

# **Community Integrated Management Plan**

## **Vaimauga East 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 Vaimauga East (Fagali'i, Vailele, Letogo and Lauli'i villages).

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

**Date of Signing: 22 June 2018**

### Village Representatives:

### Signatures:

#### Fagali'i Village

- Pepe Faaopoopo Leuelu
- Naea Ulumanua Ulaula
- Faavaeolenuu Poli
- Puna Luatimu
- Putty Ieremia

  
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 (SUI TAMAITAI)

  
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 (SUI PULENUU)


  
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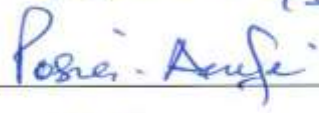
  
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#### Vailele Village


- Taufanua Lemanu
- Posia Anufe
- Sitina Sagato
- Folasi Kalapu
- Malio Tautia

  
 \_\_\_\_\_  
 (SUI TAMAITAI)

  
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**Letogo Village**

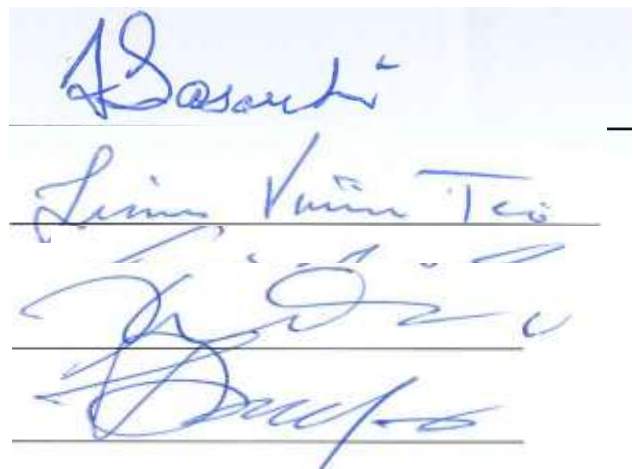
- Tuilalotea Otane
- Lotoi Lemanu
- Tavai Iefata
- Toalepai Faamanatu



Handwritten signatures of representatives from Letogo Village, including Lemanu, Mataru, and Toalepai Faamanatu.

**Lauli'I Village**

- Faalogo Sasauli
- Leniu Vainiu Teo
- Lupe T.S
- Maposua Siaso Salapo
- Tuautu Saumala



Handwritten signatures of representatives from Lauli'I Village, including Sasauli, Vainiu Teo, Siaso Salapo, and Saumala.

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

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



Ulu Bismarck Crawley  
CHIEF EXECUTIVE OFFICER, MNRE

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**Acronyms:**

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

## Glossary

“Do Minimum” Option	A Management option that involves continuing with the present maintenance and upgrading programme on and when required basis.
Emergency Management	To provide communities with skills, facilities and materials so that they may adapt, respond and recover more quickly in the event of emergencies.
Food Security	Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life
Food access:	Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as these to fall commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources)
Food availability:	The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)
Stability:	To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food in security). The concept of stability can therefore refer to both the availability and access dimensions of food security
Utilization:	Utilization of food through adequate diet, clean water, sanitation and healthcare to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security
Hazard	A source of potential harm or a situation with a potential to cause loss.
Hazard Zones	<p>Defined areas which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to six hazard zones:</p> <p><i>ASCHs</i> (areas sensitive to coastal hazards);</p> <p><i>CEHZs</i> (coastal erosion hazard zones);</p> <p><i>CFHZs</i> (coastal flood hazard zones) and</p> <p><i>CLHZs</i> (coastal landslip hazard zones)</p> <p><i>CIHZ</i> (coastal inundation hazard zones)</p> <ul style="list-style-type: none"> <li>- Coastal Inundation 0 to 15mASL – immediate coastal inundation hazard zone</li> <li>- Coastal Inundation 15 to 20mASL – 5-metre uncertainty buffer on the immediate coastal inundation hazard zone (due to potential LiDAR inaccuracies)</li> <li>- Coastal Inundation 20 to 50mASL – additional hazard zone for the purpose of assessing/planning the location of tsunami protection infrastructure beyond the 0-20mAmSL contour. Please note tsunami risk includes 0-20mASL, so tsunami hazard zones need to include the 0-15mASL and 15-20mASL polygons as well as the 20-50mASL polygon</li> <li>- Coastal Inundation 50 to 55mASL – 5-metre uncertainty buffer on the tsunami infrastructure hazard zone (due to potential LiDAR inaccuracies)</li> </ul> <p><i>IFHZ</i> (immediate fluvial hazard zone) within the steep banks of the river gorges</p> <ul style="list-style-type: none"> <li>- River bank encroachment control – 5m buffer on either side of river banks</li> <li>- Watershed management riparian zone – 20m buffer on either side of the river banks</li> </ul>
Infrastructure	Built structures and networks which support the national, regional or local community

Lifeline infrastructure:	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
Secondary infrastructure:	Infrastructure that contributes to the every-day development of the community.
Implementation Guideline	A document to guide land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defenses and works.
Issue	A specific concern regarding both cause and effect.
Land and Resource Use	The use of land and resources by the community for social, economic or other benefit (e.g. land use includes areas used for villages or crops, resource use includes activities such as sand mining, gravel extraction or fishing).
Livelihood	Livelihood refers to a person or group's "means of securing the necessities -food, water, shelter and clothing- of life".
Monitoring	Process of measuring the effectiveness or impacts of projects and works against predicted standards, levels or outcomes.
Resilience	The ability to be adaptive, responsive and quick to recover.
Community Resilience:	The ability for the community to be adaptive, responsive and quick to recover from the adverse effects of hazard.
Natural Resilience:	The ability of natural systems to be adaptive, responsive and quick to recover from natural processes or hazards.
Risk	The chance of something happening that will have an impact on objectives. It is measured in terms of consequence and likelihood. In the Community Integrated Management Plan context it is the likelihood that infrastructure, environment and biological resources and agricultural and marine resources (food security) will be subject to inland and coastal hazards and the potential for loss of property, life or land due to natural processes.
Stakeholders	Those people and organizations who may affect, be affected by, or perceive themselves to be affected by, a decision or activity. The term stakeholder may also include interested parties.
Strategy	Direction or course of action to achieve a defined vision.
Susceptibility	The degree to which infrastructure at risk is likely to be damaged by coastal hazards and how easy /difficult, expensive/ cheap it is to replace. In the context of the CIM Plan the term susceptibility is equivalent to the term vulnerability as the Samoan phrase for both susceptibility and vulnerability is the same.
Vision	A desired destiny



