



Government of Samoa

Ministry of Environment and Natural Resources  
Government of Samoa



**NATIONAL  
ENVIRONMENT AND DEVELOPMENT  
SECTOR  
PLAN  
(NESP)  
2013 - 2016**

June 2013



Australian Government  
AusAID



Government of Samoa

**MNRE Resource Information Centre**

Ministry of Natural Resources & Environment ( MNRE )

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3. Satitua River
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6. Invasive Merremia vine
7. Community consultation at Samata i Tai, Savaii ( SOE & NESP Review )
8. Green Turtle
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**Acronyms used**

ABS	Access and Benefit Sharing
AG	Attorney General
BioRAP	Biological Rapid Assessment
CCAs	Community Conservation Areas
CI	Conservation Internation
CIM	Coastal Infrastructure Management Plans
CITES	Convention on the International Trade in Endangered Species of Wild Fauna & Flora
CoC	Chamber of Commerce
COEP	Code of Environmental Practice
DMO	Disaster Management Office
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPC	Electric Power Corporation
EEZ	Exclusive Economic Zone
EREG	Environment Resource Education Guide
FDES	Framework for Development of Environment Statistics
FPAM	Forest Preservation Programme
FPP	Forest and Protected Area Management
GHG	Greenhouse Gases
IEA	Integrated Environmental Assessment
ICAO	International Aviation Organization
ICCRAHS	Integrating Climate Change Risks in the Agriculture & Health Sector of Samoa
ICCRIFS	Integration of Climate Change Risks and Resilience into Forestry Management in Samoa
ICZM	Integrated Coastal Zone Management
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Areas
KESO	Key Environment Strategic Objective
LIDAR	Light Detection And Ranging
LTA	Land Transport Authority
MAF	Ministry of Agriculture and Fisheries
MESC	Ministry of Education Sports & Culture
MESCAL	Mangrove Ecosystem for Climate Change Adaptation and Livelihood
MCIL	Ministry of Commerce Industry & Labour
MCIT	Ministry of Communications & Information Technology
MFAT	Ministry of Foreign Affairs & Trade
MJCA	Ministry of Justice & Courts Administration
MNRE	Ministry of Natural Resources and Environment
MoF	Ministry of Finance
MoH	Ministry of Health
MWCSD	Ministry of Women, Communities and Social Development
MWTI	Ministry of Works, Transport & Infrastructure
NBSAP	National Biodiversity Strategy and Action Plan
NAP	National Action Plan
NAPA	National Adaptation Program of Action
NBF	National Biosafety Framework
NEOC	National Emergency Operation Centre
NEMS	National Environment Management and Development Strategies
NGO	Non Governmental Organizations
NOAA	National Oceanic and Atmospheric Administration
NWRM	National Water Resource Management
ODS	Ozone Depleting Substance
PES	Payment of ecological services
PPCR	Pilot Project for Climate Resilience
PSC	Public Service Commission
RAC	Refrigeration and Air Condition Technicians
SAMFRIS	Samoa Forest Resource Information System

SATFP	Samoa Agro forestry and Tree Farming Program
SBS	Samoa Bureau of Statistics Environment Statistical Unit
SDS	Strategy for the Development of Samoa
SDVP	Sustainable Development Village Project
SLC	Samoa Land Corporation
SLM	Sustainable Land Management
SPREP	Secretariat for the Pacific Regional Environment Programme
SOE	State of the Environment Report
SOPAC	SPC/Technical Division for Applied Geosciences
STA	Samoa Tourism Authority
SWA	Samoa Water Authority
TEC	Target Environmental Component
TK	Traditional Knowledge ( Biological )
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
QMS	Quality Management System

## 1. Visions and Goals at the National and Sector levels

### Strategy for the Development of Samoa (SDS) 2012 – 2015 Vision

***Improved Quality of Life for All***

### SDS Goals for the Environment Sector

- ***Environmental sustainability***
- ***Climate and Disaster Resilience***

### National Environment & Development Sector Plan (NESP) 2013 - 2016

#### Vision

***Samoa's natural and built environments are well protected and resilient to natural and human-induced hazards, and supporting a sustainable and healthy human population.***

#### Goal

***Improved environmental sustainability and disaster resilience through Green Growth.***

#### Theme

***Sustainable development for green growth***

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<sup>1</sup> *Green growth - a practical means to achieve the transition to a green economy and sustainable development through concrete measures to advance the sustainable development of small island states. It allows green policies options to drive growth and investment and seeks to steer economic activity away from the overexploitation of natural capital. At the same time, it can directly help to improve livelihoods and social stability by enhancing energy and food security. ( Rio+20 Pacific Preparatory Meeting, Apia, July 2011 )*

*Green economy is a development approach that purposively charts a framework to integrate and reconcile economic and ecological interests. It seeks to transform the economy by the 5 pathways it espouses: 1. Investing in natural capital; 2. Sustainable consumption and production; 3. Sustainable infrastructure; 4. Green markets and businesses; 5. Green taxes and budget reforms. ( Rio+20 Pacific Preparatory Meeting, Apia, July 2011 )*

## 2. How to read the NESP

### a. How to read the NESP

The NESP is to be read in conjunction with the 2013 State of Environment (SOE) report and the NESP Report: Background & Process.

The SOE report produced in parallel to the NESP analysed and assessed the states of the habitats and the drivers and pressures impacting on them, to derive impacts and responses that comprise the prescriptive part of the NESP. The NESP updates the 1993 National Environment & Development Management Strategies, NEMS.

The SOE report provides:

- I. The detailed analysis of the overall context of drivers and pressures that interact and combine to cause environmental changes in Samoa.
- II. Assesses the state of health of the key habitats and species groups comprising the country's biodiversity and biophysical environment
- III. Identifies impacts generated by the operation of environmental drivers and pressures, and prescribes strategic responses for alleviating their negative impacts.

Based on the Integrated Environmental Assessment (IEA) process, the state of the environment review and NEMS were designed to provide relevant answers to the 5 fundamental assessment questions on the state of Samoa's environment and to provide for effective communication of the assessment to policy makers and different stakeholders.

- I. What is happening to the environment and Why?
- II. What are the consequences for the environment and humanity?
- III. What is being done and how effective is it?
- IV. Where are we heading?
- V. What actions could be taken for a more sustainable future?

### b. Approach to the SOE and NESP

The assessment of Samoa's environment for the 2013 SOE Report and NESP (previously called the NEMS) was based on habitat types, as opposed to past approaches wherein the environment was divided up according to different environmental resources such as forests, water, land, fisheries etc.

The analysis of environmental changes and quality thus looked at changes in the health of each habitat type, and considers the underlying drivers and pressures that impact and have causative effects on them. In this approach, Samoa's environment is organized into 8 habitat types;

1. Upland habitats
2. Lowland habitats
3. Coastal habitats
4. Rivers and Streams
5. Inshore and Offshore Marine habitats
6. Rural and urban built environment
7. Protected Areas and Key Biodiversity Areas (KBAs) and
8. Atmosphere Weather and Climate

The **DPSIR framework** is applied to both the SOE and NESP with the descriptive components of **Drivers**, **Pressures** and **States** addressed in the SOE, and the prescriptive elements of **Impacts** and **Responses** providing the focus for the NESP. A discussion of impacts provides the substance of the NESP.

### 3. What is the NESP?

#### c. What is the NESP?

The NESP articulates the overall vision and goal for the environment sector, and the higher level outcomes that it seeks to achieve. It reflects the overall vision and goal of the SDS and in doing so, clarify how the national goal and vision will be achieved in the qualities of the natural environment that the NESP represents and is responsible for.

#### d. Purpose of NESP

The NESP's primary purpose is to define and articulate the key strategies for achieving the Environment Sector and SDS goal of '**environmental sustainability and disaster risk reduction**'. It is based on the findings of the State of Environment Report but is a forward looking and prescriptive document that sets out strategies and measures for addressing the key environmental issues facing Samoa. Other related purposes include:

- I. discusses issues and impacts on the environment that stem from activities of other economic sectors including agriculture, water and sanitation, infrastructure and energy, tourism.
- II. seeks to complement other sector strategies with environmental related issues by identifying specific areas of concern that need addressing in those sectors
- III. identifies sector strategies for pursuing the overall national goals of environmental sustainability and disaster resilience set out in the Samoa's Development Strategy (SDS) 2012 – 2016.
- IV. promotes multi-agency coordination to ensure cross-cutting issues are implemented and not duplicated.
- V. propose arrangement for implementation, coordination, monitoring and reporting.

#### e. Guiding Principles

The NESP reaffirmed the Principles of the Rio Declaration 1992 underpinning the notion of equitable and sustainable development. These principles are appended in the NESP Report Background and Process ( Appendix 1 ).

The NESP is also cognizant of the outcome statement of the Rio+20, entitled, "The Future We Want", and its commitment to "...freeing humanity from poverty and hunger as a matter of urgency" (UN General Assembly, 2012)<sup>2</sup>. The Rio + 20 outcome statement elaborates that to achieve this goal, it is necessary to promote "sustained, inclusive and equitable economic growth" (ibid.) and "integrated and sustainable management of natural resources and ecosystems that supports, inter alia, economic, social and human development while facilitating ecosystem conservation, regeneration and restoration and resilience in the face of new and emerging challenges" (ibid., para 4). And while putting people at the center of sustainable development", there was agreement of the need to "work together to promote sustained and inclusive economic growth, social development and environmental protection and thereby to benefit all" (ibid., para 6).

#### f. What are High Level Outcomes?

The High Level Outcomes clarify the qualities of a natural environment that Samoa seeks to achieve that is both sustainable and resilient. These outcomes reflect the overarching end-results identified as a result of the state of the environment analysis based on the key habitats. The Outcomes provide broad strategic directions to improve environmental conditions and to achieve more sustainable environments in the future.

#### g. What are Key Environment Sector Objectives ( KESO )?

The Key Environment Sector Objectives are aligned to each of the Outcomes and each Objective prescribes specific strategies to address key environmental issues discussed in the habitats and to achieve the set outcomes. The strategies are the prescriptive elements of **Impacts** generated by the operation of environmental drivers and pressures in each of the habitats are translated into strategic **Responses** under KESOs for alleviating their negative impacts.

#### h. NESP Sector Coordination – Implementation & Monitoring

The cross cutting nature of the environment as a development issue and the shared responsibility assigned to the management of several environmental habitats and resources, makes the creation of an effective coordination mechanism for NESP implementation an imperative. The NESP identifies the principal implementers of different

<sup>2</sup> United Nations General Assembly Resolution 66/288, annex, 27 July 2012.



strategies. In general, MNRE assumes the lead responsibility for most, but also depends on input and the support of other agencies and organisations. The NESP Advisory Committee ( NESPAC ) is proposed for this role.

MNRE's institutional set up seeks to establish an Environment Sector Coordination Unit under the Corporate Services Division as linkage to all sectors and the coordination of activities under the NESP. Part of the NESP Advisory Committee role is to coordinate the monitoring of environmental changes resulting from NESP implementation. Environmental monitoring is an important part of all sector planning, especially for agencies and organizations with activities that has direct impacts on the natural and the built ( human ) environment.

The coordination of environmental monitoring involves ensuring the compatibility of monitoring data, the sharing of monitoring resources and capabilities, the harmonization of monitoring methods, protocols and indicators, and the development of a clearing-house mechanism for the proper storage and efficient retrieval of information for the use of all stakeholders.

**i. Monitoring and Updating the NESP 2013 – 16**

As a Sector Plan, the NESP will require regular review and updating to keep abreast of changing circumstances, new information and new emerging issues and priorities. The timing of these updates should seek to bring environmental sector planning in line with the national development planning process, ie., Samoa's Development Strategy 2012 - 16.

A yearly review of the NESP should be conducted to track any changes in the status of the environment using the set indicators established in the SOE assessment. The focus for M & E to be on Outcome Evaluation to assess the HOW and WHY outcomes are/ not being achieved, and on assessing the overall contributions of various factors to a given OUTCOME, with such factors including partnerships, community awareness, policy advice and dialogue, advocacy and coordination rather than on implementation processes. A simple evaluation matrix to be developed to extract lessons learned, findings and recommendations by assessing progress towards the outcomes.

**j. Linkages to the Strategy for the Development of Samoa ( SDS ) 2012-16 ( Appendix 3 )**

The environment component in the SDS 2012-16 comes under Priority Area 4: Environment Sector with 2 Key Outcome Areas encompassing Environment Sustainability and Climate and Disaster Resilience and supported with a range of strategic areas. Although the SDS was compiled prior to the SOE and NEMS review, the findings and recommendations from the assessment stands to reaffirm priority areas already outlined in the SDS for the environment sector, which has now been consolidated and refined in the NESP.

**j. Members of the NESP Advisory Committee ( NESPAC )**

The NESP Advisory Committee is comprised of representatives from the Government Ministries, Corporations, Private Sector and NGOs and chaired by the CEO of the Ministry of Natural Resources & Environment. ( Annex 2 ).

#### 4. High Level Development Outcomes

1. Habitats<sup>3</sup> and species within protected areas, sanctuaries and KBAs<sup>4</sup> are protected and maintained in natural (pristine) condition.
2. Restoration of degraded habitats<sup>5</sup> and threatened species of economic and conservation importance to healthy states and viable populations.
3. Environmental resources such as forests land, water and fisheries are managed sustainably to protect them from natural threats and contamination.
4. The rural and urban built environment<sup>6</sup> is sustainable and resilient against extreme climate induced events and longer term climate induced changes.
5. Knowledge of Samoa's biodiversity and natural resource is enhanced and kept up to date through science based assessments and ongoing monitoring.
6. Promote Low Carbon Development<sup>7</sup> in the Energy Sector through the establishment of a Nationally Appropriate Mitigation Action Programme.
7. Stakeholder engagement and involvement (in decision making) in implementation of environmental management initiatives is strengthened.
8. Reinforce an enabling environment that promotes sustainable financing and partnerships with international organizations to ensure the provision of better support towards environmental sustainability and disaster resilience<sup>8</sup>.
9. Strengthened institutional framework with improved governance and capacity at all levels<sup>9</sup> to promote integrated decision making, improve monitoring and enforcement ( SOE ), and strategic environmental assessment.
10. Promote and mainstream an integrated habitat-based approach<sup>10</sup> towards environmental assessments to support climate change adaptation<sup>11</sup> and mitigation<sup>12</sup>.

<sup>3</sup> 8 Key Habitats defined in the State of Environment Review: Upland & Cloud Forest, Lowland, Coastal strand, Rivers & Stream, Inshore & Offshore Marine, Rural & Urban Built Environment, Protected Areas and Key Biodiversity Areas (KBAs), Atmosphere, Weather and Climate.

<sup>4</sup> Key Biodiversity Areas of Samoa: Key Sites containing species most at risk of extinction, and are priority sites for conservation at a global level and national level. Samoa's KBAs comprises 8 Terrestrials + 5 Marine Areas

<sup>5</sup> Degraded habitats - sites assessed with loss of ecological and conservation value due to damages as a result of human activities, developments, marine pollution, reclamation, sand mining, tourism, mangrove cutting, deforestation, agricultural expansion etc.

<sup>6</sup> Built environment - consists of buildings and all other structures people have built. The built environment is considered as separate from the natural environment and identifies all physical man-made developments that improve the quality of life.

<sup>7</sup> Low carbon development - option for countries to explore how to achieve economic growth targets through a low carbon trajectory or through a carbon neutral pathway

<sup>8</sup> Disaster resilience - The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

<sup>9</sup> Capacity development: Individual level - Process of changing attitudes and behaviours; Institutional level - overall organizational performance and functioning capabilities; Systemic level - overall policy, economic and accountability frameworks in which institutions and individuals operate.

<sup>10</sup> Integrated habitat based approach - an assessment method of environmental monitoring based on ecological habitats with the application of the DPSIR model and the inter-related cause-effect relationship between factors of environmental change, impacts and responses.

<sup>11</sup> Adaptation to the adverse effects of climate change is - to reduce the impacts of climate change that are happening now and increase resilience to future impacts by putting in place appropriate measures to reduce the vulnerability of household, communities etc.

<sup>12</sup> Mitigation is defined as any anthropogenic ( human) interventions that can either reduce the sources of greenhouse gas (GHG) emissions (abatement) or enhance their sinks (sequestration)./ UNFCCC

## 5. Key Environment Sector Objectives (KESO)

1. To implement strategies for rehabilitating, protecting and conserving priority terrestrial ( upland, lowland and coastal ) habitats and species.
2. To implement strategies for rehabilitating, protecting and conserving threatened marine habitats and species.
3. To implement strategies for the restoration of habitats critical to species and recovery of species populations of conservation concerns.
4. To implement strategies for protecting key environment resources such as forests land, water and fisheries.
5. To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment.
6. To strengthen scientific understanding of Samoa's habitats and species and geosciences to better inform planning for environmental sustainability and for strengthening community resilience.
7. To develop and implement a Nationally Appropriate Mitigation Action (NAMA) Programme towards a Low Carbon Energy Sector.
8. To facilitate the direct participation of local communities (village councils, women, and youth) and private land owners in the planning and management (including monitoring) of habitats and species in areas under communal/freehold ownership and control.
9. To strengthen policy, regulatory, financial and strategic planning and management framework for environmental sustainability and disaster resilience.
10. Strengthen national capacity for environmental management, coordinate the NESP implementation, environmental monitoring and assessment.
11. To implement habitat/ecosystem-based strategies to support climate change adaptation and mitigation.



*Fagaloa Bay - Uafato/Tiavea Conservation zone, photo by NZ Army 2008*

## 6. Key Environment Sector Objectives and Strategies

### 6.1 Key Environment Sector Objective (KESO) 1 –

**To implement strategies for rehabilitating, protecting and conserving priority terrestrial ( upland, lowland and coastal<sup>13</sup> ) habitats and species.**

#### Sector Strategies

##### 1. Create effective and representative terrestrial protected and conservation areas.

- Acquire legal status for proposed terrestrial KBA network.
- Integrate the management of existing national parks and reserves into the KBA network.
- Develop KBA management plans (including upscaling existing parks management plans) and secure funding for effective implementation.
- Promote the replanting of native trees and other vegetation in the urban built environment.
- Encourage and support the creation of community managed protected areas
- Secure resources to support community managed terrestrial protected and conservation areas
- Conduct ecological surveys on the taxonomic data gaps for key selected sites identified under various forest projects ( eg., ICCRIFS, BioRAP, FPAM )
- Spatial Information and maps updated for ecological data and to integrate climate change risks
- Cadastral mapping to support PA network, biological and geophysical data gaps

##### 2. Encourage and facilitate the participation of land owning communities in the management of KBAs.

- Raise awareness and educate local communities of the strategic and conservation importance of the KBA network.
- Investigate the PES (payment of ecological services) approach for engaging villages and individual land owners in the protection of critical habitats including water catchment areas, and areas of high conservation values.
- Encourage and support ecotourism and other sustainable income-generating activities by local village groups as integral parts of KBA management.
- Facilitate access by schools and the general public to environmental information in appropriately packaged forms.
- Provide basic training for village representatives in habitat and species monitoring and reporting.
- Encourage and facilitate the establishment of competitive small grants funding mechanisms to support KBA friendly income generating activities by community groups.
- Provide opportunities for local communities engaged in conservation initiatives to share their experiences and knowledge.
- Support the incorporation where the heritage of cultural and traditional knowledge shared and promoted for the protection and conservation of natural resources and conservation areas.
- Promote awareness and understanding of Access to Benefit Sharing & Protection of Traditional Biological Knowledge ( ABS & TBK )

##### 3. Reduce other pressures on terrestrial habitats and species.

- Review and update the 2004 National Biodiversity Strategies and Action Plan (NBSAP). Secure funding and implement the updated NBSAP priorities.
- Review and update the 2008 – 2011 National Invasive Action Plan (NIAP). Secure funding resources and implement the updated NIAP priorities.
- Review and update Samoa's National Biosafety Framework (NBF). Secure funding, build local capacities and implement the updated NBF priorities.
- Review and update Samoa's National Action Plan ( NAP ) for land degradation. Secure funding, build local capacities and implement the updated priorities.
- Develop an Action Plan for the conservation of Samoa's marshlands. Secure funding and implement identified priorities.

<sup>13</sup> *Terrestrial habitats - Cloud & Upland Forests, Lowland areas & Coastal strands: SOE Report 2013*

- Explore and where appropriate, implement ex-situ conservation measures to ensure the survival of the Manumea, Maomao and other critically endangered endemic bird species.
- Develop and implement a National Framework and Strategy for soil resource management and conservation in Samoa.
- Assist local communities to enforce existing regulations as well as the monitoring of resources
- Strengthen the implementation and enforcement of existing planning frameworks by providing additional resources including additional staff.

