable families as a short term solution District and villages	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of	Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016) 10year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan

	to support SWA water rationing programs during times of drought District to support SWA efforts at exploratory boreholes in district ***Responsibility: SWA /MNRE/ District /Villages/ CSSP***	water supply Reduce impact from inland flooding	programming design, andextension costs of water supply and procurement of rainwater harvesting systems Utilize Hazard Maps and Geomorphologist findings to inform location and design Utilize Sui o Nu'u monthly meetings to monitor progress of village programs and responsibilities	
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuationshelterassessment and mark on CIM Plan hazard maps Develop aVillageClimateDisasterManagementPlan (VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National DisasterManagement Plan2017-2021 NationalBuildingCode National Policy for People with Disabilities

	Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***			
Electricity supply	Provide undergroundlinesint helongterm Install and connect power supply for inland residents Relocateoverheadlin estoamoreresilientlo cationwhen being replaced Install streetlights along the roads where needed for community safety Install and connect to solar power supply if made available Families to limit building and developments near electricity posts ***Responsibility: EPC/ MWTI/ Village/ Families***	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Coral reefs, lagoons and inshore fishery	Collect and dispose of crown-of-thorns (alamea) on a regular basis to prevent major outbreaks Ban the use of dynamites, herbal poisons (avaniukini),	Protect coral reefs and inshore fisheries Protect marine biodiversity	MAF Fisheries to support implementation and provide technical backstopping and monitoring	Agriculture Sector Plan 2016-2021