## 1. Introduction to the CIM Plan

### 1.1 The Strategic Vision

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

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

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

### 1.2 The Aim of the CIM Plan

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

The CIM Plan will:

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

### 1.3 Structure of the Plan

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

- ***Plan Development***, which describes the process undertaken in preparing the CIM Plan in conjunction with representatives of the Communities involved, the Government and other stakeholders with interests in the Plan area.
- ***Implementation Guidelines***, which describes the Plans and Actions recommended as outcomes of the process, together with the partner responsible for implementing these outcomes. The participants of the CIM Plan preparation process are acknowledged in the Implementation Guidelines.

## 2. Implementation Guidelines

### 2.1 Purpose of the Implementation Guidelines

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

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

### 2.2 Duration of the Plan

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

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

### 2.3 Financing of the Plan

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

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

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

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

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

### ***3. Description of Vaimauga East District***

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

The Faipule District of Vaimauga East is located at the northern side of Upolu between the districts of Anoama'a West and Vaimauga West. Four villages reside within this district and they include Letogo, Lauli'i, Fagali'i and Vailele. The entire Vaimauga East is comprised of a denomination of customary, government-owned and free-hold land. The district has a total of 9 access roads<sup>1</sup> and houses 18 churches<sup>2</sup>, 5 primary schools<sup>3</sup>, retail shops, small markets along with a few supermarkets. The district also contains the Head of State's residence at Vailele.

Majority of the families within the district have meter water while the remaining few utilize rainwater and open springs as an alternative source of water supply. As recorded in a Village Profiles Report (Ministry of Women Community and Social Development, 2013), Vailele was the only village accommodating a minor population of residents who relied on rainwater harvesting system and government water trucks as their water resources. The closest hospital<sup>4</sup> to the district is located at Moto'otua.

The district's westernmost villages<sup>5</sup> are located along the edge of a large lagoon formed by a reef system. The majority of the coastline to the west of Vailele is comprised of fine coral sand and protected by the reef, whereas at Lauli'i the absence of a reef at the center of the settlement, combined with steep beaches, exposes the coast to high level of wave action and results in a rockier coastline. Major water bodies at Fagali'i and Letogo create breaks in the reef system and likewise render the coastline to greater wave action during storms. Local water is sourced from these streams to the reticulated water network. The coastal areas are dominated by coastal and alluvial soil with generally high natural fertility. Soil types on the coastal were formed because of floods, sandy beach or silty estuaries. Inland from the coast is wet saline dominated by sloping ridges separated by deep gorges, soils that are moderately deep from 50 to 100 cm and is categorized as a wet climate.

The main water network follows the East Coast Road and a number of minor roads, with the exception of Lauli'i which has its own locally managed water scheme. SWA obtains water locally from the Letogo River and distributes it to the villages of Letogo and Vailele while water for Fagali'i is provided from the Apia water supply. Although the water source at Letogo and Vailele has been upgraded, site assessments showed agricultural activities and cattle farms near SWA reservoir, threatening the water catchment with potential contamination. The Water Resources Division of MNRE has subsequently signed an MOU with Letogo and Vailele for water catchment area replanting to safeguard its boundaries. Along the lower areas of the Letogo River, flooding from inland catchment area affects its perimeter. These conditions intensify as erosion of the riverbanks upstream of the main road bridge exacerbates inundation. In addition, flooding along the Letogo River inland from the main road bridge is increased from runoff from the catchment upstream, which also increases erosion along the riverbanks before the bridge. Springs are scattered across different parts of Lauli'i and villages insist that they need to be securely enclosed as backup drinking water supply.

Other main district infrastructures include; the main road together with bridges, drainage culverts and fords; the National Grid Electricity network. High voltage power supplies are located inland as far as Lauli'i where they are redirected to follow the coastal road. Low voltage supplies are located along the various roads that are contained in the settlements, including the main East Coast Road. Overhead telecommunications link the district directly with Apia as far as Letogo where the line stops. At Lauli'i, the telecommunications network is linked via overhead cables to a relay station which is located to the east of the village. This connection does not extend past the western-most bridge at Lauli'i and consequently there are a number of houses to the west of this bridge that do not have telephones. The Fagali'i International Airport servicing Upolu and Tutuila is located in this district.

Landward of the coastline, the district contains substantial wetlands at Fagali'i and Letogo which serve an important ecological function to the coastal environment (Reti, 2017). There is intensive land use adjacent to, and upstream of, these wetlands which are affecting the quality of water and habitat. Urban development and land use practices, such as deforestation, cattle farming and agriculture are affecting the rate of erosion and resultant supply of silt to the

<sup>1</sup> 4 tar sealed, 5 non-tar sealed

<sup>2</sup> CCCS (4), Roman Catholic (3), SDA (4), LDS (3), Methodist, AOG, Baptist Church and Pentecost Church

<sup>3</sup> Lauli'i Primary School, Vailele Primary School, Fagali'i Primary School, Letogo Primary School and Samoa Primary School

<sup>4</sup> Moto'otua National Hospital

<sup>5</sup> Letogo, Vailele and Fagali'i

coast. These processes affect the incidence of flooding in coastal areas and the rates of sediment accretion and therefore have a direct impact on the risk of damage to coastal infrastructure.