**4. Identify innovative ways to adapt to the impact of climate change.**

- Implement sustainable plans for improving the protection of critical catchment areas.
- Assign priority to securing the full protection of the entire Apia, Vaisigano and Tafitoala catchment areas.
- Promote and support the replanting of catchment and erosion prone areas.
- Promote and support the replanting of mangrove forests and exposed coastal areas.
- Encourage and facilitate the relocation of households away from high risk flood-prone areas.
- Promote the growing of food crops that are not vulnerable to wind damage including yams, sweet potatoes and similar ones.
- Support the full implementation of Samoa's NAPA.
- Encourage the implementation of natural solutions to enhance coastal resilience to climate change
- Promote efforts to rehabilitate all degraded land areas through the replanting of appropriate tree species and the use of sustainable soil management techniques.
- Develop and promote sustainable models of future climate for project sites based on a range of climate change scenarios.

**5. Strengthen the capacity of MNRE and other key national partners to more effectively plan and implement its responsibility for environmental protection and management.**

- Strengthen Forestry Division and DMO's forest fire prevention capacity through the implementation of the forest fire management strategy in collaboration with the FESA.
- Encourage compliance with Code of Environmental Practices (COEPs) on impact studies and project design.
- Support PUMA training for private sectors on standards and COEPs.
- Encourage and support zoning<sup>14</sup>, disaster planning and integrated coastal zone management planning.
- Strengthen the enforcement of sustainable land management practises and through harmonizing the land tenure system
- Strengthen integrated land use planning amongst the key national stakeholders: MNRE, MAF, MWCSO, and infrastructure services.
- Encourage training of staff and students in environmental and natural resources management by providing short and long term scholarship opportunities for tertiary level training both locally and abroad.
- Establish a high-level multi stakeholder planning mechanism to support an integrated approach to national land use planning to guide a detailed planning at the sector and sub sector level in order to optimise allocation of land based on nationally determined priorities.



*MNRE/Stakeholders Integrated Environmental Assessment Workshop for the SOE Review Plan, 2011*

<sup>14</sup> Zoning including land use zoning and hazard zones

**6.2 Key Environment Sector Objective (KESO) 2 –**

**To implement strategies for rehabilitating, protecting and conserving threatened marine habitats and species.**

**Sector strategies -****1. Create Secure and Effective Marine Protected Areas (MPAs).**

- Support the implementation of Marine KBAs already identified and integrate the management of existing reserves into the KBA network
- Acquire legal status for proposed marine KBA network.
- Support existing village fisheries reserves.
- Encourage the establishment of new reserves in areas with low coral and fish biomass especially along the northern Upolu Coast from Manono/Apolima strait to Fagaloa.

**2. Reduce Other Pressures on Coastal habitats.**

- Encourage the adoption of village resources management plans and by-laws and support their enforcement against coral destruction, use of unsustainable fishing methods, and sources of coastal pollutants.
- Control coastal development through an Integrated Coastal Zone Management (ICZM) strategy to help protect reefs from long-term stresses.
- Reduce coastal reclamation and sand mining activities by effectively enforcing existing planning and approval frameworks.
- Regulate quality of waste/brackish/grey/ballast water discharged according to acceptable standards.
- Support public and community awareness and education activities on the adverse impacts of unsustainable coastal activities on the environment and community livelihoods.
- Strengthen environmental education in primary, secondary and tertiary school curriculum.

**3. Identify Innovative Ways To Adapt.**

- Assess ways for local coastal communities to adapt to climate induced changes in coral reefs and inshore habitats.
- Develop a national strategy to deal with these impacts in consultation with local communities and the private sector.
- Support and encourage the consumption of alternative sources of protein to fish and marine fauna.
- Support environmentally sustainable traditional fishing practices
- Promote coral rehabilitation through coral transplanting programs and artificial reefs.
- Collaborate with relevant organizations and participate in regional approaches to prevent the introduction of invasive species.
- Prevent and control marine invasive species from establishing in Samoan waters.
- Conduct an inventory of all deliberately introduced species and varieties and assess their current status.

**4. Promote the conservation, sustainable management and equitable sharing of marine and ocean resources.**

- Support regional/national efforts towards marine conservation
- Provide capacity building and secure resources to implement action plans to combat marine litter and pollution
- Secure funding sources and work collaboratively with key partners on key capacity needs ( SPREP, Conservation International, SOPAC, NOAA, etc )



*Degraded coral reef,  
Lalomanu, 2012*

### 6.3 Key Environmental Strategic Objective (KESO) 3 –

To implement strategies for the restoration of habitats critical to species and recovery of species populations of conservation concerns.

#### Sector Strategies -

##### 1. Policy/legal frameworks and Implementation

- Strengthen the implementation, monitoring and enforcement of existing legislations eg, Marine Wildlife Regulation 2009 that offers protection, management and conservation of listed species of conservation concern.
- Develop management plans for the restoration of habitats critical to species such as turtles, dolphins etc
- Promote eco-tourism operations beneficial to the conservation of species and critical habitats
- Monitoring of developments in collaboration with Fisheries Division, Samoa Tourism Authority and Ministry of Women, Community & Social development etc.
- Implementation and monitoring of national/international obligations under CITES<sup>15</sup>
- Ensure close coordination and cooperation with key agencies in the implementation of obligations under CITES.
- Encourage community programs that would assist with the recovery of the listed species of conservation concern including the re-introduction of the designated species
- Increase and promote the awareness of the general public with regards to these species.
- Secure resources to assist with recovery programs and costs
- Encourage the listing of these species in the IUCN Red Listing to ensure International cooperation
- Successful pilot sites of degraded lands rehabilitated and improved critical landscapes under GEF 5 Project

##### 2. Exploration of resources & Research

- Establish guidelines to control and monitor the use of resources within and outside of Samoa
- Permits and approval for research on resources ( Forest products, Water, biodiversity etc )
- Promote knowledge sharing and technical expertise through research and awareness



*Cuvier's Beaked Whale stranded at Utulaelae village, 2010, photo by Ms Juney Ward*

<sup>15</sup> Convention on the International Trade in Endangered Species of Wildlife Fauna and Flora

**6.4 Key Environment Strategic Objective (KESO) 6a, b, c –**

**To implement strategies for protecting key environment resources such as forest land, water & fisheries.**

**Sector Strategies – a. Forest land****1. Policy frameworks to help reverse deforestation and forest degradation and promote sustainable use and management of forests as well as their conservation and restoration.**

- Formulate, implement and enforce sustainable use of forest management plans and regulatory tools.
- Rehabilitate critical degraded areas within the upland and lowland habitats.
- Implement and enforce the Forest Policy, Forestry Management Act 2011, regulations through the MNRE Authorised Officers and Village Council, Committees
- Develop effective partnerships with NGOs/CSOs (komiti tumama, schools)

**2. Improve knowledge and understanding of forests resources**

- Expand and maintain SAMFRIS for quality assurance of forest resource data and information
- Conduct ecological restoration programmes with communities and schools.
- Build capacity and strengthen community engagement to sustainably manage forest resources.
- Produce maps and spatial data for forestry, PA networks, hazards, water catchments areas etc
- Enhance public awareness programmes to foster active participation from the general public, communities, schools, stakeholders in forest resource management.

**3. Improve the enabling environment for sustainable forest management**

- Formulate sustainable forest policy and management plans for protected forest areas with all stakeholders.
- Enforce ongoing monitoring and evaluation of policies and plans with key stakeholders
- Promote partnerships with communities, Working Committees, private sector, tour operators etc in the management and monitoring of forests areas
- Mainstream and integrate forest issues into other sector policies/plans
- Develop community programmes to rehabilitate and restore critical degraded habitats through conservation projects for forests and sustainable land management

**4. Strengthen community engagement in sustainable forest management**

- Active participation of communities in Forest conservation projects
- ICCRIFS Pilot sites in Upolu & Savaii
- Forest & Protected area management ( FPAM )
- Samoa Agro forestry & Tree Farming
- Forest Preservation Program
- Improved knowledge & Capacity within communities

**Sector Strategies – b. Water****1. Strengthen watershed conservation and management**

- Formulate, implement and enforce watershed management plans and regulatory tools in key watershed areas sustaining water supplies
- Rehabilitate river banks/riparian zones
- Take critical watershed areas (upstream) as reserves

**2. Improve knowledge and understanding of water resources**

- Expand and maintain the National Hydrometric Network
- Quality assurance of water resources data and information
- Expand the scope of water quality testing to include physical, biological and chemical parameter analysis.
- Build local capacity to ensure successful completion of drilling programme for groundwater mapping and modelling
- Strengthen baseline hydrological information on groundwater, coastal springs and lakes
- Carry out sustainable yields assessments for surface and groundwater sources



**3. Improve the enabling environment for water resources management**

- Formulate the National Water Resource Plan ( NWR )
- Provide secretariat functions to the Water Resources Technical Committee and the Water Resource Management Board
- Ongoing monitoring and evaluation of policies and plans
- Formulation of village bylaws with communities
- Promote effective partnership with SOEs and the private sector
- Mainstream and integrate water issues into other sector policies/plans
- Develop community programmes to rehabilitate and effectively protect groundwater, freshwater springs and lakes ( though conservation projects )

**4. Strengthen enforcement of water legislation and plans**

- Implement and enforce the National Water Resources Policy, Water Resources Management Act 2008, regulations and village bylaws
- Strengthen enforcement and effective implementation of the Water Abstraction Licensing Scheme
- Reduce pollution in rivers, streams and lakes through enforcement options in the Water Resources Management Act 2008
- Include water safety plans in the Samoa National Drinking Water Standards 2008

**5. Strengthen community engagement in water resources management**

- Develop effective partnerships with NGOs/CSOs (komiti tumama, schools)
- Develop a pilot for payment for ecosystem services in relevant watershed areas
- Pilot and evaluate feasibility of community extension services in critical watershed areas for possible upscaling to strengthen engagement with key communities

**Sector Strategies – c. Fisheries**

1. Strengthen collaboration with Ministry of Agriculture & Fisheries / Fisheries Division
  - Support services and information sharing with MAF to strengthen partnership
  - Active participation in marine conservation programmes.
2. Improve the enabling environment for coordination between agencies and stakeholders, etc
  - Ongoing monitoring and evaluation of policies and plans relevant to marine resources’ conservation and sustainable livelihood
  - Collaborate and assist with the formulation of village bylaws and MPAs
  - Partnership with SOEs and the private sector to promote collaborative monitoring
  - Mainstream and integrate environment issues into other sector policies/plans



*Conservation efforts under the IWRM Project targeting upland forest and catchments areas, photo by Sam Semisi/MNRE*

**6.5 Key Environment Sector Objective (KESO) 5 –**

**To implement strategies to reduce the vulnerability<sup>16</sup> and increase the resilience<sup>17</sup> of Samoa's urban and rural built environment<sup>18</sup>.**

**Sector Strategies****6.5.1 Waste management****1. Improve household and industrial waste management –**

- Promote and encourage waste to energy conversion of municipal, organic and agricultural wastes.
- Increase the percentage of household waste reaching the landfills.
- Encourage household composting of organic wastes.
- Facilitate and support waste segregation at source.
- Facilitate and support the recycling of non-biodegradable household and commercial waste using among other strategies, the use of incentives.
- Institute and enforce bans on the importation of selected non-biodegradable and hazardous materials.
- Encourage and facilitate the importation and use of biodegradable alternatives to banned non-biodegradable products.
- Encourage successful contractors to use efficient machinery and technologies to improve the efficiency and effectiveness of services.
- Undertake regular waste audits (three yearly) to provide up-to-date information to support nation-wide waste management.
- Promote waste management as every one's responsibility through appropriate approaches including public education and awareness activities.
- Promote national anti litter education campaign
- Partnership to continue the national village beautification competition with STA, MWCSO, private sector
- Develop sustainable systems to improve disposal and storage of hazardous waste substances

**2. Strengthen the legal framework for waste management.**

- Actively enforce the Waste Management Act 2010.
- Enact regulation to clarify and elaborate on stipulations of the Act.
- Encourage the development and adoption of village by-laws to support and enforce waste management within villages.
- Strengthen community capacity to enforce village by-laws for waste management and monitoring.
- Develop a Principle Act to address and manage the full spectrum of the chemical lifecycle and hazardous waste (eg, oil, e-waste, mercury and other hazardous chemicals)
- Implement Samoa's obligations under the Rotterdam, Stockholm, Basel, Waigani and Noumea Conventions
- Improve monitoring, evaluation and risk assessment of hazardous chemicals

**3. Strengthen MNRE and relevant stakeholder capacity in waste management.**

- Provide appropriate training and capacity building opportunities for MNRE and waste contractors with regards to safety standards and waste management.
- Upgrade waste treatment facilities in Vaiaata including the installation of leachate collection facilities.
- Strengthen compliance monitoring for waste collection contractors.
- Improve capacity for prevention, preparedness and response to chemicals accidents
- Improve facilities for technical research and assessment of chemical wastes.
- Promote safe alternatives for banned ozone depleting substances

<sup>16</sup> reduce the vulnerability to climate change - is the risk of adverse things happening Vulnerability is a function of three factors: Exposure, Sensitivity, Adaptive capacity, community resilience - is the capacity of a community to respond to disasters and adverse impacts of climate change and recovering quickly

<sup>17</sup> Resilience - ability to recover to a sustainable stable state after an event, etc (Note: definitions taken from the UNFCCC context.)

<sup>18</sup> Rural & Urban built environment - consists of buildings and all other structures people have built. The built environment is considered as separate from the natural environment and identifies all physical man-made developments that improve the quality of life.

**4. Improve risk management and governance of chemicals and hazardous waste**

- Develop a sector wide chemical management policy
- Strengthen inter-agency coordinating mechanisms among the relevant stakeholders
- Develop a tracking system to monitor the trade, storage, distribution, use and disposal of chemicals and hazardous waste
- Develop a Chemicals Information Network (CIN) to facilitate the exchange of national and international information and data on chemicals and hazardous waste
- Build and strengthen capacity of MNRE (DMO & DEC) to coordinate response to chemicals and hazardous waste induced emergencies in collaboration with FESA and other response agencies.

**6.5.2 Sanitation****1. Improve household sanitation systems**

- Encourage and facilitate the replacement of leaky household septic tanks with properly sealed septic tanks.
- Raise community and public awareness of the importance of proper septic tank designs and the implications of defective septic tanks on public health and the environment.
- Ensure proper specifications for septic tank designs are incorporated and enforced through the Samoa's National Building Code and PUMA's Code of Environmental Practises.
- Promote the use of biogas digesters as an alternative onsite waste management system in appropriate settings.
- Work closely with relevant agencies and corporations involved in water quality monitoring (including SWA and MOH) to share information relevant for the prompt identification and monitoring of high risk areas as a result of poor sanitation facilities.

**6.5.3 Innovative Energy****1. Promote the Green House Gas Abatement Strategy ( GHGAS ) to reduce greenhouse gas emissions through Energy Efficiency<sup>19</sup> ( EE ) and Renewable Energy<sup>20</sup> ( RE ) from the following priority areas;**

- Land, marine, air transport and building sectors
- Deforestation and land degradation
- Replacement of fossil fuels with biofuel
- Investigate and promote new sources of renewable energy
- Strengthened regulatory framework to mitigate GHG<sup>21</sup> emissions
- Promote and encourage energy conservation and efficient energy use.

**2. Encourage and facilitate the implementation of the following energy efficiency strategies -**

- Importation of energy efficient commercial/industrial and household technologies.
- Public acceptance of energy conservation household practices through educational programs and others means including the use of incentives.
- Promote the use of pre-paid electricity in all households with key stakeholders

**3. Encourage and facilitate the use of indigenous renewable energy sources.**

- Support public investment in renewable energy generation.
- Investigate possible incentives to encourage private investment in indigenous renewable energy generation.
- Support and encourage local research into alternative and renewable energy sources.
- Support Government initiatives to achieve the national target of 20% Renewable Energy by the year 2030.

**4. Facilitate and support the shift to a low-carbon and climate resilient path.**

- Provide wider awareness programmes to schools, private sector, communities etc promoting simple and practical tools to low carbon development.
- Encourage partnership with the private sector to promote low carbon tools

<sup>19</sup> EE - using appliances ( electrical and vehicles ) that uses less power to operate but provides higher output

<sup>20</sup> RE - is any energy source that is naturally replenish, like that derived from biomass, hydro, solar, wind, wave and ocean thermal energy conversion (OTEC) and geothermal

<sup>21</sup> GHG mitigation - reduce Green House Gas emissions from the use of fossils fuels in the production of energy.

#### 6.5.4 Population

1. **Support the implementation of strategies to maintain annual growth rate within sustainable levels.**
2. **Discourage urban migration and high population concentration along coastal areas.**
3. **Encourage population relocation to areas outside natural hazard zones including low-lying and flood-prone areas.**
4. **Collaboration with key stakeholders to establish information network and data sharing to support strategic plans.**
  - Support national surveys and data collection of environmental statistics and maps
  - Collaborate with key agencies to establish a statistical framework or guidelines for national data monitoring and update ( ie., MNRE Information Hub with linkages to the Environment Statistical Unit within the Samoa Bureau of Statistics )

#### 6.5.5 Sustainable Infrastructure

1. **Support the implementation of priorities of the National Infrastructure Strategic Plan (NSIP) for climate change adaptation and mitigation.**
  - Encourage the relocation of infrastructure and communities away from high hazard areas.
  - Assess the risk of compounding coastal erosion on neighbouring beaches of tourism value and other coastal infrastructure including hotels, as a result of poorly sited seawalls.
  - Facilitate efforts towards the reduction of urban congestion and air pollution through eco-efficient transportation ( ie., public transport/ non-motorised transport ), alternative transport fuel, energy-efficient buildings ( green buildings ), integrated urban planning responsive to climate change risks and renewable energy systems.
  - Develop alternative low carbon technologies with careful planning to avoid negative environmental impacts such as loss of food or forest land, biodiversity and water resources.
2. **Encourage the integration of the KBA network in national infrastructure planning.**
  - Avoid construction of any form of vehicle access tracks into priority KBAs.
  - Support the implementation of recommendations in the KBA and BioRAP Survey.
3. **Encourage and support the proactive use of environmental and social safeguards including EIAs in screening and designing infrastructure facilities.**
  - Develop National Urban Policy
  - City Development Strategy
  - Urban flood hazard mapping
  - Urban flood management plans
  - Urban Vulnerability and Adaptation Assessment
  - Precinct Master Plan - Revitalization



*Illegal dumping along the road to the Mulifanua wharf*

**6.6 Key Environment Sector Objective (KESO) 6 -**

**To strengthen scientific understanding of Samoa's habitats and species and geosciences to better inform planning for environmental, sustainability and strengthening community resilience<sup>22</sup>.**

**Sector Strategies -****1. Broad public participation in decision-making.**

- Encourage all members to be actively engaged in sustainable development by incorporating specific knowledge and practical know-how into national and local policy making.
- Provide easy access to information and communication technologies to share information and decision makers to be accountable.
- Ensure spatial analysis processes to be compatible and complementary with PAs network designs and other conservation strategies.

**2. Identify key information gaps in all habitat-types and encourage collaborative research and surveys with local and international scientific organizations and institutions for their investigation.**

- Support monitoring surveys targeting key cetacean species and marine reptiles, in particular whales and dolphins, and hawksbill turtles nesting sites.
- Support surveys of lesser known marine habitats and fauna groups including seagrasses, algae,
- Support recommendations of the BioRAP report for additional studies into the biodiversity of the Central Savaii Rainforest KBA.
- Assess the current status of Samoa's wetland and marshland habitats.
- Initiate investigations of coastal sand and gravel budgets, composition and sinks and sources to support the sustainable management of sand mining and coastal reclamation activities.
- Ascertain the extent of reported marine shellfish lead contamination in Vaiusu Bay and surrounding areas, and fish poisoning.
- Monitor climate change induced changes in marine habitats and species of high conservation value.

**3. Support and participate in regional and international initiatives for geosciences features monitoring and assessment, networks for monitoring earthquakes, tsunamis, sea level rise, changes in coastline, sources of aggregates and rainfall levels.**

- Promote staff development and work attachments to enhance MNRE staff capacity and relevant stakeholders to conduct research and monitoring work.
- Encourage the participation of relevant stakeholders in MNRE workshops and Environment Forums to promote better understanding and awareness of earthquakes, tsunamis, sea level rise, changes in coastline etc
- Provide easy access to publications and researches for the general public and schools.
- Establish Quality Management System in place to provide weather information to the aviation industry and other relevant agencies ( ie with ICAO/SPREP )

**4. Provide and participate in opportunities for staff training in research methods for ecosystems and species assessments, surveys and data analyses.**

- Capacity building to improve the availability of Climate Change information and knowledge to support evidence-based monitoring and evaluations.
- Capacity building for spatial design, technical mapping and GPS to monitor the state of the environment and to document climate change impacts.
- Collaboration with key agencies to develop a statistical framework to support information network and data sharing.

