# Community Integrated Management Plan Aiga i le Tai 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 Aiga I le Tai and Satuimalufilufi Village (Apai Tai, ApolimaUta, Apolima Tai, Faleu Tai, Lalovi, Lepuia'i Tai, Manono Uta, Mulifanua, Paepaealā, Salua Tai and Satuimalufilufi villages).

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

Date of Signing: 22 June 2015

Representative:	Signature:
Apai Tai Village, Manono Tai	
Feauina Tolovae	3-1-1
• Finau – Apai Tavita	The said .
Faimafili Finau	15.
• Alo Tile	A9
Kaisu Faimalo	B.S.
Apolima Tai Village  • Sa'u Filimaua	Lan.
• Sa'u Shute	Starte
Sa'u Faamanuia	PARMOUNTS
Tautaiole Vao Tautala	1-400 -V.
Taumaiasi Atapana	TATE

## Apolima Uta Village

- Sa'u Polafaasili Puavase Sa'u
- Tina Sa'u
- Tolusefulutasi Siliva
- Sa'u Iosefa
- Anaimalo Sa'u

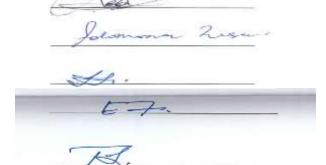
#### Faleu Tai Village, Manono Tai

- Lesā Tominiko
- Solomona Lesā
- Losi Leiataua
- Eseta Futi
- Terisa Leiataua

#### Lalovi Village

- Seulu Iloa
- Seuklu Pelela
- Togia Tuavela
- Gale Togia
- Falute Tafia





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#### Lepuia'i Tai Village, Manono Tai

- Litia Vaipae
- Leiataua Ueli
- Sulu Tavita
- Leiataua Laki

Manono Uta Village

- Mulipola Liki
- Leiataua Punitai
- Mulipola Pemerika
- Taupau Joe Faatupu
- Auapaau Lailoa Manoa

Mulifanua Village

- Ma'uu Lopeti Ifopo
- Aiga Tau Maloto
- Talaleomalie Pritchard
- Vaatiuola L Misi
- MAuinatu Kofe Mafua

Paepaealā Village

- Malaga Teofilo Vaatiuola
- Tuifaasisna Tofaimaa
- Letelemaana Fuga
- Kaloto Tomasi
- Tiumalu Samuelu

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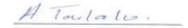
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#### Salua Tai Village, Manono Tai

- Aupaau Talilalo
- Mulipola Tausala
- Eseta Elisala
- Talia Auapaau
- Malo Taupau

#### Satuimalufilufi Village

- Tiumalu Taua
- Malumaauga Pisa
- Fuga Manuele
- Mavaega Tamati



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Mate. Taupau

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The Government of Samoa adopts the Community Integrated Management Plan for the Faipule District of Aiga I le Tai 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

ACCII	Avera Canaitive to Canatal Haranda
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	1
KPI	Key Biodiversity Area
	Key Performance Indicator
LTA	Land Transport Authority
LTO	Long Term Output
MAF	Ministry of Agriculture and Fisheries
MET Office	Meteorological Office
МоН	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
JIIDI GLI JGI	Programme
	1 10grunnic

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.

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.

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).

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.

Livelihood

Food access

#### Introduction to the CIM Plan

#### The Strategic Vision

The District Community Integrated Management (CIM) Plan for Aiga I le Tai District and Satuimalufilufi Village 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 improves resilience by identifying actions and solutions considered as best approach to issues identified. Not all the solutions may be actioned immediately but the plan will ensure that issues and options are identified for the long-term improvement in resilience of community livelihoods, infrastructure, and environment and resource systems.

The CIM Plan will:

- 1. Improve the community's awareness of all hazard risks from the ridge to the reef;
- 2. Enable the community as well as providers of services and physical, financial, and technical support in all climate prone sectors, to reduce inland and coastal hazard risks in villages;
- 3. Enable the community and government service providers of infrastructure services, livelihoods, environment and natural resources to better adapt, respond and recover from cyclones.

#### 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 Programme for Climate Resilience Enhancing Climate Resilience for Coastal Resources and Communities (PPCR ECR) prepared two (2) key documents:

- **Community Engagement Plan (CEP)**-the guidelines provided in the CEP is an excellent capacity building tool that can be used by CSO's and village communities themselves to aid development of small grant proposals to existing small grant funding mechanisms like CSSP and the UNDP-GEFSGP
- ➤ **District Sub Project (DSP)** the guidelines provided in the DSP targets single districts or multi-district projects with a large number of beneficiaries.

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

## 1. Description of Aiga I le Tai District

#### **Physical and Natural Resource Setting**

The Faipule District of Aiga I le Tai covers the islands of Manono and Apolima as well as part of Upolu at the western end of Upolu Island. Satuimalufilufi village which is part of the Faipule District of Aana Alofi 3, is covered under the Aiga i le Tai CIM Plan as it is located between the villages of Apolima Uta and Lalovi (refer map of district). The villages in the Aiga I le Tai district include Manono-Uta, Apolima-Uta, Lalovi, Mulifanua and Paepaealā from Upolu while Faleu Tai, Salua Tai, Lepuia'i Tai and Apai Tai are villages of Manono Tai. Apolima Tai covers the whole of Apolima Island which lies north-west of Manono Tai.

The physical and natural resource setting has been divided into distinct settings – Mulifanua to Manono Uta, Manono Island and Apolima Island – this setting provides three different environments to be considered in this CIM Plan.

#### Mulifanua Wharf to Manono Uta

The Mulifanua Wharf to Manono Uta sector of the Plan area is generally a flat or gently sloping plain characterized by a coastal berm with a wide low-lying area behind. The coast is, in most parts, a sandy shore with intermittent natural headlands including Cape Fatuosofia. The coastline is also highly modified with numerous reclamations jutting out into the lagoon creating smaller pocket beaches and interrupting sediment flow along the shore. There are also a number of poor quality seawalls along the coast in this area.

The low-lying area is mainly swamp, in some parts there is standing or tidal water (behind Apolima Uta) and in others it consists of mangroves (between the main road and the Samoan Village Resort) or reeds. Outside of the swamp areas, most vegetation is plantation or garden. Remnant lava flows dissect the low-lying areas at intervals mainly between Lalovi and Satuimalufilufi. The southern end of the District at Manono Uta changes from a typical soft coast to a harder rocky coastline.

Satuimalufilufi land is partly covered by the Apolima Uta coastal marshland, and through the years, coastal erosion and sea level rise has resulted in the loss of over 20m of previously coastal areas. A seawall now protects the coastal part of the village as well as the main west coast road that runs along the village. As sea level continue to rise, so will the wetlands behind the village, rendering it uninhabitable being so closely situated to the wetlands.

The main district infrastructure in the Mulifanua to Manono Uta area of the CIM Plan include the main road¹which is considered a lifeline access as it connects the western side of Upolu to services such as the hospital², Faleolo International Airport, wharves, ports and other essential services. There are also seawalls with the most recent ones constructed in 2011 as part of the Tsunami Recovery Programme. The Aana West Coast Road is considered an important part of the district's infrastructure, however is listed as high severity for coastal hazard risk in the Vulnerability Assessment of the Samoa Road Network report³. Government managed seawalls include ones located at Satuimalufilufi, Apolima Uta and Manono Uta. These were constructed in 2004 and 2006 but later reconstructed in 2011 after being damaged by the tsunami of 2009.

The main road provides primary access to and from Apia, to the Faleolo International Airport, the Mulifanua wharf to Savai'i as well as district facilities and services including the district hospital, schools, churches and shops. The Aana West Coast Road connects the district to the southern side villages of Falelatai, Lefaga and Faleaseela but it is located within the flooding and erosion hazard zones and, in some parts, is only metres from the high water mark.

Where the road is close to the coast there is typically an un-designed seawall along the berm edge, which has not stopped erosion. In some places holes as much as a metre wide exist behind the rocks. Many of the drainage culverts under the road are blocked or damaged and are not effective in draining the low-lying area behind the road. This district sits within the LTA Samoa Infrastructure Asset Management Zone 6 and aside from the main Aana West Coast Road, has a total of 9 access roads<sup>4</sup> maintained by the government. There are approximately 6 unsealed roads/tracks in the district. Majority of these roads are in poor conditions and in need of maintenance.

<sup>&</sup>lt;sup>1</sup>Aana West Coast Road. Source: LTA Samoa Infrastructure Asset Management Register

<sup>&</sup>lt;sup>2</sup>Leulumoega and Motootua Hospitals

<sup>3</sup>LTA 2016

<sup>&</sup>lt;sup>4</sup> Paepaeala Road 1 & 2, Fuailoloo Road 1 & 2, FaleuManono Rd, Salua Access Roads 1 & 2. Lepuiai andSatuimalufilufi Rd not

Overhead electricity lines are on the inland side of the main west coast road. The water network is currently being upgraded to follow the inland side of the road. Construction works are, in some places, affecting the carriageway and cutting off or blocking the drainage culverts. It is expected that this network will remain in place for 30 – 40 years unless damaged by cyclones. The telephone network to this area is provided by way of a micro-wave station at Apolima Uta and distributed by overhead lines from the central point.

The main land and resource use issue affecting the public or "lifeline" infrastructure along the Mulifanua Wharf to Manono Uta coast is the location of the road on the top of the sand berm. This combined with inadequate, blocked or damaged drainage culverts is seen as being the main cause of flooding in the areas behind the road. Rains of two days are reported to leave standing water for up to a week. This is common throughout the rainy season. This also affects the natural environment of the low-lying areas behind the coastal development, restricting flushing and creating unnatural conditions in these areas. The coast is highly modified with many reclamations interrupting sediment flow along the coast and un-designed seawalls ineffective against erosion. Sand mining has occurred on some parts of the coast both for domestic and commercial use. Most villages have management controls in place for domestic use and there is no commercial mining at present. Government is concerned at the on-going demand for sand for commercial use and seeks to identify specific sites for this. The Upolu based communities have limited access to area suitable for cultivation or livestock grazing area. Land available for crops is small in comparison to other districts. Much of the resettled land is logged and supports small household crops. This limits the varieties of crops that can be successfully cultivated. There is limited opportunity for raising livestock as well.

The agricultural ecosystem is mixed cropping on a small household scale. The soil type is influenced by ponding and swamp area. Fishery is a temporary operation with the brood stock being sourced from local reefs flats. The soil is rich and supports a number of plantations. The dominant varieties are banana, taro and coconut. Household income source is obtained through plantation and fishing.

Development is characteristically "ribbon-like", along the main west coast road, which provides easy access to the main services. The district now relies on mobile phones rather than landlines so underground cabling priority is based on commercial companies funding priorities.

#### Manono Island

Manono Island is a low, cone shaped island approximately 2.4km long and 1.5km wide, 290ha in area. At its highest point it is 95m above sea level. The island lies within the main Upolu reef/lagoon system as described, about 3.5km from Upolu. The reef to the south is about 1km off-shore while to the west and north it is about 800m off-shore. There are no breaks in the reef to the south and west while there is a narrow break to the north which is used for access to Apolima Island. Manono Island has a cluster of communities that are all close to the shoreline. The island is a surrounding fringing coral reef system that creates a lagoon system and natural protection from prevailing storms and trade winds. The coastline is generally rocky with small pocket beaches. The developed parts of the coast have been modified with the extension of private jetties, or rock walls, out from many properties. The only significant sand beach is in front of Apai Tai village. It was reported that this beach was moved inland about 30m by cyclones Ofa (1990) and Val (1991). Behind the beach is a low-lying area which remained flooded for 3 weeks following the cyclones.

There are four villages on the island. Faleu Tai is the largest village and is closest to Upolu, located on the southern tip of the island. Faleu was one of those affected by the 2009 tsunami which damaged the jetty currently Utilized by Faleu and neighbouring villages to travel to Manono Uta and Apolima Tai. Salua Tai is located on the northern tip of the island about 2.4km from Faleu Tai. There is continuous residential and some tourism resort developments along the eastern coast (facing Upolu) between the two villages. Lepuia'i Tai and Apai Tai villages are located on the south-west facing the coast. Lepuia'i Tai is adjacent to Faleu Tai and Apai Tai is approximately 2km west of Faleu Tai. There is a distinct break in development between Lepuia'i Tai and Apai Tai. Apai Tai is located on a sandy beach while the other villages are located on rocky shorelines. There is almost no development along the north-west coast or more than 100m from the shore.

on LTA SIAM. Names may differ between LTA and MWTI records

Manono Island livelihood is quite similar to that of Apolima Island. There are a variety of crops farmed on the island. Most are small scale and associated with household subsistence. Fishing is the main economic activity on the island and there are small provision shops in the village. Development is focused along the eastern coast. There is one main tourist "resort" although other families also provide beach fales. The cash economy of the island is dominated by traditional work. The majority of the residents are largely sustained by plantation work and fishing. There are commercial oyster and giant clam farms on Manono Tai managed by Lepuiai, Apai and Faleu Tai residents and a private company.

The island is well planted with plantations and gardens with some open areas apparent from the aerial photograph (Flown 1999). It generally has a constant slope of about 10 degrees to the shore, although there are areas behind Apai Tai and Lepuia'i Tai that are flatter and flooded in extended periods of rain. A single sand track approximately 7.5km long circles the island. The track generally lies within the Coastal Hazard Erosion and Flooding zones. There are no permanent water courses on the island. Water is supplied by SWA through a submarine pipeline and is supplemented by wells and rain water by way of roof tanks. The piped water is intermittent and salination has been reported due to the water mains being located in the coastal erosion and flooding zones.

The coast of Manono Island has not only been impacted by the 2009 tsunami, domestic sand mining for construction and development purposes, but also the many private jetties along the coast interrupting the natural movement of sand. The local beaches are the only source of sand for construction on the island as the main wharf and jetties are not large enough to accommodate equipment and vehicles usually required for construction loads and purposes. Private jetties are formed from loose coast rocks often for each family along the shoreline. The effect is to remove some of the natural coast (used as raw material for the jetty), and potentially increasing the rate of localised erosion. Poor maintenance along the road contributes to some erosion from storm water runoff over soft road edges.

Over the years, island flooding occurs only during cyclones when waves run up the shore and recede once the storm passes. At Apai Tai and Lepuia'i Tai, flood waters lie for some time in low-lying areas behind a higher coastal area. Residents have responded to the problem by building their homes higher. The electricity supply is limited to the times that the generator is operated (7 - 8 hours per day). Piped water supply is intermittent resulting in reliance on rain water and wells.

#### **Apolima Island**

Apolima Island is a remnant volcanic cone located outside the main reef and lagoon system that surrounds much of Upolu. It is a small island of about 95 hectares, approximately 9.5km from Upolu. The highest part of the island (about 160m above mean sea level) is along the southern rim of the volcano from where it slopes steeply (approximately 45 degrees) to the southern coast and less steeply to the remnant crater and the northern side of the island.

Apolima Tai village is located close to the northern side of the island and is accessed by way of a breach in the crater wall. This has formed a "pocket" beach in a small bay which provides safe harbour for fishing craft. The entrance to the bay is through a narrow gap in the volcanic rocks which limits the size of craft that can be used for access. The entrance faces directly north, which is the direction from which a cyclone is most likely to approach from and the village facing the beach is very exposed to these events. The buildings are at least 60m from the present shoreline. The outer "face" of the island is generally steep cliffs, bare of vegetation and actively eroding into the sea. Inside, the crater is well vegetated with plantations and gardens. The Coastal Hazard Zone maps indicate that the outer face of the island is eroding (Landslip hazard) at an average rate of about 0.5m/yr.