Invasive species are contributing to the loss of native species however there are efforts at replanting by communities such as Letogo. Forested areas near streams are dominated by *pulumamoe* and *Tamaligi paepae* both of which are vulnerable to strong winds. Letogo is replanting local tree species such as *Malili* and *Tava* to help stop land slips and erosion of steep slopes close to the reservoir. A significant part of the catchment area is still covered by natural forest although there are indications of earlier disturbances by strong winds. Invasive species common to this district include *vaomigi(Hiptiscapitata)* a recently introduced weed that is fast spreading in cultivated and pastured lands; *vaolapiti(SolannomMammosum)* an introduced sub-shrub usually uncommon in cultivated areas; *vaopinati(Sennatora)*; *lusina(Leucaenaleucocephala)* a wild tamarind, sometimes locally uncommon; *vaopovi(pennisetumpurpleum)* a tall reed-like grass common on road sides originally introduced as cattle feed; *losa* Honolulu sometimes referred to as *losafiti* is a fast growing introduced shrub with showy white flowers that has become a pest as they do not produce seeds and spread wildly; *vilitaliga(clerodendrumquadrioculare)* dominate areas where it grows, sprouting readily from the roots and forming dense thickets; *puluvaio(funtumia elastic)* or African Rubber tree, a serious threat as it dominates secondary growth, preventing the return of native forests and species; *Tamaligi uliuli(albizziachinensis)* which survives in the soil for many years making eradication very difficult; *merremia(merremiapeltata)* a large leaf like vine that invades open space and smother large trees that remain in cultivated or wind damaged forest areas and *fa'apasi(Spathodiacamapanulata)* or African tulip (Reti, 2017).

### 3.2 Social and Economic Setting

The Vaimauga East district currently has a population of 7,690; Fagali'i 1,439, Lauli'i 2,109, Letogo 1,273 and Vailele 2,869. Of the total 7,690, total male is 3,900, female 3,790<sup>6</sup>.

Development to the west of the district is influenced by the primary urban centre of Apia, which provides substantial employment opportunities for the district. This, combined with the availability of suitable free-hold government administered land away from the coast has resulted in large areas of the settlements of Fagali'i, Vailele and Letogo being located away from the coastline. At Fagali'i in particular, where inland access to Apia is the greatest, the majority of the settlement is located away from the coast. Further east at Lauli'i, the topography of the area has restricted development to coastal areas and two main valleys. Substantial areas of developments in Fagali'i, Letogo and Lauli'i are within the CEHZ and CFHZ. At Vailele the settlements are elevated and therefore are not within the CEHZ and CFHZ. With the exception of Fagali'i, primary road access is along the main East Coast Road. This road is sealed along its entire length. Secondary access is available to Fagali'i, Vailele, and Letogo via the inland road which runs parallel to Fagali'i Airport. This road crosses the Vaivase Ford at its western end and the Fagali'i stream at the eastern end. The road down to the Fagali'i River is in poor condition and the ford across the river is unimproved across the natural river bed. The entire length of the East Coast Road at Fagali'i is located within the CEHZ and CFHZ.

Cash economy of the village is dominated by traditional work. The majority of residents are largely sustained by plantation work, mixed cropping, cattle farms, poultry farming, piggery farming and fishing.

The District is the site of a number of significant economic activities including the Little Sisters of the Poor Aged Care Centre (Mapuifagalele), which provides employment for 40+ staff, and the Fagali'i Airport. The main economic activities are, however found in Apia, which contributes substantially to employment in the district.

### 3.3 Climate Risk and Resilience

The use of LiDar mapping data, hydrologist and geomorphologist data and findings for this district has helped determine inland and coastal hazard zones and high risk areas for Vaimauga East. The immediate risks for some areas of Vaimauga East are from coastal inundation, storm surges and fluvial hazards. Some areas are located within the tsunami red zone.

The district has a total area of 3,380 hectares. Total number of buildings in the tsunami shore exclusive zone is 107 and 463 sit within the Watershed Management Riparian Zone. These buildings need to be relocated or have their floors reinforced and raised above flooding level. There are several rivers and streams running through this district so inland flooding and storm water runoff is a major concern.

<sup>6</sup> SBS Village Directory Census 2016 preliminary count

Element at risk includes all human-made infrastructure and natural features, which consist of physical and non-physical infrastructures that face risks from natural disasters. Human-made physical infrastructures include houses, road networks, utilities networks, bridges, drainage networks and railways. Human made non-physical elements consist of economic, cultural and political environments. Natural features that may be affected by natural disasters include beaches, river systems, swamps, vegetation and all fauna in these environments

## 4. Vaimauga East District Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Drainage systems to be improved in high risk areas	<p>Assess and upgrade culverts on main East Coast road especially at junctions with access roads (Letogo Plantation Road; Tuli'alomalala Street;, Tuli'olovalu Street; Manuma Street sitting within combined hazard zones (IFHZ, CEHZ, CFHZ) and in accordance with <i>Vulnerability Assessment of the Samoa Road Network</i> recommendations</p> <p>Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding</p> <p>Implement regular drainage inspection and maintenance</p> <p><b>Responsibility: LTA/ MWTI/MWCSD /Village / Families</b></p>	<p>Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimizes national disaster recovery expenditure on damaged properties, public and private assets</p>	<p>Use existing information for guidance but not limited to: <i>"Vulnerability Assessment of the Samoa Road Network (2017)"; "Review of National Road Standards in Samoa (2016)"; "Samoa Code of Environmental Practice (2007)"</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>utilize hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p>	<p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
Access/work roads require maintenance and upgrade as it exacerbates flooding	<p>Implement routine maintenance of the road and side drains (Golf Course Road; Manumea Street) and clear any debris obstructing the free flow of surface water runoff</p> <p>Construct roadside drainage ditches</p>	<p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Safer villages, houses and roads</p>	<p>utilize hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>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</p>	<p>National Disaster Management Plan2017-2021</p> <p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>

	<p>where needed</p> <p>Implement routine maintenance of the roads and clear any debris obstructing the free flow of surface water runoff</p> <p>Enforce environmental safeguards where reclamations are proposed. Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p><b>Responsibility: LTA/ MWTI/ MNRE/ Villages/Families</b></p>	<p>Minimize national disaster recovery expenditure on damaged properties and public assets</p>	<p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> <p>utilize environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Vaimauga East district</p>	
<p>Village houses, churches and government assets located in high risk hazard zones</p>	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p>	<p>Minimize expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>utilize hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>