**5. Establish an Environmental Information Hub for storage and dissemination of information gathered.**

- Consultations with key agencies in the design and management of the information hub

<sup>22</sup> Community resilience - capacity of communities to respond to disasters and adverse impacts of climate change and recovering quickly.

**6.7 Key Environmental Strategic Objective (KESO) 7 -**

**To facilitate and support the shift to a low-carbon and climate resilient economy<sup>23</sup>.**

**Sector Strategies****1. Reduction of Greenhouse Gas Abatement Strategy for social economic development and sustainable environment towards Negative Emission Samoa.**

- Develop a National Appropriate Mitigation Action ( NAMA ) to integrate Renewable Energy ( RE ) and Energy Efficiency ( EE ) to other sectors plans for low carbon developments.
- Develop Renewable Energy and Energy Efficiency Policy and ACT for monitoring of renewable energy development and technologies to assure no practices, equipments, products and residuals endangers the environment.
- Enforce the development of the eight NGH GAS priority areas to maximize reduction of Greenhouse Gas emission.
- Develop close coordination between MNRE and key Ministries, Corporations and the Private Sector to promote the co-benefits for mitigation and transformation to more sustainable development paths through EE and RE. ( land, electricity, building, maritime etc )
- Promote Waste-to-Energy initiatives towards an environmentally clean environment with key stakeholders ( MoF, EU WSSSP, SPREP, MNRE, Private Sector )

**2. Promote sector coordination to strengthen information sharing and monitoring.**

- Support MNRE as the leading coordinating agency for overall coordination of Renewable Energy and Energy efficiency developments.
- Provide environmental advisory to renewable energy developers and utilities to ensure maximize protection of the environment.
- Monitoring of renewable energy production ( collect and analyse data for reporting ).
- Encourage and facilitate the participation of staff in appropriate trainings in GHG emissions monitoring and assessment.
- Consolidate the periodic compilation and preparation of the GHG emission from Energy production and Energy Efficiency related activities.
- Provides Annual Reports for GHG Emission from all Energy Producers and Users.
- Develop and manage Renewable Energy & Energy Efficiency Information Database and Energy GHG emission.
- Promote public awareness and develop information materials for the general public

**3. Reducing high levels of dependence on imported fossils fuels as the main source of energy.**

- Encourage Investment in Renewable Energy to increase contribution in total energy up to 15 % by 2016.
- Investing in improved water infrastructure such as reduced leaking water pipes which contribute to significant energy wastage.
- Price incentives - MNRE to actively engage the public through tv advertisements to reduce energy consumption by switching to energy efficient light bulbs, house hold appliances, and through energy conservation by switching off appliances when not in use, and avoiding unnecessary use of vehicles.
- (This provides information and incentives for consumers to make informed decisions in relation to reducing energy consumption).
- Develop a Carbon tax or Green tax for marine and aviation sector to help with conservation efforts.

<sup>23</sup> Climate resilient economy - absorptive capacity to respond to a disturbance and recovering quickly. Such disturbances can be caused by natural disasters and changing of climate conditions and human activities such as deforestation, invasive species etc

**6.8 Key Environment Sector Objective (KESO) 8 -**

**To facilitate the direct participation of local communities (village councils, women, youth, private sector and other local groups in the planning and management ( including monitoring ) of habitats and species in areas under communal ownership and control.**

**Sector Strategies –****1. Broad public participation in decision-making.**

- All members to be actively engaged in sustainable development by incorporating specific knowledge and practical know-how into national and local policy making.
- Easy access to information and communication technologies to share information and decision makers to be accountable.
- Initiate and support capacity building activities for local communities ( NGOs etc ).

**2. Disseminate properly packaged environmental information to the general public including village councils, local community (women, aumaga, youth etc.), church groups and schools.**

- Use the mass media as an avenue for regular features on topical environmental issues targeting primary and secondary schools and the general public.
- Translate and package important environmental information and reports and make them accessible and available to village groups including women's and youth groups and village councils.

**3. Target villages and customary land owners whose land hosts habitats and species of high conservation value, for awareness raising activities.**

- Provide information and support to villages whose assistance and support are crucial to the protection of the Central Savaii Rainforest KBA.
- Review and update the 2012 SOE Report Card and distribute widely to schools, village organizations and the general public.
- Support information dissemination through the use of mass media outlets.

**4. Strengthen existing co-planning and co-management arrangements for village fisheries reserves, district marine protected areas and community based conservation areas.**

- Engage community representatives regularly in environmental information sharing and training events.
- Provide technical advice, support and basic training for community based habitat based monitoring.
- Co-responsibility for environmental monitoring, habitat and species recovery and protection initiatives and co management under customary land tenure.
- Provide capacity building and educational support to ensure communities have skills and knowledge to fulfil responsibilities effectively.

**5. Encourage community and individual landowners' participation in business ventures that promote the sustainable use and management of natural habitats and species. Provide technical assistance and support as appropriate.**

- Consultations with communities on the 'Payment for ecological services' ( PES ) such as forest conservation, watershed protection, mangrove protection, marine protected areas, etc.
- Encourage and support community involvement in ecotourism ventures.
- Assist and support the development of renewable energy sources (biomass, solar, hydro, wind) on customary lands.
- Support relevant government initiatives targeting community involvement in habitat and species recovery activities including tree replanting in catchment and coastal areas, agro-forestry and permaculture systems, organic agriculture, waste management activities and others.
- Eco-tourism – partnership to develop and coordinate a sustainable market for tourist activities
- Enabling environment for job creation by private sectors investing in green growth.
- Encourage business and private sector support to take on green growth as part of business ventures in the context of sustainable development and improved livelihood.

**6.9 Key Environment Sector Objective (KESO) 9 -**

**To strengthen the policy, regulatory, financial and strategic planning and management framework for environmental sustainability and disaster resilience.**

**Sector Strategies –****1. Review and update existing legislation and regulations and enact new ones as appropriate to strengthen the capacity of MNRE and key stakeholders to enforce compliance.**

- Capacity building initiatives supported as part of the NCSA follow-up project
- Easy access to and availability of legal publications to key stakeholders and law enforcement agencies ( Legal Manual, Acts etc )
- Regular updates and monitoring for MNRE Authorised Officers on compliance measures
- Enhance capacity of MNRE and stakeholders on the monitoring and reporting obligations for MEAs.
- Strengthen the capacity of MNRE and other relevant agencies for tracking and measuring physical and biological chemical, meteorological indicators for environmental health by investing in up-to-date equipment, information gathering activities and staff training.
- Encourage and actively support inclusive and consultative approaches to planning and, where appropriate, the co-management of habitats and species under customary land tenure.

**2. Improve environmental monitoring, enforcement and compliance to support national compliance, regional and international reporting.**

- Review and update national environment sub-sector strategies including the NAPA, NBSAP, National Invasive Species Action Plan, and National Implementation Framework for Biosafety, Solid Waste Management Strategy, National Disaster Management Plan and the DRM National Action Plan and others.
- Invest as a matter of high priority in the collection of scientifically sound, accurate and up-to-date environmental statistics to measure environmental change and ecological health.
- Enhance financial reporting compliance and obligations through continuous capacity building and networking.

**3. Improve medium term financial planning and management of the National Environment Sector Plan.**

- multi-sector mechanism to coordinate environmental monitoring, data management and the sharing of monitoring capacities and resources, to support national and sector level planning and management.
- Effective coordination ( national, regional, international ) levels for a robust response to disasters, environmental emergencies and improved forecasting and early warning systems.
- Improved coordination between emergency response, early recovery and developments efforts.

**4. Improve access to and management of donor funds in close collaboration with between MoF, PSC, MNRE.**

- Finance, planning and aid management to ensure resources are aligned and implemented through country systems internal/ external financing options.
- Mobilise the necessary financial resources/ instruments to support the implementation of community based projects ( climate change funding, innovative financing mechanisms )
- Encourage the use of natural resource valuations and payment of ecosystems services (PES) in national and sector level planning and decision making to strengthen environmental sustainability integration in national planning and budgeting.
- Investigate the potential means of establishing a conservation trust fund earmarked for environment conservation and protection actions.
- National trust fund arrangements to be explored
- accessing multilateral/global climate change funds through Implementing Agencies ( IA ) eg., UNDP, WB, UNEP, ADB, FAO



**6.10 Key Environmental Strategic Objective (KESO) 10 -**

**Strengthen national capacity for environmental management, coordinate the NESP implementation, environmental monitoring and assessment.**

**Sector Strategies****1. Institutional set-up**

- Establish the Environment Coordination Unit under MNRE to coordinate the monitoring of environmental changes in the SOE habitats and the impacts of NESP implementation.
- Establish the NESP Advisory Committee ( NESPAC ) with membership and representation drawn from Government agencies, organizations and institutions, NGOs and the private sector.
- Formalise arrangement with PSC and MoF on the responsibilities of the Environment Coordination Unit

**2. Improved sector coordination of environmental initiatives through a robust and effective management framework**

- Strengthen role of MNRE as the leading agency for the overall coordination of environmental monitoring, assessment and reporting.
- Design and implement a multi-sector and multi-agency environmental monitoring programme that consolidate all environmental monitoring under different Divisions of MNRE and other agencies.
- The monitoring programme to harmonize data gathering activities, monitoring methods and protocols, indicators and metrics.
- Facilitate the establishment of a centralized clearing house mechanism within MNRE that will house all monitoring assessments data and reports and which will be accessible to all legitimate stakeholders.
- Facilitate the mainstreaming and integration of environment and climate and disaster resilience strategies into all sector plans

**3. SOE Assessment & Reporting**

- Consolidate the periodic compilation and preparation of the State of Environment Report as a core activity and priority output of MNRE (to support and ensure consistent data gathering needed to produce future SOEs).
- Enhance sector coordination through information sharing and promoting close partnership with key Ministries, Corporations, NGOs and the private sector in the management and monitoring of environmental resources.
- Promote multi-agency coordination to ensure cross-cutting issues are not duplicated, but to complement other sector strategies with environmental related issues by identifying specific areas of concern that need addressing in those sectors ( agriculture, water and sanitation, infrastructure and energy, tourism ).

**4. Capacity building & awareness**

- Encourage and facilitate the participation of staff in appropriate trainings in environmental monitoring and assessment.
- Support the design and management of electronic data storage facilities, and the development of information sharing and access protocols.
- Provide training to all MNRE staff and staff of other relevant agencies in the use of an MNRE based clearing house mechanism by which all monitoring information is accessed and shared.

**6.11 Key Environmental Strategic Objective ( KESO ) 11 –****To implement habitat/ ecosystem-based strategies to support climate change adaptation and mitigation****Sector Strategies****1. Integrated approach to environmental assessment.**

- Review and update NAPA, and implement updated NAPA priorities to document full analysis of impacts community benefits.
- Review and update existing Coastal Infrastructure Management Plans to incorporate a ridge-to-reef approach.
- Implement updated CIM Plans priorities.
- Support the development of water purification and alternative water storage programs for communities.
- Implementation of the PPCR
- Secure access to the Adaption Fund

**2. To implement strategies for improving atmospheric conditions and support climate change adaptation and mitigation**

- Assess local sources of pollution and how they affect the atmosphere.
- Encourage the use of materials and products that do not deplete the atmospheric ozone layer
- Encourage the use of meteorological data to monitor air quality
- Promote the sustainable development of land transport infrastructure
- Conserve forest resources and increase percentage of land under PA network.
- Encourage the use of alternative and renewable energy sources.
- Review vehicle inspection standards to reduce exhaust emission and improve engine performance.
- Encourage the use of alternatives to replace existing ozone depleting substances.

**3. Develop knowledge and promote understanding of the predicted impacts of climate change and greenhouse effect.**

- Assess the impacts on the atmosphere of development projects and some domestic activities.
- Review current policies on the importation and use of motor vehicles.
- Review the cost structures for petroleum products.
- Review present production of energy to promote sustainable cost recovery.
- Establish pollution limits for atmospheric discharge from domestic and industrial activities.
- Provide incentives for non-polluting or less polluting industrial processes and products.
- Develop appropriate designs for buildings and towns in response to predicted climatic changes.
- Develop procedures to promote the equitable allocation of fresh air and other public goods.
- Develop national policies for alternative energy sources.

**4. Develop understanding of the effects of pollution on atmospheric quality.**

- Establish facilities to collect, analyse and disseminate information on the causes and consequences of pollution in the atmosphere.
- Provide updated information on the global developments in climatic changes and atmospheric pollution.
- Encourage and support research programmes on pollution controls.
- Undertake cost/benefit studies into alternative energy supplies and sustainable transportation.
- Establish the effects of some traditional behaviour (e.g. open burning) on the atmosphere.

**5. Generate public awareness of global climatic changes and the need to protect the atmosphere.**

- Develop community programmes to combat atmospheric pollution.
- Promote public education programmes on the causes and effects of global climatic changes.
- Promote public support for clean air policies through consumer networks.
- Encourage public participation in efforts to reduce pollution of the atmosphere.
- Encourage self sufficiency in preparation for the predicted outcomes of global climatic changes.

- Inform the public of global efforts to combat climate change and atmospheric pollution.
- Promote public awareness on protection of the Ozone layer.
- Assess the likely risks due to climate change (e.g. sea level rise and tropical cyclones) in the design of long term projects.
- Approve appropriate planning standards for coastal and low lying areas.
- Develop urban design criteria to minimize the effects of potential sea-level rise and climate change.
- Develop engineering designs for buildings and physical infrastructures, especially in the low-lying areas.
- Establish appropriate standards for the provision of public services in high-risk areas.
- Promote self sufficiency in preparation for expected natural disasters.
- Assess the likely impacts of sea level rise on ground water and marine resources.
- Determine the social effects of sea level rise on coastal communities which may have to relocate elsewhere.
- Adopt appropriate land use practises for low-lying areas.

**6. Develop knowledge and promote understanding of the predicted impacts of climate change and the greenhouse effect.**

- Provide facilities to collect, analyse and disseminate information on climate change and the greenhouse effect.
- Educate the public on the causes and effects of climate change.
- Inform the public on current global and regional knowledge on sea level rise.
- Monitor local tidal fluctuations and coastal wave actions.
- Monitor weather patterns and regional wind movements.
- Promote public awareness of the risks to life and property associated with sea-level rise and tropical cyclones.
- Prepare guidelines on actions to adopt in response to climate change.

**7. Capacity Building measures to strengthen national efforts for improving atmospheric conditions and support climate change adaptation and mitigation.**

- Training initiatives and development packages targeted to specialised skilled areas such as atmospheric conditions, climate change, greenhouse gas emissions, solar and wind alternatives
- Provide relevant capacity building support to key agencies and private companies.



Green House Gas Emissions Diagram/ UNEP



River clean-up campaign around Upolu

Stakeholder consultations



Widespread of the Merremia vines in the coastal and lowland habitats



Myna bird eradication programmes

Promoting traditional fishing practices



Mangrove replanting at degraded sites

## 7. Log frame matrix

Table 1:

OUTCOME 1 - Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural ( pristine ) condition.						
Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 1 - TERRESTRIAL</b>  To implement strategies for rehabilitating, protecting and conserving priority terrestrial (upland, lowland and coastal) habitats and species.	<b>1. Create effective and representative terrestrial protected and conservation areas.</b>	<ul style="list-style-type: none"> <li>- Acquire legal status for proposed terrestrial KBA network.</li> <li>- Integrate the management of existing national parks and reserves into the KBA network.</li> <li>- Develop KBA management plans (including upscaling existing parks management plans) and secure funding for effective implementation.</li> <li>- Promote the replanting of native trees and other vegetation in the urban built environment.</li> <li>- Encourage and support the creation of community managed protected areas.</li> <li>- Secure resources to support community managed terrestrial protected and conservation areas.</li> <li>- Improve facilities for National Parks</li> <li>- Conduct ecological surveys on the taxonomic data gaps for key selected sites identified under various projects ( eg., ICCRIFS, BioRAP, FPAM )</li> <li>- Spatial Information and maps updated for ecological data</li> </ul>	Proportion of terrestrial areas protected - 8 % of total land area under PA ( MDG Report 2010 )  KBA Report 2010: 8 Terrestrial KBAs - 33% of total land area, 6 of 8 currently est. under Govt or community conservation. ( currently 18% under PAs )	Proportion of terrestrial areas protected - 1 8 % of total land area under PA	20 % of total land area under PA	25 % of total land area under PA
			% of KBAs with Management Plans 25 Protected areas & Reserves	4 existing KBAs selected to develop Management Plans under GEF 5 critical landscape project	1 KBA site established & under PA network	1 KBA site established & under PA network
			SOE Report - 99% of Samoa vegetated with forest cover 99% upland Upolu non native 91% upland Savaii native trees  Mauga o Salafai National Park - no data	1 ecological studies & survey native trees	Native Tree planting @ 4 selected sites	2 Management Plans for 2 National Parks
	<b>2. Encourage and facilitate the participation of land owning communities in the management of KBAs.</b>	<ul style="list-style-type: none"> <li>- Raise awareness and educate local communities of the strategic and conservation importance of the KBA network.</li> <li>- Investigate the PES (payment of ecological services) approach for engaging villages and individual land owners in the protection of sensitive habitats including water catchment areas, and areas of high conservation values.</li> <li>- Encourage and support ecotourism and other</li> </ul>	25 Parks & Reserves established as conservation areas by the govt or village communities.  26 Sustainable Development Village Plans under MWCS ( SDVP )  KBA Report: Community Conservation Areas:	Community workshops: 1. KBAs 2. Monitoring & Reporting 3. Understanding environmental indicators.	MOUs with 2 CCAs with required Management Plan	1 Eco-tourism venture established with CCA.