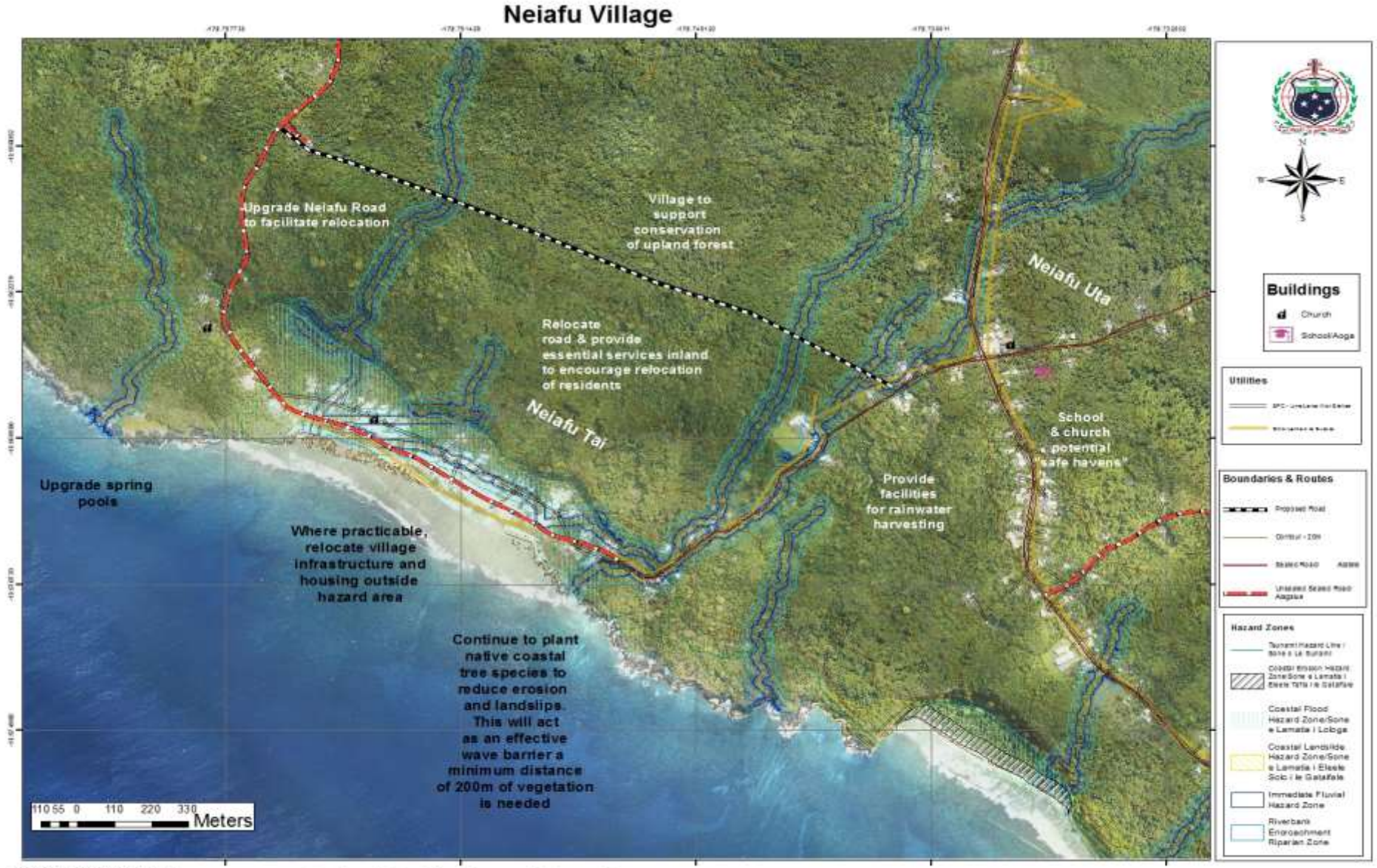
	chemicals and other unsustainable fishing methods. ***Responsibility: Village Council, fishing households, MAF-Fisheries***			
Sand mining	Continue ban on sand mining Research on the impacts of sand mining Village consultation on sand mining policy and regulation ***Responsibility: MNRE/ Village***	Mitigatepotentialdamage fromcoastalerosion and floodingaccommodatingthehazard Safer villages, houses and roads Reduce impact from coastal erosion	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks Undertake assessments of identified sites Undertake consultation with villages affected by proposed sand/rock mining	Draft Soil Resource Management Bill
Governance	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Strengthen the governance of natural resources and land use through Bylaws	Update and/or develop bylaws to manage the use of natural resources, and to control land use impacts; such as drainage maintenance, rubbish dumping, sand mining, stray animals and unregulated developments in water catchment areas and near boreholes. Collaborate with Sui o Nuu to monitor the use of and impact on natural resources Facilitate continuous awareness raising programs with the villages ***Responsibility: MWCSD /Village***	Strengthen implementation of all national sector plans Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies Improve ability of communities to adapt, respond and recover quickly in the long term Improve accountability and enabling environment of communities	Develop and register district/village bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	Village Fono Act (Amendment Bill 2016) Community Sector Plan Community Development Plan 2016-2021


Coastal erosion evident


Access loop to Tufutafoe


Village Pool drying up

Neiafu 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

4.3 FalelimaVillage Interventions

CIM Plan Solutions

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

	district to manage processes by requiring villagers to get the appropriate permits and consent ***Responsibility: Village / Families /MWTI/ MNRE***			
Main South Coast Rd: exposure to high risk hazard zones (inundation, fluvial and tsunami shore exclusive zone)	Investigate relocating main road inland (length 1.6km) from the coast as **long term solution** forhigh riskhazard area in Falelima where road sits less than 5mtrs from the coast and is within fluvial and tsunami shore exclusive zone. Area also identified in *Assessment of the Samoa Road Network* and *Road Network Adaptation Strategy* Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and ***Responsibility :LTA /MWTI/ MNRE/ Villages/Families***	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	Undertake further consultation with village and prepare EIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design Prepare EIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan [Draft] Samoa Relocation Strategy 2016 and Neiafu Village Hazard Zone Relocation Plan
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	Investigate track identified on Falelima map, assess suitability, including land availability, for upgrading as potential 'connecting' road to proposed inland road Enforce environmental safeguards	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters Reduce impact from coastal erosion and natural disasters	Undertake further consultation with village and prepare EIA Utilise Hazard Maps/models and Geomorphologist Drainage Infrastructure Database to inform location and design Prepare EIA and detailed surveys: topographical, geotechnical and soils Include in budget programming CBA, design and construction Designation of the CEHZ and CFHZ as an "at risk" zone with	CIM Strategy 2015 TSP2014-2019 Goal 2 KO 1 Community Sector Plan [Draft] Samoa Relocation Strategy 2016 and Neiafu Village Hazard Zone Relocation Plan