	<b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b>			
Flood protection measures for fords and bridges	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream of Letogo and Vailele</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>	<p>Minimize expenditure on damaged properties &amp; personal assets</p> <p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Maintains lifeline access for all of Upolu</p> <p>Safer villages, houses and roads</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs</p> <p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings</p> <p>utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities</p> <p>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</p> <p>Include in budget programming CBA, design and construction.</p> <p>Designation of the IFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</p>
Evacuation Shelter and a connected escape route needed for emergency preparedness and response	<p>Assess and/or select location for either an existing or new evacuation shelter, including safe access routes to the shelter</p> <p>Conduct evacuation shelter assessment and mark on CIM Plan hazard maps</p> <p>Develop a Village Climate Disaster Management Plan(VCDMP)</p>	<p>Improve resilience of public infrastructure</p> <p>Improve preparedness and readiness response to natural disasters</p>	<p>Enforcement of National Building Code 2017</p> <p>utilize hazard maps and Geomorphologist findings to inform location and designs</p>	<p>National Disaster Management Plan2017-2021</p> <p>National Building Code</p> <p>National Policy for People with Disabilities</p>

	<p>Conduct trainings for People With Disabilities (PWDs) on emergency and disaster response strategies</p> <p>Implement CDCRM program</p> <p>Install relevant signs to guide the community on emergency response procedures and to locations of evacuation shelters</p> <p>Where no suitable houses exist, build emergency shelter(s) outside the hazard zones</p> <p>Retrofit identified and approved schools or churches outside hazard zones and designate as evacuation shelter</p> <p><b>Responsibility: MNRE /DMO/ MWTI/Village /CSSP/Council of Churches/MWCSD</b></p>			
<p>Electricity supply</p>	<p>Provide underground lines in the long term</p> <p>Install and connect power supply for inland residents</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Install streetlights along the roads where needed for community safety</p> <p>Install and connect to solar power supply if made available</p> <p>Families to limit building and developments near electricity posts</p>	<p>Maintain electricity supply at all times including natural disasters</p> <p>Avoid accidents from fallen electricity posts</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p>	<p>EPC Strategic Plan</p>

	<i>Responsibility: EPC/ MWTI/ Village/Families</i>			
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
District Upland Forest	<p>Continue programme by Forestry on replanting native forestry species of the upland forest</p> <p>Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p><b>Responsibility: MNRE-WRD &amp; Forestry/ District /Village/CSSP</b></p>	<p>Protects and enhance local species diversity</p> <p>Reduced risk of slips and erosion</p> <p>Reduce impact from inland flooding</p>	<p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants</p> <p>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</p> <p>MNRE Forestry to advise on appropriate species, depth and density of planting and provide seedlings for different vegetation types suitable to the habitats and planting materials for village</p>	<p>Community Engagement Plan</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
Protection of catchment areas	<p>Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p>	<p>Reduced risk of slips and erosion</p> <p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p> <p>Restoration Operational Plan 2016-2020</p>

	<p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility:</b> <b>MNRE/</b> <b>/SWA/District/Village/</b> <b>CSSP/GEF-SGP</b></p>			
<p>Flood protection measures (soft solution to support flood protection measures for infrastructure)</p>	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility: MNRE/ Villages</b></p>	<p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Safer villages, houses and roads</p>	<p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian vegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
<p>Soft coastal protection measures needed for most vulnerable areas</p>	<p>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</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p><b>Responsibility: MNRE/ MAF/Villages</b></p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

Governance	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
<p>Strengthen the governance of natural resources and land use through Bylaws</p>	<p>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.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility:</b> <b>MWCSD /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>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</p> <p>Utilize Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>

# Vaimauga East District Map

## VAIMAUGA EAST DISTRICT



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

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

## 5. Fagali'i Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guidelines to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Flood protection measures for fords and bridges	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream of Fagali'i and Vaivase-uta</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility:</b> <b>MWTI/ LTA/MNRE</b></p>	<p>Minimise expenditure on damaged properties &amp; personal assets</p> <p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Maintains lifeline access for all of Upolu</p> <p>Safer villages, houses and roads</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs</p> <p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities</p> <p>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</p> <p>Include in budget programming CBA, design and construction.</p> <p>Designation of the IFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</p>
Village infrastructure located in high risk hazard zones; such as houses, schools, Churches, Businesses, Committee houses etc	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard</p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>

	<p>zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility:</b> <b>Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Increases awareness for insurance</p>	<p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	
Electricity supply	<p>Provide underground lines in the long term</p> <p>Install and connect power supply for inland residents</p> <p>Relocate overhead lines to a more resilient location when being replaced</p> <p>Install streetlights along the roads where needed for community safety</p> <p>Install and connect to solar power supply if made available</p> <p>Families to limit building and developments near electricity posts</p>	<p>Maintain electricity supply at all times including natural disasters</p> <p>Avoid accidents from fallen electricity posts</p>	<p>Monitor distribution networks to avoid overloading poles and contributing to line failures</p>	EPC Strategic Plan