**OUTCOME 1 - Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural ( pristine ) condition.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 1- TERRESTRIAL</b>  <b>To implement strategies for rehabilitating, protecting and conserving priority terrestrial ( upland, lowland and coastal ) habitats and species.</b>		sustainable income-generating activities by local village groups as integral parts of KBA management. - Provide basic training for village representatives in habitat and species monitoring and reporting. - Encourage and facilitate the establishment of competitive small grants funding mechanisms to support KBA friendly income generating activities by community groups. - Provide opportunities for local communities engaged in conservation initiatives to share their experiences and knowledge. - close & effective collaboration with communities re KBAs on communal lands	1. Change in forest cover extent within terrestrial KBAs 2. Change in % of CCAs with Management Plan in place.  25 villages under ICCRIFS ( Upolu & Savaii )  FPAM Project	Cost-benefit analysis on PES	35% - within KBAs	40% - within KBA
				1 pilot site for Upolu under CCA ( ICCRIFS Project )  National Forest Audit for Upolu & Savaii	1 Community survey	1 pilot site for Savaii under CCA ( FPAM Project )
	<b>3. Reduce other pressures on terrestrial habitats and species.</b>	- Review and update the 2008 – 2011 National Invasive Action Plan (NISAP). Secure funding resources and implement the updated NISAP priorities. - Review and update the 2001 National Biodiversity Strategies and Action Plan (NBSAP). Secure funding and implement the updated NBSAP priorities. - Review and update Samoa’s National Biosafety Framework (NBF). Secure funding, build local capacities and implement the updated NBF priorities. - Review and update Samoa’s National Action Plan on land degradation. - Develop an Action Plan for the conservation of Samoa’s marshlands. Secure funding and implement identified priorities. - Explore and where appropriate, implement ex-situ conservation measures to ensure the survival of the Manumea and other critically endangered endemic bird species. - Vaipu marshland area surveyed ( largest remaining area )	NBSAP 2001 NISAP 2008  SOE Report: 2013 6 coastal marshes in Samoa, degraded by human impact.  Invasive species monitoring : myna birds eradication -  merremia vine taking up 50% remaining lowland forest  Increasing trend of unsustainable sand mining at vulnerable areas.	NBSAP Reviewed 2 Consultations conducted	Assessment of Coastal marshes for Upolu & Savaii	Develop Action Plan for Marshlands
				Habitat cadastral boundaries /mapping for land capability and soil use developed	4 critical areas under replanting native tree programmes	4 critical areas under replanting native tree programmes
	<b>4. Identify innovative ways to adapt to the impact of climate change.</b>	- Implement sustainable measures for improving the protection of critical catchment areas. - Assign priority to securing the full protection of the	NAPA 1 - 5 Projects	NAP Review & Consultation  Sand mining Policy & Guidelines	Vaipu marshland area assessment	Invasive species monitoring report.
				conservation area established for the	Tafitoala catchment Management Plan	Management Plan for the Apia/

**OUTCOME 1 - Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural ( pristine ) condition.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 1- TERRESTRIAL</b>  To implement strategies for rehabilitating, protecting and conserving priority terrestrial (upland, lowland and coastal) habitats and species.		entire Apia, Vaisigano and Tafitoala catchment areas. - Promote and support the replanting of catchment and erosion prone areas. - Promote and support the replanting of mangrove forests and exposed coastal areas. - Encourage and facilitate the relocation of households away from flood-prone areas. - Promote the growing of food crops that are not vulnerable to wind damage including yams, sweet potatoes and similar ones. - Support the full implementation of Samoa's NAPA.	SOE Report: Key sites under mangrove replanting ( MESCAL Project ) 1,000 ha total mangrove area	Anoama'a district and Savaii uplands areas (FPAM project sites)		Vaisigano catchment areas
				5 % increase of Mangrove replanting conducted at selected sites.	5 % of Mangrove replanting conducted at selected sites.	5 % of Mangrove replanting conducted at selected sites.
	<b>5. Strengthen the capacity of MNRE and other key national partners to more effectively plan and implement its responsibility for environmental protection and management.</b>	- Strengthen Forestry Division and Disaster Management's forest fire prevention capacity through the implementation of the Forest Fire Management Strategy in collaboration with the FESA - Encourage compliance with Code of Environmental Practices (COEPs) on impact studies and project design. - Support PUMA training for private sectors on standards and COEPs. - Encourage and support zoning disaster planning and integrated coastal zone management planning. - Strengthen the enforcement of sustainable land management practices and through harmonizing the land tenure system. - Strengthen integrated land use planning amongst key national stakeholders: MNRE, MAF, MWCSO etc - Encourage tertiary level training of staff and students in environmental and natural resources management. - Establish a high-level multi stakeholder planning mechanism to support an integrated approach to national land use planning to guide a detailed planning at the sector and sub sector level in order to optimise allocation of land, based on nationally determined priorities.	Forest fire prevention awareness raising consultations in 13 villages  Samoa In-Country Training Prog funding MNRE Workshops ( 3 per year )  CIM Plans: Coastal hazard zones for whole coast of Samoa  Tsunami Inundation Modelling and Mapping: whole coast of Samoa	1 National Forest Fire Plan & Consultation  National land use plan to guide (allocation of land based on nationally determined priorities.)  Integrated land-use planning	2 community based forest fire prevention program implemented  training for private sectors on standards and Code of Environmental Practice ( COEP )  Zoning disaster planning workshop	Aerial photographs updated  Integrated coastal zone management planning workshop.  National land use plan finalised

**OUTCOME 1 - Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural ( pristine ) condition.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 2 – MARINE HABITATS</b>  To implement strategies for rehabilitating, protecting and conserving threatened marine habitats and species	<b>1. Create secure and effective Marine Protected Areas (MPAs).</b>	<ul style="list-style-type: none"> <li>- Support the implementation of Marine KBAs already identified and integrate the management of existing reserves into the KBA network</li> <li>- Acquire legal status for proposed marine KBA network.</li> <li>- Support existing village fisheries reserves.</li> <li>- Encourage the establishment of new reserves in areas with low coral and fish biomass especially along the northern Upolu Coast from Manono/Apolima strait to Fagaloa.</li> </ul>	KBA Report 2010:3 out of 7 Marine KBAs partially or completed established under Govt or village communities.  Marine KBAs - 23% inshore reef of Samoa ( 14% under PAs )  2 MPAs & 80 Village fisheries reserves	1 Critical marine KBAs restored and managed sustainably at Vaotupua Falealupo Savaii	Manono Marine Protected area established	Apolima marine Protected Area established
				Management Plan Savaii, Vaotupua		1 Critical marine KBAs restored and managed sustainably ( 1 Mile Reef Zone )
	<b>2. Reduce Other Pressures on Coastal habitats and species.</b>	<ul style="list-style-type: none"> <li>- Encourage the adoption of village resources management plans and by-laws and support their enforcement against coral destruction, use of unsustainable fishing methods, and sources of coastal pollutants.</li> <li>- Control coastal development through an Integrated Coastal Zone Management (ICZM) strategy to help protect reefs from long-term stresses.</li> <li>- Reduce coastal reclamation and sand mining activities by effectively enforcing existing planning and approval frameworks.</li> <li>- Regulate the quality of waste/brackish/grey/ballast water discharged according to acceptable standards.</li> <li>- Support public and community awareness and education activities on the adverse impacts of unsustainable coastal activities on the environment and community livelihoods.</li> <li>- Strengthen environmental education in primary secondary and tertiary school curriculum.</li> </ul>	2 MPAs & 80 Village fisheries reserves  CIM Plans  Sandmining policy ( draft )  Reclamation policy  Marine Pollution Act 2008  SOE Reports - increasing trend of costal reclamation with compounding impacts	National Land-use/Capability Policy developed	# CIM Plans reviewed – PPCR /AF  Village resources Management Plans Developed ( 4 villages )	2 Village by-laws  Village resources Management Plans Developed ( 4 villages )
				NISAP – National Merremia Vine Eradication campaign with MWCS&D & communities -	Review & update EREG Years 7 – 10 ( Environment Resource Education Guide )	3 prioritized invasive species are controlled
			National Clean Up Campaign negotiations with Private Sector & Contractors, Communities	Review & Update Disaster Risk Management Teachers & Students Tool Kit	National Clean Up Campaign ( waste )	



**OUTCOME 1 - Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural ( pristine ) condition.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 2 – MARINE HABITATS</b>  To implement strategies for rehabilitating, protecting and conserving threatened marine habitats and species	<b>3. Identify Innovative Ways To Adapt.</b>	<ul style="list-style-type: none"> <li>- Assess ways for local coastal communities to adapt to climate induced changes in coral reefs and inshore habitats.</li> <li>- Develop a national strategy to deal with these impacts in consultation with local communities and the private sector.</li> <li>- Support and encourage the consumption of alternative sources of protein to marine fish and resources.</li> <li>- Support environmentally sustainable traditional fishing practises.</li> <li>- Promote coral rehabilitation through coral replanting programs and artificial reefs.</li> <li>- Collaborate with relevant organizations and participate in regional approaches to prevent the introduction of invasive species.</li> <li>- Prevent and or control marine invasive species from establishing in Samoan waters.</li> <li>- Conduct an inventory of all deliberately introduced species and varieties and assess their current status</li> </ul>	CIM Plans 2006 upgraded under the PPCR Project  SOE Reports - 1,000 ha of total mangrove area  MESCAL Project - mangrove assessment found new species of mangrove  SOE Report: 40 % Samoa's coral reef with high coral cover( 60% for Savaii & 30% Upolu )  Coral richness - 50% Savaii coastline & 25% Upolu coastline	Restoration prog for the Xylocarpus molluccensis mangrove in Siutu Savaii.	2 Fisheries reserves to restock inshore areas with depleted species ( north coast of Upolu )	2 Fisheries reserves to restock inshore areas with depleted species ( north coast of Upolu )
				Coral replanting programs at key selected sites	Coral replanting programs at key selected sites	CIM Plans updated & national consultations
	<b>4. Promote the conservation, sustainable management and equitable sharing of marine and ocean resources.</b>	<ul style="list-style-type: none"> <li>- support regional/national efforts towards marine conservation</li> <li>- Provide capacity building and secure resources to implement action plans to combat marine litter and pollution with MAF and the private sector</li> <li>- Target marine conservation management areas with unique coral communities</li> <li>- To work collaboratively with key partners ( SPREP, CI, SOPAC, NOAA, etc )</li> </ul>	Coral Bleaching Assessment Report Cetacean Survey Upolu 2008  Fish Abundance - Nth coast of Savaii ( between Falealupo & Apolima) high biomass, hot spot for Samoa Upolu - low biomass  Fish diversity: 1. high abundance along nth western coast of Savaii 2. Low abundance along Nth Upolu coast from Manono to Apolima strait to Apia Fagaloa Bay.  Tuna stock - levels of exploitation within the max. sustainable yield ( MSY )	Coral assessment for Northern Upolu	Surveys & assessments for: 1. seaweed & algae 2. molluscs 3. crustaceans 4. echinoderms	Surveys & assessments for: 1. seaweed & algae 2. molluscs 3. crustaceans 4. echinoderms
				Seagrass survey	Design Monitoring tool for Inshore & Offshore species using SOE indicators	Reintroduction of clams in inshore areas using community based reserves

**OUTCOME 2 – Restoration of degraded habitats and threatened species of economic and conservation importance to healthy states and viable populations.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 3</b>  To implement strategies for the restoration of habitats critical to species and recovery of species populations of conservation concerns	<b>1. Policy /legal frameworks</b>	<ul style="list-style-type: none"> <li>- Strengthen the implementation, monitoring and enforcement of existing legislations eg, Marine Wildlife Regulation 2009 that offers protection, management and conservation of listed species of conservation concern.</li> <li>- Develop management plans for the restoration of habitats critical to species such as turtles etc</li> <li>- Recovery of populations of species</li> <li>- Promote eco-tourism operations beneficial to the conservation of species</li> <li>- Monitoring of developments in collaboration with Fisheries Division etc.</li> <li>- Successful pilot sites of degraded lands rehabilitated and improved critical landscapes/ GEF 5 &amp; Water Projects/</li> </ul>	Marine Wildlife Regulation 2009 2009 survey turtles in captivity  Marine Species Action Plan 2013-17  Proportion of species threatened with extinction - 30 ( 2010 MDG Report )  % of degraded lands rehabilitated and improved critical landscapes	2013 turtle survey.  Develop Marine Wildlife Guideline	Management Plan for species of conservation concern.	Marine Species Action Plan reviewed
	<b>2. Monitoring &amp; Enforcement</b>	<ul style="list-style-type: none"> <li>- Encourage community programs that would assist with the recovery of the listed species of conservation concern</li> <li>- Increase and promote the awareness of the general public with regards to these species.</li> <li>- secure resources to assist with recovery programs and costs</li> <li>- encourage the listing of these species in the IUCN Red Listing to ensure International cooperation</li> <li>- Encourage communities to restrict/prohibit the utilization of these species and any particular device or means of obtaining/taking the designated species.</li> </ul>	Baseline to be developed  Marine turtle nesting at Aleipata and Safata	Database of species of concern  Awareness programme at Manono Island  Develop Monitoring & Evaluation Framework	Awareness programme  Monitoring & Evaluation Framework implemented	Awareness programme  Monitoring & Evaluation Framework reviewed
	<b>3. Exploration of resources &amp; Research</b>	<ul style="list-style-type: none"> <li>- Guidelines to control and monitor the use of resources</li> <li>- Permits and approval for research on resources ( Forest products, Water, biodiversity etc )</li> <li>- Promote knowledge sharing and technical expertise through research and awareness</li> </ul>	Marine Wildlife Regulation Bio prospecting Permits  4 Permits on Research on average CITES  BioRAP Research 2012 - new species found and are being tested.	# of research studies commissioned by MNRE	Environment Forum & publications	# of research studies commissioned by MNRE

**OUTCOME 3 – Environmental resources such as forest land, water and fisheries are managed sustainably to protect them from natural threats and contamination.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 4 - WATER</b>  To implement strategies for protecting key environment resources such as forest land, water & fisheries	<b>1. Improve knowledge and understanding of water resources</b>	<ul style="list-style-type: none"> <li>- Expand and maintain the National Hydrometric Network</li> <li>- Quality assurance of water resources data and information</li> <li>- Expand the scope of water quality testing to include physical, biological and chemical parameter analysis.</li> <li>- Build local capacity to ensure successful completion of drilling programme for groundwater mapping and modelling</li> <li>- Strengthen baseline hydrological information on groundwater, coastal springs and lakes</li> <li>- Carry out sustainable yields assessments for surface and groundwater sources</li> <li>- Community awareness campaigns to improve understanding and foster active participation</li> </ul>	7 existing monitoring boreholes	10	13	16
			Launched River Ecosystem Health Monitoring Program	2 report cards developed for priority river systems	3 new report cards developed	3 new report cards developed
			Increase community awareness on water catchments areas and risks of unsustainable farming methods.			
			Draft Water Environmental Guidelines	Finalise and approve guidelines		
	<b>2. Improve the enabling environment for water resources management</b>	<ul style="list-style-type: none"> <li>- Formulate the National Water Resources Management ( NWRM Plan )</li> <li>- Provide secretariat functions to the Water Resources Technical Committee and the WRM Board</li> <li>- Ongoing monitoring and evaluation of policies and plans</li> <li>- Formulation of village bylaws</li> <li>- Partnership with SOEs and the private sector</li> <li>- Mainstream and integrate water issues into other sector policies/plans</li> <li>- Partnership with SOEs and the private sector</li> <li>- Mainstream and integrate water issues into other sector policies/plans</li> </ul>	Draft NWRM Plan		Finalise NWRM Plan	
			Proportion of population using an improved drinking water source : 97.3 (2010 MDG Report )	Proportion of population using an improved drinking water source	Proportion of population using an improved drinking water source	Proportion of population using an improved drinking water source
			2 village bylaws established & in implementation	2 new bylaws approved	2 new bylaws approved	2 new bylaws approved
	<b>3. Strengthen enforcement of water legislation and plans</b>	<ul style="list-style-type: none"> <li>- Implement and enforce the National Water Resources Policy, Act, regulations and village bylaws</li> <li>- Strengthen enforcement and effective implementation of the Water Abstraction Licensing Scheme</li> </ul>	1 GW Abstraction Licenses issued	3 new licenses issued	3 new licences issued	3 new licenses issued

**OUTCOME 3 - Environmental resources such as forests land, water and fisheries are managed sustainably to protect them from natural threats and contamination.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>FOREST LAND</b>  <b>To ensure effective coordination and implementation of forest management strategies and enforcement, monitoring.</b>		<ul style="list-style-type: none"> <li>- Reduce pollution in rivers, streams and lakes through enforcement options in the WRM Act 2008</li> <li>- Include water safety plans SNDWS 2008</li> </ul>				
	<b>4. Strengthen community engagement in water resources management</b>	<ul style="list-style-type: none"> <li>- Develop new partnerships with NGOs/CSOs (komiti tumama, schools)</li> <li>- Develop a pilot for payment for ecosystem services in relevant watershed areas</li> <li>- Pilot and evaluate feasibility of community extension services in critical watershed areas for possible upscaling to strengthen engagement with key communities</li> <li>-</li> </ul>	Payment of Ecological Services ( PES) questionnaires completed for Togitogiga catchment	Launch Togitogiga PES pilot focusing on Tourism sector	Partnership with Communities in the operation of PES at Togitogiga	Communities fully engaged in the PES programme at Togitogiga.
	<b>5. Implement conservation projects for groundwater, freshwater springs and lakes</b>	<ul style="list-style-type: none"> <li>- Develop community programmes to rehabilitate and effectively protect groundwater, freshwater springs and lakes</li> </ul>	Lanotoo lake profile done  Freshwater springs inventory survey completed for Upolu	Lake Lanoto profile establish	Freshwater springs rehabilitation establish for Upolu	Freshwater springs rehabilitation programme establish for Savaii
	<b>1. Policy frameworks to help reverse deforestation and forest degradation and promote sustainable use and management of forests as well as their conservation and restoration.</b>	<ul style="list-style-type: none"> <li>- Formulate, implement and enforce sustainable use of forest management plans and regulatory tools.</li> <li>- Rehabilitate critical degraded areas within the upland and lowland habitats.</li> <li>- Implement and enforce the Forest Policy, Forestry Management Act 2011, regulations through the MNRE Authorised Officers and Village Council, Committees</li> <li>- Develop effective partnerships with NGOs/CSOs (komiti tumama, schools)</li> </ul>	SOE Report - 99% of Samoa vegetated with forest cover 99% upland Upolu non native 91% upland Savaii native trees  ICCRIFS site - Mauga o Salafai National Park - no data  Vegetation of Lake Lanoto'o - 98 ha disturbed secondary forest	Forest Management Policy developed with stakeholders  Forest Audit exercise	National consultations	Update data on

**OUTCOME 1 - Habitat: OUTCOME 3 - Environmental resources such as forest land, water and fisheries are managed sustainably to protect them from natural threats and contamination.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
	<b>2. Improve knowledge and understanding of forests resources</b>	<ul style="list-style-type: none"> <li>- Expand and maintain SAMFRIS for quality assurance of forest resource data and information</li> <li>- Conduct ecological restoration programmes with communities and schools.</li> <li>- Build capacity and strengthen community engagement to sustainably manage forest resources.</li> <li>- Produce maps and spatial data for forestry, PA networks, hazards, water catchments areas etc</li> <li>- Enhance public awareness programmes to foster active participation from the general public, communities, schools, stakeholders in forest resource management.</li> </ul>	<p>Lowland ecological survey 1991</p> <p>No data on awareness levels or survey</p> <p>1991 survey - Mauga o Salafai - 129 ha ( 2 % ) cloud forest</p>	<p>SAMFRIS update</p> <p>Conduct lowland survey to update 1991 data</p> <p>Communication Strategy &amp; Survey</p>	<p>SAMFRIS update</p> <p>Survey for lowland forests</p> <p>Consultations and workshops to develop Mauga o Salafai Management Plan</p>	<p>SAMFRIS update</p> <p>Consultations and workshops to develop Mauga o Salafai Management Plan</p>
	<b>3. Improve enabling environment for effective forest management.</b>	<ul style="list-style-type: none"> <li>- Strengthen enforcement of forest legislation and plans</li> <li>- Effective implementation of conservation projects for forest management.</li> <li>- Improve awareness programmes to promote critical ecological value of upland &amp; lowland forests.</li> <li>- Continuous capacity building and partnership with USP/NUS to promote interest in forestry work</li> <li>- Consultation re BIORAP findings to protect Upland Savaii as World Heritage Site</li> <li>- Enforce ongoing monitoring and evaluation of policies and plans with key stakeholders</li> <li>- Promote partnerships with communities, Working Committees, private sector, tour operators etc in the management and monitoring of forests areas</li> <li>- Mainstream and integrate forest issues into other sector policies/plans</li> <li>- Develop community programmes to rehabilitate and restore critical degraded habitats through conservation projects for forests and sustainable land management</li> </ul>	<p>Percentage of land area covered by forest increases: (2010) - 154,190 ha/ Lowlands / SOE Report 48% Savaii &amp; 69% Upolu</p> <p>Upland forest: Savaii - 91% native forest Upolu - 99% non-native</p> <p>Decreasing trend/interest as Professional Foresters</p>	<p>50 % Savaii 70% Upolu</p> <p>5% inc. native forest</p> <p>Consultations with schools ( 3 )</p> <p>Consultations with communities</p>	<p>55 % Savaii</p> <p>5% inc. native forest</p> <p>Consultations with schools ( 3 )</p> <p>Consultations with communities</p>	<p>60% Savaii</p> <p>5% inc. native forest</p> <p>Consultations with schools ( 3 )</p> <p>Consultations with communities</p>

**OUTCOME 3 - Environmental resources such as forest land, water and fisheries are managed sustainably to protect them from natural threats and contamination.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>FISHERIES - To ensure effective coordination and implementation of sustainable management strategies for marine resources</b>	<b>4. Strengthen community engagement in sustainable forest management</b>	<ul style="list-style-type: none"> <li>- Active participation of communities in Forest conservation projects</li> <li>- ICCRIFS Pilot sites in Upolu &amp; Savaii</li> <li>- Forest &amp; Protected area management ( FPAM )</li> <li>- Samoa Agro forestry &amp; Tree Farming</li> <li>- Forest Preservation Program</li> <li>- Improved knowledge &amp; Capacity within communities</li> <li>-</li> </ul>	# and % of trees provided under the community forestry prog increases 175,200 ( SDS 2012-16 )	5%  # of community demonstration sites	10%  # of community demonstration sites	15%  # of community demonstration sites
	<b>1. Strengthen collaboration with MAF/ Fisheries Division</b>  <b>2. Improve the enabling environment for coordination between agencies etc</b>	<ul style="list-style-type: none"> <li>- Support services and information sharing with MAF to strengthen partnership</li> <li>- Active participation in marine conservation programmes.</li> <li>- Ongoing monitoring and evaluation of policies and plans relevant to marine resources</li> <li>- Collaborate and assist with the formulation of village bylaws and MPAs</li> <li>- Partnership with SOEs and the private sector to promote collaborative monitoring</li> <li>- Mainstream and integrate integrated environment issues into other sector policies/plans</li> </ul>	# if Village by laws  7Marine KBAs  SOE Report: Coral richness or diversity - 35% Samoa's coastline is high ( 50% Savaii coastline & 25% Upolu coastline )	1 MPA targeting Nth Upolu with high coral diversity.	Coral replanting at key sites degraded but with high coral diversity  Coral monitoring & assessment.	1 MPA