The geographic isolation and difficulty of access make provision of services and infrastructure here a special case. Some residents have relocated to the Upolu part of the district but approximately 50 households remain on the island. On the island of Apolima, reef fishing is an important livelihood to the island community as well as supplementing fish to the community of Upolu. Water is provided through a central tank, supplemented by isolated rain catchment areas. Any significant alteration in rain patterns will have direct impact on the agriculture production. Families that have resettled on Upolu faces reduced areas for agricultural and cropping purposes as the soil there is not well drained and mainly swampy.

The beach formation consists of a steep coral/sand berm behind which is a wide low-lying area taking up the area eroded by cyclones Ofa and Val. The area is overgrown with plant material and is a good example of natural

revegetation. Native forest vegetation of these islands are completely altered by the years of human settlements with a small exception of remaining native ridge forests on Apolima which understandably, has not been affected by developments due to its difficult and inaccessible terrain. Several seabirds were observed nesting the seaward cliffs of Apolima mountain ridges. A small wetland area with an active stream exists in the middle of Apolima but its ecology has not been studied. The fringing coral reefs system around these islands are intact and rich with fish and shell fish species through swath of damaged reefs are recovering from recent cyclones, part destructive fishing and over-fishing practices

#### **Social and Economic Setting**

The most recent census (2016) shows the population of the following villages in the Aiga I le Tai District at Mulifanua (504), Paepaeala (162), ManonoUta (1394), Apolima Uta (500), Faleu Tai (250), Salua Tai (136), Apai (124), Lepuiai (183), Apolima Tai (96), and Satuimalufilufi (747). There are 6 schools within the district; 2 Pre-schools<sup>5</sup> and 4 Primaries<sup>6</sup>. A total of 22 churches are divided between the villages of Satuimalufilufi, Mulifanua, Apolima Tai, Manono Uta, Apai, Faleu Manono, Lepuiai Tai and Salua Tai. There are 4 tourist accommodations<sup>7</sup>, 3 are based in the western part of Upolu and 1 is located on the island of Manono.

Aiga I le Tai is ranked as the 5<sup>th</sup> highest district that derive their income sources from remittances. The division of houses in the district showed 15 open Samoan fales, 21 open Samoan fales with extension, 1 closed Samoan fale, 146 open European house, 49 open European houses with extension, 144 closed European houses, 70 closed European houses with extension, 2 houses with 2 floors, 29 faleo'o and 31 *faleapalaiti*. This sums up to a total of 508 households in the Aiga I le Tai district. About 66 families in the district have no access to water supply; which has ranked the district with the most counted families with no water supply in a survey of 25 districts from Upolu and Savaii<sup>8</sup>.

#### 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 Aiga I le Tai. The immediate risks for some areas of Aiga I Le Tai District are coastal landslips, coastal erosion and fluvial hazards.

Part of the district in the western end of Upolu sits in a very high combined risk area with about 78 buildings in the Tsunami shore exclusive zone, Coastal Flood Hazard Zone (CFHZ), Coastal Erosion Hazard Zone (CEHZ) and Immediate Fluvial Hazard Zone (IFHZ). The island of Manono Tai has 101 buildings in the CFHZ and Tsunami shore exclusive zone. Apolima Tai Island has about 4 buildings in the CEHZ and 7 buildings in the CFHZ. It is of note that most buildings in this high risk coastal zone are schools, health centres and women's committee houses. Relocation options must be considered.

The main Aana West Coast Road is ranked high in severity of impacts from coastal erosion<sup>9</sup> but the AF Disaster Risk Management maps clearly show parts of the main road sitting in an area of combined hazard zones<sup>10</sup> which puts this crucial infrastructure at a very high risk. These specific high risk areas of the road will need to relocate as it is the only access connecting communities in the western coast<sup>11</sup> to essential services (hospital, wharf, and airport). Blocked culverts, damaged or non-existent drainage also increase the risk of the communities and essential infrastructure. Inland flooding from catchment areas and wetland areas are exacerbating storm surges during the rainy season or cyclone season. This district requires an integrated land management strategy that considers both engineering (hard) and soft options such as increasing the wetland coverage; riparian replanting and coastal replanting. When designing the size of culverts, a number of elements should be taken into account, i.e. size of drainage area, surrounding terrain type, rainfall intensity, etc.

<sup>&</sup>lt;sup>5</sup>Saleiuatua Pre-School and Lepuiai Pre-school.

<sup>&</sup>lt;sup>6</sup>Mulifanua Primary School, ApolimaUta Primary School, FaleuManono Tai Primary School and Salua Tai Primary School.

<sup>&</sup>lt;sup>7</sup>Aggie Greys Hotel, Airport Lodge, Levasa Resort and The Sweet Escape

<sup>8</sup>MNRE. 2017. CDCRM Household survey: final report

<sup>&</sup>lt;sup>9</sup>LTA. 2016. Vulnerability Assessment of the Samoa Road Network

<sup>&</sup>lt;sup>10</sup>CEHZ, CFHZ, IFHZ and tsunami shore exclusive zones

<sup>&</sup>lt;sup>11</sup>Includes Falelatai and Samatau as well as Lefaga and Faleaseela

Certain coastal areas of Aiga I le Tai is eroding at a much faster rate due to human influence. Sand mining is a major contributor to such cause. There is also evidence of recent reclamations in the coastal area which is affecting the natural flow of the wetland into the sea. The combination of floodplains, sand mining and reclamations puts this part of the district in a potential dangerous situation. Some villages in this district have no lands to relocate to, or have lands but are hemmed in by the coastal and wetland areas. These villages have requested land from the government to relocate to as a long term solution.

Rainwater harvesting is evidently a well-accepted, effectively universal practice for the scattered population of Aiga I le Tai District. 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 be regarded as one of the primary resources in the district, which can effectively be Utilized in much of the area as the principal potable source, to be managed in conjunction with other potential sources of lesser reliability or (possibly mixed with) poorer quality. Clearly, the more rainwater harvesting that can be developed in the area, then the less demand needs to be placed on more conventional piped (SWA) water supplies sourced from the locally extremely "sensitive" aquifer (Tokalauvere, 2017).

## 2. Aiga I le Tai District Interventions

## Mulifanua Wharf to Manono Uta

#### **CIM Plan Solutions**

Infrastructure	Best Solutions	Benefits	Guideline to assist	Relevant
			with the implementation	Sector Plans, National Strategies & Policies
Main Aana West Coast Rd: exposure to high risk hazard zones (IFHZ, CEHZ, CFHZ and tsunami shore exclusive zone)	Upgrade main Aana West Coast Road to accommodate for hazard zones and in accordance with Vulnerability Assessment of the Samoa Road Network recommendations  Inspect, strengthen and undertake regular maintenance for existing government managed seawalls in most vulnerable areas as short term solution for high risk area from Mulifanua to Manono Uta where road sits less than 5mtrs from the coast and is within fluvial and tsunami shore exclusive zones. Area also identified as high severity rating in Assessment of the Samoa Road Network Adaptation Strategy  Investigate relocating main road inland (length 1.6km) from the coast as long term solution for high risk hazard area from Mulifanua to Manono Uta 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  Responsibility: LTA/MWTI	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	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
Drainage systems to be improved in high risk areas of main Aana West Coast Road	Assess and upgrade culverts on main Aana West Coast Road especially at junctions with access roads sitting within combined hazard	Improves infrastructure resilience and rate of response and recovery to	Use existing information for guidance but not limited to: "Vulnerability	CIM Strategy 2015 TSP2014- 2019 Goal 2

<sup>12</sup>May involve routine, preventive or remedial maintenance process

especially at junctions of hazard zones (IFHZ, CEHZ, CFHZ and Tsunami shore exclusive zone) and access roads (Paepaeala Access Road, Fuailolo'o Access Roads 1&2, Faleuuta Access Road and Salua-uta Access Road exacerbating inland flooding and storm water surges affecting infrastructure, village homes and other assets	zones exacerbating inland flooding and storm water surges affecting infrastructure, village homes and other assets (IFHZ, CEHZ, CFHZ)— culverts in accordance with Vulnerability Assessment of the Samoa Road Network recommendations  Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding  Implement regular drainage inspection and maintenance  Responsibility: LTA/MWTI/MNRE/MWCSD/Village/Families	natural hazards and disasters  Encourages coastal families to relocate inland  Maintains lifeline access for all of Upolu  Minimises national disaster recovery expenditure on damaged properties, public and private assets	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	KO 1
Village houses, schools, churches and government assets in extremely high risk hazard zones	Relocate assets outside of high risk hazard zones when re-building  Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ  Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones  Design infrastructure to take into account the immediate hazard zones;	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	CIM Strategy 2015 National Building Code

of houses away from hazard zones and as potential escape routes    Implement   routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff 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/ Villages/Families   Extend the water supply quality and network to be improved   Extend the water supply to families   Increase improved   Infrastructure   Database to inform location and designs and readiness rate of recovery   Infrastructure   Database to inform location and designs and readiness and readiness rate   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 early affect the natural habitats and ecosystems of the public assets   Designation of the public assets   Designation of the public assets   Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Aiga i le Tai district   T		Т	T		<del></del>
Reticulated water supply, quality and network to be improved  Extend the water supply to families inland with no network to be improved    A continuation of the water supply to families inland with no network to be improved   CIM Strategory and periods   CIM Strategory and compared   CIM Strategory	work roads to facilitate relocation of houses away from hazard zones and as potential escape	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  Assess and upgrade access/work roads as potential escape routes  Construct roadside drainage ditches where needed  Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff  Village to regulate developments near and around road shoulders of 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/ MNRE/	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	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  Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions  Utilise environmental and social safeguards including EIAs in screening and	Disaster Management Plan 2017- 2021  TSP 2014- 2019 Goal 2
supply, quality and network to be improved families inland with no network to be improved access to water adaptation during drough periods bylaws to include water and adaptation during drough bylaws to include water and drough bylaws				designing built environment infrastructure projects for Aiga i le	
Procure rainwater harvesting Improve developments Sector Plan	supply, quality and network to be	families inland with no access to water  Procure rainwater harvesting	adaptation during drought periods Improve	register District/Village bylaws to include regulating developments	2015 Water and Sanitation

	families as a short term solution	resilience and rate of recovery	areas and boreholes	Investment Plan (2016)
	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	Improve health and sanitation  Reduce contamination of water supply  Reduce impact from inland flooding	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	Community Engagement Plan
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter  Conduct evacuation shelter assessment and mark on CIM Plan hazard maps  Develop a Village Climate Disaster Management Plan (VCDMP)  Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies  Implement CDCRM program  Install relevant signs to guide the community on emergency response 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	Improve resilience of public infrastructure  Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017  Utilise hazard maps and Geomorphologist	National Disaster Management Plan 2017- 2021 National Building Code National Policy for People with Disabilities

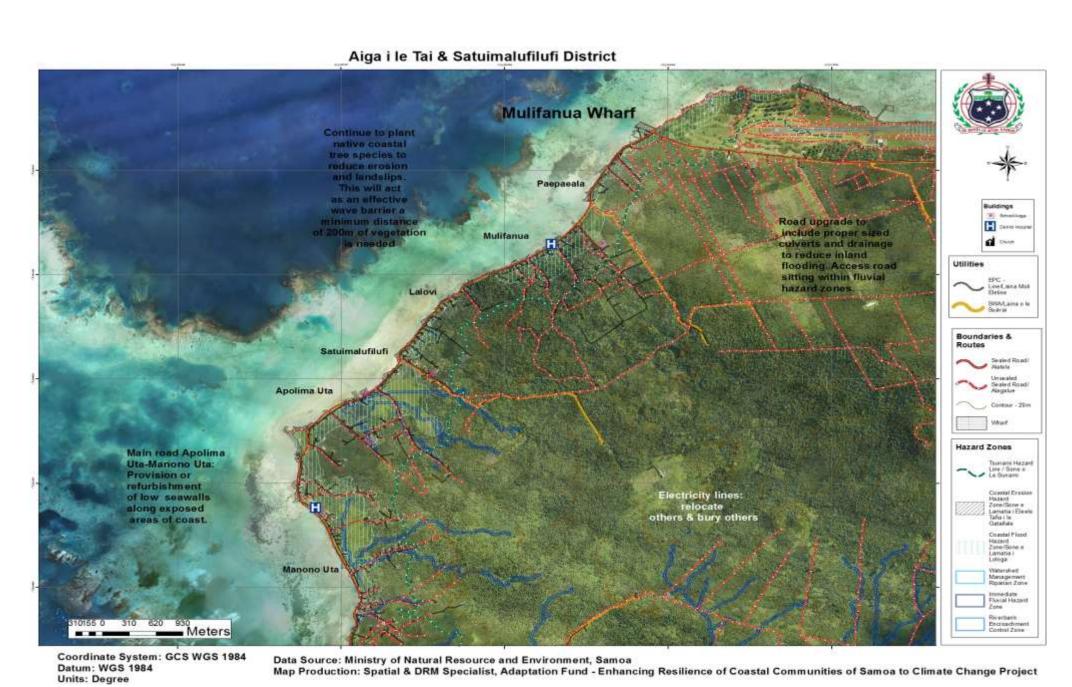
	T	T		1
	churches outside hazard zones and designate as evacuation shelter  Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD			
Electricity supply	Provide underground lines in the long term  Install and connect power supply for inland residents  Relocate overhead lines to a more resilient location when being replaced  Install streetlights along the roads where needed for community safety  Install and connect to solar	Maintain electricity supply at all times including natural disasters  Avoid accidents from fallen electricity posts	networks to avoid	EPC Strategic Plan
	power supply if made available  Families to limit building and developments near electricity posts  Responsibility: EPC/MWTI/Village/Families			
Effluent and wastewater management systems	Provide a network sewage collection and treatment system for district  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 programme  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	Utilise Hazard maps and Geomorphologist findings to inform location	National Waste Management Strategy
			Utilise Sui o Nu'u	

Natural Resources and Environment	Best Solutions	Benefits	monthly meetings to monitor progress of village programmes on waste management  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 coasta erosion and natural disasters  Implements an Ecosystem Based Approach	area  MAF to assist in establishment of pilot sites to trial	NESP 2018 - 2022  Two Million Tree Planting Strategy 2015-2020  Restoration Operational Plan 2016-2020
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	damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	MNRE to continue to identify specific sites for inshore/inland sustainable sand/rock mining to meet demand without compromising riverbanks  Undertake	Draft Soil Resource Management Bill

			mining of rivers	
Pest management; invasive plants and animals	Implement an eradication programme to eradicate, contain or exclude invasive species  Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken  Conduct education and	Maintains natural ecosystem  Builds resilience of community livelihood and food security	Develop an integrated land management plan for Aiga i le Tai district with the	Agriculture Sector Plan 2016-2021 Samoa's National Invasive Species Action Plan (NISAP)
	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  District to fence domestic animals		awareness of farmers on impacts to water flows from poor livestock management  MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly	
	Responsibility: Villages /District/ MNRE/MAF/ SROS		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	Strengthen implementation of all national sector plans  Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies  Improve ability	bylaw to protect all district/ village and government assets, environment, livelihood and food security especially activities affecting water catchment areas and coastline	Village Fono Act (Amendment Bill 2016)  Community Sector Plan  Community Development Plan 2016- 2021
	to monitor the use of and impact on natural resources	of communities	Utilise Sui o Nu'u monthly meetings to	

Facilitate continuous awareness raising programs with the villages	•	monitor progress of district/village bylaws	
Responsibility: MWCSD /Village	Improve accountability and enabling environment of communities		