	<b>Responsibility: EPC/ MWTI/ Village/Families</b>			
Effluent and wastewater management systems	<p>Provide a network sewage collection and treatment system for district</p> <p>Introduce ban on latrines established in and around fluvial hazard zones</p> <p>Extend effluent and wastewater management systems outside of the Greater Apia Urban Area</p> <p>Conduct campaign for public awareness of district ban and establish a “neighborhood watch” agreement with district to monitor and manage introduced policies</p> <p>Government, district and villages to monitor, report and apply penalty on offenders</p> <p><b>Responsibility: MNRE/ MWCSO/ District/ Village</b></p>	<p>Increase adaptation during extreme weather events</p> <p>Improve infrastructure resilience and rate of recovery</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p>	<p>Develop an integrated land management plan for Vaimauga East district</p> <p>Utilise Waste Management Act/Legislation to guide process of effecting the ‘polluter pays’ principle</p> <p>Review wastewater strategy/legislation to include role of Village/District bylaws</p> <p>Develop/Update and register District/Village bylaws to include regulating developments and latrines around catchment areas and areas susceptible to flooding</p> <p>Include in budget programming design, and installment of sewage and treatment systems</p> <p>Utilise Hazard maps and Geomorphologist findings for planning purposes</p> <p>Utilise Sui o Nu’u monthly meetings to monitor progress of village programmes on waste management</p>	<p>National Waste Management Strategy</p> <p>National Waste Management Policy</p>
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Upland Forest	<p>Continue programme by Forestry on replanting native forestry species of the upland forest</p> <p>Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases</p>	<p>Protects and enhance local species diversity</p> <p>Reduced risk of slips and erosion</p> <p>Reduce impact from inland flooding</p>	<p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants</p> <p>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</p> <p>MNRE Forestry to advice on appropriate species, depth and density of planting and</p>	<p>Community Engagement Plan</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	<p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p><b>Responsibility:</b> <b>MNRE-WRD &amp; Forestry/ District /Village/CSSP</b></p>		<p>provide seedlings for different vegetation types suitable to the habitats and planting materials for village</p>	
Protection of catchment areas	<p>Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p> <p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility:</b> <b>MNRE/ /SWA/District/Village/ CSSP/GEF-SGP</b></p>	<p>Reduced risk of slips and erosion</p> <p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p> <p>Restoration Operational Plan 2016-2020</p>
Flood protection measures (soft solution to support flood protection measures for infrastructure)	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action</p>	<p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p>	<p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	<p>plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility:</b> <b>MNRE/ Villages</b></p>	<p>Safer villages, houses and roads</p>	<p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	
<p>Soft coastal protection measures needed for most vulnerable areas</p>	<p>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</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p><b>Responsibility:</b> <b>MNRE/ MAF/Village</b></p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Strengthen the governance of natural resources and land use through Bylaws	<p>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.</p> <p>Collaborate with Sui o Nuu to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility: MWCSO /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>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</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>

<b>Non-CR issues raised during consultations</b>	<b>Proposed Solution</b>	<b>Comments</b>
Road curve near Fagali'i Airport and footpath <b>Responsibility: LTA</b>	Assess safety of travelling public (pedestrians and traffic). Requires consultations with landowners. Potential case for compensation as there is not enough road reserve	Not a CR issue. Safety issue which requires involvement of Samoa Airport Authority, LTA and general public
Inadequate/poor road condition to SWA reservoir and catchment area <b>Responsibility: SWA/Village/Landowner</b>	SWA, Village council and landowner to resolve and upgrade where necessary	Road not a CR issue however, has an indirect effect as it accesses catchment area



# Fagali'i Village Map

## FAGALI'I



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. Vailele Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guidelines to assist with the implementation	Relevant National, Sector Plans and Strategies
Village houses, churches and government assets located in high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS</b></p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>

<p>Drainage systems require maintenance and upgrade at junctions of main East Coast Road and access roads</p>	<p>Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff</p> <p>Install larger sized culverts where needed</p> <p>Construct roadside drainage ditches where needed</p> <p>Village to conduct regular drainage and waterway clearance activities to support the effectiveness of the drains</p> <p><b>Responsibility:</b> <b>LTA/ MWTI/ /Village /</b></p>	<p>Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimizes national disaster recovery expenditure on damaged properties, public and private assets</p>	<p>Use existing information for guidance but not limited to: <i>“Vulnerability Assessment of the Samoa Road Network (2017)”</i>; <i>“Review of National Road Standards in Samoa (2016)”</i>; <i>“Samoa Code of Environmental Practice (2007)”</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilize hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Vaimauga East District</p>	<p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>
<p>Flooding from storm water runoff into ‘centre’ of village settlement</p>	<p>Implement routine maintenance of the road and side drains and clear any debris obstructing the free flow of surface water runoff</p> <p>Village to conduct regular drainage and waterway clearance in and around homes</p> <p>District to regulate and plan developments near and around waterways to accommodate for stormwater runoff</p>	<p>Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimizes national disaster recovery expenditure on damaged properties, public and private assets</p>	<p>Use existing information for guidance but not limited to: <i>“Vulnerability Assessment of the Samoa Road Network (2017)”</i>; <i>“Review of National Road Standards in Samoa (2016)”</i>; <i>“Samoa Code of Environmental Practice (2007)”</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilize hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p>	<p>CIM Strategy 2015</p> <p>NISP2011 KESO 5</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Community Sector Plan</p>



	<b>Responsibility: Village / Families</b>		Develop Integrated Catchment Strategy and Flood Management Plan for Vaimauga East District	
Flood protection measures for fords and bridges	<p>Upgrade waterways</p> <p>Upgrade all crossings</p> <p>Upgrade or repair riverine embankment protection work upstream</p> <p>Ensure river channel upstream is cleared and maintained regularly</p> <p>Construct levees to reduce flooding along estuaries and coastal streams</p> <p>Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings</p> <p>Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments</p> <p><b>Responsibility: MWTI/ LTA/MNRE/ District/ Village</b></p>	<p>Minimize expenditure on damaged properties &amp; personal assets</p> <p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Maintains lifeline access for all of Upolu</p> <p>Safer villages, houses and roads</p>	<p>Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs</p> <p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings</p> <p>Utilize environmental and social safeguards including EIAs in screening and designing infrastructure facilities</p> <p>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</p> <p>Include in budget programming CBA, design and construction.</p> <p>Designation of the IFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p> <p>Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA</p>
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Soft coastal protection measures needed for most vulnerable areas	Plant native species along coastal areas to strengthen existing seawall and to reduce	Soft coastal protection measures will support and strengthen existing and	Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural	<p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational</p>

	<p>coastal erosion and landslips; Talie, Fetau, Toa, Togatogo are known to have greater resilience to natural disasters and changing climate conditions</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p><b>Responsibility: MNRE/MAF/Villages</b></p>	<p>new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>Plan 2016-2020</p>
Upland Forest	<p>Continue programme by Forestry on replanting native forestry species of the upland forest</p> <p>Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p><b>Responsibility: MNRE-WRD &amp; Forestry/District/Village/CSSP</b></p>	<p>Protects and enhance local species diversity</p> <p>Reduced risk of slips and erosion</p> <p>Reduce impact from inland flooding</p>	<p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants</p> <p>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</p> <p>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</p>	<p>Community Engagement Plan</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
Protection of catchment areas	<p>Promote and support agroforestry and</p>	<p>Reduced risk of slips and erosion</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p>