**OUTCOME 4 - The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 5</b>  <b>Strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment.</b>	<b>A. Waste management</b> <b>1. Improve household and industrial waste management</b>	<ul style="list-style-type: none"> <li>- Promote and encourage waste to energy conversion of municipal, organic and agricultural waste</li> <li>- Increase the percentage of household waste reaching the landfills.</li> <li>- Encourage household composting of organic wastes.</li> <li>- Facilitate and support waste segregation at source.</li> <li>- Facilitate and support the recycling of non-biodegradable household and commercial waste using among other strategies, the use of incentives.</li> <li>- Institute and enforce bans on the importation of selected non-biodegradable and hazardous materials.</li> <li>- Encourage and facilitate the importation and use of biodegradable alternatives to substitute banned non-biodegradable products.</li> <li>- Encourage successful contractors to use efficient machinery and technologies to improve the efficiency and effectiveness of services.</li> <li>- Undertake regular waste audits (three yearly) to provide up-to-date information to support nationwide waste management.</li> <li>- Promote waste management as every one's responsibility through appropriate approaches including public education and awareness activities.</li> <li>- Develop sustainable systems to improve disposal and storage of hazardous waste substances</li> </ul>	<p>Waste Audit: 97% population under waste collection services 88% of household waste generated not delivered to Tafaigata ( illegal dumping )</p> <p>58% total waste volume delivered to Tafaigata could be recycled or composted</p> <p>Plastic Bag Prohibition on Importation Regulations 2006</p> <p>Management of hazardous wastes not well monitored. 82% Petroleum as main chemical by usage</p> <p>Hospital wastes well monitored &amp; managed</p>	<p>Survey to assess delivery/performance of waste collecting contractors</p> <p>Guidelines for Contractors</p> <p>Waste recycling campaign – 3Rs Clean Up Samoa campaign with communities, schools</p> <p>Market Waste composting at Tafaigata</p> <p>Improved Stewardship system for Chemicals</p>	<p>Clean Up Samoa campaign with communities, schools</p> <p>Waste Audit</p> <p>Cases of illegal dumping</p> <p>Container Deposit Levy for specific difficult wastes such as plastic bottles, aluminium cans and ferrous cans.</p> <p>Improved Tracking system for chemicals and hazardous waste</p>	<p>Clean Up Samoa campaign with communities, school</p> <p>Cases of illegal dumping</p> <p>Waste Minimization Strategy</p> <p>Improved Tracking system for chemicals and hazardous waste</p>
	<b>2. Strengthen the legal framework for waste management.</b>	<ul style="list-style-type: none"> <li>- Actively enforce the Waste Management Act 2011.</li> <li>- Enact regulation to clarify and elaborate on stipulations of the Act.</li> <li>- Encourage the development and adoption of village by-laws to support and enforce waste management within villages.</li> <li>- Strengthen community capacity to enforce village by-laws for waste management.</li> <li>- Develop a Principle Act to address and manage the full spectrum of the chemical lifecycle and hazardous waste (eg, oil, e-waste, mercury and other hazardous chemicals)</li> <li>- Promote and Implement the obligations of the</li> </ul>	<p>Waste Management Act 2011.</p> <p>MNRE Investigation Manual 2012</p> <p>National Chemicals Management Strategy</p> <p>National Chemicals Management Policy</p>	<p>Awareness programmes of Waste Management Act</p> <p>Enforce Monitoring &amp; Compliance – Authorised Officers</p> <p>Improved implementation of the chemicals and</p>	<p>Awareness programmes of Waste Management Act</p> <p>Enforce Monitoring &amp; Compliance – Authorised Officers</p> <p>Transparent model and improved accountability for</p>	<p>Awareness programmes of Waste Management Act</p> <p>Enforce Monitoring &amp; Compliance – Authorised Officers</p> <p>Enhanced technical capacity among relevant</p>

**OUTCOME 4 - The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 5</b>  <b>To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment.</b>		Rotterdam, Stockholm, Basel, Waigani and Noumea Conventions - Improve monitoring, evaluation and risk assessment		waste related conventions	regulating chemicals and hazardous waste	stakeholders on best available practices and techniques
	<b>3. Strengthen MNRE's and key stakeholders' capacity in waste management.</b>	- Provide appropriate training and capacity building opportunities for waste management staff. - Upgrade waste treatment facilities in Vaiaata including the installation of leachate collection facilities. - Strengthen compliance monitoring for waste collection contractors. - Improve capacity for prevention, preparedness and response to chemicals accidents - Improve facilities for technical research and assessment - Promote safe alternatives for banned ozone depleting substances	<i>Knowledge of sound management of chemicals best practices limited among many Govt ministries, private sector and the public.</i>	Refresher Training for Authorised Officers & Private Contractors	Refresher Training for Authorised Officers & Private Contractors	Refresher Training for Authorised Officers & Private Contractors  Improved networking and information exchange among the relevant stakeholders
	<b>4. Improve risk management and governance of chemicals and hazardous waste</b>	- Legislation and tracking system for chemicals and hazardous wastes developed and implemented - Develop a sector wide chemical management policy - Strengthen inter-agency coordinating mechanisms among the relevant stakeholders - Develop a tracking system to monitor the trade, storage, distribution, use and disposal of chemicals and hazardous waste - Develop a Chemicals Information Network (CIN) to facilitate the exchange of national and international information and data on chemicals and hazardous waste - Build and strengthen the capacity of MNRE (DMO & DEC) to respond to chemicals and hazardous materials induced emergencies in collaboration with FESA and other response agencies	National Integrated Policy on Chemicals and Hazardous Waste  National Chemicals Management Strategy  National Chemical Tracking System Plan  National Disaster Management Plan Fire & Emergency Management Act 2007 Chemical response operation 2008 report  Drills at BOC, Vailima Breweries,	Enhanced coordination and collaboration among the relevant stakeholders          Response plan for chemicals and hazardous materials induced emergencies	Improved Tracking system for chemicals and hazardous waste          2 Containment and mop training program  Protective Gear and equipment for containment and	Improved Tracking system for chemicals and hazardous waste          1 Chemicals response simulation and 2 training programs



**OUTCOME 4 - The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 5</b>  <b>To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment</b>			Origin Energy		mop up operations  Chemicals response simulation	
	<b>B. Sanitation</b> <b>1. Improve household sanitation systems</b>	<ul style="list-style-type: none"> <li>- Encourage and facilitate the replacement of leaky household septic tanks with properly sealed septic tanks.</li> <li>- Raise community and public awareness of the importance of proper septic tank designs and the implications of defective septic tanks on public health and the environment.</li> <li>- Ensure proper specifications for septic tank designs are incorporated and enforced through the Samoa's National Building Code and PUMA's Code of Environmental Practises.</li> <li>- Promote the use of biogas digester systems with a secondary slurry treatment system as an option to improving sanitation in appropriate settings.</li> <li>- Work closely with relevant agencies and corporations involved in water quality monitoring to share information relevant for the prompt identification of high risk areas as a result of poor sanitation facilities.</li> <li>- Develop a licensing system to regulate storage, collection and disposal of sludge waste.-</li> <li>- Improve operations and maintenance of the sludge treatment facilities</li> </ul>	Proportion of population using an improved sanitation facility ( MDGs )  SOE report: 95.2% private households with improved toilet facilities 84.9% - septic tank 80% septic tanks not constructed properly	Proportion of population using an improved sanitation facility	Proportion of population using an improved sanitation facility	Proportion of population using an improved sanitation facility
				Review National Building Code 1992	Code of Environmental Practises reviewed	Household sanitation survey
				Improved operations and maintenance of the sludge facilities and services	Improved operations and maintenance of the sludge facilities and services	Effective Licensing system for Sludge operations and services
	<b>C. Energy</b> <b>1. Promote the NGHGAS to reduce greenhouse gas emissions through Energy efficiency and Renewable energy through:</b>	<ul style="list-style-type: none"> <li>- Reduced GHG from land, marine and air transport by 10%</li> <li>- Reduced GHG from deforestation and degradation</li> <li>- Reduced GHG replacement of fossil fuels with biofuel</li> <li>- Reduced GHG through support of Energy Efficiency in the building sector</li> <li>- Reduced GHG by providing new sources of renewable energy</li> <li>- Reduced GHG Strengthened regulatory framework</li> </ul>	Inc. Of petroleum consumption to 68% of total energy 80% of imported petroleum – transport sector	Review implementation status of the Energy Policy  Report - EE Building sector	Implement at least 2 Renewable Energy project  Implement at least 2 Energy Efficiency project	Implement at least one Renewable Energy project  Implement at least one Energy Efficiency project

**OUTCOME 4 - The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 5</b>  <b>To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment</b>		to mitigate GHG emissions - Reduced GHG by promote and encourage energy conservation and efficient energy use				
	<b>2. Encourage and promote the implementation of the following energy efficient strategies -</b>	- the importation of energy efficient commercial/industrial and household technologies. - Promote energy conservation household practises through educational programs and others means including the use of incentives. - the use of pre-paid electricity in all households. - provision of results and analysis tested on Energy Efficiency Appliances for public and community awareness	National Greenhouse Gas Inventory	Provide approved Energy Efficiency Appliances and Technologies tested in Samoa and easily adopted by public and communities.	percentages of Energy Efficiency appliances used at households, Public buildings and private sectors	percentages of Energy Efficiency appliances used at households, Public buildings and private sectors
	<b>3. Encourage and facilitate the use of indigenous renewable energy sources.</b>	- Support public investment in renewable energy generation. - Provide incentives to encourage private investment in indigenous renewable energy generation. - Support and encourage local research into alternative and renewable energy sources. - Support Government initiatives to achieve the national target of 20% renewable energy by the year 2030.	National Greenhouse Gas Inventory	Seek funds to design and construct energy efficiency stoves and economical and durable renewable energy convention technology for converting of biomass into energy	Continue with promotion of Renewable energy technology for convention of indigenous renewable energy sources into useful fuel.	conduct surveys to determine percentage of Renewable energy achieved
	<b>D. Population</b> <b>1. Support the implementation of strategies to maintain annual growth rate within sustainable levels.</b> <b>2. Discourage urban migration and high population concentration along coastal areas.</b> <b>3. Encourage population relocation to areas outside hazard zones including low-lying and flood-prone areas.</b> <b>4. Collaboration with key</b>	- Community consultations to include discussion on population issues - Share information on coastal habitats and settlements issues. - Collect information on population exposure to climate and disaster risks based on their location and socio-economic status - Negotiate and include environmental issues in the Population Census with Samoa Bureau of Statistics. - Inform the population of potential disaster and climate risks to prepare them to respond	Population Census 2011: growth rate of 0.6% below annual growth rate of 1.0%  Pop. Total – 187,820 70% pop & physical infrastructure on low-lying coastal areas  vulnerability analysis and hazard mapping conducted ( 4 hazards assessed & mapped )  Household Survey to identify	CIM Plans updated with hazard zones   2 hazards assessed and mapped	environmental issues in the Population Census with Bureau of Statistics	environmental issues in the Population Census with Bureau of Statistics  # of responses & recovery preparedness and planning programmes implemented

**OUTCOME 4 - The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 5</b>  <b>To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment</b>	<b>stakeholders to establish information network and data sharing to support strategic plans.</b>	<ul style="list-style-type: none"> <li>- Support national surveys and data collection of environmental statistics and maps</li> <li>- Collaborate with key agencies to establish a statistical framework or guidelines for national data monitoring and update ( ie., MNRE Information Hub with linkages to the Environment Statistical Unit within the Samoa Bureau of Statistics )</li> </ul>	vulnerable households in 5 villages  7% of total number of villages completed their community disaster planning program.  33% country wide coverage of emergency radio communication and estimated 3% coverage by siren	15% coverage of villages with community disaster program completed 100% country wide coverage of emergency radio communication and 20% coverage by siren as early warning	17% coverage of villages with community disaster program completed	19% coverage of villages with community disaster program completed  50 % coverage by siren for early warning
	<b>E. Infrastructure</b> <b>1. Support the implementation of priorities of the National Infrastructure Strategic Plan (NISP) for climate change adaptation and mitigation</b>	<ul style="list-style-type: none"> <li>- Encourage the relocation of infrastructure and communities away from high hazard areas.</li> <li>- Assess the risk of compounding coastal erosion on neighbouring beaches of tourism value and other coastal infrastructure including hotels, as a result of poorly sited seawalls.</li> <li>- Encourage the integration of the KBA network in national infrastructure planning.</li> <li>- Discourage the construction of all vehicle access roads into priority KBAs.</li> <li>- Encourage and support the proactive use of environmental and social safeguards including EIAs in screening and designing infrastructure facilities.</li> </ul>	4 Hazards mapped with sensitive areas  27.0 km of seawalls constructed up to 2010 along the coast  67 seawall requests pending approval in 2012	CIM Plans reviewed  Urban planning hazard map  3 rockwalls, 2 seawalls, Update CSI (Coastal Survey Index)	Flood protection plans  Key settlements identified for relocation  Coastal study on effects of seawall structures	CIM Plans updated  Integrated Coastal Adaptation Strategy
	<b>2. Urban Planning &amp; Management</b>	<ul style="list-style-type: none"> <li>- Develop National Urban Policy</li> <li>- City Development Strategy</li> <li>- Urban Vulnerability and Adaptation Assessment</li> <li>- Precinct Master Plan – Revitalization</li> </ul>	CIM Plans  No urban plan	National Urban Policy Town / Urban Plan	Flood mapping and management plans. City Development Strategy	Precinct Master Plans

**OUTCOME 5 - Knowledge of Samoa's biodiversity and natural resource is enhanced and kept up to date through science based assessments and ongoing monitoring**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 6</b>  To strengthen scientific understanding of Samoa's habitats and species and geosciences to better inform planning for environmental sustainability and strengthening community resilience.	<b>1. Broad public participation in decision-making.</b>	<ul style="list-style-type: none"> <li>- All members to be actively engaged in sustainable development by incorporating specific knowledge and practical know-how into national and local policy making.</li> <li>- Easy access to information and communication technologies to share information and decision makers to be accountable.</li> <li>- Support and participate in regional and international initiatives for environmental monitoring and assessment.</li> <li>- Ensure spatial analysis processes to be compatible and complementary with PAs network designs and other conservation strategies.</li> <li>- Consultations with key agencies in the design and management of the information hub</li> </ul>	Climate Early Warning System ICCHRAS - Information available for the Agriculture and health sectors SAMFRIS - Forest resource information	Design framework for information hub	information sources catalogued	A centralised information hub with all biodiversity and natural resource data
	<b>2. Identify key information gaps in all habitat-types and encourage collaborative research and surveys with competent local and international scientific organizations and institutions for their investigation.</b>	<ul style="list-style-type: none"> <li>- Support monitoring surveys targeting key cetacean species and marine reptiles, in particular whales and dolphins, and hawksbill turtles nesting sites.</li> <li>- Support surveys of lesser known marine habitats and fauna groups including seagrasses, algae,</li> <li>- Support recommendations of the BioRAP report for additional studies into the biodiversity of the Central Savaii Rainforest KBA.</li> <li>- Assess the current status of Samoa's wetland and marshland habitats.</li> <li>- Initiate investigations of coastal sand and gravel budgets, composition and sinks and sources to support the sustainable management of sand mining and coastal reclamation activities.</li> <li>- Ascertain the extent of reported marine shellfish lead contamination in Vaiusu Bay and surrounding areas, and fish poisoning.</li> <li>- Monitor climate change induced changes in marine habitats and species of high conservation value.</li> </ul>	Biodiversity & water resources database  data available on websites (mnre, SPREP) and internet including MNRE/SPREP library portals  No. of scientific and assessment surveys of resource ecosystems conducted.	database created, indicators updated every year  coastal sand and gravel study	MNRE Information Centre upgraded to establish Information Hub  Study / Report on marine shellfish lead contamination in Vaiusu Bay and surrounding areas	database online and available in library portals  Technical survey reports completed
	<b>3. Support and participate in regional and international initiatives for geosciences</b>	<ul style="list-style-type: none"> <li>- External funding opportunities for training</li> <li>- Information sharing/ resources with tertiary institutions</li> </ul>	Develop a Climate Early Warning and information services for all sectors of Samoa starting with 9 NAPA priorities	Data/ resources collected and	Data/ resources collected and	Data/ resources collected and

**OUTCOME 5 - Knowledge of Samoa's biodiversity and natural resource is enhanced and kept up to date through science based assessments and ongoing monitoring**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
	<b>features monitoring and assessment, including regional and international networks for monitoring earthquakes, tsunami, sea level rise, changes in coastline, sources of aggregates and rainfall levels.</b>	<ul style="list-style-type: none"> <li>- Scientific research promoted with NUS students</li> <li>- Encourage research within MNRE</li> <li>- Continuous participation in technical overseas attachments and information sharing</li> <li>- Provide on-the-job training for MNRE staff and stakeholders</li> <li>- Promote staff development and work attachments to enhance MNRE staff capacity and relevant stakeholders to conduct research and monitoring work.</li> <li>- Encourage the participation of relevant stakeholders in MNRE workshops and Environment Forums to promote better understanding and awareness of earthquakes, tsunami, sea level rise, changes in coastline etc</li> <li>- Provide easy access to publications and researches for the general public and schools.</li> <li>- Establish Quality Management System in place to provide weather information to the aviation industry and other relevant agencies ( ie with ICAO/SPREP )</li> </ul>	<p>Increase number of climate data analyses and associated information services on an ongoing basis.</p> <p>Number of monthly, seasonal and annual reports provided to end users.</p> <p>Database Management System CLIDE (Climate Database for the Environment) upgrade capacity to store digitized data</p> <p>Available of secure database management system for storage and retrieval of meteorological data</p> <p>Increase number of staff on technical work attachments per year ( 3 )</p>	<p>available at Hub.</p> <p>Climate Warning and information services for all sectors</p> <p>Increase number of staff on technical work attachments per year ( 3 )</p> <p>Training for QMS for weather aviation network</p>	<p>available at Hub.</p> <p>Climate Warning and information services for all sectors</p> <p>Increase number of staff on technical work attachments per year ( 3 )</p> <p>Establish Quality Management System</p>	<p>available at Hub.</p> <p>Climate Warning and information services for all sectors</p> <p>Increase number of staff on technical work attachments per year ( 3 )</p>
	<b>4. Provide and participate in opportunities for staff training in research methods for ecosystems and species assessments, surveys and data analyses.</b>	<ul style="list-style-type: none"> <li>- Capacity building to improve the availability of Climate Change information and knowledge to support evidence-based monitoring and evaluations.</li> <li>- Capacity building for spatial design, technical mapping and GPS to monitor the state of the environment and to document climate change impacts.</li> <li>- Collaboration with key agencies to develop a statistical framework to support information network and data sharing.</li> </ul>	<p>Publications presented at the Environment Forums</p> <p>Staff or consult research under the WSSSP - Water &amp; Sanitation Forum</p>	<p>Average of 3 papers per year</p> <p>Technical training ( 2 ) for mapping exercise under DMO &amp; Forestry</p>	<p>Average of 3 papers per year</p> <p>Publications available on the Information Hub</p>	<p>Average of 3 papers per year</p>

**OUTCOME 6 - Promote Low Carbon Development in the Energy Sector through the establishment of a Nationally Appropriate Mitigation Action Programme**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 7</b>  To facilitate and support the shift to a low-carbon and climate resilient economy	<b>1. Regulatory Framework to promote energy sector reforms.</b>	<ul style="list-style-type: none"> <li>- Develop Renewable Energy and Energy Efficiency Policy and ACT for monitoring of Renewable energy development and technologies to assure no practices, equipments, products and residuals endangers the environment.</li> <li>- Develop a National Appropriate Mitigation Action ( NAMA ) to integrate Renewable Energy and Energy Efficiency to other sectors plans for low carbon developments.</li> <li>- Develop NGHGS eight priority areas to maximize reduction of Greenhouse Gas emission.</li> <li>- Seek funding from the Global environment facilities for mitigation activities</li> <li>- Promote the co-benefits for mitigation and transformation to more sustainable development paths through EE and RE.</li> <li>- Collaborates with energy sector and relevant agency in implementation of NAMA and GHG emission monitoring.</li> <li>- Promote Waste-to-Energy initiatives towards an environmentally clean environment with key stakeholders ( MoF, EU WSSSP, SPREP, MNRE, Private Sector )</li> </ul>	National Greenhouse Gas Abatement Strategy 2008-2018  Only two out of eight priorities area are partially implemented  2 household and one community with Renewable energy for mitigation of Methane	Renewable Energy Development Policy  Develop the National Appropriate Mitigation Action plan (NAMA)	Greenhouse gas emission monitoring strategy policy with set emission targets based on first and second GHGAS Inventory results and Emission analysers data	Continue with the implementation of Low Carbon Development in all relevant sectors
	<b>2. Sector Coordination</b>	<ul style="list-style-type: none"> <li>- Designate MNRE Renewable Energy Division as the leading agency for overall coordination of Renewable Energy and Energy efficiency Technical Advisor.</li> <li>- Provide Environmental advisory to Renewable energy developers and utilities to ensure maximize protection of environment.</li> <li>- Monitoring of renewable energy production agency and to collect and analysis data for reporting.</li> <li>- Close coordination between MNRE and key Ministries, Corporations and the Private Sector to</li> </ul>	Sector Coordination meetings  Baseline to be established	Stakeholder consultations & awareness workshops  Conduct at least two public Consultation On GHG Emission control.	2 Workshop on GHG emissions monitoring and assessment  energy audit  Environmental Guidelines for renewable energy developments and	Surveys on the effectiveness of workshops and as baseline for overall capacity developments  Conduct GHG Emission Inventory and provide results to all sectors

**OUTCOME 6 - Promote Low Carbon Development in the Energy Sector through the establishment of a Nationally Appropriate Mitigation Action Programme**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 7</b>  <b>To facilitate and support the shift to a low-carbon and climate resilient economy</b>		ensure environmental sustainability through renewable energy development - Encourage and facilitate the participation of staff in appropriate trainings in GHG emissions monitoring and assessment. - Conduct awareness programmes for the government Ministries and Agencies, Private Sector and Non Government Organization, Communities and Schools		Update GHG Inventory  Establish a GHG Emission monitoring committee	list of environmentally friendly technologies  Conduct GHG Emission Inventory and provide results to all sectors	
	<b>3. Reducing high levels of dependence on imported fossils fuels as the main source of energy.</b>	- Investing in Renewable energy to increase its contribution and to reduce fossil fuel consumption to 15% by 2016 . - Climate proofing infrastructure e.g. strengthened roads, building codes, effective zoning - Price incentives - MNRE to actively engage the public through tv advertisements to reduce energy consumption by switching to energy efficient light bulbs, house hold appliances, and through energy conservation by switching off appliances when not in use, and avoiding unnecessary use of vehicles. - Developing of a carbon or green free tax to help with environment conservation efforts - Promote Investment in improved water infrastructure ie., leaking water pipes contribute to significant energy wastage	30% renewable energy in Samoa's total energy consumption in 2012	5 % reduction in fossil fuel consumption  Design and construct biomass energy efficiency stoves  Submit proposal for tax incentives for energy efficiency appliances and discussion of a green tax policy  Develop programme to assist SWA in lowering electricity bill.	5 % reduction in fossil fuel consumption  Conduct consultation with all stakeholders about development of Green tax	5 % reduction in fossil fuel consumption  Develop at least three projects for rolling over of biogas digester systems for household and farmers.