Non-CR issues raised during consultations	Proposed Solution	Comments	
District lands	District requested land from Related to CR as relocation is one		
Responsibility: Village/	government for relocation	recommended solutions to impacts of climate	
<b>1 0</b> ,   9		change included in the Aiga I le Tai CIM Plan	



## 3. Manono Tai

## **CIM Plan Solutions**

CIM Plan Sol	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
			the implementation	Plans, National Strategies & Policies
Main wharves	Assess and upgrade main wharves to accommodate for response and recovery teams and equipments for both islands as only lifeline and connectivity infrastructure between Upolu, Manono-Tai and Apolima-Tai  Inspect, strengthen and undertake regular maintenance of existing government managed seawalls in most vulnerable areas where there is no alternative route for relocation, as short term solution for high risk area  Responsibility: SPA/MWTI/ MNRE/Villages/CSSP/NGO	Improve infrastructure resilience and rate of recovery Improve preparedness and readiness response to natural disasters  Maintain lifeline access for all of Aiga i le Tai  Safer villages, houses and roads	Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities  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  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
Main roads: exposure to high risk hazard zones (IFHZ, CEHZ, CFHZ and tsunami shore exclusive zone)	Upgrade and maintain <sup>13</sup> main road to accommodate for hazard zones and in accordance with Vulnerability Assessment of the Samoa Road Network recommendations Responsibility: LTA/ MWTI/ MNRE/ Villages	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 Aiga i le Tai	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 Aiga i le Tai 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

 $<sup>^{13}\</sup>mathrm{May}$  involve routine, preventive or remedial maintenance process

		C-f		
		Safer villages, houses and roads		
Village houses, churches, and other 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 national disaster recovery expenditure on damaged properties and public assets  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
Reticulated water supply, quality and network to	Extend the water supply to families inland with no access to water	Increase adaptation during drought	Develop and register District/Village bylaws to include regulating	CIM Strategy 2015 Water and Sanitation
be improved	Procure rainwater harvesting systems for	periods	developments around catchment areas and	Sector Plan SWA 10 Year
	vulnerable families as a short term solution	Improve infrastructure	boreholes	Investment Plan (2016)
	District and village to	resilience and rate of recovery	Implement SWA (2016)10 year investment plan to	-

	support SWA water rationing programmes during times of drought 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*	Improve health and sanitation  Reduce contamination of water supply  Reduce impact from inland flooding	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	Community Engagement Plan
Electricity supply	Provide underground lines in the long term  Install and connect power supply for inland residents  Relocate overhead lines to a more resilient location when being replaced  Install streetlights along the roads where needed for community safety  Install and connect to solar power supply if made available  Families to limit building and developments near electricity posts  Responsibility: EPC/MWTI/	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
Effluent and wastewater management systems	Introduce ban on latrines established in and around IFHZ, CEHZ and CFHZs  Families in fluvial hazard zones to install proper septic waste disposal systems  Implement district/village drainage cleanup and awareness programme  Produce posters and	Increase adaptation during extreme weather events  Improve infrastructure resilience and rate of recovery  Improve health and sanitation  Reduce contamination of water supply	Develop an integrated land management plan for Apolima Tai and Manono Tai  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	National Waste Management Strategy

	village signs for public		flooding	
	awareness			
	Responsibility: MNRE/ MWCSD/ District/ Village		Utilise Hazard maps and Geomorphologist findings to inform location	
Natural	BestSolutions	Benefits	Guideline to assist with	RelevantSector Plans,
Resources and Environment			the implementation	National Strategies & Policies
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	Mitigate potential damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads  Reduce impact from coastal	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	Draft Soil Resource Management Bill
	sand/rock mining  Raise awareness and support of sustainable land use practices  Responsibility: MNRE/ Village/Families	erosion  Economic benefit for village from sustainable sand mining activities	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	
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	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	Develop an integrated land management plan for Aiga i le Tai 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	NESP 2018 - 2022 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

	Responsibility: MNRE/	Ecosystem	crops	
	MAF/Villages	Based Approach		
Pest	Implement an	Maintains	Develop an integrated land	Agriculture Sector
management;	eradication programme	natural	management plan for Aiga	Plan 2016-2021
invasive plants	to eradicate, contain or	ecosystem	i le Tai district with the	
and animals	exclude invasive species		aim of reducing any	Samoa's National
		Builds	unnecessary actions that	Invasive Species
	Implement an inventory	resilience of	may adversely affect the	Action Plan (NISAP)
	of invasive species and	community	natural habitats and	
	include information on	livelihood and	ecosystems of the area	
	their past, present and	food security		
	potential future		MAF to raise awareness of	
	distribution, as well as		farmers on impacts to water	
	impacts and possible		flows from poor livestock	
	actions that can be taken		management	
	Conduct education and		MNRE, MAF and SROS to	
	awareness programmes		implement aggressive,	
	on the impacts of		nationwide invasive	
	invasive species		species eradication	
	mvasive species		programme based on	
	Implement the Integrated		inventory of invasive	
	Pest Management		species and conduct	
	Programme		campaign on public	
			awareness accordingly	
	Implement Sustainable			
	Land Management (SLM)		Training for farmers on	
	practices		pests management	
			particularly affecting fruit	
	Build the capacity of		trees and crops	
	farmers to manage stray			
	animals (pigs, cattle) that			
	are contaminating water			
	sources			
	Responsibility: Villages			
	/District/ MNRE/MAF/			
	SROS			
Governance	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
			the implementation	Plans, National
				Strategies & Policies
Strengthen the	Update and/or develop	Strengthen	Develop and register	Village Fono Act
governance of	bylaws to manage the	implementation	district/village bylaw to	(Amendment Bill
natural	use of natural resources,	of all national	protect all district/ village	2016)
resources and	and to control land use	sector plans	and government assets,	
land use through	impacts; such as	C1	environment, livelihood	Community Sector
Bylaws	drainage maintenance,	Strengthen	and food security	Plan
	rubbish dumping, sand	monitoring of	especially activities	Community
	mining, stray animals and unregulated	all National Acts,	affecting water catchment areas and coastline	Community Development Plan
	developments in water	Regulation,	areas and coastinie	2016-2021
	catchment areas and	Strategies,	Utilise Sui o Nu'u monthly	2010-2021
	near boreholes.	Plans and	meetings to monitor	
	near Borenoies.	Policies	progress of district/village	
	Collaborate with Sui o			
	Nuu to monitor the use	Improve ability		
	I Muu to monitor the use		1	į.
		of communities		
	of and impact on natural resources	of communities to adapt,		
	of and impact on natural			
	Collaborate with Sui o	Improve ability	bylaws	

awareness raising	in the long term	
programs with the		
villages	Improve	
	accountability	
Responsibility: MWCSD	and enabling	
/Village	environment of	
	communities	

Non-CR issues raised during consultations	Proposed Solution	Comments
District lands Responsibility: Village/ Government/	District requested land from government for relocation purposes	Indirectly related to CR as relocation is one of the recommended solutions to impacts of climate change included in the Aiga I le Tai CIM Plan
Lighthouse maintenance Responsibility: SPA/DAC		Although considered a safety issue, it is indirectly related to CR as it will be required for all travelling public (including government inspection/recovery teams) not just residents of Apolima Tai and Manono Tai

# 4. Apai Village Interventions

## **CIM Plan Solutions**

Infrastructu	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
re	Dest solutions	belletits	the implementation	Plans, National Strategies & Policies
Village infrastructur e located in high risk hazard zones; such as houses, schools, Churches, Businesses, Committee houses etc	Relocate assets outside of high risk hazard zones when rebuilding  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
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	Improve resilience of public infrastructure  Improve preparedness and readiness response to	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

	shelter assessment	natural disasters		Disabilities
	and mark on CIM Plan			NISP 2011 KESO 5
	hazard maps			NIST ZOTT RESOS
	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			
Coastal	Assess potential of a	Reduce impact	Planning provisions to be	NESP 2018 - 2022
protection	revetment for badly	from inland	guided by the Planning	
	eroded coastal areas	flooding on coastal	and Urban Management Act 2004	
	where relocation is not possible as <b>short</b>	areas	ACL 2004	
	term solution	Mitigate potential	Utilise hazard maps and	
		damage from	Geomorphologist	
	Encourage	coastal erosion and flooding	Drainage Infrastructure Database to determine	
	relocation of	accommodating	safe areas for relocation	
	families/houses in badly eroded coastal	the hazard	purposes	
	areas	C - C	Designation of the IPITE	
		Safer villages, houses and roads	Designation of the IFHZ, CEHZ and CFHZ as an "at	
	Responsibility:	115 abob ana 15 aus	risk" zone with	
	MNRE/ Village		appropriate landuse	
	/MWTI		planning controls and	
	1		restrictions	

Reticulated water supply, quality and network to be improved	Install streetlights along the roads where needed for community safety  Relocate overhead lines to a more resilient location when being replaced  Provide underground lines in the long term Install and connect to solar power supply if made available  Responsibility: EPC /MWTI/Villages  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 and village to support SWA water rationing programmes during times of drought  District to support SWA efforts at exploratory boreholes in district  District and villages to support SWA efforts at exploratory boreholes in district  District and villages to support SWA efforts at exploratory boreholes, intakes and catchment areas  Responsibility:  SWA/ MWCSD/MNRE / District/Village/CSSP	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts  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	Monitor distribution networks to avoid overloading poles and contributing to line failures  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  Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes 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
Marine	Assess feasibility of	Protects and	MAF and MNRE DEC to	NESP 2018 - 2022
resources depletion	creating a marine reserve for village as backup, alternative food supply	enhance local species diversity  Maintains natural	provide technical assistance and backstopping in the assessment and	Community Engagement Plan

	Village to restock marine reserve with suitable species  Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction  Research improved inshore fishery resources that are resilient to climate change  Village to provide fencing for domestic animals to prevent waste contaminating marine reserve  Responsibility: MNRE /MAF/ Village /CSSP/ UNDP-GEF SGP	ecosystem  Builds resilience of community livelihood and food security	establishment of a marine reserve for village  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Village to seek funding to establish marine reserve  MAF to raise awareness of farmers on impacts to water flows from poor livestock management	Agriculture Sector Plan 2016- 2021
Soft coastal protection measures needed for most vulnerable areas	Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions  To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  *Responsibility:**  MNRE/MAF/Villages	Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast  Reduce impact from coastal erosion and natural disasters  Implements an Ecosystem Based Approach	Develop an integrated land management plan for Aiga i le Tai 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 2018 - 2022 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

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

Non-CR issues raised during consultations	Proposed Solution	Comments
Village lands	Village requested land from	Related to CR as relocation is one of the
Responsibility: Village/	government for relocation	recommended solutions to impacts of climate change
Government/	purposes	included in the Aiga I le Tai CIM Plan

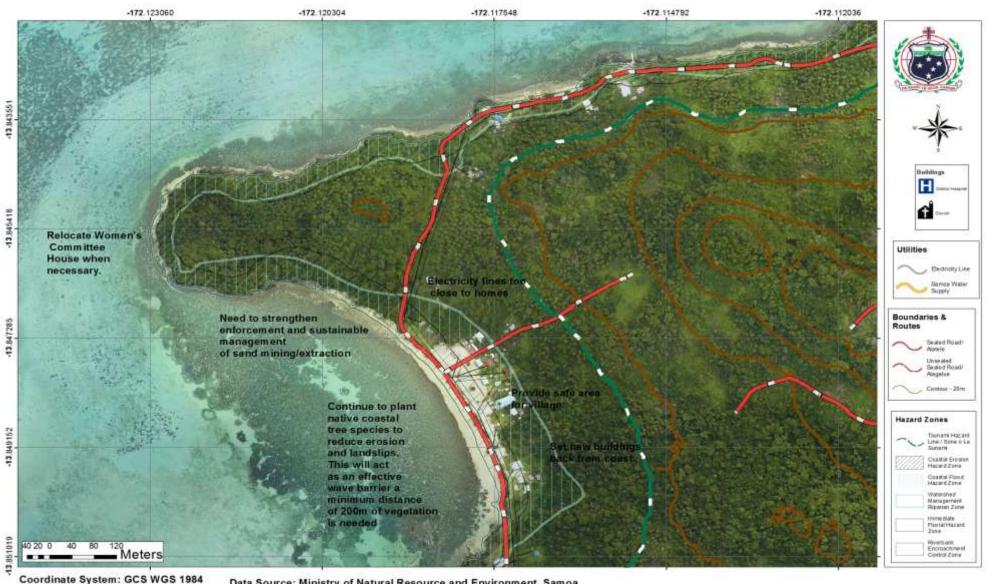






#### Apai tai Village Map

# Apai Tai Village



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. Apolima Uta Village Interventions

#### **CIM Plan Solutions**

CIM Plan Solut		D. C.	6 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	n.l
Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, Apolima Primary school, Pre- school, jetty, church and 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
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as short term solution	Reduce impact from inland flooding on coastal areas  Mitigate potential	Planning provisions to be guided by the Planning and Urban Management Act 2004  Utilise hazard maps and Geomorphologist	NESP 2018 - 2022
		damage from	Drainage Infrastructure	

			1	
	Encourage relocation of families/houses in badly eroded coastal areas  Responsibility: MNRE/ Village /MWTI	coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	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	
Drainage systems require maintenance and upgrade in high risk areas on main Aana West Coast road especially at junctions where access roads and tracks <sup>14</sup> meet national road	Assess and upgrade culverts on main Aana West Coast road and junction of Faleu Access Road and upgrade to recommended —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 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
Upgrade access <sup>15</sup> / work roads to national standards to alleviate inland flooding and encourage relocation	Assess feasibility of upgrading existing tracks and work roads as potential relocation roads and as backup connectivity and lifeline for main Aana	Improve infrastructure resilience and rate of recovery	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs Utilise environmental and	CIM Strategy 2015  NISP 2011 KESO 5  TSP 2014-2019 Goal 2 KO 1

<sup>&</sup>lt;sup>14</sup>Only Faleu Access Road and Salua no.2 Access Road under LTA RMIP Zone 6. Other tracks and unsealed access roads and are not covered under national road network maintenance programme

<sup>&</sup>lt;sup>15</sup>Existing work/access roads and tracks not covered under LTA national network road maintenance programme