	<p>other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate developments around the upland area</p> <p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility:</b> <b>MNRE/ /SWA/District/Village/ CSSP/GEF-SGP</b></p>	<p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p>	<p>Restoration Operational Plan 2016-2020</p>
<p>Village pool located in high risk hazard zones (coastal erosion and flooding from fluvial inundation, wave impacts and storm surges)</p>	<p>Village pool is currently in a poor location with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs</p> <p>Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works)</p>	<p>Increase adaptation during drought periods</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p>	<p>Utilise Hazard Maps and Geomorphologist findings to inform location and design</p> <p>MNRE Water &amp; Sanitation to conduct water testing and analysis of village pool prior to any intervention</p> <p>Update Village bylaws to include managing and maintaining village natural resources</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p>	<p>CIM Strategy 2015</p> <p>Community Engagement Plan</p>

	<b>Responsibility: MoF-CSSP/ MNRE/Villages/ NGOs</b>			
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Strengthen the governance of natural resources and land use through Bylaws	<p>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.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility: MWCSO /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>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</p> <p>Utilize Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>

<b>Non-CR issues raised during consultations</b>	<b>Proposed Solution</b>	<b>Comments</b>
Guardrail along open drain on East Coast Rd <b>Responsibility: LTA</b>	Provide cover for open drain	Not a CR issue. Safety issue under LTA RMP
Road extension to reach upland areas <b>Responsibility: Village</b>	Village to resolve with private landowners.	Road not a CR issue however, if request is approved, development will affect natural environment. Any extension to consider undertaking a proper EIA



# Vailele Village Map

## VAILELE



## 7. Letogo Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Guideline that assists with the Implementation	Relevant National, Sector Plans and Strategies
Village houses, churches and government assets located in high risk hazard zones	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility: Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Minimise expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>Utilise hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>

<p>Drainage systems to be improved in high risk areas of main East Coast Road</p>	<p>Assess and upgrade culverts on main East Coast road especially at junctions with access roads (Togo Street and Seugogo Street; sitting within combined hazard zones (IFHZ, CEHZ, CFHZ)–</p> <p>Implement national standards for culverts and drains to facilitate the overland flow of storm water and reduce flooding affecting infrastructure, village homes and other assets</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to conduct regular drainage and waterway clearance behind homes</p> <p>Village to fence off domestic animals to limit damage to drains and culverts and to reduce contaminants from entering watercourse and waterways</p> <p>District to regulate developments near and around waterways and drainage connecting to main East Coast</p>	<p>Improves infrastructure resilience and rate of response and recovery to natural hazards and disasters</p> <p>Encourages coastal families to relocate inland</p> <p>Maintains lifeline access for all of Upolu</p> <p>Minimizes national disaster recovery expenditure on damaged properties, public and private assets</p>	<p>Use existing information for guidance but not limited to:  <i>“Vulnerability Assessment of the Samoa Road Network (2017)”</i>; <i>“Review of National Road Standards in Samoa (2016)”</i>; <i>“Samoa Code of Environmental Practice (2007)”</i></p> <p>Undertake a Cost Benefit Analysis to weigh options for funding</p> <p>Incorporate environmental and social safeguards concerns in the design and undertake consultations with affected communities</p> <p>Apply for necessary permits as required by law</p> <p>Utilise hazard maps and Geomorphologist Infrastructure Drainage Database to inform designs</p> <p>Develop Integrated Catchment Strategy and Flood Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include maintenance of drainages and illegal rubbish dumping into waterways</p>	<p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p>
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	Road  <b>Responsibility:</b> <b>LTA/ MWTI/MWCSD/ Village</b>			
Flood protection measures for fords and bridges	Upgrade waterways  Upgrade all crossings  Upgrade or repair riverine embankment protection work upstream of Moata'a, Vini, Vaiala, Faatoia and Vaivase-uta  Ensure river channel upstream is cleared and maintained regularly  Construct levees to reduce flooding along estuaries and coastal streams  Install advisory edge markers and depth markers to warn vehicle and pedestrians at all crossings  Government and Villages to liaise and collaborate on processes needed to protect riverbanks from land clearing and developments  <b>Responsibility:</b> <b>MWTI/ LTA/MNRE/ District/ Village</b>	Minimise expenditure on damaged properties & personal assets  Mitigate potential damage from inland flooding  Reduce flooding of built up areas  Maintains lifeline access for all of Upolu  Safer villages, houses and roads	Conduct a full catchment management, drainage analysis and geotechnical engineering survey and use its recommendations to inform location and designs  Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database findings  Utilise environmental and social safeguards including EIAs in screening and designing infrastructure facilities  Develop an integrated land management plan with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area  Include in budget programming CBA, design and construction.  Designation of the IFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions	CIM Strategy 2015  TSP2014-2019 Goal 2 KO 1  Vulnerability Assessment of the Samoa Road Network (2016) and Road Network Adaptation Strategy, LTA
<b>Natural Resources and Environment</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guidelines that assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Upland Forest	Continue programme by Forestry on replanting native	Protects and enhance local species diversity	MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops and plants	Community Engagement Plan  Two Million Tree Planting