**OUTCOME 7 - Stakeholder engagement and involvement (in decision making) in implementation of environmental management initiatives is strengthened**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 8</b>  To facilitate the direct participation of local communities (village councils, women, and youth) and private land owners in the planning and management (including monitoring) of habitats and species in areas under communal/freehold ownership and control.	<b>1. Broad public participation in decision-making.</b>	<ul style="list-style-type: none"> <li>- All members to be actively engaged in sustainable development by incorporating specific knowledge and practical know-how into national and local policy making.</li> <li>- Easy access to information and communication technologies to share information and decision makers to be accountable.</li> <li>- Support and participate in regional and international initiatives for environmental monitoring and assessment.</li> <li>- Initiate and support capacity building activities for local communities.</li> </ul>	Workshops & national consultation per year ( 6 )  SLM Training Centre for farmers, Asau	2 national consultations  Trainings of communities to empower them to manage and monitor the resources	3 national consultations	3 national consultations
	<b>2. Disseminate properly packaged environmental information to the general public including village councils, local community (women, aumaga, youth etc.), church groups and schools.</b>	<ul style="list-style-type: none"> <li>- Use the mass media as an avenue for regular features on topical environmental issues targeting primary and secondary schools and the general public.</li> <li>- Translate and package important environmental information and reports and make them accessible and available to village groups including women's' and youth groups and village councils.</li> <li>- Encourage, facilitate and support village environmental conservation initiatives by providing relevant information and technical advice.</li> </ul>	MNRE Public awareness materials	Environment Resource Education Guide to schools  Package resources disseminated agencies	Environment Resource Education Guide to schools  Package resources disseminated agencies	Environment Resource Education Guide to schools  Package resources disseminated agencies
	<b>3. Target villages and customary land owners whose land hosts habitats and species of high conservation value, for awareness raising activities.</b>	<ul style="list-style-type: none"> <li>- Provide information and support to villages whose assistance and support are crucial to the protection of the Central Savaii Rainforest KBA.</li> <li>- Review and update the 2012 SOE Report Card and distribute widely to schools, village organizations and the general public.</li> <li>- Support information dissemination through the use of mass media outlets.</li> <li>- Trusting partnerships with communities to sustainably manage resources and monitor changes in the environment</li> </ul>	8 Terrestrial KBAs - 7 Marine KBAs – 3 currently co-managed by Govt and communities  4 Forest Village Committees  3 national consultations in Savaii – SOE/2013 5 national consultations in Upolu under SOE & ICCRIFS, Water	MOUs with villages  Report Card 2013  NBSAP national consultations ( 4 )	School Roadshow	Community stakeholder workshop
	<b>4. Strengthen existing co-planning and co-</b>	<ul style="list-style-type: none"> <li>- Engage community representatives regularly in environmental information sharing and training</li> </ul>		National ( 2 )	2 national	2 national



**OUTCOME 7 - Stakeholder engagement and involvement (in decision making) in implementation of environmental management initiatives is strengthened**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 8</b>  To facilitate the direct participation of local communities (village councils, women, and youth) and private land owners in the planning and management (including monitoring) of habitats and species in areas under communal/freehold ownership and control.	<b>management arrangements for village fisheries reserves, district marine protected areas and community based conservation areas.</b>	events. - Provide technical advice, support and basic training for community based habitat based monitoring. - Co responsibility of environmental monitoring, habitat and species recovery and protection initiatives and co management under customary land tenure. - Provide capacity building and educational support to ensure communities have skills and knowledge to fulfil responsibilities effectively.	MPAs  Village by-laws operational	consultation with Communities: MAF, MWCSO, MNRE,  - MOUs - Management Plan - Village Development Plans	workshops for village reps: Management Plans	workshops for village reps: Management Plans
	<b>5. Encourage community and individual landowners' participation in business ventures that promote the sustainable use and management of natural habitats and species.</b>	- Payment for ecological services such as forest conservation, watershed protection, mangrove protection, marine protected areas, etc. - Encourage and support community involvement in ecotourism ventures. - Assist and support the development of renewable energy sources (biomass, solar, hydro, wind) on customary lands. - Support relevant government initiatives targeting community involvement in habitat and species recovery activities including tree replanting in catchment and coastal areas, agro-forestry and permaculture systems, organic agriculture, waste management activities and others. - Eco-tourism – partnership to develop and coordinate a sustainable market for tourist activities - enabling environment for job creation by private sectors investing in green growth. - encourage business and private sector support to take on green growth as part of business ventures in the context of sustainable development and improved livelihood.	To be established	PES Workshop with stakeholders  Negotiations with private sector / tour operators re eco-tourism  Impact awareness survey	PES Workshop with stakeholders  tree replanting in catchment and coastal areas	MOU with private sector  tree replanting in catchment and coastal areas

**OUTCOME 8 - Enabling environment that promotes sustainable financing and partnerships with international organizations to ensure the provision of better support towards environmental sustainability and disaster resilience.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 9</b>  <b>a. To strengthen the policy and regulatory framework to enhance environmental sustainability</b>    <b>b. To strengthen medium to long term financial management</b>	<b>1. Review and update existing policy and regulatory framework</b>	<ul style="list-style-type: none"> <li>- Undertake an audit of existing environmental policies , strategies and legislation in place with a view to integrate and harmonise where appropriate</li> <li>- Identify and select priority policies , strategies and legislation for review and update</li> <li>- Undertake review and update of selected priority policies, strategies and legislation</li> <li>- Undertake scientifically sound research, assessments to provide accurate and up-to-date environmental statistics to support policy formulation/review.</li> </ul>	To be established based on the Audit findings	Baseline + 2%	4%	6%
	<b>2. Improve environmental monitoring, enforcement and compliance</b>	<ul style="list-style-type: none"> <li>- Establish and update on a regular basis a national database for all environmental policies and legislative tools for monitoring compliance</li> <li>- Identify an appropriate incentive based scheme to recognise and encourage consistent compliance</li> <li>- Identify an appropriate incentive based scheme to recognise and encourage consistent compliance</li> </ul>	To be established	Baseline + 10%	20%	30%
	<b>1. Improve medium term financial planning and management of the National Environment Sector Plan</b>	<ul style="list-style-type: none"> <li>- Review and update the Sector MTEF on annual basis</li> <li>- Engage the private sector in environment and disaster and climate financing /investment</li> </ul>	Develop Environment Sector MTEF in 13/14 Budget as baseline - MNRE takes up 8.5 % of National Budget  All Climate Change Adaptation and Mitigation projects NAPA 1-5	Baseline + 2%	4%	6%
	<b>2. Encourage the use of natural resource valuations and payment ecosystems services (PES)</b>	<ul style="list-style-type: none"> <li>- Identify area(s) to Pilot PES and document lessons learned for national roll out</li> <li>- Encourage and actively support inclusive and consultative approaches to planning and, where appropriate, the co-management of habitats and species under customary land tenure.</li> <li>- To establish a criteria for an economic valuation of Samoa's ecosystem and having it part of Samoa's GDP</li> </ul>	To be established	1 workshop for MNRE + stakeholders on PES and Cost benefit analysis	Consultation on 1 selected site	
	<b>3.To improve and increase access to external donor funds</b>	<ul style="list-style-type: none"> <li>- Enhance access to global climate change funds through Implementing Agencies ( IA ) eg., UNDP, WB, UNEP, ADB, FAO</li> </ul>	Climate Trust Fund (in pipeline) Pacific Catastrophe and Financing			

**OUTCOME 8 - Enabling environment that promotes sustainable financing and partnerships with international organizations to ensure the provision of better support towards environmental sustainability and disaster resilience.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
		- Explore potential and feasible National trust fund arrangements	Initiative (Insurance Cover for Disasters)			
<b>8c. To establish and implement an effective coordination framework to facilitate environmental planning, implementation, monitoring and evaluation processes</b>	<b>1. Establish institutional arrangements for effective coordination</b>	<ul style="list-style-type: none"> <li>- Re-activate the NESP Taskforce to coordinate the planning, implementation, monitoring and review of the NESP</li> <li>- Establish an integrated performance monitoring system for the NESP</li> <li>- Undertake integrated and coordinated annual reviews of the NESP</li> </ul>	<p>To be established</p> <p>Disaster Risk Management National Action Plan 2011-2016</p>	Baseline + 5%	10%	15%
	<b>2. Strengthen participation of local communities in the NESP process</b>	<ul style="list-style-type: none"> <li>- Implement participatory approaches</li> <li>- Increase participation of NGOs / Civil Society Groups, Churches</li> </ul>	<p>To be established</p>	<p>Baseline + 5%</p> <p>M &amp; E Framework developed</p>	<p>10%</p> <p>M &amp; E Framework implemented</p>	15%

**OUTCOME 9 - Strengthened institutional framework with improved governance and capacity at all levels to promote integrated decision making, improve monitoring and enforcement, and strategic environmental assessment.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO 10</b>  <b>Strengthen national capacity for environmental management; coordinate the NESP implementation, environmental monitoring and assessment.</b>	<b>1. Institutional set-up</b>	<ul style="list-style-type: none"> <li>- Establish an Environment Coordination Unit under MNRE to coordinate the monitoring and reporting of environmental changes in SOE habitats and the impacts of NESP implementation</li> <li>- Establish the NESP Advisory Committee with membership and representation drawn from Government agencies, organizations and institutions, NGOs and the private sector.</li> </ul>	Sector Coordination meetings	Review of the NESP to incorporate other sectors' plans relevant requirements	At least 50% of stakeholders have mainstreamed the NESP into their sector plans and programs.  Implement NCSA 2 <sup>nd</sup> phase - project	SOE Information Hub  Data update
	<b>2. Improved sector coordination of environmental initiatives through a robust and effective management framework</b>	<ul style="list-style-type: none"> <li>- Designate MNRE as the leading agency for overall coordination of environmental monitoring, assessment and reporting proposed above.</li> <li>- Designate within MNRE a secretariat to handle coordination tasks and communications.</li> <li>- Design and implement a multi-sector and multi-agency environmental monitoring programme that consolidate all environmental monitoring under different Divisions of MNRE and those of other agencies. The monitoring programme will harmonize data gathering activities, monitoring methods and protocols, indicators and metrics.</li> <li>- Facilitate the establishment of a centralized clearing house mechanism within MNRE that will house all monitoring assessments data and reports and which will be accessible to all legitimate stakeholders.</li> <li>- Facilitate the mainstreaming and integration of environment, and disaster and climate resilience into all sector plans</li> </ul>	<p>To be established</p> <p>6 sectors plans with disaster and climate resilience strategies (Health, Agriculture, Education, Tourism, Water &amp; Sanitation, and Community)</p>	<p>NESP secretariat established and functioning</p> <p>NESPAC established and functioning</p> <p>NESP monitoring and reporting system established and functioning</p>	<p>Sector Coordination Meetings</p> <p>1 sector plan</p>	<p>SOE hub - funding for CHM Project</p> <p>1 sector plan</p>
	<b>3. SOE Assessment &amp; Reporting</b>	<ul style="list-style-type: none"> <li>- Consolidate the periodic compilation and preparation of the State of Environment Report as a core activity and priority output of MNRE.</li> <li>- Consolidate environmental monitoring across all Divisions of MNRE as a core function of the agency, to support and ensure consistent data gathering needed to produce future SOEs.</li> <li>- Consolidate the regular compilation of the State of Environment (SOE) Report as a priority output of MNRE.</li> </ul>	<p>SOE Reports with set indicators to be used for assessments</p> <p>National Reports under MEAs</p> <p>Co-Funding mechanisms with development partners</p> <p>CDC Reports</p>	<p>SOE data update</p> <p>Capacity building training</p>	SOE data update	SOE data update

**OUTCOME 9 - Strengthened institutional framework with improved governance and capacity at all levels to promote integrated decision making, improve monitoring and enforcement, and strategic environmental assessment.**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<p><b>KESO 10</b></p> <p><b>Strengthen national capacity for environmental management; coordinate the NESP implementation, environmental monitoring and assessment.</b></p>	<p><b>4. Capacity building &amp; awareness at all levels.</b></p>	<ul style="list-style-type: none"> <li>- Encourage and facilitate the participation of staff in appropriate trainings in environmental monitoring and assessment.</li> <li>- Support the design and management of electronic data storage facilities, and the development of information sharing and access protocols.</li> <li>- Provide training to all MNRE staff and staff of other relevant agencies in the use of an MNRE based clearing house mechanism by which all monitoring information is accessed and shared.</li> <li>- promote integrated decision making, exchange of information and providing expertise</li> <li>- Review and update existing legislation and regulations and enact new ones as appropriate to strengthen the capacity of MNRE to encourage and if necessary enforce compliance.</li> <li>- Strengthen the capacity of MNRE and other relevant agencies for tracking and measuring physical and biological chemical, meteorological indicators for environmental health by investing in up-to-date equipment, information gathering activities and staff training.</li> </ul>	<ul style="list-style-type: none"> <li>- Published Report on Forums and others</li> <li>- Compliance Monitoring Reports</li> <li>- CDC approval</li> </ul>	<p>Invest as a matter of high priority in the collection of scientifically sound, accurate and up-to-date environmental statistics to measure environmental change and ecological health.</p>	<p>Data update</p> <p>UNDP Project</p> <p>Clearing House Mechanism training</p>	<p>Information hub Upgraded system/database</p> <p>UNDP Project</p>

OUTCOME 1 - Habitat: OUTCOME 10 - Promote and mainstream an integrated habitat-based approach towards environmental assessments to support climate change adaptation and mitigation						
Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
<b>KESO11</b>  To implement habitat/ecosystem based strategies to support climate change adaptation and mitigation.	<b>1. Monitor and support the effective implementation of National Programmes to reduce GHG emissions through an Integrated approach</b>	<ul style="list-style-type: none"> <li>- Review and update NAPA, and implement updated NAPA priorities.</li> <li>- Review and update existing Coastal Infrastructure Management Plans to incorporate a ridge-to-reef approach.</li> <li>- Implement updated CIM Plans priorities.</li> <li>- Support the development of water purification and alternative water storage programs for communities.</li> </ul>	Net GHG emitted (emission minus removals)  # of climate adaptation and mitigation projects completed and under implementation	NAPA review workshop	Impact assessment study	Funding roll-over  Reports on review  # of projects approved for new cycle
	<b>2. Implement strategies (for improving air quality) to support climate change adaptation and mitigation</b>	<ul style="list-style-type: none"> <li>- Assess local sources of pollution and how they affect the atmosphere.</li> <li>- Encourage the use of materials and products that do not deplete the atmospheric ozone layer</li> <li>- Encourage the use of meteorological data to monitor air quality</li> <li>- Promote the sustainable development of land transport infrastructure</li> <li>- Conserve forest resources and create tree cover.</li> <li>- Encourage the use of alternative and renewable energy sources.</li> <li>- Review vehicle inspection standards to reduce exhaust emission and improve engine performance.</li> <li>- Encourage the use of alternatives to replace existing ozone depleting substances</li> </ul>	HCFC baseline 3.88 metric tonnes  Consumption of ozone-depleting substances ( MDGs 2.2 (2008)  HCFC freeze at 3.88metric tonnes on 1 <sup>st</sup> January 2013  CO2 emissions total, per capita and per \$1 GDP (PPP) - 1.96 (2010 MDG Report )	Review air quality standards    Workshops on Ozone depleting substances alternatives	HCFC consumption reduction by 10% of baseline on 1 <sup>st</sup> January 2015	CO2 emissions total, per capita and per \$1 GDP (PPP) - 1.96   Consumption of ozone-depleting substances
	<b>3. Develop knowledge and promote understanding of the predicted impacts of climate change and greenhouse effect.</b>	<ul style="list-style-type: none"> <li>- Assess the impacts on the atmosphere of development projects and some domestic activities.</li> <li>- Review current policies on the importation and use of motor vehicles.</li> <li>- Review the cost structures for petroleum products.</li> <li>- Review present production of energy to promote sustainable cost recovery.</li> <li>- Establish pollution limits for atmospheric discharge from domestic and industrial activities.</li> <li>- Provide incentives for non-polluting or less polluting industrial processes and products.</li> <li>- Develop appropriate designs for buildings and towns in response to predicted climatic changes.</li> </ul>	Regulation in place for Ozone safe and energy efficient technologies	Survey on domestic activities that impact on atmospheric pollution   Incentive programs on environmental safe products	Update reports from the Energy and Transport Sector	Update reports from the Energy and Transport Sector

**OUTCOME 10 - Promote and mainstream an integrated habitat-based approach towards environmental assessments to support climate change adaptation and mitigation**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
	<b>4. Develop understanding of the effects of pollution on atmospheric quality.</b>	<ul style="list-style-type: none"> <li>- Establish facilities to collect, analyse and disseminate information on the causes and consequences of pollution in the atmosphere.</li> <li>- Provide updated information on the global developments in climatic changes and atmospheric pollution.</li> <li>- Encourage and support research programmes on pollution controls.</li> <li>- Undertake cost/benefit studies into alternative energy supplies and sustainable transportation.</li> <li>- Establish the effects of some traditional behaviour (e.g. open burning) on the atmosphere.</li> <li>-</li> </ul>	Baseline to be established	Inclusion of atmospheric information in Education curriculums	Report on the Causes of Atmospheric Pollution for Samoa	Update reports for Information Database / Information Hub
	<b>5. Generate public awareness of global climatic changes and the need to protect the atmosphere.</b>	<ul style="list-style-type: none"> <li>- Develop community programmes to combat atmospheric pollution.</li> <li>- Promote public education programmes on the causes and effects of global climatic changes.</li> <li>- Promote public support for clean air policies through consumer networks.</li> <li>- Encourage public participation in efforts to reduce pollution of the atmosphere.</li> <li>- Encourage self sufficiency in preparation for the predicted outcomes of global climatic changes.</li> <li>- Inform the public of global efforts to combat climate change and atmospheric pollution.</li> <li>- Promote public awareness on protection of the Ozone layer.</li> <li>- Assess the likely risks due to climate change (e.g. sea level rise and tropical cyclones) in the design of long term projects.</li> <li>- Develop urban design criteria to minimize the effects of potential sea-level rise and climate change.</li> <li>- Establish appropriate standards for the provision of public services in high-risk areas.</li> <li>- Promote self sufficiency in preparation for expected disasters.</li> <li>- Assess the likely impacts of sea level rise on ground water and marine resources.</li> </ul>	Climate Outlook reports from Climate Services Section	Awareness programs for schools  Consultations with communities on protection of the ozone layer  Formulate National Atmospheric Policy  3 school workshops on ozone	Awareness programs for schools  Consultations with communities on protection of the ozone layer  Study on the social effects of sea level rise on coastal communities to relocate.	Awareness programs for schools  Consultations with communities on protection of the ozone layer

**OUTCOME 10 - Promote and mainstream an integrated habitat-based approach towards environmental assessments to support climate change adaptation and mitigation**

Key Environment Sector Objective ( KESO )	Sector Strategies	Actions	Baseline Indicators	Performance Targets per FY		
				13/14	14/15	15/16
		<ul style="list-style-type: none"> <li>- Determine the social effects of sea level rise on coastal communities which may have to relocate elsewhere.</li> <li>- Adopt appropriate land use practises for low-lying areas.</li> </ul>				
	<p><b>6. Develop knowledge and promote understanding of the predicted impacts of climate change and the greenhouse effect</b></p>	<ul style="list-style-type: none"> <li>- Provide facilities to collect analyse and disseminate information on climate change and the greenhouse effect.</li> <li>- Educate the public on the causes and effects of climate change.</li> <li>- Inform the public on current global and regional knowledge on sea level rise.</li> <li>- Monitor local tidal fluctuations and coastal wave actions.</li> <li>- Monitor weather patterns and regional wind movements.</li> <li>- Promote public awareness of the risks to life and property associated with sea-level rise and tropical cyclones.</li> <li>- Prepare guidelines on actions to adopt in response to climate change.</li> </ul>	<p># of knowledge products on tidal and coastal actions</p> <p># of products that are weather and wind related</p>	<ul style="list-style-type: none"> <li>-awareness campaigns</li> <li>-workshops</li> <li>-dissemination of climate technology information to stakeholders</li> </ul>	Extend awareness programs to include rural areas and Savaii Island	2 Weather monitoring reports
	<p><b>7. Capacity Building measures to strengthen national efforts for improving atmospheric conditions and support climate change adaptation and mitigation,.</b></p>	<ul style="list-style-type: none"> <li>- Training initiatives and development packages targeted to specialised skilled areas such as atmospheric conditions, climate change, greenhouse gas emissions, solar and wind alternatives</li> <li>- Provide relevant capacity building support to key agencies and private companies</li> </ul>	<p>50% RAC trained technicians</p> <p>30% RAC trained technicians</p>	<ul style="list-style-type: none"> <li>-Refrigeration and Air condition technicians training</li> <li>-Customs and Enforcement Officers training</li> </ul>	80% RAC technicians trained	100% RAC technicians trained



## 8. Implementing Agencies

Table 2 identifies lead and supporting agencies for all recommended strategies of NESP.