	Responsibility: LTA /MWTI/ MNRE /MWCSD/ Villages /Families/District	Safer villages, houses and roads Minimise national disaster recovery expenditure on damaged properties, public and private assets	appropriate landuse planning controls and restrictions	
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter Conduct evacuationshelterassessment and mark on CIM Plan hazard maps Develop aVillageClimateDisasterManagementPlan(VCDMP) Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies Implement CDCRMprogram Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate	Improve resilience of public infrastructure Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017 Utilise hazard maps and Geomorphologist findings to inform location and designs	National DisasterManagement Plan2017-2021 NationalBuildingCode National Policy for People with Disabilities

	as evacuation shelter ***Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD***			
Reticulated water supply, quality and network to be improved	Extend the water supply to families inland with no access to water Procure rainwater harvesting rainwater harvesting systems for vulnerable families as a short term solution District and villages to support SWA water rationing programs during times of drought District to support SWA efforts at exploratory boreholes in district ***Responsibility: SWA /MNRE/ District /Villages/ CSSP***	Increase adaptation during drought periods Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply Reduce impact from inland flooding	Develop/Update and register District/Village bylaws to include regulating developments around catchment areas and boreholes Implement SWA (2016) 10year investment plan to improve water supply network to support all inland families without access to drinking water Include in budget programming design, and extension costs of water supply and procurement of rainwater harvesting systems Utilize Hazard Maps and Geomorphologist findings to inform location and design Utilize Sui o Nu'u monthly meetings to monitor progress of village programs and responsibilities	CIM Strategy 2015 Water and Sanitation Sector Plan SWA 10 Year Investment Plan(2016) Community Engagement Plan
Natural Resources and Environment	**Best Solutions**	**Benefits**	**Guideline to assist with the implementation**	**Relevant Sector Plans, National Strategies & Policies**
Illegal rubbish dumping	Implement village awareness and cleanup programme to reduce illegal rubbish dumping Implement district/village drainage cleanup and awareness programme Produce posters and village signs for	Improve health and sanitation Reduce leachate into environment and water supply Reduce contaminant from overland flooding entering sea	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 Utilise Waste Management Act/Legislation to guide process of effecting the 'polluter pays' principle Develop and register District/Village bylaws to	National Waste Management Strategy National Waste Management Policy Draft NESP 2017-2021

	public awareness Introduce ban on illegal rubbish dumping in district especially around fluvial hazard zones Conduct campaign for public awareness of district ban and establish a "neighbourhood watch" agreement with district to monitor and report on illegal dumping activities Government, district and villages to monitor, report and apply penalty on offenders ***Responsibility: MNRE/ District/ Village***		include penalizing illegal rubbish dumping in district lands Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management	
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	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