	1			
	West Coast Road	preparedness	social safeguards	
	Road upgrades to	and readiness	including EIAs in	
	Road upgrades to include adequate sized	response to	screening and designing built environment	
	culverts to facilitate the	natural	infrastructure projects for	
	overland flow of storm	disasters	Aiga i le Tai district	
	water exacerbating river	Reduce impact		
	overruns, and to reduce	from coastal	Designation of the IFHZ,	
	flooding onto main	erosion and	CEHZ and CFHZ as an "at	
	roads and neighbouring	natural	risk" zone with	
	villages	disasters	appropriate landuse	
	Where reclamations are	Maintains	planning controls and restrictions	
	proposed, Government	lifeline access	i esti ictions	
	and district to manage	for all of Upolu		
	processes by requiring	•		
	villagers to get the	Safer villages,		
	appropriate permits	houses and		
	and consent	roads		
	Responsibility: LTA	Minimise		
	/MWTI/ MNRE/	national		
	District/ Village	disaster		
		recovery		
		expenditure on damaged		
		properties and		
		public assets		
Reticulated water	Extend the water	Increase	Develop and register	CIM Strategy 2015
supply, quality and	supply to families	adaptation	District/Village bylaws	
network to be	inland with no access	during drought	to include regulating	Water and
improved	to water	periods	developments around catchment areas and	Sanitation Sector
	Procure rainwater	Improve	boreholes	Plan
	harvesting systems for	infrastructure	Borenoies	SWA 10 Year
	vulnerable families as a	resilience and	Implement SWA	Investment Plan
	short term solution	rate of	(2016)10 year	(2016)
	District and village to	recovery	investment plan to	Community
	support SWA water	1 1.1	improve water supply	Engagement Plan
	rationing programmes	Improve health and sanitation	network to support all inland families without	
	during times of	and Samtation	access to drinking water	
	drought	Reduce	l seed to desire the seed of t	
	District to support SWA	contamination	Include in budget	
	efforts at exploratory	of water supply	programming design,	
	boreholes in district	D 1	and extension costs of	
	District and villages to	Reduce impact from inland	water supply and	
	support SWA efforts at	flooding	procurement of	
	protecting and	1100011116	rainwater harvesting	
	conserving boreholes, intakes and catchment		systems	
	areas		Utilise hazard maps and	
	Responsibility: SWA/		Geomorphologist findings to inform location and	
	MWCSD/ MNRE /		designs	
	District/ Village/			
	CSSP		Utilise Sui o Nu'u	
			monthly meetings to	
			monitor progress of	
	1	<u> </u>	village programmes and	

			responsibilities	
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 programme  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 programmes on waste management	National Waste Management Strategy
	Best Solutions	Benefits	Guideline to assist with	Relevant Sector
Resources and			the implementation	Plans, National
Marine reserve	Assess feasibility of creating a marine reserve for village as backup, alternative food supply  Village to restock marine reserve with suitable species  Village to collect and dispose of crown-ofthorns (alamea) on a regular basis to prevent major outbreaks  Continue to ban the use of dynamites, herbal poisons (avaniukini), chemicals and other unsustainable fishing methods including sand mining and extraction  Village to provide fencing for domestic	Protects and enhance local species diversity  Sustains ecosystem services and functions  Reduce contamination of food supply  Reduce impact from inland flooding	MAF and MNRE DEC to provide technical assistance and backstopping in the assessment and establishment of a marine reserve for village  Develop Village Bylaws to include management of natural resources (spring pools, marine reserve, forest etc)  Identify funding /budget requirements and implementation programme for establishment of protected areas in district	Strategies & Policies  NESP 2018 - 2022  Community Engagement Plan  Agriculture Sector Plan 2016-2021

	animala to marrant			
	animals to prevent			
	waste contaminating marine reserve			
	marme reserve			
	Responsibility:			
	MNRE/MAF/ Village			
	Council/CSSP/ NGO/			
	UNDP-GEF SGP			
Coastal	Plant native species	Soft coastal	Develop an integrated	NESP 2018 - 2022
Restoration	along coastal areas to	protection	land management plan	
	strengthen existing	measures will	for Aiga i le Tai district	Two Million Tree
	seawall and to reduce	support and	with the aim of reducing	Planting Strategy
	coastal erosion and	strengthen	any unnecessary actions	2015-2020
	landslips; Talie, Fetau,	existing and	that may adversely affect	Dostovation
	Toa, Togatogo are	new infrastructure	the natural habitats and ecosystems of the area	Restoration Operational Plan
	known to have greater	along the coast	ceosystems of the area	2016-2020
	resilience to natural		MAF to assist in	2010 2020
	disasters and changing climate conditions	Reduce impact	establishment of pilot	
		from coastal	sites to trial climate	
	To act as an effective	erosion and	ready plant varieties	
	wave barrier, a	natural		
	minimum distance of	disasters	MNRE Forestry, DEC and	
	200m of vegetation is needed	Implements an	MAF to collaborate on	
		Ecosystem	supply of climate	
	Responsibility: MNRE/	Based	resilient crops	
	MAF/Villages	Approach		
Mangrove area	Research new species	Protects and	MNRE DEC to provide	Draft NESP 2017-
conservation	found in mangrove area	enhance local	technical assistance and	2021
		species	backstopping in the	
	Undertake an	diversity	development of a	Community
	assessment of tidal		Wetland Management	Engagement Plan
	flow necessary to	Sustains	Plan for Aiga i le Tai	
	maintain a healthy natural environment	ecosystem services and	District	
	natural environment	functions	Identify funding /budget	
	Limit land clearance		requirements and	
	and developments	Reduce	implementation	
	adjacent to wetland	contamination	programme to continue	
	areas	of water supply	protection of	
			mangrove/wetland areas	
	Continue to plant native species along	Reduce impact from inland	in district	
	coastal areas to reduce	from inland flooding		
	erosion and landslips.	nooung		
	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			

Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme  Implement Sustainable Land Management (SLM) practices  Conduct pilot site trials for climate ready plant varieties  Responsibility: MAF/MNRE/village	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design  Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants  MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting  MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

	т 1 .	D	D 1	A . 1. 2 .
Pest management;	Implement an	Maintains	Develop an integrated	Agriculture Sector
invasive plants	eradication programme	natural	land management plan	Plan 2016-2021
and animals	to eradicate, contain or exclude invasive	ecosystem	for Aiga i le Tai district with the aim of reducing	Samoa's National
	species	Builds	any unnecessary actions	Invasive Species
	species	resilience of	that may adversely affect	Action Plan (NISAP)
	Implement an		the natural habitats and	Action Fian (NISAL)
	inventory of invasive	community livelihood and	ecosystems of the area	
	species and include	food security	ceosystems of the area	
	information on their	1000 Security	MAF to raise awareness	
	past, present and		of farmers on impacts to	
	potential future		water flows from poor	
	distribution, as well as		livestock management	
	impacts and possible			
	actions that can be		MNRE, MAF and SROS to	
	taken		implement aggressive,	
	tunen		nationwide invasive	
	Conduct education and		species eradication	
	awareness		programme based on	
	programmes on the		inventory of invasive	
	impacts of invasive		species and conduct	
	species		campaign on public	
			awareness accordingly	
	Implement the		Tunining for formore on	
	Integrated Pest		Training for farmers on	
	Management		pests management	
	Programme		particularly affecting	
			fruit trees and crops	
	Implement Sustainable			
	Land Management			
	(SLM) practices			
	Duild the consider of			
	Build the capacity of			
	farmers to manage stray			
	animals (pigs, cattle) that are contaminating			
	water sources			
	water sources			
	Responsibility:			
	Villages /District/			
<b>C</b>	MNRE/MAF/ SROS	D. C.		D.L C
Governance	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National
			the implementation	Strategies &
				Policies
Strengthen the	Update and/or develop	Strengthen	Develop and register	Village Fono Act
governance of	bylaws to manage the	implementatio	district/village bylaw to	(Amendment Bill
natural	use of natural	n of all national	protect all district/	2016)
resources and	resources, and to	sector plans	village and government	
land use through	control land use		assets, environment,	Community Sector
Bylaws	impacts; such as	Strengthen	livelihood and food	Plan
	drainage maintenance,	monitoring of	security especially	
	rubbish dumping, sand	all National	activities affecting water	Community
	mining, stray animals	Acts,	catchment areas and	Development Plan
	and unregulated	Regulation,	coastline	2016-2021
	developments in water catchment areas and	Strategies, Plans and	Utilise Sui o Nu'u	
	near boreholes.	Policies	monthly meetings to	
	near borenotes.	1 Ulicies	monitor progress of	
i .			momitor progress of	

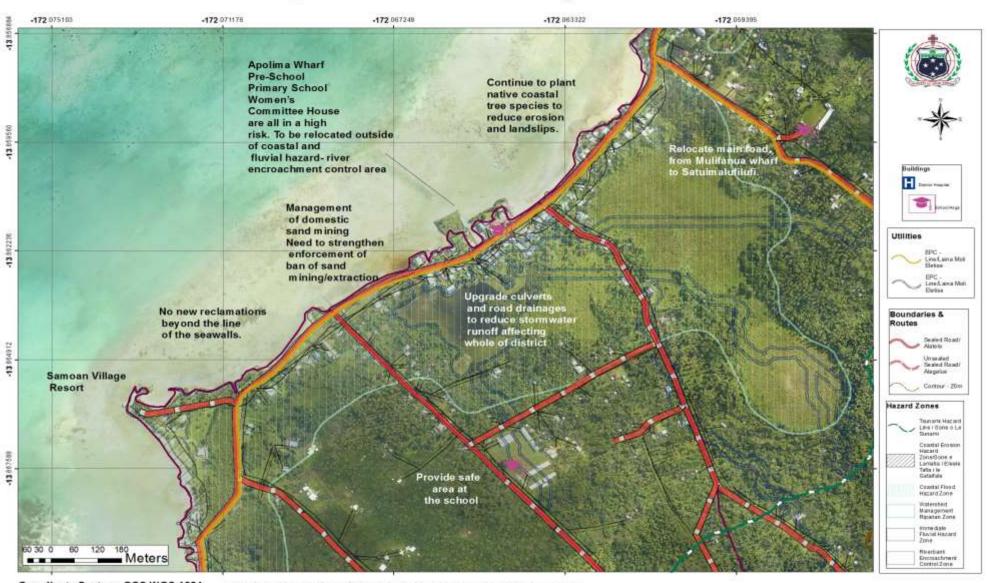
Collaborate with Sui o	Improve ability	district/village bylaws	
Nuu to monitor the use	of communities		
of and impact on	to adapt,		
natural resources	respond and		
	recover quickly		
Facilitate continuous	in the long		
awareness raising	term		
programs with the			
villages	Improve		
	accountability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







## **Apolima Uta Village**



Coordinate System: GCS WGS 1984 Datum: WGS 1984

Units: Degree

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

## 6. Apolima Tai Village Interventions

### **CIM Plan Solutions**

Infrastructure	Best Solutions	Benefits	Guideline to assist	Relevant Sector
			with the implementation	Plans, National Strategies & Policies
Village houses, church and other government assets located in high risk hazard zones	Relocate assets outside of high risk hazard zones when rebuilding  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
Marine landing ramp: main wharf	Repair and upgrade damaged marine	Maintain lifeline access and	Identify funding/ budget requirements	CIM Strategy 2015
	landing ramp	connectivity	and implementation programme	Community Sector Plan
	Enforce environmental safeguards under the	Improve preparedness	Designation of the	Apolima Village
	PUMA Act when	and readiness	CEHZ, CFHZ and	Hazard Zone

	upgrading wharves and jetties	response to natural disasters	tsunami shore exlusive zones as an "at risk" zone with appropriate landuse planning controls and restrictions	Resettlement Plan (VHZRP)
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 NISP 2011 KESO 5
supply: tank t	Relocate main water tank out of hazard	Improve preparedness	Develop and register District/Village	CIM Strategy 2015
	zones  Procure rainwater	and readiness response to natural disasters	bylaws to include regulating developments around	Water and Sanitation Sector

	harvesting systems as backup for vulnerable families as a short term solution  Regulate developments and remove latrines around water supply  Village to fence domestic animals away from areas susceptible to flooding  Responsibility:  District/Village/ CSSP/NGO	Increase adaptation during drought periods Improve health and sanitation Reduce contamination of water supply	identified hazard zones  Include in budget programming relocation of tanks and procurement of rainfall catchment systems  Utilize Hazard Map Hazard maps and Geomorphologist findings for planning purposes  Utilize Sui o Nu'u monthly meetings to monitor progress of	Plan Community Engagement Plan
Solar power plant	Replace battery to maintain electricity supply to Apolima island  Responsibility: District /Village/ CSSP/NGO  Best Solutions	Maintain connectivity  Improve preparedness and readiness response to natural disasters  Benefits	village programmes and responsibilities  Village to seek funding  Utilize Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities  Guideline to assist	CIM Strategy 2015  Community Engagement Plan Energy Sector Plan  Relevant Sector
Resources & Environment	Dest Solutions	Belletits	with the implementation	Plans, National Strategies & Policies
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	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	CIM Strategy 2015  Community Engagement Plan
	the pool is undertaken (eg: fence/repair works)  Responsibility: MoF-CSSP/ MNRE/Villages/NGOs		Update Village bylaws to include managing and maintaining village natural resources	

	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	Reduce impact from coastal erosion and natural disasters  Implements an Ecosystem Based Approach	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	
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	Proposed Solution		Comments											
consultations															
Village lands											relocation				
Responsibility:	Village/	governn	nent	for	relo	cation					ons to im				nate
Government/		purpose	es				change i	ncluc	ded ii	n th	e Aiga I le '	Гаі (	CIM P	lan	







# **Apolima Tai**



Datum: WGS 1984

Units: Degree

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

### 6. Faleu tai Village Interventions

#### **CIM Plan Solutions**

CIM Plan S	olutions			
Infrastructur e	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Village houses, church and other 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	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
	Responsibility: Village / Families /MWTI/ MNRE/ MWCSD			
Coastline protection: combination of hard and soft solutions	Investigate potential for upgrading seawalls in areas where road sits less than 5mtr from coastline  Encourage relocation of families/houses in badly eroded coastal areas	Improve infrastructure resilience and rate of recovery  Improve preparedness and readiness response to natural disasters  Reduce impact from coastal erosion and	Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities  Utilize Sui o Nu'u monthly meetings to monitor progress of village replanting and cleanup programmes	CIM Strategy 2015  NESP 2018 - 2022  Community Sector Plan