**Table 2: NESP Strategies and Implementers**

Key Environmental Sector Objective (KESO #)	Strategies	Main Implementing Agencies & Organizations	Other Agencies & organizations with supporting roles
(KESO) 1 – To implement strategies for rehabilitating, protecting and conserving priority terrestrial (upland, lowland and coastal) habitats and species.	<ol style="list-style-type: none"> <li>1. Create secure and effective representative terrestrial protected and conservation areas.</li> <li>2. Encourage and facilitate the participation of land owning communities in the management of KBAs.</li> <li>3. Reduce other pressures on terrestrial habitats and species.</li> <li>4. Identify innovative ways to adapt to the impact of climate change.</li> <li>5. Strengthen the capacity of MNRE and other key national partners to more effectively plan and implement its responsibility for environmental protection and management.</li> </ol>	MNRE, MWCS D	MAF, MOF, MJCA, SPREP, NUS, USP, MESC, AG, Police, SWA, STA, SPREP, SBS, OLSSI, PSC, SLC
(KESO) 2 – To implement strategies for rehabilitating, protecting and conserving (degraded) threatened marine habitats and species.	<ol style="list-style-type: none"> <li>1. Create Effective Marine Protected Areas (MPAs).</li> <li>2. Reduce Other Pressures on Coastal habitats.</li> <li>3. Identify Innovative Ways To Adapt.</li> <li>4. Promote the conservation, sustainable management and equitable sharing of marine and ocean resources.</li> </ol>	MNRE, MAF Fisheries, MWCS D	MFAT, MOF, Police, MoH  NUS, SROS, USP, CI, SPREP, Private Sector
(KESO) 3 – To implement strategies for the restoration of habitats critical to species and recovery of species populations of conservation concerns.	<ol style="list-style-type: none"> <li>1. Policy /legal frameworks/ CITES</li> <li>2. Exploration of resources &amp; Research</li> <li>3. Monitoring &amp; Enforcement</li> </ol>	MNRE, MWCS D, MAF, MFAT	METI, OLSSI, AG, SUNGO, CoC, Police, NUS, STA, SPREP, CI, USP
(KESO) 4a, b, c, – To implement strategies for protecting key environment resources such as forest land, water & fisheries.	<ol style="list-style-type: none"> <li>1. Policy frameworks to help reverse deforestation and forest degradation and promote sustainable use and management of forests as well as their conservation and restoration.</li> <li>2. Strengthen watershed conservation and management</li> <li>3. Strengthen collaboration with MAF/ Fisheries Division</li> </ol>	MNRE, MAF, MWCS D	SWA, SPREP, CI, NUS, MESC, SLC
	<ol style="list-style-type: none"> <li>1. Improve knowledge and understanding of forests resources</li> <li>2. Improve knowledge and understanding of water resources</li> </ol>	MNRE, MAF, MWCS D, NUS, USP, MESC	STA, SLC

	<ol style="list-style-type: none"> <li>1. Improve the enabling environment for sustainable forest management</li> <li>2. Improve the enabling environment for water resources management</li> <li>3. Improve the enabling environment for coordination between agencies etc</li> </ol>	MNRE, MAF, MWCS D, NUS, USP, MESC	STA, SPREP, METI, SHA, MOF, MWCS D, Chamber of Commerce (CoC), LTA, EPC, CSSP
	<ol style="list-style-type: none"> <li>1. Strengthen enforcement of legislation and plans on fisheries and forests.</li> <li>2. Strengthen enforcement of water legislation and plans</li> </ol>	MNRE, MAF, MWCS D, NUS, USP, MESC, Police	STA, SHA, MOF, MWCS D, AG, Chamber of Commerce (CoC), LTA, EPC, CSSP, FESA
	<ol style="list-style-type: none"> <li>1. Strengthen community engagement in forest management</li> <li>2. Strengthen community engagement in water resources management</li> <li>3. Strengthen community engagement in fisheries resource management</li> </ol>	MNRE, MAF, MWCS D, NUS, USP, MESC, Police	FAO, SWA, MoH
	<ol style="list-style-type: none"> <li>1. Implement conservation projects for forests</li> <li>2. Implement conservation projects for groundwater, freshwater springs and lakes</li> </ol>	MWCS D, MNRE, MAF	STA, SHA, MOF, MWCS D, SWA, Chamber of Commerce (CoC), LTA, EPC, CSSP
(KESO) 5 –  To implement strategies to reduce the vulnerability and increase the resilience of Samoa's urban and rural built environment.	<p>Waste management</p> <ol style="list-style-type: none"> <li>1. Improve household and industrial waste management –</li> <li>2. Strengthen the legal framework for waste management.</li> <li>3. Strengthen MNRE and relevant stakeholder capacity in waste management.</li> <li>4. Improve risk management and governance of chemicals and hazardous waste</li> </ol>	MNRE, CoC, SAME, Private Sector	MAF, MWCS D, POLICE, NUS, USP, MOF, CSSP, SPREP
	<p>Sanitation</p> <ol style="list-style-type: none"> <li>1. Improve household sanitation systems</li> </ol>	MNRE, SWA., NHS, LTA, MWTI	MWCS D, STA, SHA, CoC, SAME
	<p>Innovative Energy</p> <ol style="list-style-type: none"> <li>1. Promote the GHGAS to reduce greenhouse gas emissions through Energy efficiency and Renewable energy from the following priority areas</li> <li>2. Encourage and facilitate the implementation of energy efficiency strategies</li> <li>3. Encourage and facilitate the use of indigenous renewable energy sources.</li> <li>4. Facilitate and support the shift to a low-carbon and climate resilient path.</li> </ol>	MNRE, MOF, EPC, SWA	MAF, SPREP, CI, METI/OLSSI, NUS, Private Sector, MCIL
	<p>Population</p> <ol style="list-style-type: none"> <li>1. Support the implementation of strategies to maintain annual growth rate within sustainable levels.</li> <li>2. Discourage urban migration and high</li> </ol>	MNRE, MAF, MWTI, SBS	MOF, SWA, MWCS D, METI, OLSSI, MAF, STA, MOH, LTA,

	<p>population concentration along coastal areas.</p> <ol style="list-style-type: none"> <li>Encourage population relocation to areas outside natural hazard zones including low-lying and flood-prone areas.</li> <li>Collaboration with key stakeholders to establish information network and data sharing to support strategic plans.</li> </ol>		
	<p>4.5.5 Sustainable Infrastructure</p> <ol style="list-style-type: none"> <li>Support the implementation of priorities of the National Infrastructure Strategic Plan (NSIP) for climate change adaptation and mitigation.</li> <li>Encourage the integration of the KBA network in national infrastructure planning. Avoid construction of any form of vehicle access tracks into priority KBAs.</li> <li>Encourage and support the proactive use of environmental and social safeguards including EIAs in screening and designing infrastructure facilities.</li> </ol>	<p>MNRE Forestry PUMA, MWTI, LTA, MAF, MWCS D</p>	<p>PSC, MESC, NUS, USP, Private Sector</p>
<p>(KESO) 6 –</p> <p>To strengthen scientific understanding of Samoa’s habitats and species and geosciences to better inform planning s for environmental, sustainability and strengthening community resilience.</p>	<ol style="list-style-type: none"> <li>Support and participate in regional and international initiatives for environmental monitoring and assessment.</li> <li>Identify key information gaps in all habitat-types and encourage collaborative research and surveys with competent local and international scientific organizations and institutions for their investigation.</li> <li>Support and participate in regional and international initiatives for geosciences features monitoring and assessment, including regional and international networks for monitoring earthquakes, tsunami, sea level rise, changes in coastline, sources of aggregates and rainfall levels.</li> <li>Provide and participate in opportunities for staff training in research methods for ecosystems and species assessments, surveys and data analyses and in the design and management of information hub for storage and dissemination of information gathered.</li> <li>Establish an information hub for storage and dissemination of information gathered.</li> </ol>	<p>MNRE, SBS, USP, NUS, MESC, SPREP, CI</p>	<p>Samoa Chamber of Commerce, MCIL, MCIT</p>
<p>(KESO) 7 –</p> <p>To facilitate and support the shift to a low carbon and climate resilient economy.</p>	<ol style="list-style-type: none"> <li>Reduction of Greenhouse Gas Abatement Strategy for social economic development and sustainable environment towards Negative Emission Samoa.</li> <li>Promote sector coordination to strengthen information sharing and</li> </ol>	<p>MNRE WRD, Forestry SWA EPC IWRA MWCS D</p>	<p>POLICE, SWA, MWCS D, NHS, EPC, MWCS D, Council of Chiefs</p>

	<p>monitoring.</p> <p>3. Reducing high levels of dependence on imported fossil fuels as the main source of energy.</p>	MOH	
<p>(KESO) 8 –</p> <p>To facilitate the direct participation of local communities (village councils, women, youth, private sector and other local groups in the planning and management ( including monitoring ) of habitats and species in areas under communal ownership and control.</p>	<ol style="list-style-type: none"> <li>1. Broad public participation in decision-making.</li> <li>2. Disseminate properly packaged environmental information to the general public including village councils, local community (women, aumaga, youth etc.), church groups and schools.</li> <li>3. Target villages and customary land owners whose land hosts habitats and species of high conservation value, for awareness raising activities.</li> <li>4. Strengthen existing co-planning and co-management arrangements for village fisheries reserves, district marine protected areas and community based conservation areas.</li> <li>5. Encourage community and individual landowners’ participation in business ventures that promote the sustainable use and management of natural habitats and species. Provide technical assistance and support as appropriate.</li> </ol>	MNRE, MWTI, LTA, MAF, EPC, MWCS, MESC SWA, NUS	MOF, MAF, EPC,
<p>(KESO) 9</p> <p>To strengthen the policy, regulatory, financial and strategic planning and management framework for environmental sustainability and disaster resilience.</p>	<ol style="list-style-type: none"> <li>1. Establishment and implement monitoring systems to support national compliance and regional and international reporting.</li> <li>2. Review and update existing legislation and regulations and enact new ones as appropriate to strengthen the capacity of MNRE to encourage and if necessary enforce compliance.</li> <li>3. Review and update national environment sub-sector strategies including the NAPA, NBSAP, National Invasive Species Action Plan, and National Implementation Framework for Biosafety, Solid Waste Management Strategy and others.</li> <li>4. Invest as a matter of high priority in the collection of scientifically sound, accurate and up-to-date environmental statistics to measure environmental change and ecological health.</li> <li>5. Establish a multi-sector mechanism to coordinate environmental monitoring, data management and the sharing of monitoring capacities and resources, to support national and sector level planning and management.</li> <li>6. Strengthen the capacity of MNRE and other relevant agencies for tracking and</li> </ol>	MNRE, MOF, PSC, AG, MWCS	MoH, Police, MESC, NUS, MCIL, SBS, USP, SPREP

	<p>measuring physical and biological chemical, meteorological indicators for environmental health by investing in up-to-date equipment, information gathering activities and staff training.</p> <p>7. Encourage the use of natural resource valuations and payment of ecosystems services (PES) in national and sector level planning and decision making to strengthen environmental sustainability integration in national planning and budgeting.</p> <p>8. Encourage and actively support inclusive and consultative approaches to planning and, where appropriate, the co-management of habitats and species under customary land tenure.</p> <p>9. Effective coordination ( national, regional, international ) levels for a robust response to environmental emergencies and improved forecasting and early warning systems.</p> <p>10. Improved coordination between emergency response, early recovery and developments efforts.</p> <p>11. Mobilise the necessary national, regional and international physical, economic and financial resources to coordinate financial instruments. ( climate change funding, innovative financing mechanisms )</p>		
<p>(KESO) 10</p> <p>Effective policy and legal frameworks that regulate activities, coordinate the NESP implementation, environmental monitoring and assessment.</p>	<ol style="list-style-type: none"> <li>1. Institutional set-up</li> <li>2. Improved sector coordination of environmental initiatives through a robust and effective management framework ( Sector Coordination )</li> <li>3. SOE Assessment &amp; Reporting</li> <li>4. Capacity building &amp; awareness</li> </ol>	<p>MNRE, MOH, LTA MAF, SBS MWTI, PSC</p>	<p>SPREP UNEP WMO, SPREP UNEP</p> <p>MOF</p>
<p>(KESO) 11 –</p> <p>To implement habitat/ecosystem-based strategies to support climate change adaptation and mitigation.</p>	<ol style="list-style-type: none"> <li>1. Integrated approach to environmental assessment.</li> <li>2. To implement strategies for improving atmospheric conditions and support climate change adaptation and mitigation</li> <li>3. Develop knowledge and promote understanding of the predicted impacts of climate change and greenhouse effect.</li> <li>4. Develop knowledge and promote understanding of the predicted impacts of climate change and the greenhouse effect.</li> <li>5. Generate public awareness of global climate changes and the need to protect the environment</li> <li>6. Develop knowledge and promote understanding of the predicted impacts of</li> </ol>	<p>MNRE, CDC, MOF</p>	<p>MAF, STA, SROS, NUS, MWCS, LTA, EPC, MOH, MESC, NGO rep PSC</p>

	<p>climate change and green house gas effect.</p> <p>7. Capacity Building measures to strengthen national efforts for improving atmospheric conditions and support climate change adaptation and mitigation.</p>		
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## 6. Project Profiles

### A. Summary of Project Profiles

#### *Project Profile A1 - Environmental Monitoring*

<b>Project Profiles</b>	<b>Costs - US\$</b>
A. Cross-cutting Activities	
A1 - Environmental Monitoring.	US\$ 50,000
A2 - Environmental Monitoring - Aerial Photography Exercise for Samoa.	US\$ 250,000
A3 - Environmental Sustainability - Enhancing integrated land use planning	US\$ 50,000
A4 - Review and update of National Biodiversity Strategy and Action Plan ( NBSAP )	US\$ 220,000
B. Coastal Habitats	
B1 - mangrove Assessment and Rehabilitation	US\$ 100,000
B2 - Ecological Assessment of coastal marshes of Samoa	US\$ 50,000
B3 - Mangrove Awareness Raising Workshops for Communities	US\$ 25,000
B4 - Beach sand assessment study	Us\$ 50,000
C. Inshore and Offshore Marine Habitats	
C1 - Survey of seagrass communities in Samoa	US\$ 20,000
D - Rural and Urban Built environment ( Energy )	
D1 - Promoting Biogas Digester technology for communal settings	US\$ 26,000,000
<b>TOTAL FUNDING</b>	<b>US\$ 26,815,000</b>

**A. Cross-cutting Activities****Project Profile A1 - Environmental Monitoring**

Background	The lack of time series data and consistent on-going monitoring of most if not all aspects of the biophysical environment seriously hinders environmental assessment for the State of Environment Report. The SOE 2012 introduces a habitat-based approach to environmental monitoring and assessment to facilitate a direct monitoring of the intrinsic values of habitats and species. But their utility for future assessment depends on effective and consistent application. It is important that environmental monitoring is recognized as a key priority activity of MNRE with budgetary resources and staff dedicated to it on an on-going basis.
Aim and Scope	MNRE needs to develop a strategy for environmental monitoring that will set out the following – <ul style="list-style-type: none"> <li>• Identify key environmental parameters consistent with key Government priorities that needs close monitoring;</li> <li>• Review physical and biological indicators and metrics of environmental quality and environmental sustainability used in the SDS and SOE and finalized a set of environmental indicators that will be monitored and used for long term environmental assessments;</li> <li>• Define environmental protocols for each indicators and metrics, identifying lead and supporting organizations for implementation.</li> <li>• Define how all collected data may be best managed and stored including protocols for accessing data for all approved users.</li> <li>• Develop an annual environmental monitoring plan for selected priority indicators.</li> <li>• An assessment of the manpower needs for its effective implementation, including an indication of areas wherein specific training may be needed.</li> <li>• A clearly defined mechanism for coordinating environmental monitoring within MNRE and with relevant other agencies and organizations with related monitoring and data gathering activities, to promote efficiency and non-duplication, and the sharing of data.</li> </ul>
Description	The tasks are as defined in the Aim and Scope above.
Cost Estimates	Consultant fees and miscellaneous expenses - US\$25,000 Workshops and reviews – US\$25,000
Executing Agency	MNRE
In-kind Support	Collaboration with MAF (Fisheries, Biosecurity and Crops), MOH, SROS, SWA and EPC is essential.
Duration	3 months.



**Environmental Monitoring*****Project Profile A2 - Aerial Photography Exercise for Samoa***

Background	A key indicator for assessing Samoa's environmental health is forest cover. It is relevant to the assessment of almost all types of land use changes including impacts of agriculture, state of protected areas and Key Biodiversity Areas, conditions of water catchment areas, spread in human settlement and infrastructure and others. The most recent aerial photography data was taken in 2004 and these are now clearly obsolete. While there is value in the use of remote sensing satellite imagery, their value is not guaranteed where there is substantial cloud cover. An aerial photography exercise on the other hand can be scheduled for when there is clear skies to avoid this and to guarantee top quality pictures.
Aim and Scope	Commission and aerial photography covering the whole of Samoa to provide vegetation cover data for environmental assessment and land use planning purposes.
Description	The Project will require outsourcing to a specialized outfit with the right expertise and technological capacity. The main cost component will be the hire of a plane for the aerial runs and the processing of aerial photos.
Cost Estimates	Surveillance US\$200,000 Stakeholder Consultations US\$25,000 Technical reviews with key agencies US\$5,000 Technical/ Digital Mapping US\$15,000
Executing Agency	MNRE – Land Management and Technical Divisions, DEC, Forestry, Agriculture
In-kind Support	Good potential for collaboration and cost sharing with other agencies that can use the same information including MAF, LTA and EPC.
Duration	Three - six months.