	programs with the villages ***Responsibility: MWCSD /Village***			

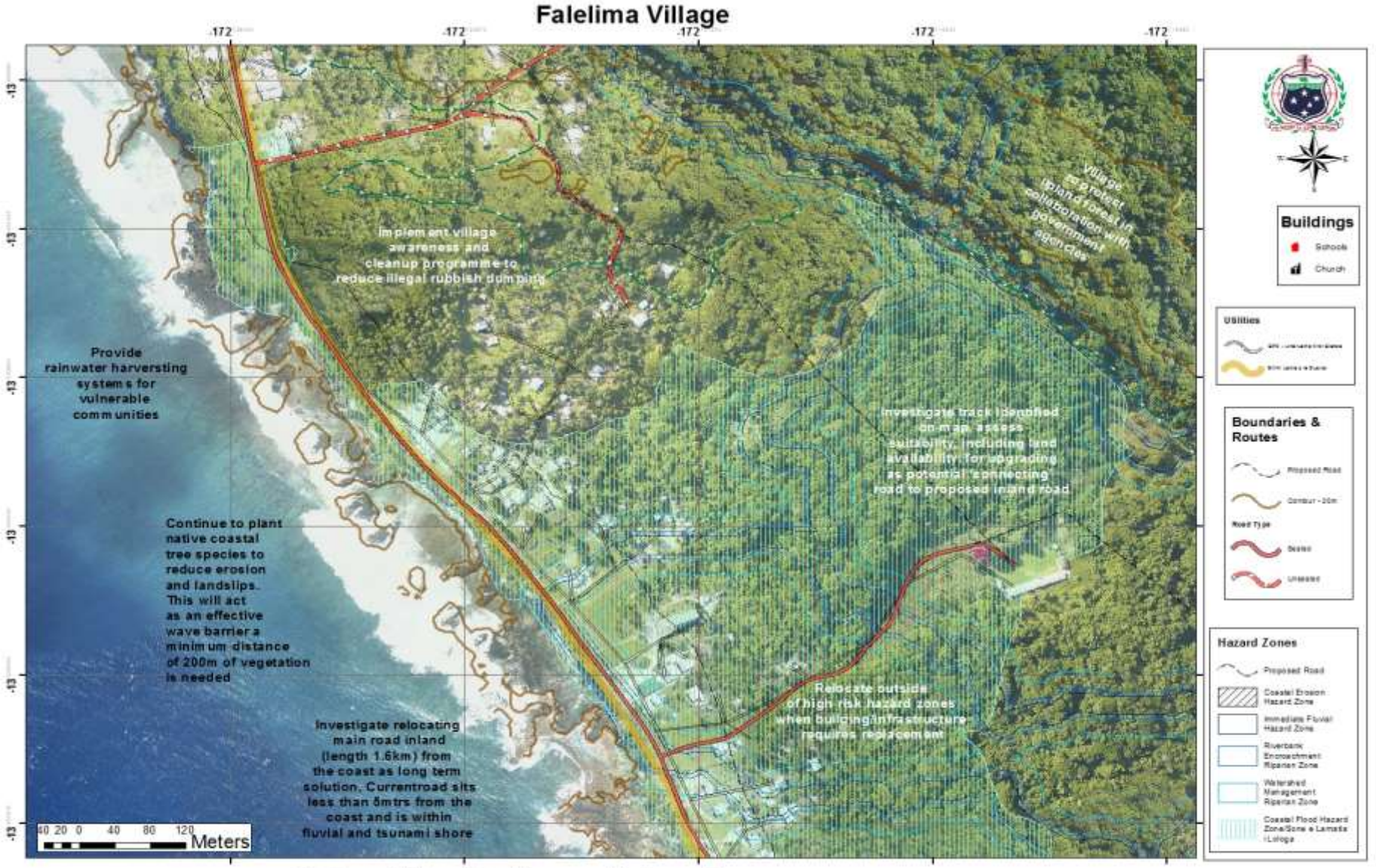
Non-CR issues raised during consultations	**Proposed Solution**	**Comments**
Rubbish stands ***Responsibility:Village***	Procure rubbish stands and install on main road and access roads	Not a CR issue. Indirectly related to Infrastructure (rubbish dumping) but not a priority in relation to other priority issues raised. Relevant under Waste Management Programme
Beach tourism project(s) ***Responsibility: Village/STA***	Establish and set up beach tourist sites in Falelima	Not a CR issue. Indirectly related to Livelihood but not a priority. May be relevant under STA CC related project. Requires major investment as area identified is in hilly, with rocky outcrop area


Illegal dumping at roadside Falelima


Existing Rockwall eroded


Open ground susceptible to inundation

Falelima 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

4.4. Savaii AF Districts Overview Map of Coastal Inundation Zones