Repair and upgrade damaged posts  Willage to maintain and upgrade letty Village to limit number of private jetties on island Island  Responsibility: SPA/ MNRF/ Village /CSSP/ NGO  Natural Resources and Environment Coastal Restoration  Plant native species along coastal areas to strengthen existing scawall and to reduce coastal erosion and landships. Talie, Fetau, Too, Toogatogo are known to have greater resilience to natural disasters and changing climate conditions  To act as an effective wave barrier, as minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAP/Willages  Restoration  Resources and to real to grow the first the amount of reducing constal erosion and landships. Talie, Fetau, Too, Toogatogo are known to have greater resilience to natural disasters and changing climate conditions  To act as an effective wave barrier, as minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAP/Willages  Restoration  Resources, and to control land use impacts; such as suffinged and use land		D 11 11 MAYANTI /	I . 1.1.	T	
Repair and upgrade damaged posts		Responsibility: MWTI/	natural disasters		
Repair and upgrade damaged posts  Village to maintain and upgrade preparedness of private jetties on island  Responsibility: SPA/MNRE/ Village / CSSP/ NGO  Natural Resources and landing controls and province planning controls and restrictions  Restoration  Natural Resources and landisplant to the implementation programme  Basel Solutions  Restoration  Natural Resources and landisplant to the implementation programme  Privinoment  Cosstal Restoration  Plant native species along coastal areas to strengthen existing seawall and to reduce coastal erosion and landisplay. Tale, 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  Restoration  Resources and land upgrade damaged posts  Willage to limit number of planting controls and restrictions  Resources and land upgrade landiss and consecutive with the implementation planting controls and restrictions and evidence of supply of climate ready plant varieties  Responsibility. MNRE/MAF/Villages  Responsibility: MNRE/MAF/Village bylaw to protect all districty village and government assets, environment illustration for all natural resources, and to manual sector plans and construent assets, environment illustration for all natural descriptions on the protect all districty village and government assets, environment and provide and control and natural resources and land use impacts such as the protect all districty village and government assets, environment, level of the protect and control and natural assets and fo		MNKL/ Village	Safer villages, houses		
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Admaged posts   Village to maintain and upgrade jetty   Village to limit number of private jetties on island   Improve preparedness and readiness and readiness in and or readiness and response to natural disasters   Village proposition   Vi					
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Admaged posts   Village to maintain and upgrade jetty   Village to limit number of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on island   Improve preparedness and readiness of private jetties on preparedness and readiness of private jetties on indicating and readiness of private jetties on indicating and readiness of private jetties on indicating and readiness of private jetties on preparedness and readiness and social safeguards on screening and designing infrastructure and social safeguards on the CEHZ, CFHZ and tsunamis shore exclusive zones as an "fat risk" zone with appropriate landuse planning controls and restrictions      Natural   Best Solutions   Benefits   Soft   Coastal protection measures with the implementation of all and stance of 200m of vegetation is needed   Paproach	I a bb	Danish and amond	Maintain lifeling	11	CIM Charles 2015
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of private jetties on island  Responsibility: SPA/ MNRE/ Village /CSSP/ NGO  **SPA/ NGO  **SPA/ MNRE/ Village /CSSP/ NGO  **Best Solutions  Resources and Environment  Coastal Restoration  Strengthen existing scawall and to reduce coastal erosion and landslips; Talle, Fetau, Toa, Toagtogo 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/ Responsibility: MNRE/ Responsibility: MNRE/ Responsibility: MNRE/ Responsibility: MNRE/ MAP/Villages  Governance  Best Solutions  Benefits  Cuideline to assist with the implementation  Coastal erosion and landslips; Talle, Fetau, a minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAP/Villages  Governance  Best Solutions  Benefits  Soft coastal land management plan for Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAP/Villages  Governance  Best Solutions  Benefits  Soft coastal land management plan for Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area man at matural disasters and changing climate conditions  To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAP/Villages  Responsibility: MNRE/ MAP to collaborate on supply of climate ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate ready plant varieties  Willage Fono Act district/village and government, livelihod and food  The provided designing infrastructure actions in restrictions  Relevant Sector Plans, National varieties and trisk provided and food  The provided designing infrastructure actions and at risk. Plan		Willage to limit number			
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climate conditions To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  Responsibility: MNRE/MAF/Villages  Governance  Best Solutions  Strengthen the bylaws to manage the governance of natural resources, and to resources and land use impacts; such as interesting an Ecosystem Based Approach  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  More Forestry, DEC and MAF to collaborate on supply of climate resilient crops  Strengthen the implementation  Strengthen the obylaws to manage the monitoring of all livelihood and food plant  Notice of all livelihood and food plant  Notice of all livelihood and food pilot sites to trial climate ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  Strategies & Policies  Village Fono Act (Amendment Bill assets, environment, livelihood and food plant register village and government assets, environment, livelihood and food plant register village and government assets, environment, livelihood and food plant register village and government assets, environment, livelihood and food plant ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate ready plant varieties  MORE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  Strategies & Policies  National Strategies & Policies  National Strategies of Plant varieties				MAF to assist in	2010-2020
To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  Responsibility: MNRE/MAF/Villages  Governance  Best Solutions  Strengthen the bylaws to manage the governance of natural resources and land use impacts; such as impacts; such as minimum distance of Strengthen and make the impacts; such as monitoring of all land use impacts; such as minimum distance of 200m of vegetation is needed Approach  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops  MNRE Forestry, DEC and MAF to collaborate on supply of climate residence of supply of climate residence on supply of climate residence on supply of climate residence on supply of climate ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate residence on supply of climate resi		0 0			
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needed  Responsibility: MNRE/ MAF/Villages  Best Solutions  Benefits  Guideline to assist with the implementation  Strategies & Policies  Strengthen the bylaws to manage the governance of natural resources and land use impacts; such as monitoring of all livelines and solutions  Strengthen  Update and/or develop bylaws to manage the implementation of all national sector plans resources and land use impacts; such as monitoring of all livelines assets, environment, land use impacts; such as monitoring of all livelines assets, environment, land use impacts; such as monitoring of all livelines assets, environment, land use impacts; such as monitoring of all livelines assets, environment, land use impacts; such as monitoring of all livelines assets as livelines as			Approach		
Responsibility: MNRE/MAF/Villages  Best Solutions  Benefits  Guideline to assist with the implementation  Strategies  Policies  Strengthen the bylaws to manage the governance of natural resources, and to resources, and land use impacts; such as monitoring of all impacts; such as monitoring of all invelved in the material resources and land use impacts; such as monitoring of all invelved in the material resilient crops  Relevant Sector Plans, National Strategies  Policies  Village Fono Act (Amendment Bill 2016)  Strengthen implementation of all district/village and government assets, environment, livelihood and food plan				MAE to collaborate on	
Governance Best Solutions Benefits Guideline to assist with the implementation Strategies & Policies  Strengthen the bylaws to manage the governance of natural resources and land use impacts; such as monitoring of all monitoring		_			
Strengthen the bylaws to manage the governance of natural resources and land use lan		needed		supply of climate	
Strengthen the bylaws to manage the governance of natural resources and land use lan		needed  Responsibility: MNRE/		supply of climate	
Strengthen Update and/or develop bylaws to manage the bylaws to manage the governance of natural resources, and to resources and land use Update and/or develop strengthen bylaws to manage the implementation of all livelihood and food plant. Strengthen bylaws to manage the implementation of all livelihood and food plant.	Governance	needed  Responsibility: MNRE/ MAF/Villages	Benefits	supply of climate resilient crops  Guideline to assist with	
the governance of natural resources and land use bylaws to manage the governance of natural resources and land use land use bylaws to manage the use of natural resources, and to land use land	Governance	needed  Responsibility: MNRE/ MAF/Villages	Benefits	supply of climate resilient crops  Guideline to assist with	Plans, National Strategies &
natural resources, and to resources and land use limpacts; such as monitoring of all livelihood and food plan		needed  Responsibility: MNRE/ MAF/Villages  Best Solutions		supply of climate resilient crops  Guideline to assist with the implementation	Plans, National Strategies & Policies
resources and land use Strengthen assets, environment, land use impacts; such as monitoring of all livelihood and food Plan	Strengthen the	needed Responsibility: MNRE/ MAF/Villages Best Solutions  Update and/or develop bylaws to manage the	Strengthen implementation of all	supply of climate resilient crops  Guideline to assist with the implementation  Develop and register district/village bylaw to	Plans, National Strategies & Policies  Village Fono Act (Amendment Bill
land use impacts; such as monitoring of all livelihood and food Plan	Strengthen the governance of	needed  Responsibility: MNRE/ MAF/Villages  Best Solutions  Update and/or develop bylaws to manage the use of natural	Strengthen implementation of all	supply of climate resilient crops  Guideline to assist with the implementation  Develop and register district/village bylaw to protect all district/	Plans, National Strategies & Policies  Village Fono Act (Amendment Bill
land use Asia as a sintenance National Asta associate	Strengthen the governance of natural	needed  Responsibility: MNRE/ MAF/Villages  Best Solutions  Update and/or develop bylaws to manage the use of natural resources, and to	Strengthen implementation of all national sector plans	supply of climate resilient crops  Guideline to assist with the implementation  Develop and register district/village bylaw to protect all district/village and government	Plans, National Strategies & Policies  Village Fono Act (Amendment Bill 2016)
THE COURT OF THE C	Strengthen the governance of natural resources and	needed  Responsibility: MNRE/ MAF/Villages  Best Solutions  Update and/or develop bylaws to manage the use of natural resources, and to control land use	Strengthen implementation of all national sector plans Strengthen	supply of climate resilient crops  Guideline to assist with the implementation  Develop and register district/village bylaw to protect all district/village and government assets, environment,	Plans, National Strategies & Policies  Village Fono Act (Amendment Bill 2016)  Community Sector

Bylaws	rubbish dumping, sand	Regulation,	activities affecting water	Community
•	mining, stray animals	Strategies, Plans and	catchment areas and	Development Plan
	and unregulated	Policies	coastline	2016-2021
	developments in water			
	catchment areas and	Improve ability of	Utilise Sui o Nu'u	
	near boreholes.	communities to	monthly meetings to	
		adapt, respond and	monitor progress of	
	Collaborate with Sui o	recover quickly in the	district/village bylaws	
	Nuu to monitor the use	long term	ansured, image symme	
	of and impact on			
	natural resources	Improve		
		accountability and		
	Facilitate continuous	enabling		
	awareness raising	environment of		
	programs with the	communities		
	villages			
	Responsibility:			
	MWCSD /Village			

Non-CR issues during consultat		Propos	sed Solution			Comments
Village lands		Village	requested	land	from	Related to CR as relocation is one of the recommended
Responsibility:	Village/	governm	ent for reloca	tion pur	poses	solutions to impacts of climate change included in the
Government/						Aiga I le Tai CIM Plan







## Faleu Tai Village





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. Lalovi Village Interventions

#### **CIM Plan Solutions**

CIM Plan Solu		D C.	6 111	n.lc
Infrastructure	Best Solutions	Benefits	Guideline 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
Coastline protection: combination of hard and soft solutions	Investigate potential for upgrading government managed seawalls in areas where road sits less than 5mtr from coastline as short term solution	Improve infrastructure resilience and rate of recovery  Improve preparedness and readiness	Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities	CIM Strategy 2015  PUMA Act  Community Engagement Plan  NESP 2018 - 2022
	Where reclamations, sand mining, extraction or other major coastal works are proposed, Government and village	response to natural disasters  Reduce impact from coastal erosion and	Develop and register Village bylaws to include banning of sand mining, reclamation works in high risk hazard	Village Fono Act (Amendment Bill 2016)

	T			
	to manage processes by requiring villagers to get	natural disasters	zones and illegal rubbish dumping in	
	the appropriate permits	Safer villages,	waterways and	
	and consent	houses and roads	drains	
	and consent	nouses and roads	uranis	
	Clear debris from			
	existing culverts near		Utilize Sui o Nu'u	
	seawalls to enable free		monthly meetings to	
	outflow of storm water		monitor progress of	
	and streams		village replanting and	
			cleanup programmes	
	Ban reclamations			
	beyond seawalls			
	Responsibility: MWTI/ MNRE/ Village			
Main Aana West	Continue investigating	Improve	Utilize environmental	CIM Strategy 2015
Coast Road and	relocating main road	infrastructure	and social safeguards	
junctions of	(2km arterial road) in	resilience and	including EIAs in	TSP2014-2019 Goal
main west coast	areas where road sits	rate of recovery	screening and	2 KO 1
road and access	less than 5mtr from		designing	
roads/tracks16	coastline in accordance	Improve	infrastructure	Vulnerability
	with <i>Vulnerability</i>	preparedness and	facilities	Assessment of the
	Assessment of the Samoa	readiness	UtilizeHazard Map	Samoa Road
	Road Network	response to	Hazard maps and	Network (2016)
	recommendations	natural disasters	Geomorphologist	and Road Network
		_	Drainage	Adaptation
	Assess and upgrade	Reduce impact	Infrastructure	Strategy, LTA
	access roads/tracks to	from coastal	Database	
	include adequate sized	erosion and		
	culverts to facilitate the	natural disasters	Include in budget	
	overland flow of storm	C C :11	programming CBA,	
	water and to reduce	Safer villages, houses and roads	design and	
	flooding onto main lifeline and connectivity	nouses and roads	construction	
	road	Minimize	Designation of the	
	Toau	national disaster	CEHZ and CFHZ as an	
		recovery	"at risk" zone with	
	Responsibility:LTA/M	expenditure on	appropriate landuse	
	WTI/ MNRE/ District/	damaged	planning controls and	
	Village	properties and	restrictions	
	Village	public assets		
		•		
Evacuation	Assess and/or select	Improve	Enforcement of	National Disaster
Shelter and a	location for either an	resilience of	National Building	Management Plan
connected escape	existing or new	public	Code 2017	2017-2021
route needed for	evacuation shelter,	infrastructure		National Building
emergency	including safe access		Utilise hazard maps	Code
preparedness	routes to the shelter	Improve	and Geomorphologist	National Policy for
and response		preparedness	findings to inform	People with
	Conduct evacuation	and readiness	location and designs	Disabilities
	shelter assessment and	response to		NISP 2011 KESO 5
	mark on CIM Plan	natural disasters		14151 ZULL KESU S
	hazard maps			
	Davidon a Will			
	Develop a Village Climate Disaster			
	Management Plan			

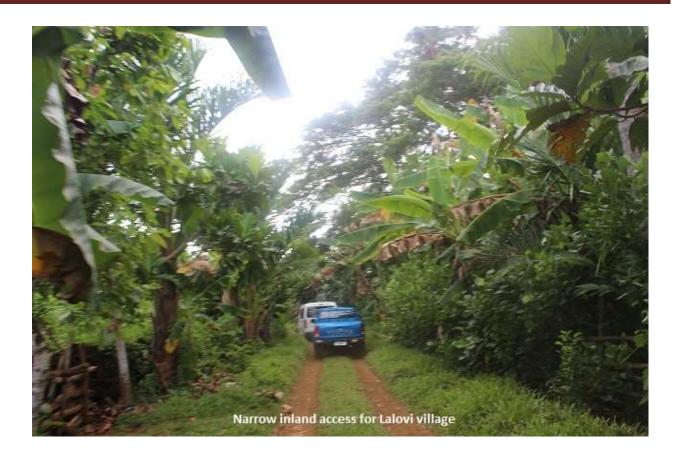
 $<sup>^{16}\</sup>mbox{Access}$  roads not in national network nor LTA road maintenance programme

	(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			
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	CIM Strategy 2015  Water and Sanitation Sector Plan  SWA 10 Year Investment Plan (2016)  Community Engagement Plan
			of water supply and procurement of rainwater harvesting systems  Utilise hazard maps and Geomorphologist findings to inform	

			location and designs	
Natural Resources &	Best Solutions	Benefits	Guideline to assist with the	Relevant Sector Plans, National
Environment			implementation	Strategies & Policies
Mangrove area	Undertake an	Protects and	Develop an	Draft NESP 2017-
conservation	assessment of tidal flow	enhance local	integrated land	2021
	necessary to maintain a healthy natural	species diversity	management plan for Aiga i le Tai district	Community
	environment	Sustains	with the aim of	Engagement Plan
		ecosystem	reducing any	
	Limit land clearance and developments adjacent	services and functions	unnecessary actions that may adversely	
	to wetland areas	Tunctions	affect the natural	
	Continue to plant native	Reduce	habitats and	
	species along coastal	contamination of	ecosystems of the	
	areas to reduce erosion	water supply	area	
	and landslips. To act as an effective wave	Reduce impact	Implement wetland	
	barrier, a minimum	from inland	and mangrove	
	distance of 200m of	flooding	protection programme	
	vegetation is needed		programme	
	Village to fence off domestic animals		Identify funding	
			/budget requirements and	
	Responsibility: MNRE /		implementation	
	Village /CSSP/ UNDP- GEF SGP/ MWTI		programme for	
			establishment of protected areas in	
			district	
Coastal	Plant native species	Soft coastal	Develop an	NESP 2018 - 2022
Restoration	along coastal areas to strengthen existing	protection measures will	integrated land management plan for	Two Million Tree
	seawall and to reduce	support and	Aiga i le Tai district	Planting Strategy
	coastal erosion and	strengthen	with the aim of	2015-2020
	landslips; Talie, Fetau, Toa, Togatogo are	existing and new infrastructure	reducing any unnecessary actions	Restoration
	known to have greater	along the coast	that may adversely	Operational Plan
	resilience to natural		affect the natural	2016-2020
	disasters and changing climate conditions	Reduce impact from coastal	habitats and ecosystems of the	
	To act as an effective	erosion and	area	
	wave barrier, a	natural disasters		
	minimum distance of	Implements an	MAF to assist in establishment of pilot	
	200m of vegetation is needed	Ecosystem Based	sites to trial climate	
	Responsibility: MNRE/	Approach	ready plant varieties	
	MAF/Villages		MNRE Forestry, DEC	
	, ,		and MAF to	
			collaborate on supply	

			of climate resilient crops		
Livelihood and Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies	
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops ( i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme  Implement Sustainable Land Management (SLM) practices  Conduct pilot site trials for climate ready plant varieties  Responsibility: MAF/MNRE/village	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants  MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting  MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020	