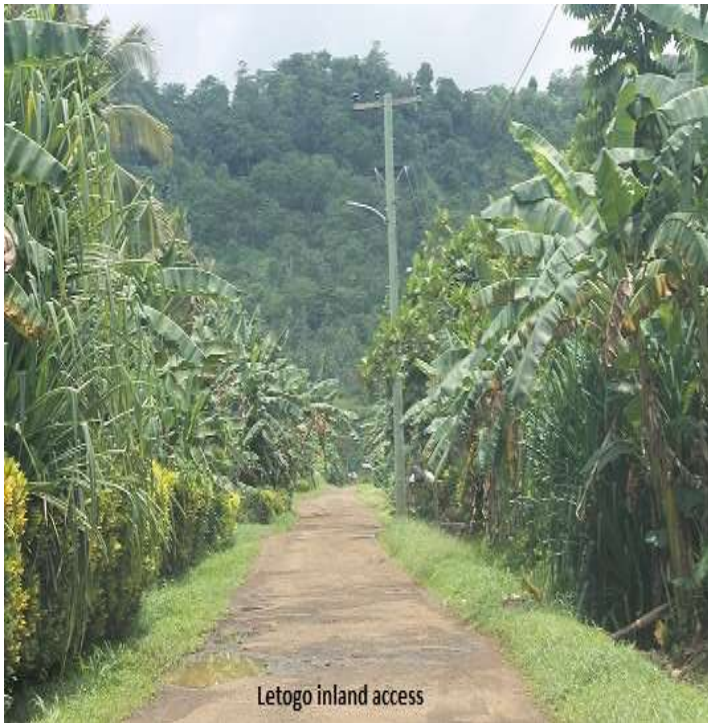
	<p>forestry species of the upland forest</p> <p>Promote agroforestry and mixed planting including fruit trees species to promote ecological stability, soil protection and reduce crop vulnerability to pests and diseases</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p><b>Responsibility: MNRE-WRD &amp; Forestry/District/Village/CSSP</b></p>	<p>Reduced risk of slips and erosion</p> <p>Reduce impact from inland flooding</p>	<p>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</p> <p>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</p>	<p>Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
Protection of catchment areas	<p>Promote and support agroforestry and other cropping systems that combine trees and crops, especially in catchments, and erosion-prone and sensitive areas</p> <p>Limit land clearance and agricultural development around catchment areas, SWA intake and boreholes in district</p> <p>Enforce Watershed Management Riparian Zone and Riverbank Encroachment Control and regulate</p>	<p>Reduced risk of slips and erosion</p> <p>Improve resilience of catchments</p> <p>Improve preparedness and readiness response to natural disasters</p> <p>Reduce contamination of water supply</p>	<p>Develop Integrated Watershed/Catchment Strategy and Flood Management Plan for Vaimauga East District</p> <p>Develop and register District/Village bylaws to include penalizing illegal deforestation and developments in upper catchment areas</p>	<p>Water Sector Plan</p> <p>Community Engagement Plan</p> <p>Restoration Operational Plan 2016-2020</p>

	<p>developments around the upland area</p> <p>Replant catchment areas with local species such as tava, and poumuli</p> <p><b>Responsibility:</b> <b>MNRE/</b> <b>/SWA/District/Village/</b> <b>CSSP/GEF-SGP</b></p>			
Flood protection measures (soft solution to support flood protection measures for infrastructure)	<p>Conduct riparian replanting along river channels and watercourses</p> <p>Encourage planting of indigenous species in conjunction with engineered water land drainage action plans</p> <p>Promote and support village and district afforestation in the upper and mid-catchment areas to reduce riverbank failures especially in flood prone areas</p> <p><b>Responsibility:</b> <b>MNRE/ Villages</b></p>	<p>Mitigate potential damage from inland flooding</p> <p>Reduce flooding of built up areas</p> <p>Safer villages, houses and roads</p>	<p>Implement Vaimauga East Integrated Catchment Strategy and Flood Management Plan in conjunction with hazard Maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>MNRE to zone hazard areas along major watercourses based on flood risk to provide suitable areas for riparian revegetation</p>	<p>Two Million Tree Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>
Soft coastal protection measures needed for most vulnerable areas	<p>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</p> <p>To act as an</p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

	effective wave barrier, a minimum distance of 200m of vegetation is needed  <b>Responsibility:</b> <b>MNRE/</b> <b>MAF/Villages</b>			
<b>Livelihood and Food Security</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Pest management; invasive plants and animals affecting taro plantations, vegetable gardens, inshore fishery resources	<p>Implement an eradication programme to eradicate, contain or exclude invasive species</p> <p>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</p> <p>Conduct education and awareness programmes on the impacts of invasive species</p> <p>Implement the Integrated Pest Management Programme</p> <p>Implement Sustainable Land Management (SLM) practices</p> <p>Build the capacity of farmers to manage stray animals (pigs, cattle) that are contaminating water sources</p>	<p>Maintains natural ecosystem</p> <p>Builds resilience of community livelihood and food security</p>	<p>Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to raise awareness of farmers on impacts to water flows from poor livestock management</p> <p>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</p> <p>Training for farmers on pests management particularly affecting fruit trees and crops</p>	<p>Agriculture Sector Plan 2016-2021</p> <p>Samoa's National Invasive Species Action Plan (NISAP)</p>

	<b>Responsibility: Villages /District/ MNRE/MAF/ SROS</b>			
<b>Governance</b>	<b>Best Solutions</b>	<b>Benefits</b>	<b>Guideline to assist with the implementation</b>	<b>Relevant Sector Plans, National Strategies &amp; Policies</b>
Strengthen the governance of natural resources and land use through Bylaws	<p>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.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility: MWCS D /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>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</p> <p>Utilise Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>

<b>Non-CR issues raised during consultations</b>	<b>Proposed Solution</b>	<b>Comments</b>
<p>Clarify ownership of land as some families may be residing illegally in the catchment Area</p> <p><b>Responsibility: Village/Government</b></p>	<p>Village to collaborate with Government on removing/relocating families who are residing illegally in the Catchment area</p>	<p>Not a CR issue but the relocation of squatters is critical to limit developments around Catchment area</p>



# Letogo Village Map

## LETOGO



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. Lauli'i Village Interventions