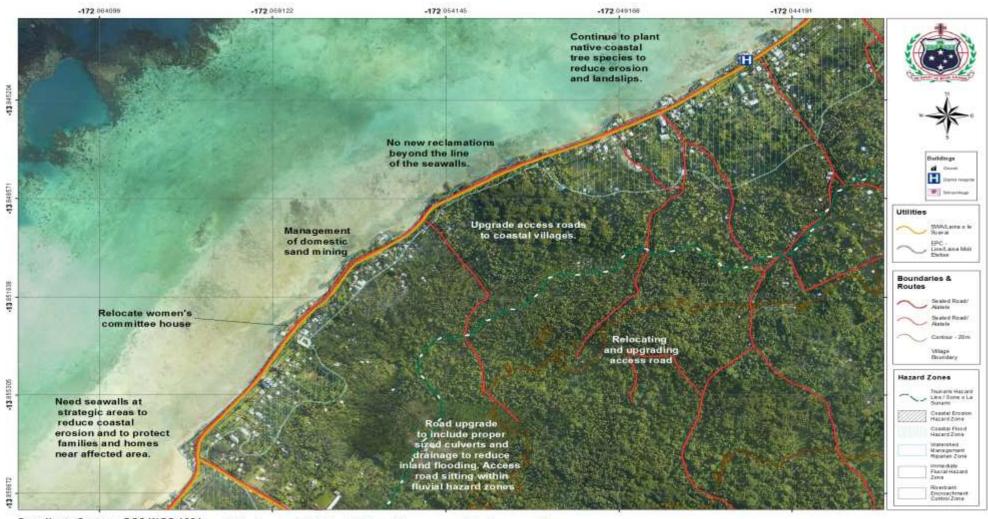
Governance	Best Solutions	Benefits	for different vegetation types suitable to the habitats and planting materials for village  Guideline to assist with the	Relevant Sector Plans, National
			implementation	Strategies & Policies
Strengthen the governance of natural resources and land use through Bylaws	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:	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
	MWCSD /Village	communices		





#### Lalovi Village Map

## Lalovi Village



Coordinate System: GCS WGS 1984 Datum: WGS 1984

Units: Degree

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

## 8. Lepuia'i-Tai Village Interventions

### **CIM Plan Solutions**

Infrastructu	Best Solutions	Benefits	Guideline to assist	Relevant Sector
re	Dest solutions	Beliefits	with the	Plans, National
			implementation	Strategies & Policies
Village	Relocate assets outside	Minimise	Planning provisions	CIM Strategy 2015
houses,	of high risk hazard	expenditure on	to be guided by the	on ronding zors
churches and	zones when re-building	damaged	Planning and Urban	National Building
other		properties and	Management Act	Code
government	Develop landuse	personal assets	2004	
assets located	planning and	P · · · · · · · · · · · · · · · · · · ·		
in high risk	development controls to	Safer villages,	Enforcement of	
hazard zones	restrict developments	houses and roads	National Building	
	within high risk hazard		Code 2017	
	zones such as CEHZ and	Increases		
	CFHZ	awareness for	Encourage insurance	
		insurance	of significant	
	Conduct awareness		investments and	
	raising campaign on		assets within hazard	
	flood resilient building		zones	
	practices and designs for			
	at risk communities		Utilise hazard maps	
	living in and near high		and	
	risk hazard zones		Geomorphologist	
			Drainage	
	Design infrastructure to		Infrastructure	
	take into account the		Database to	
	immediate hazard		determine safe areas	
	zones; for example,		for relocation	
	raise floor levels of		purposes	
	houses in flood prone		Designation of the	
	areas		Designation of the IFHZ, CEHZ and	
	Families and village to		CFHZ as an "at risk"	
	limit building and		zone with	
	developing on natural		appropriate landuse	
	overland flow paths		planning controls	
	exacerbating inland		and restrictions	
	flooding and storm water			
	surges			
	Responsibility: Village			
	/ Families /MWTI/			
	MNRE/ MWCSD			
Evacuation	Assess and/or select	Improve	Enforcement of	National Disaster
Shelter and a	location for either an	resilience of	National Building	Management Plan
connected	existing or new	public	Code 2017	2017-2021
escape route	evacuation shelter,	infrastructure		National Building
needed for	including safe access		Utilise hazard maps	Code
emergency	routes to the shelter	Improve	and Geomorphologist	National Policy for
preparedness		preparedness	findings to inform	People with
and response	Conduct evacuation	and readiness	location and designs	Disabilities
	shelter assessment and	response to		
	mark on CIM Plan	natural disasters		NISP 2011 KESO 5
	hazard maps			
	Develop a Village			
	Climate Disaster			

	Management (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			
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as short term solution  Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent  Responsibility: MNRE/Village Council/CSSP/NGO/UNDP-GEF SGP	Reduce impact from inland flooding on coastal areas  Mitigate potential damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	Planning provisions to be guided by the Planning and Urban Management Act 2004  Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes  Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	NESP 2018 - 2022
Electricity supply	Install streetlights along the roads where needed for community safety Relocate overhead lines	Maintain electricity supply at all times including	Monitor distribution networks to avoid overloading poles and contributing to	EPC Strategic Plan

Natural Resources	to a more resilient location when being replaced  Provide underground lines in the long term  Install and connect to solar power supply if made available  Responsibility: EPC /MWTI/ Villages  BestSolutions	natural disasters Avoid accidents from fallen electricity posts  Benefits		Relevant Sector Plans, National
and			implementation	Strategies & Policies
Environment				1/222 2012 2022
Marine reserve	Assess feasibility of creating a marine reserve for village as backup, alternative food supply  Village to restock marine reserve with suitable species  Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction  Research improved inshore fishery resources that are resilient to climate change  Village to provide fencing for domestic animals to prevent waste contaminating marine reserve  Responsibility: MNRE /MAF/ Village /CSSP/UNDP-GEF SGP	Protects and enhance local species diversity  Maintains natural ecosystem  Builds resilience of community livelihood and food security	MAF and MNRE DEC and CC to provide technical assistance and backstopping in the assessment and establishment of a marine reserve for village  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Village to seek funding to establish marine reserve  MAF to raise awareness of farmers on impacts to water flows from poor livestock management	NESP 2018 - 2022  Community Engagement Plan  Agriculture Sector Plan 2016-2021
Coastal Restoration	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	Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast  Reduce impact from coastal erosion and	Develop an integrated land management plan for Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	NESP 2018 - 2022 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020

	wave barrier, a minimum distance of 200m of vegetation is needed  Responsibility: MNRE/ MAF/Villages	natural disasters  Implements an Ecosystem Based Approach	MAF to assist in establishment of pilot sites to trial climate ready plant varieties  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops	
Governance	Best Solutions	Benefits	Guideline toassist 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 raise consultations	d during	Propo	sed So	lutio	n		Comm	ents	S						
Village lands		Village	reque	sted	land	from	Related	to	CR	as	relocation	is	one	of	the
Responsibility:	Village/	governr	nent	for	relo	cation					ions to imp				
Government/		purpose	es				change i	nclu	ided	in t	he Aiga I le '	Гаі	CIM F	Plan	l







### Lepuia'i Tai Village Map

# Lepuia'i Tai Village



Datum: WGS 1984

Units: Degree

Map Production: Spatial & DRM Specialist, Adaptation Fund - Enhancing Resilience of Coastal Communities of Samoa to Climate Change Project

# 9. Manono-Uta Village Interventions

### **CIM Plan Solutions**

Infrastructure	Best Solutions	Benefits	Guideline to assist	Relevant Sector
inii asti actai c	best solutions	Deficites		
Village houses, churches, Manono uta Primary School 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  Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm	Minimise expenditure on damaged properties and personal assets  Safer villages, houses and roads  Increases awareness for insurance	with implementation  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	Plans, National Strategies & Policies  CIM Strategy 2015  National Building Code
	water surges  Responsibility: Village  / Families /MWTI/ MNRE/ MWCSD			
Upgrade access/ work roads to facilitate relocation of houses away from hazard zones	Undertake engineering and feasibility study of existing seawalls, roads, drainage in line with reclamations within IFHZ and CFHZ  Assess and upgrade	Improve infrastructure resilience and rate of recovery  Improve preparedness and readiness	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs  Develop an Integrated Flood Management Plan	CIM Strategy 2015  National Disaster Management Plan 2017-2021
	local access roads especially in area sitting within fluvial hazard zone, to include adequate sized culverts to facilitate the overland	response to natural disasters  Reduce impact from coastal erosion and	for Aiga i le Tai District.  MNRE to develop  zonation strategy for  safe areas  Develop an integrated	

	1 -	T	T	<del>,                                      </del>
	flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands  Assess and upgrade culverts on most vulnerable parts of the local road especially at junction with main Aana West Coast Road (Salua Access Roads and local tracks <sup>17</sup> ) in accordance with Vulnerability Assessment of the Samoa Road Network recommendations  District to regulate reclamations and developments near and around waterways and drainage connecting to main Aana West Coast Road  Responsibility: LTA /MWTI/ MNRE/District/	natural disasters  Safer villages, houses and roads  Minimise national disaster recovery expenditure on damaged properties and public assets	land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Include in budget programming CBA, design and construction  Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions  Develop and register Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways  Utilise Sui o Nu'u monthly meetings to monitor progress of village cleanup and	
	MWCSD/Village/		awareness programmes	
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	Improve resilience of public infrastructure  Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017  Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan 2017-2021 National Building Code National Policy for People with Disabilities NISP 2011 KESO 5

 $<sup>^{17}\</sup>mbox{Not}$  in national road network nor LTA normal road maintenance programme for Upolu Zone 6

Coastal	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	Reduce impact	Planning provisions to	NESP 2018 - 2022
Coastal protection	Assess potential of a revetment for badly eroded coastal areas where relocation is not possible as short term solution  Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent  Responsibility: MNRE/Village Council/CSSP/NGO/UNDP-GEF SGP	Reduce impact from inland flooding on coastal areas  Mitigate potential damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	Planning provisions to be guided by the Planning and Urban Management Act 2004  Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes  Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	NESP 2018 - 2022
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 programme  Produce posters and village signs for public awareness	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	National Waste Management Strategy

	Responsibility: MNRE/ MWCSD/ District/Village		Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste management	
Electricity supply	Provide underground lines in the long term  Install and connect power supply for inland residents  Relocate overhead lines to a more resilient location when being replaced  Install streetlights along the roads where needed for community safety  Install and connect to solar power supply if made available  Families to limit building and developments near electricity posts  Responsibility: EPC/MWTI/	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	Village/Families Best Solutions	Benefits	Guideline to assist	Relevant Sector
Resources and Environment	Dest solutions	Benefits	with the implementation	Plans, National Strategies & Policies
Restoration	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/*	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	Develop an integrated land management plan for Aiga i le Tai 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	Two Million Tree Planting Strategy 2015-2020  Restoration Operational Plan 2016-2020
Mangrove area	MAF/Villages  Research new species	Approach Protects and	and MAF to collaborate on supply of climate resilient crops MNRE DEC to provide	Draft NESP 2017-
Mangrove area conservation	found in mangrove area  Undertake an	Protects and enhance local species diversity	technical assistance and backstopping in the development of a	Community

	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	Sustains ecosystem services and functions  Reduce contamination of water supply  Reduce impact from inland flooding	Wetland Management Plan for Aiga i le Tai District  Identify funding /budget requirements and implementation programme to continue protection of mangrove/wetland areas in district	Engagement Plan
Livelihood & Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme  Implement Sustainable Land Management (SLM) practices  Conduct pilot site trials for climate ready plant varieties  Responsibility: MAF/MNRE/village	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design  Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants  MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

			MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial	
			Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	
			MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
Pest management; invasive plants	Implement an eradication programme to eradicate, contain or	Maintains natural ecosystem	Develop an integrated land management plan for Aiga i le Tai district	Agriculture Sector Plan 2016-2021
and animals	exclude invasive species  Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken  Conduct education and awareness programmes on the impacts of invasive species	Builds resilience of community livelihood and food security	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	Samoa's National Invasive Species Action Plan (NISAP)
	invasive species  Implement the Integrated Pest Management Programme and Sustainable Land Management (SLM) practices		aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly  Training for farmers on	
	Build the capacity of		pests management	

	animals (pigs, cattle) that are contaminating water sources  Responsibility: Villages /District/ MNRE/MAF/SROS		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 raiduring consultations	ised	Propos	sed Solutior	1		Comm	ents							
Village lands		Village	requested	land	from	Related	to	CR	as	relocation	is	one	of	the
Responsibility: Vi	llage/	governn	nent for	relo	cation	recomm	ende	d sol	utior	is to impacts	of o	climat	e cha	ange
Government/		purpose	S			included	in tł	ne Aig	ga I le	e Tai CIM Pla	n			

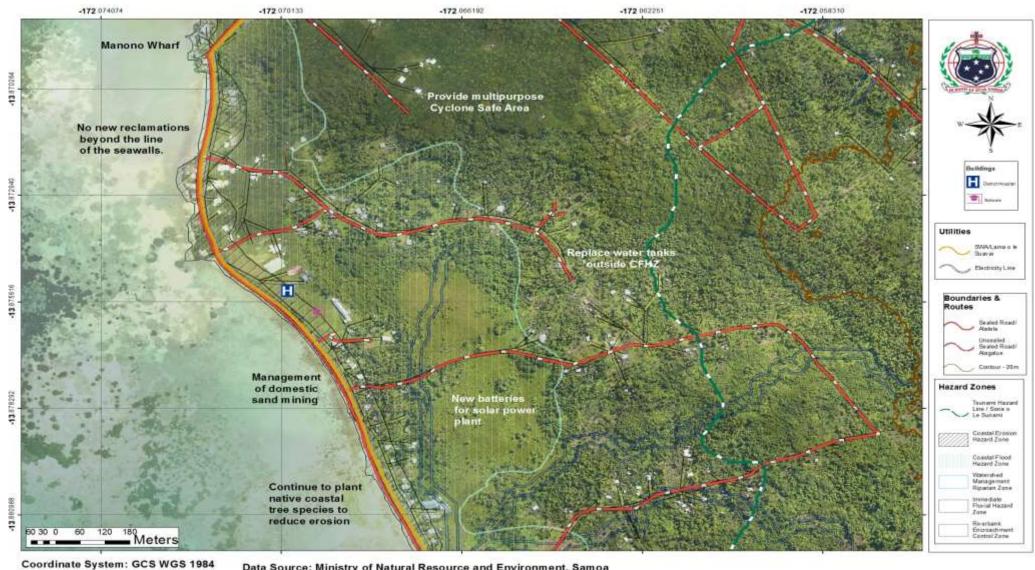






#### Manono Uta Village Map

# Manono Uta Village



Datum: WGS 1984

Units: Degree

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

# 10. Mulifanua Village Interventions

### **CIM Plan Solutions**

Infrastructure	Best Solutions	Benefits	Guideline to assist	Relevant Sector Plans,
inii asti uttui e	Dest solutions	Beliefits	with the	National Strategies &
Village houses, churches, hospital, Mulifanua Wharf 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	Minimise expenditure on damaged properties and personal assets  Safer villages, houses and roads  Increases awareness for insurance		
	exacerbating inland flooding and storm water surges  Responsibility: Village / Families / MWTI/ MNRE/ MWCSD			
Coastline protection: combination of hard and soft solutions	Investigate potential for upgrading government managed seawalls in areas where road sits less than 5mtr from coastline as short term solution	Reduce impact from inland flooding on coastal areas  Mitigate potential	Planning provisions to be guided by the Planning and Urban Management Act 2004  Utilise hazard maps	NESP 2018 - 2022
	Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits	damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes  Designation of the IFHZ, CEHZ and CFHZ	

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	and consent  Ban reclamations beyond seawalls  Responsibility: LTA/MWTI/MNRE/Village		as an "at risk" zone with appropriate landuse planning controls and restrictions	
Main Aana West Coast Road and junctions of main road and access roads/tracks18	Council  Continue investigating relocating main road (2km arterial road) in areas where road sits less than 5mtr from coastline in accordance with Vulnerability Assessment of the Samoa Road Network recommendations  Assess and upgrade access roads/tracks to include adequate sized culverts to facilitate the overland flow of storm water and to reduce flooding onto main lifeline and connectivity road  Responsibility: LTA/MWTI/ MNRE/District/Village	Improve infrastructure resilience and rate of recovery  Improve preparedness and readiness response to natural disasters  Reduce impact from coastal erosion and natural disasters  Safer villages, houses and roads  Minimize national disaster recovery expenditure on damaged properties and public assets	Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities  UtilizeHazard Map Hazard maps and Geomorphologist Drainage Infrastructure Database  Include in budget programming CBA, design and construction  Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015  TSP2014-2019 Goal 2  KO 1  Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
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	Improve resilience of public infrastructure  Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017  Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan 2017-2021 National Building Code National Policy for People with Disabilities NISP 2011 KESO 5
	program			

 $<sup>^{18}\</sup>mbox{Only Paepaeala Roads}$  (2) and Fuailoloo Roads 1 & 2 in LTA Upolu Zone 6 RMIP

		T		
Reticulated water supply, quality and network to be improved	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  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 & 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	Protects and enhance local species diversity  Sustains ecosystem services and functions	Develop an integrated land management plan for Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural	Draft NESP 2017- 2021 Community Engagement Plan

	Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  Village to fence off domestic animals  Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI	Reduce contamination of water supply  Reduce impact from inland flooding	habitats and ecosystems of the area  Implement wetland and mangrove protection programme  Identify funding /budget requirements and implementation programme for establishment of protected areas in district	
Coastal Restoration	Promote and support village and district tree planting on coastal areas around existing seawalls to strengthen seawalls and reduce erosion using native species such as talie, fetau, toa etc that are known to have greater resilience to natural disasters and changing climate conditions  Depth and density of planting to be increased and a minimum vegetative distance of 200mm as an effective wave barrier distance	Maintains natural ecosystem  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 reads	Develop an Integrated Flood Management Plan for Manono-uta. Utilize Sui o Nu'u monthly meetings to monitor progress of village cleanup and awareness programmes MNRE Forestry to provide technical assistance to guide village planting programmes in coastal areas  MNRE Forestry to provide suitable climate ready trees suitable for coastal conditions	NESP 2017 – 2021  Two Million Tree Strategy 2015-2020  Forestry Management Act 2011
Livelihood and Food Security	Best Solutions	roads  Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants  MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

			climate change and	
	Implement Sustainable Land Management (SLM) practices		support in supply of nursery trees, technology and	
	Conduct pilot site trials for climate ready plant varieties		infrastructure to have a sustainable mechanism for replanting	
	Responsibility: MAF/ MNRE/village		MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial	
			Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	
			MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the	
			habitats and planting materials for village	
Governance	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Strengthen the governance of natural resources and	Update and/or develop bylaws to manage the use of natural resources, and to control land use	Strengthen implementation of all national sector plans	Develop and register district/village bylaw to protect all district/village and	Village Fono Act (Amendment Bill 2016)
land use through Bylaws	impacts; such as drainage maintenance, rubbish dumping, sand mining,	Strengthen monitoring of all	government assets, environment, livelihood and food security especially	Community Sector
	stray animals and unregulated developments in water catchment areas and near boreholes.	National Acts, Regulation, Strategies, Plans and Policies	activities affecting water catchment areas and coastline	Community Development Plan 2016-2021
	Collaborate with Sui o Nuu to monitor the use of and impact on natural resources  Facilitate continuous	Improve ability of communities to adapt, respond and recover quickly in the long term	Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws	
	awareness raising	Improve		

programs with the villages	accountability
Responsibility: MWCSL /Village	and enabling environment of communities

### Mulifanua Village Map

# Mulifanua Village





Coordinate System: GCS WGS 1984 Datum: WGS 1984

Units: Degree

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

# 11. Paepaeala Village Interventions

### **CIM Plan Solutions**

Infractructure		Benefits	Guideline to assist	Relevant Sector
Infrastructure	Best Solutions	Delients	with the	Relevant Sector Plans, National
			implementation	Strategies & Policies
Village houses,	Relocate assets outside	Minimise	Planning provisions	CIM Strategy 2015
churches	of high risk hazard	expenditure on	to be guided by the	
hospital, and	zones when re-building	damaged	Planning and Urban	National Building
other	8	properties and	Management Act	Code
government	Develop landuse	personal assets	2004	
assets located in	planning and			
high risk hazard	development controls to	Safer villages,	Enforcement of	
zones	restrict developments	houses and roads	National Building	
	within high risk hazard		Code 2017	
	zones such as CEHZ and	Increases		
	CFHZ	awareness for	Encourage insurance	
		insurance	of significant	
	Conduct awareness		investments and	
	raising campaign on		assets within hazard	
	flood resilient building practices and designs for		zones	
	at risk communities		Utilise hazard maps	
	living in and near high		and Geomorphologist	
	risk hazard zones		Drainage	
	Tisk nazara zones		Infrastructure	
	Design infrastructure to		Database to	
	take into account the		determine safe areas	
	immediate hazard		for relocation	
	zones; for example,		purposes	
	raise floor levels of			
	houses in flood prone		Designation of the	
	areas		IFHZ, CEHZ and CFHZ	
			as an "at risk" zone	
	Families and village to		with appropriate	
	limit building and		landuse planning	
	developing on natural		controls and	
	overland flow paths exacerbating inland		restrictions	
	flooding and storm water			
	surges			
	_			
	Responsibility: Village / Families /MWTI/			
	/ Families /MWTI/ MNRE/ MWCSD			
Coastline	Investigate potential	Reduce impact	Planning provisions	NESP 2018 - 2022
protection:	for upgrading	from inland	to be guided by the	11101 1010 1011
combination of	government managed	flooding on	Planning and Urban	
hard and soft	seawalls in areas where	coastal areas	Management Act	
solutions	road sits less than 5mtr		2004	
	from coastline as <b>short</b>	Mitigate		
	term solution	potential damage	Utilise hazard maps	
		from coastal	and Geomorphologist	
	Enforce environmental	erosion and	Drainage	
	safeguards where	flooding	Infrastructure	
	reclamations are	accommodating	Database to	
	proposed. Government	the hazard	determine safe areas	
	and district to manage	0.6	for relocation	
	processes by requiring	Safer villages,	purposes	

		1		,
	villagers to get the appropriate permits and consent Responsibility: LTA/MWTI/MNRE/Village Council	houses and roads	Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	
Main Aana West Coast Road and junctions of main road and access roads/tracks <sup>19</sup>	Continue investigating relocating main road (2km arterial road) in areas where road sits less than 5mtr from coastline in accordance with Vulnerability Assessment of the Samoa Road Network recommendations  Assess and upgrade access roads/tracks to include adequate sized culverts to facilitate the overland flow of storm water and to reduce flooding onto main lifeline and connectivity road  Responsibility:LTA /MWTI/ MNRE/ District/ Village	Improve infrastructure resilience and rate of recovery  Improve preparedness and readiness response to natural disasters  Reduce impact from coastal erosion and natural disasters  Safer villages, houses and roads  Minimize national disaster recovery expenditure on damaged properties and public assets	Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities  Utilize Hazard Map Hazard maps and Geomorphologist Drainage Infrastructure Database  Include in budget programming CBA, design and construction  Designation of the CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015  TSP2014-2019 Goal 2 KO 1  Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
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	Improve resilience of public infrastructure  Improve preparedness and readiness response to natural disasters	Enforcement of National Building Code 2017  Utilise hazard maps and Geomorphologist findings to inform location and designs	National Disaster Management Plan 2017-2021 National Building Code National Policy for People with Disabilities NISP 2011 KESO 5

 $<sup>^{19}\!</sup>$  Only Paepaeala Roads (2) and Fuailoloo Roads 1 & 2 in LTA Upolu Zone 6 RMIP

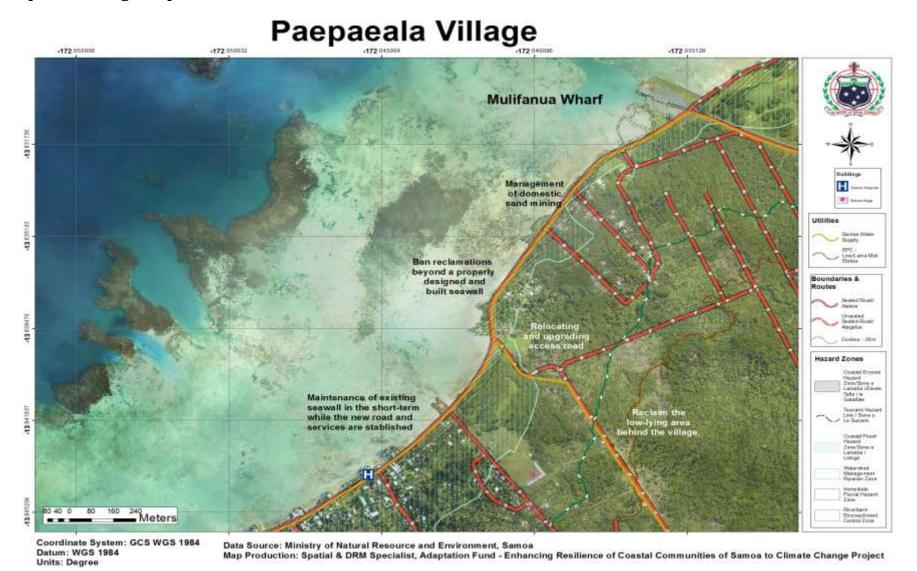
Reticulated water supply, quality and network to be improved	Implement program  Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters  Where no suitable houses exist, build emergency shelter(s) outside the hazard zones Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter  Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD  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 exploratory boreholes in district  District 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  Benefits	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
Resources & Environment			with the implementation	Plans, National Strategies & Policies
Mangrove area conservation	Undertake an assessment of tidal flow necessary to maintain a	Protects and enhance local species diversity	Develop an integrated land management plan for	Draft NESP 2017- 2021

	healthy natural environment  Limit land clearance and developments adjacent to wetland areas  Continue to plant native species along coastal areas to reduce erosion and landslips. To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed  Village to fence off domestic animals  Responsibility: MNRE / Village /CSSP/ UNDP-GEF SGP/ MWTI	Sustains ecosystem services and functions  Reduce contamination of water supply  Reduce impact from inland flooding	Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Implement wetland and mangrove protection programme  Identify funding /budget requirements and implementation programme for establishment of protected areas in district	Community Engagement Plan
Coastal Restoration	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 Aiga i le Tai 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 2018 - 2022 Two Million Tree Planting Strategy 2015-2020 Restoration Operational Plan 2016-2020
Livelihood and	Best Solutions	Benefits	Guideline to assist	Relevant Sector
Food Security			with the implementation	Plans, National Strategies & Policies
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops ( i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote	Improve health through access to clean water and waste management Improve recovery to create more resilient villages Improve	Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

	ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme  Implement Sustainable Land Management (SLM) practices  Conduct pilot site trials for climate ready plant varieties	preparedness and readiness response to natural disasters	collaborate on supply of climate resilient crops and plants  MAF to provide trainings, awareness raising on crop diversification to suit prolonged impacts of climate change and support in supply of nursery trees, technology and infrastructure to have a sustainable mechanism for replanting	
	Responsibility: MAF/ MNRE/village		MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area	
			MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village	
Governance	Best Solutions	Benefits	Guideline to assist with the	Relevant Sector Plans, National Stratogics & 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	Strengthen implementation of all national sector plans  Strengthen	implementation  Develop and register district/village bylaw to protect all district/village and government assets, environment,	Village Fono Act (Amendment Bill 2016)  Community Sector Plan
un ougn bylaws	drainage maintenance, rubbish dumping, sand	monitoring of all National Acts,	livelihood and food security especially	Community

and develo catchm	, stray animals unregulated pments in water ent areas and oreholes.	Regulation, Strategies, Plans and Policies Improve ability	activities affect water catchm areas and coastline Utilise Sui o N	2016-2021 e	Plan
Nuu to of ar	orate with Sui o monitor the use ad impact on resources	of communities to adapt, respond and recover quickly in the long term	monthly meetings monitor progress district/village byla	of	
Facilita awarer progra villages	less raising ms with the	Improve accountability and enabling environment of communities			
/Villag	nsibility: MWCSD e				

#### Paepaeala Village Map



## 12. Salua tai Village Interventions

### **CIM Plan Solutions**

Infractructure		Benefits	Guideline to assist	Relevant Sector
Infrastructure	Best Solutions	Benefits	with the implementation	Plans, National Strategies & Policies
Village houses, churches, preschool and other 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/	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
Coastline protection: combination of hard and soft solutions	Investigate potential for upgrading seawalls <sup>20</sup> in areas where road sits less than 5mtr from coastline	Reduce impact from inland flooding on coastal areas	Planning provisions to be guided by the Planning and Urban Management Act 2004	NESP 2018 - 2022
Solutions	Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring	Mitigate potential damage from coastal erosion and flooding accommodating the hazard	Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas	

 $<sup>^{20}\</sup>mbox{Constructed}$  in 2011 under Tsunami Recovery Programme

		-	l c 1	
	villagers to get the	Cofor willows	for relocation	
	appropriate permits and consent	Safer villages, houses and roads	purposes	
	Consent	ilouses allu roaus	Designation of the	
			IFHZ, CEHZ and CFHZ	
	Responsibility: LTA/		as an "at risk" zone	
	MWTI/ MNRE/ Village		with appropriate	
	Council		landuse planning	
			controls and	
			restrictions	
Evacuation	Assess and/or select	Improve	Enforcement of	National Disaster
Shelter and a	location for either an	resilience of	National Building	Management Plan
connected escape	existing or new	public	Code 2017	2017-2021
route needed for	evacuation shelter,	infrastructure		National Building
emergency	including safe access		Utilise hazard maps	Code
preparedness	routes to the shelter	Improve	and Geomorphologist	National Policy for
and response	Conduct evacuation	preparedness	findings to inform	People with
	Conduct evacuation shelter assessment and	and readiness response to	location and designs	Disabilities
	mark on CIM Plan hazard	response to natural disasters		
	maps	ilaturai uisasters		
	Парз			
	Develop a Village			
	Climate Disaster			
	Management Plan			
	(VCDMP)			
	Conduct trainings for			
	People With Disabilities			
	(PWDs) on emergency			
	and disaster response strategies			
	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			
	GHAI CHES/PIW CSD			