### CIM Plan Solutions

Infrastructure	Best Solutions	Benefits	Implementation Guideline	Relevant National, Sector Plans and Strategies
Village infrastructure located in high risk hazard zones; such as houses, schools, Churches, Businesses, Committee houses etc	<p>Relocate assets outside of high risk hazard zones when re-building</p> <p>Develop landuse planning and development controls to restrict developments within high risk hazard zones such as CEHZ and CFHZ</p> <p>Conduct awareness raising campaign on flood resilient building practices and designs for at risk communities living in and near high risk hazard zones</p> <p>Design infrastructure to take into account the immediate hazard zones; for example, raise floor levels of houses in flood prone areas</p> <p>Families and village to limit building and developing on natural overland flow paths exacerbating inland flooding and storm water surges</p> <p><b>Responsibility:</b> <b>Village / Families /MWTI/ MNRE/ MWCS D</b></p>	<p>Minimize expenditure on damaged properties and personal assets</p> <p>Safer villages, houses and roads</p> <p>Increases awareness for insurance</p>	<p>Planning provisions to be guided by the Planning and Urban Management Act 2004</p> <p>Enforcement of National Building Code 2017</p> <p>Encourage insurance of significant investments and assets within hazard zones</p> <p>utilize hazard maps and Geomorphologist Drainage Infrastructure Database to determine safe areas for relocation purposes</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an "at risk" zone with appropriate landuse planning controls and restrictions</p>	<p>CIM Strategy 2015</p> <p>National Building Code</p>
Upgrade access/work roads to facilitate relocation of houses away from hazard zones	Assess and upgrade Pito Road, Laulii Road and Leusoalii Access Road (LTA Upolu Zone 12 RRM) as potential escape route	<p>Improve infrastructure resilience and rate of recovery</p> <p>Improve preparedness and readiness</p>	<p>utilize hazard maps and Geomorphologist Drainage Infrastructure Database to inform location and designs</p> <p>Develop an integrated land management plan with the aim of reducing any</p>	<p>National Disaster Management Plan2017-2021</p> <p>CIM Strategy 2015</p> <p>TSP2014-2019 Goal 2 KO 1</p>



	<p>Upgrades to include adequate sized culverts to facilitate the overland flow of storm water exacerbating river overruns, and to reduce flooding onto main roads and village lands</p> <p>Install adequate drainage and culverts on main East Coast Road to facilitate free flow of streams into sea and reduce flooding into Lauli'i</p> <p>Implement regular drainage inspection and maintenance</p> <p>Village to regulate developments near and around road shoulders of all access roads</p> <p>Enforce environmental safeguards</p> <p>Where reclamations are proposed, Government and district to manage processes by requiring villagers to get the appropriate permits and consent</p> <p>The responsible company that caused the damage to the seawall to re-do the seawall and install new drainage culverts</p> <p><b><i>Responsibility: LTA/ MWTI/ MNRE/MWCSD/ District/ Village /Families</i></b></p>	<p>response to natural disasters</p> <p>Safer villages, houses and roads</p> <p>Minimise national disaster recovery expenditure on damaged properties and public assets</p>	<p>unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>Designation of the IFHZ, CEHZ and CFHZ as an “at risk” zone with appropriate landuse planning controls and restrictions</p> <p>Utilise environmental and social safeguards including EIAs in screening and designing built environment infrastructure projects for Vaimauga East district</p>	<p>Community Sector Plan</p>
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Natural Resources and Environment	Best Solutions	Benefits	Guideline to assist with the implementation	Relevant Sector Plans, National Strategies & Policies
Village pool	<p>Village pool is currently in a poor location with an assessment needed for options to either rejuvenate or find a new site depending on the location of springs</p> <p>Test the quality of the water source before any further investment on the pool is undertaken (eg: fence/repair works)</p> <p><b>Responsibility: MoF-CSSP/ MNRE/Villages/ NGOs</b></p>	<p>Increase adaptation during drought periods</p> <p>Improve health and sanitation</p> <p>Reduce contamination of water supply</p>	<p>utilize Hazard Maps and Geomorphologist findings to inform location and design</p> <p>MNRE Water &amp; Sanitation to conduct water testing and analysis of village pool prior to any intervention</p> <p>Update Village bylaws to include managing and maintaining village natural resources</p> <p>Utilize Sui o Nu'u monthly meetings to monitor progress of village programmes and responsibilities</p>	<p>CIM Strategy 2015</p> <p>Community Engagement Plan</p>
Soft coastal protection measures needed for most vulnerable areas	<p>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</p> <p>To act as an effective wave barrier, a minimum distance of 200m of vegetation is needed</p> <p><b>Responsibility: MNRE/ MAF/Villages</b></p>	<p>Soft coastal protection measures will support and strengthen existing and new infrastructure along the coast</p> <p>Reduce impact from coastal erosion and natural disasters</p> <p>Implements an Ecosystem Based Approach</p>	<p>Develop an integrated land management plan for Vaimauga East district with the aim of reducing any unnecessary actions that may adversely affect the natural habitats and ecosystems of the area</p> <p>MAF to assist in establishment of pilot sites to trial climate ready plant varieties</p> <p>MNRE Forestry, DEC and MAF to collaborate on supply of climate resilient crops</p>	<p>NESP 2017-2021</p> <p>Two Million Tree Planting Strategy 2015-2020</p> <p>Restoration Operational Plan 2016-2020</p>

Governance	Best Solutions	Other Benefits	Implementation Guideline	Relevant Sector Plans, National Strategies & Policies
<p>Strengthen the governance of natural resources and land use through Bylaws</p>	<p>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.</p> <p>Collaborate with Sui o Nu'u to monitor the use of and impact on natural resources</p> <p>Facilitate continuous awareness raising programs with the villages</p> <p><b>Responsibility:</b> <b>MWCS /Village</b></p>	<p>Strengthen implementation of all national sector plans</p> <p>Strengthen monitoring of all National Acts, Regulation, Strategies, Plans and Policies</p> <p>Improve ability of communities to adapt, respond and recover quickly in the long term</p> <p>Improve accountability and enabling environment of communities</p>	<p>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</p> <p>Utilize Sui o Nu'u monthly meetings to monitor progress of district/village bylaws</p>	<p>Village Fono Act (Amendment Bill 2016)</p> <p>Community Sector Plan</p> <p>Community Development Plan 2016-2021</p>



Poorly drain access road



Exposed Pipelines



Exposed developments to fluvial flooding

# Lauli'i Village Map

## LAULI'I VILLAGE



# Upolu AF Districts Overview Map of Coastal Inundation Zones