Jetty	Repair and upgrade damaged posts  Village to maintain and upgrade jetty  Village to limit number of private jetties on island  Responsibility: SPA/MNRE/ Village /CSSP/NGO	Maintain lifeline access and connectivity  Improve preparedness and readiness response to natural disasters	Identify funding/budget requirements and implementation programme  Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities  Designation of the CEHZ, CFHZ and tsunami shore exlusive zones as an	CIM Strategy 2015  Community Engagement Plan
			"at risk" zone with appropriate landuse planning controls and restrictions	
Electricity supply	Install streetlights along the roads where needed for community safety  Relocate overhead lines to a more resilient location when being replaced  Provide underground lines in the long term Install and connect to solar power supply if made available  Responsibility: EPC /MWTI/ Villages	Maintain electricity supply at all times including natural disasters Avoid accidents from fallen electricity posts	Monitor distribution networks to avoid overloading poles and contributing to line failures	EPC Strategic Plan
Island water supply: pipelines	Relocate main water pipelines away from CEHZ and CFHZ  Procure rainwater harvesting systems as backup for vulnerable families as a short term solution  Regulate developments and remove latrines around water supply  Village to fence domestic animals away from areas susceptible to flooding  Responsibility:  District/Village/ CSSP/NGO	Improve preparedness and readiness response to natural disasters  Increase adaptation during drought periods  Improve health and sanitation  Reduce contamination of water supply	Develop and register District/Village bylaws to include regulating developments around identified hazard zones  Include in budget programming relocation of tanks and procurement of rainfall catchment systems  Utilize Hazard Map Hazard maps and Geomorphologist findings for planning purposes  Utilize Sui o Nu'u monthly meetings to	CIM Strategy 2015  Water and Sanitation Sector Plan  Community Engagement Plan

			monitor progress of village programmes and responsibilities	
Natural Resources & Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Marine Protected Area and inshore fishery resources	Village to restock marine reserve with suitable species  Collect and dispose of crown-of-thorns (alamea) on a regular basis to prevent major outbreaks  Continue to ban the use of dynamites, herbal poisons (avaniukini), chemicals and other unsustainable fishing methods including sand mining and extraction  Enforce village bylaws on ban on rubbish dumping in coastal areas  Responsibility: Village fishing households, MAF/CSSP/NGO	Protect coral reefs and inshore fisheries  Protect marine biodiversity  Protects and enhance local species diversity  Sustains ecosystem services and functions	MAF Fisheries to support implementation and provide technical backstopping and monitoring  Develop 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 Village Bylaws to include management of natural resources (spring pools, marine reserve, forest etc)	Agriculture Sector Plan 2016-2021  Community Engagement Plan
Coastal Restoration	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 Aiga i le Tai 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 2018 - 2022  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 programme to eradicate, contain or exclude invasive species  Implement an inventory of invasive species and include information on their past, present and potential future distribution, as well as impacts and possible actions that can be taken  Conduct education and awareness programmes on the impacts of invasive species  Implement the Integrated Pest Management Programme  Implement Sustainable Land Management (SLM) practices  Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources  Responsibility: Villages/District/MNRE/MAF/SROS	Maintains natural ecosystem  Builds resilience of community livelihood and food security	Develop an integrated land management plan for Aiga i le Tai district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  MAF to raise awareness of farmers on impacts to water flows from poor livestock management  MNRE, MAF and SROS to implement aggressive, nationwide invasive species eradication programme based on inventory of invasive species and conduct campaign on public awareness accordingly  Training for farmers on pests management particularly affecting fruit trees and crops	Agriculture Sector Plan 2016-2021  Samoa's National Invasive Species Action Plan (NISAP)
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management Programme	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design  Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants  MAF to provide	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

Governance  Strengthen the governance of	Best Solutions  Update and/or develop bylaws to manage the	Benefits  Strengthen implementation	sites to trial climate ready plant varieties and provide advice, seedlings and planting material for village/families as a trial  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  MNRE Forestry to advice on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village  Guideline to assist with the implementation  Develop and register district/village bylaw	Relevant Sector Plans, National Strategies & Policies  Village Fono Act (Amendment Bill
			with the implementation	Plans, National Strategies & Policies

near boreholes.			
	Improve ability	Utilise Sui o Nu'u	
Collaborate with Sui o	of communities	monthly meetings to	
Nuu to monitor the use	to adapt,	monitor progress of	
of and impact on natural	respond and	district/village bylaws	
resources	recover quickly	, 3	
	in the long term		
Facilitate continuous			
awareness raising	Improve		
programs with the	accountability		
villages	and enabling		
villages	0		
	environment of		
Responsibility: MWCSD	communities		
/Village			

#### Salua Tai Village Map

## Salua Tai Village



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

# 13. Satuimalufilufi Village Interventions

### **CIM Plan Solutions**

Infractructur	Best Solutions	Benefits	Guideline to assist	Relevant Sector
Infrastructur e		Denents	with the implementation	Plans, National Strategies & Policies
Village houses, churches, Satuimalufilufi Primary School and government assets located in high risk hazard zones	Relocate assets outside of high risk hazard zones when rebuilding  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
Upgrade access/ work roads to	Upgrade to include adequate sized culverts to facilitate	Improve infrastructure resilience and	Utilise hazard maps and Geomorphologist	CIM Strategy 2015  National Disaster
facilitate relocation of houses away from hazard zones and	the overland flow of storm water exacerbating river overruns, and to	rate of recovery  Improve preparedness	Drainage Infrastructure Database to inform location and designs	Management Plan 2017-2021
alleviate inland	reduce flooding onto main roads and village	and readiness response to	Develop an	

flooding from	lands	natural	Integrated Flood	
inadequate	iditus	disasters	Management Plan	
culverts/	Implement regular		for Aiga i le Tai	
drainage	drainage inspection	Reduce impact	District. MNRE to	
	and maintenance	from coastal	develop zonation	
		erosion and	strategy for safe	
	Village to restrict	natural	areas	
	rubbish dumping into	disasters	Davidan	
	waterways and conduct regular	Safer villages,	Develop an integrated land	
	clearance of rubbish	houses and	management plan	
	behind homes	roads	with the aim of	
			reducing any	
	Village to regulate	Minimise	unnecessary	
	developments near	national	actions that may	
	and around road	disaster	adversely affect the	
	shoulders of all access roads	recovery	natural habitats	
	Toaus	expenditure on damaged	and ecosystems of the area	
	Enforce	properties and		
	environmental	public assets	Include in budget	
	safeguards		programming CBA,	
			design and	
	Where reclamations		construction	
	are proposed, Government and		Designation of the	
	district to manage		IFHZ, CEHZ and	
	processes by requiring		CFHZ as an "at risk"	
	villagers to get the		zone with appropriate	
	appropriate permits		landuse planning	
	and consent		controls and	
	D 11111 1774 /		restrictions	
	Responsibility: LTA/			
	MWTI/ MNRE/   District/ Village		Develop and	
	/Families/CSSP		register Village	
	,		bylaws to include maintenance of	
			drainages and	
			illegal rubbish	
			dumping into	
			waterways	
Evacuation	Assess and/or select	Improve	Enforcement of	National Disaster
Shelter and a	location for either an existing or new	resilience of public	National Building Code 2017	Management Plan 2017-2021
connected escape route	evacuation shelter,	infrastructure	Code 2017	National Building
needed for	including safe access		Utilise hazard maps	Code
emergency	routes to the shelter	Improve	and Geomorphologist	National Policy for
preparedness	Conduct	preparedness	findings to inform	People with
and response	Conduct evacuation shelter assessment	and readiness	location and designs	Disabilities
	and mark on CIM Plan	response to natural		NISP 2011 KESO 5
	hazard maps	disasters		
	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			
Coastal protection: combination of hard and soft options	Assess potential of a revetment <sup>21</sup> for badly eroded coastal areas where relocation is not possible as <b>short term solution</b> 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/Village	Reduce impact from inland flooding on coastal areas  Mitigate potential damage from coastal erosion and flooding accommodating the hazard  Safer villages, houses and roads	Planning provisions to be guided by the Planning and Urban Management Act 2004  Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes  Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	NESP 2018 - 2022

 $<sup>^{21}\!</sup>S\!eawall$  constructed in 2011 under Tsunami Recovery Programme

Effluent and wastewater	Introduce ban on latrines established in	Increase adaptation	Review wastewater strategy/ legislation	National Waste Management
management systems	and around fluvial hazard zones	during extreme weather events	to include role of Village/District bylaws	Strategy
	Families in fluvial hazard zones to install proper septic waste disposal systems	Improve infrastructure resilience and rate of recovery	Develop/Update and register District/Village bylaws to include	
	Implement district/ village drainage cleanup and	Improve health and sanitation	regulating developments and latrines in IFHZ and areas susceptible to	
	awareness programme	contamination of water supply	flooding	
	Produce posters and village signs for public awareness		Utilise Hazard maps and Geomorphologist findings to inform location	
	Responsibility: MNRE/ MWCSD/ District/Village		Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes on waste	
Electricity	Provide underground	Maintain	management  Monitor	EPC Strategic Plan
supply	Install and connect power supply for inland residents	electricity supply at all times including natural disasters	distribution networks to avoid overloading poles and contributing to line failures	
	Relocate overhead lines to a more resilient location when being replaced	Avoid accidents from fallen electricity posts		
	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			
Reticulated water supply,	Extend the water supply to families	Increase adaptation	Develop and register	CIM Strategy 2015
quality and	inland with no access	during drought	District/Village	Water and

improved	to water	periods	bylaws to include	Sanitation Sector
	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	Improve infrastructure resilience and rate of recovery Improve health and sanitation Reduce contamination of water supply Reduce impact from inland flooding	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	Plan SWA 10 Year Investment Plan (2016) Community Engagement Plan
			findings to inform location and designs	
Natural Resources and	BestSolutions	Benefits	Guideline to assist with the	Relevant Sector Plans, National
Environment			implementation	Strategies & Policies
Coastal Restoration	Plant native species along coastal areas to strengthen existing	Soft coastal protection	Develop an integrated land	NESP 2018 - 2022

Livelihood & Food Security	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Marine reserve	Assess feasibility of creating a marine reserve for village as backup, alternative food supply  Village to restock marine reserve with suitable species  Continue to ban the use of dynamites, herbal poisons (ava niukini), chemicals and other unsustainable fishing methods including sand mining and extraction  Research improved inshore fishery resources that are resilient to climate change  Village to provide fencing for domestic animals to prevent waste contaminating marine reserve  Responsibility: MNRE /MAF/ Village /CSSP/UNDP-GEF SGP	Protects and enhance local species diversity  Maintains natural ecosystem  Builds resilience of community livelihood and food security	MAF and MNRE DEC and CC to provide technical assistance and backstopping in the assessment and establishment of a marine reserve for village  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Village to seek funding to establish marine reserve  MAF to raise awareness of farmers on impacts to water flows from poor livestock management	NESP 2018 - 2022  Community Engagement Plan  Agriculture Sector Plan 2016-2021
Plantations, crops and plants threatened by changes in climate, inland flooding and inadequate soil for planting	Promote and facilitate planting of rootcrops (i.e yams, sweet potato) which are more resilient to cyclones, droughts and floods  Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases  Implement the Integrated Pest Management	Improve recovery to create more resilient villages Improve preparedness and readiness response to natural disasters	Utilise Hazard Maps and Geomorphologist findings to inform location and design  Agriculture sector to provide best practice management guidelines for the management of water that allows for levels of contamination to be kept to minimum  MNRE Forestry, DEC and MAF to collaborate on supply of climate	Agriculture Sector Plan 2016-2021  Two Million Tree Strategy 2015-2020  Restoration Operational Plan 2016-2020

Programme resilient crops and plants Implement MAF to provide Sustainable Land trainings, awareness Management (SLM) raising crop on practices diversification to suit prolonged Conduct pilot site impacts of climate trials for climate ready change and support plant varieties in supply of nursery trees, technology Responsibility: MAF/ and infrastructure MNRE/village have sustainable mechanism for replanting MAF to assist in establishment of pilot sites to trial climate ready plant varieties and provide advice. seedlings and planting material for village/families as a trial Develop an integrated land management plan with the aim of reducing anv 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 the to habitats and planting materials for village

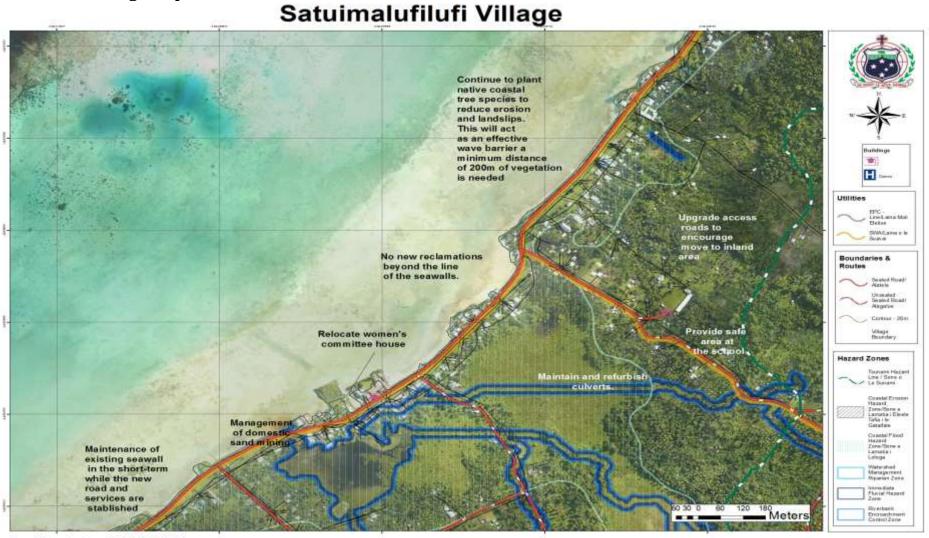
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Pest	Research new type of	Maintains	Develop an	Agriculture Sector
management;	vegetation found in	natural	integrated land	Plan 2016-2021
invasive plants	rivers and seas of	ecosystem	management plan	
and animals	Solosolo		for Aiga i le Tai	Samoa's National
		Builds	district with the aim	Invasive Species
	Implement an	resilience of	of reducing any	Action Plan (NISAP)
	eradication	community	unnecessary actions	
	programme to	livelihood and	that may adversely	
	eradicate, contain or	food security	affect the natural	
	exclude invasive		habitats and	
	species		ecosystems of the	
			area	
	Implement an			
	inventory of invasive		MAF to raise	
	species and include		awareness of	
	information on their		farmers on impacts	
	past, present and		to water flows from	
	potential future		poor livestock	
	distribution, as well as		management	
	impacts and possible		management	
	actions that can be		MNRE, MAF and	
	taken		SROS to implement	
	taken		aggressive,	
			nationwide invasive	
	Conduct education		species eradication	
	and awareness		programme based	
	programmes on the			
	impacts of invasive		on inventory of invasive species and	
	species		conduct campaign	
			on public awareness	
	Implement the		accordingly	
	Integrated Pest		accordingly	
	Management		Training for	
	Programme		farmers on pests	
			management	
	Implement			
	Sustainable Land		particularly	
	Management (SLM)		affecting fruit trees	
	practices		and crops	
	practices			
	Build the capacity of			
	farmers to manage			
	stray animals (pigs,			
	cattle) that are			
	contaminating water			
	sources			
	Responsibility:			
	Villages /District/			
	MNRE/MAF/ SROS			
	,,			
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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





### Satuimalufilufi 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

## Upolu AF Districts Overview Map of Coastal Inundation Zones