## Environmental Sustainability

### *Project Profile A3 – Enhancing integrated land use planning*

Background	<p>Formal land use planning is limited in Samoa. In part it is due to the customary ownership of over 80% of the country's land that severely limits Government's ability to dictate land use except through the use of legislation. Where land use planning is possible without the constraints of customary land ownership, there is little evidence of effective coordination between relevant agencies of the Government.</p> <p>Several agencies are directly engaged in planning and to date appear to have avoided collision and conflict by concentrating on different areas. MNRE's Water Resources Division (WRD) concentrates of catchment planning advocating an integrated ridge-to-reef approach, while PUMA has been developing Sustainable Management Plans (SMPs) for Vaitele, with a wider mandate for developing SMPs throughout Samoa. The Ministry of Women, Communities and Social Development (MWCSO) is reported to have developed with about 23 villages climate resilience plans which also involve the allocation of uses to different parts of community lands. Existing Coastal Infrastructure Management (CIM) Plans developed in a World Bank funded SIAM I and II are to be updated with another national planning exercise using the ridge-to-reef approach to expand the scope beyond the coastal focus of existing CIM Plans. MNRE-DEC completed in 2009 a study recommending the protection of 8 terrestrial Key Biodiversity Areas (KBAs) that are now the target of MNRE-DEC's terrestrial conservation activities. All of this takes place in a predominantly agricultural economy where the Government is actively seeking to reinvigorate agriculture, with strategies for increased commercialization, and larger scale production units. MAF is also reported to have the capacity for matching land and soil types to crops productivity to ensure optimum land allocation for agricultural purposes.</p> <p>There is a serious issue of lack of coordination in planning that screams out of these different initiatives. For an island country with a limited land area, where conflicting but legitimate land uses are inevitable, the allocation of land to different uses needs to be optimized. The integrated approach to land use planning is widely cited by all agencies as the only sensible approach. And while different agencies claim to have adopted an integrated approach to producing their plans, the credibility is such claims are undermined by the mere fact that there is no high-level planning mechanism that decides on priorities from a national perspective, taking into account all legitimate needs of the country, the values of different areas, and optimizing allocation based on nationally determined priorities.</p> <p>It is imminently desirable that the Government explores the creation of a centralized mechanism for facilitating a truly integrated approach to land use allocation in Samoa. It's a multi-stakeholder mechanism that should have the capacity to identify all values inherent in different areas, identify main options for allocation, assigns priority land uses, and then facilitate the development of integrated land use maps to guide detailed land use planning at the sector and sub-sector levels.</p> <p>The plans may not be enforceable within customary owned and private lands, but it would provide a powerful advisory tool to guide public and private investment.</p> <p>The opportunity to create a mechanism such as proposed is presented by plans currently in the pipeline for the updating of existing District and Village CIM Plans</p>
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	under the World Bank PPCR.
Aim and Scope	To establish a mechanism for national level coordination of all land use planning, to guide detailed planning at the sector and sub-sector level.
Description	This initiative needs to be promoted by MNRE through the Cabinet Development Committee. It may require a consultant to review existing frameworks and recommend an appropriate mechanism, its functions, and methods of working, and membership.
Cost Estimates	It can be achieved in house at no cost. Alternatively, a consultant can be engaged to put together a proposal for CDC's consideration.  <div style="text-align: right;">           Consultant fees US\$10,000            Consultations with stakeholders US\$25,000            MNRE Technical Reviews US\$15,000         </div>
Executing Agency	MNRE to take lead and to submit a proposal to CDC.
In-kind Support	Consultations of the concept would be necessary to solicit the broad support from other agencies with functions that require some level of land use allocation.
Duration	4 weeks for a consultant to undertake a brief review and consultations with key agencies and to prepare a concise report.

**Project Profile A4 – Review and Update of National Biodiversity Strategy and Action Plan (NBSAP)**

Background	<p>Samoa's NBSAP was formally adopted in 2001 in part to comply with party obligations under the Convention on Biological Diversity (CBD) and to address Samoa's need for a systematic approach to the conservation and sustainable use of its biodiversity. Samoa's Fourth National Report to the CBD (2009) noted that since its adoption, about 78% of all activities prescribed were either completed or being implemented, including open-ended activities which implementation is on-going. The remaining 22% of prescribed activities were not implemented.</p> <p>Since 2001, significant progress has been made in biodiversity conservation on most fronts. This include progress made in mainstreaming biodiversity conservation and environmental consideration generally in national and sector level plans, new policies on a number of biodiversity related areas, the designation of two new national parks, the identification of new Key Biodiversity Areas (KBAs) based on a gap analysis using rarity and irreplaceability as organizing criteria, and a number of biodiversity surveys and assessment completed.</p> <p>The Fourth National Communication to the CBD recommended that the NBSAP be reviewed and updated to reflect existing gaps in implementation, current issues and new priorities. This is now long overdue.</p>
Aim and Scope	To review and update the NBSAP to identify gaps in implementation, take into account new issues and old but relevant ones, and reach consensus on new priorities.
Description	The Project will require the engagement of a consultant to lead the review and revision exercise. The MNRE–DEC will coordinate and organize all stakeholder consultations and provide support to the consultant as necessary in other areas. The Project should
Cost Estimates	US\$220.000
Executing Agency	MNRE – DEC
In-kind Support	
Duration	3 months

## B. Coastal Habitats

### Project Profile B1 - Mangrove Assessment and Rehabilitation

Background	One of Samoa's most valuable coastal habitats are mangrove forests scattered along the coastline of Upolu and Savaii. There are three mangrove species widely regarded as present although some recent studies suggested there may be more. Of the three mangrove species found ( <i>Rhizophora samoensis</i> (Red mangrove), <i>Bruguiera gymnorrhiza</i> (Oriental mangrove) and <i>Xylocarpus moluccensis (granatum)</i> , the latter ( <i>Xylocarpus</i> ) is extremely rare and is found in only one location (2 acres in size) in Siutu Salailua in Savaii. The protection of this remaining population should now be of immediately priority to avoid extinction. The opportunity for <i>in-situ</i> conservation measures is available, at the same time, <i>ex-situ</i> approaches should also be considered to ensure its long term viability.
Aim and Scope	To ensure the protection <i>in situ</i> of the last remaining stand of <i>Xylocarpus moluccensis</i> and its long term conservation with additional populations established elsewhere.
Description	<p>The overall strategy is two fold (i) interventions to protect in-situ the remaining population of <i>Xylocarpus moluccensis (granatum)</i> and (ii) to establish new populations in other locations to ensure the species survival and continuing viability.</p> <p>In-situ protection in Siutu calls for a community based approach involving the village of Siutu Salailua. MNRE should encourage and facilitate this approach with the local Council of Chiefs. An approach for funding from sources such as Civil Society Support Program (CSSP) and GEF's Small Grants Program should be encouraged.</p> <p>Mangrove replanting in other sites can be incorporated into MNRE's existing forest restoration activities.</p>
Cost Estimates	<p>US\$60,000 – for community based initiatives</p> <p>US\$ 10,000 – MNRE (mangrove propagation &amp; replanting)</p> <p>US\$ 30,000 – Community consultations &amp; monitoring</p>
Executing Agency	MNRE; CSSP and or GEF-SGP for community based intervention.
In-kind Support	MNRE and Fisheries Division of MAF to provide technical support and advice to the relevant community based organization in Siutu Salailua that will implement a community based project.
Duration	Community based project – on-going with donor funding needed for at least the initial 2 years. Interventions by MNRE should be on-going.

**Project Profile B2 - Ecological assessment of coastal marshes of Samoa**

Background	<p>Coastal and mountain marshes are amongst the most distinct habitats of Samoa's natural environment. There are six coastal marshes and five montane marshes, all of which are threatened to varying degrees by natural and anthropogenic factors. The last assessment of these habitats was by Whistler in 1991. Since then, the status of these habitats have not been reassessed. Whistler (ibid.) noted that some are unique and priority for conservation actions. They need to be assessed and built into MNRE's environmental monitoring program for longer term monitoring. The coastal marshes listed in the Directory of Wetlands for Oceania are :</p> <p>Falealili Marsh, Upolu - A series of small herbaceous marshes on the south coast of Upolu, degraded by human impact. The small marsh at Malaemalu was identified as a priority site for conservation by Pearsall and Whistler (1991), but its present status is unknown.</p> <p>Apolima Fou Marsh, Upolu - A small herbaceous marsh at the west end of Upolu, the least disturbed of any coastal marsh in Western Samoa when last assessed in 1991.</p> <p>Pu'apu'a Marsh, Savai'i - A small marsh near the east end of Savai'i, degraded by human settlement and not considered to be a priority area for protection.</p> <p>Faga Marsh, Savai'i - A small marsh near the east end of Savai'i, degraded by human settlement and not considered to be a priority area for protection.</p> <p>Falealupo Marshes (Cape Mulinu'u), Savai'i - Two areas of coastal marsh at the extreme western end of Savai'i, degraded by past exploitation and human settlement, and severely damaged by Hurricane Ofa in 1990. The preservation of the village forest under a covenant agreement has in the early 1990's increased awareness of the conservation importance of this area. The southern marsh (Tofutafoe) was recommended for designation as a Nature Reserve by Holloway and Floyd (1975), and identified as a priority site for conservation by Pearsall and Whistler (1991). But its current status is unknown.</p> <p>Satoalepai Marsh, Savai'i - A large degraded marsh near Matautu Bay at the northern tip of Savai'i. The cyclones of 1990 and 1991 opened up an outlet to the sea, and sea water now flows freely into the marsh.</p>
Aim and Scope	To assess the ecological status and condition of the following coastal marshes in Upolu and Savaii for future conservation planning purposes – (i) Satoalepai Marsh, (ii) Falealupo Marshes (iii) Savaii (iv) Apolima Fou Marsh in Apolima Fou, Upolu; (v) Falealili Marsh.
Description	<p>An rapid ecological assessment (the TNC REA methodology may be applicable) of the condition of the above marshes will address this gap in MNRE's knowledge of Samoa's various habitats for conservation planning purposes. Listing of dominant flora and fauna species, detailed map showing boundaries and other main features, and an assessment of existing and potential threats would be useful conservation planning.</p> <p>The study will recommend marshes to focus on for conservation purposes, justification of selection and key activities needed and likely costs.</p>
Cost Estimates	US\$50,000
Executing Agency	MNRE – Division of Environment and Conservation (DEC). The project should be within the technical capacity of MNRE, particular DEC.
In-kind Support	Technical Division of MNRE for mapping work.
Duration	4 weeks field work and 3 weeks report preparation and map production.

**Project Profiles B3: Mangrove Awareness Raising Workshops for Communities**

Background	<p>Mangroves are unique ecosystems that live halfway between the land and the sea. There are three species found in Samoa. These are <i>Rhizophora samoensis</i> (Red mangrove), <i>Bruguiera gymnorhiza</i> (Oriental mangrove) and <i>Xylocarpus moluccensis (grantum)</i>. The latter is extremely rare and is found in only one location (2 acres in size) in Siutu Salailua in Savaii .</p> <p>The total area of mangroves has been variously estimated – Zann (1991) <sup>24</sup> estimated 1,250 ha and Bell (1985)<sup>25</sup> 1,000 ha. Its distribution is confined mainly to Upolu and Savaii, often along sheltered coastlines where sediments deposit, such as river estuaries. Recent reports (Saifaleupolu &amp; Mataese, 2012) observed that many are continually lost due to house construction, waste dumping and cutting for firewood.</p> <p>Mangroves form a very productive ecosystem playing an important ecological role as nursery grounds and as a physical habitat for a wide variety of vertebrates and invertebrates. In addition, they recycle nutrients, and maintain the nutrient mass balance of estuarine ecosystems. Mangrove leaves, wood, roots, and detritus material provide essential food chain resources and habitat to a wide variety of wildlife. They also serve as storm buffers, and their roots stabilize shorelines and filter sediments from rivers, enhancing water clarity.</p> <p>Impacts of climate change such as increase sea level rise, strong wave surges, more frequent and stronger cyclones highlights the importance of mangroves for coastal protection purposes. But the continuing loss due to human use and impacts suggests lack of local communities understanding of the importance of mangroves.</p>
Aim and Scope	<p>To raise community awareness and understanding of the role mangroves play in coastal protection, fish spawning and as habitat for a wide range of marine species.</p> <p>To solicit community support for and participation in mangrove conservation and replanting.</p>
Description	5 one—day workshops targeting chiefs, women, and youth of five communities near mangroves in Upolu.
Cost Estimates	<p>Main expenses are – refreshments, village ava ceremony, use of PP projector and stationery, transport costs.</p> <p>Est budget per workshop – US\$5000/workshop X 5 workshops = US\$25,000.00</p>
Executing Agency	MNRE – Division of Environment and Conservation
In-kind Support	Support and collaboration of MAF-Fisheries Division may be necessary.
Duration	5 days

<sup>24</sup> Cited by Lopeti, E and T.Foliga. undated. Samoa Country Report. MNRE/MAF-Fisheries. Unpublished report.

<sup>25</sup> Iakopo. M. 2006. Mangroves of Samoa: Status and Conservation. Ministry of Natural Resources, Environment and Meteorology, Samoa. 40pp.

**Project Profile B4 – Beach sand assessment study**

Background	<p>Beach sand in Samoa is constantly mined for domestic use and construction purposes. In many coastal areas, there are anecdotal evidence of coastal erosion caused in part by sand mining activities. These impacts if continued unabated, will threaten coastal infrastructure and coastal community assets, as well as homes. Concerned about the environmental impact of unregulated sand mining, the Government through MNRE introduced a permit system to regulate exploitation, particularly for commercial and large scale uses.</p> <p>The current licensing system assesses affected beaches for potential environmental impacts as a basis for approving a sand mining licence. The regulatory framework however is relatively weak, mainly because MNRE lacks both the information and expertise on coastal processes to properly assess sand budgets and their dynamics. It is vital for the sustainable management of beach sand resources that this information is generated, and technical capacity in coastal processes is strengthened within the Ministry.</p>										
Aim and Scope	<ul style="list-style-type: none"> <li>To conduct an assessment of the available and potentially available sand resources in Samoa as a basis for supporting the sustainable management of Samoa's beach sand resource and the administration of the existing sand mining licensing system.</li> <li>To build MNRE's technical capacity in coastal processes with respect to beach sand dynamics and related processes.</li> </ul>										
Description	<p>The Project will involve the engagement of a coastal engineer/processes expert to conduct the said assessment and provide MNRE staff with training in this area.</p> <p>The main output will be a report that includes detailed assessment of key beaches recommended for sand mining, with specific guidelines on assessing sand budgets and monitoring sustainable use. The consultant will also work closely and provide training for counter part staff.</p>										
Cost Estimates	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Consultant fees –</td> <td style="text-align: right;">\$25,000</td> </tr> <tr> <td>Travel and per diems for consultant –</td> <td style="text-align: right;">\$10,000</td> </tr> <tr> <td>Local costs -</td> <td style="text-align: right;">\$5,000</td> </tr> <tr> <td></td> <td style="text-align: right;"><u>US\$40,000</u></td> </tr> <tr> <td></td> <td style="text-align: right;"><u>Consultations &amp; Reviews US\$10,000</u></td> </tr> </table>	Consultant fees –	\$25,000	Travel and per diems for consultant –	\$10,000	Local costs -	\$5,000		<u>US\$40,000</u>		<u>Consultations &amp; Reviews US\$10,000</u>
Consultant fees –	\$25,000										
Travel and per diems for consultant –	\$10,000										
Local costs -	\$5,000										
	<u>US\$40,000</u>										
	<u>Consultations &amp; Reviews US\$10,000</u>										
Executing Agency	MNRE – Land Management Division										
In-kind Support	Technical support from SOPAC would be desirable in detailed project design. SOPAC is also an option for providing technical expert services.										
Duration	8 weeks consultancy										



### C. Inshore and Offshore Marine Habitats

#### Project Profile C1 - Survey of seagrass communities in Samoa

Background	<p>Seagrass bed distribution in Samoa is limited with the best patches found around Manono Island and the Northern coasts of Upolu. Only two species of seagrasses have been reported to occur in Samoa, <i>Halophila ovalis</i> and <i>Syringodium isoetifolium</i> (Hartog 1970, cited in Skelton et al. 2000). Some researchers (Skelton et al, op cit) are of the opinion that <i>H. ovalis</i> reported in Samoa is probably endemic or belongs to another species, <i>H. minor</i>. <i>Halophila</i> spp. specimen collected from the Palolo Deep Marine Reserve recently showed it to resemble <i>H. minor</i> morphologically.</p> <p>There has not been any detailed survey of the status of seagrasses in Samoa since 1992. A MAF-Fisheries (2010) report noted that algae and seaweeds represented 20% of the substrates within all 16 fish reserves monitored but there is no listing of the 16 reserves wherein this observation was made.</p> <p>Not enough information is available to assess seagrasses using indicators of area coverage, biomass and richness used in the SOE. Consequently the SOE does not have an assessment of the health of this habitat.</p> <p>The main threats are sedimentation from land based sources, and activities such as sand-dredging.</p>
Aim and Scope	To assess the ecological state of seagrasses communities in Samoa's inshore marine environment. The assessment will provide information sufficient to properly map their geographic spread, identify all flora and fauna, and consult with local fishers to identify possible sources of anthropogenic pressure sources. The results will provide baseline data for future assessment monitoring using SOE indicators of area coverage, biomass and richness. It will also establish monitoring plots that will be visited regularly for time series measurements based on an approved protocol.
Description	MNRE's DEC will design an appropriate survey methodology to establish permanent sample/monitoring plots, and conduct survey to collect the appropriate data for baselines to support the use of approved indicators of area coverage, biomass, species diversity. A monitoring report will make an assessment of habitat health presently missing from the SOE 2012 due to the lack of information. The study report will also provide recommendations for future conservation measures including monitoring protocols.
Cost Estimates	US\$20,000
Executing Agency	MNRE – DEC; possibly SPREP support and assistance.
In-kind Support	MAF Fisheries assistance and collaboration would be desirable.
Duration	8 weeks

## D. Rural and Urban Built Environment

### Energy

#### *Project Profile – Promoting Biogas Digester technology for communal settings*

Background	<p>Government policy promoting the use of renewable energy technologies is targeting the immediate investment in small run-of-river hydropower schemes and solar, with biofuels and wind largely in the research stage. The use of biogas digesters however has been proven technically feasible, but wider replication appears to be stymied by factors including labour availability for the manual maintenance of the system, limited input volumes of green and organic wastes, and social concerns about handling of septic tank waste and off-site disposal of other toilet (non-faecal) wastes.</p> <p>The benefits of biogas digesters however, extend beyond renewable energy generation to improving waste management particularly if biogas digesters are properly integrated with other activities including piggery, aquaculture and vegetable farming. This set up is well demonstrated at Vaitele Residential area where biogas technology supplies biogas for a community hall and a low income family with a natural waste water treatment in a form of a beautification garden and boundary trees fences.</p> <p>The largest demonstration is at the YWAM campus at Falelauniu where biogas technology supplies 100% cooking gas for a campus population of about 100 and about 20% of its electricity. The YWAM experience also shows that biogas digesters works best in this kind of communal context where there is an adequate population to generate optimum volumes of green and organic wastes consistently, labour is readily available to attend to the manual maintenance of the system, and where social biases and preferences are more manageable. An agricultural based demonstration is at the Ministry of Agriculture and Fishery Crops division which demonstrated the application of natural fertilizer from the bio-digester for vegetables and some root crops. A village biogas demonstration at Piu village at southern site of Upolu island utilized the merrenia vine (invasive species) for production of biogas for cooking at the community eating hall. This project is a potential large demonstration for removing of invasive species and same time replant the local trees and plants for restoration of the forestry and water catchment area.</p>
Aim and Scope	To promote and facilitate the wider use of renewable energy technologies, in this case biogas digesters, in appropriate settings in Samoa.
Description	<p>The project is proposed to consist of three phases.</p> <p>Phase 1 – Evaluate all biogas feasibility studies conducted at Vaitele, Piu, YWAM and Nuu and write proposal for roll over to the residential areas, rural and farming areas.</p> <p>Phase 2 – Support and assist in securing funding to facilitate a switch from current sources to renewable energy from biogas digesters at both institutions &amp; Encourage the wider application of biogas digesters in other similar communal settings including school hostels, district hospitals and others. Install about 100-150 biogas digester every year and up to 1000 in five years</p>
Cost Estimates	<p>Budget for Phase 1 almost completed and was funded by EU Water Sector : USD\$100,000</p> <p>PHASE: Project Coordinator, materials and Installation for five year period:26,000,000</p> <p>Year 1 : USD\$400,00</p> <p>Year 2: USD\$450,00</p> <p>Year 3 : USD\$550,00</p> <p>Year 4: USD\$600,000</p>

	Year5: USD\$600,000
Executing Agency	MNRE – Renewable Energy Division
In-kind Support	Technical assistance and support from EPC may be necessary.
Duration	Phase 1 – 1 month Phase 2 and 3 will depend on consultants' recommendations.

**Appendix 1: Guiding Principles based on Rio (UNCED) Principles 1992**

1. The people of Samoa are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
2. The Government of Samoa has the sovereign right to exploit its own resources, pursuant to its environmental and development policies.
3. The right to development must be fulfilled so as to equitably meet the development and environmental needs of present and future generations.
4. In order to achieve sustainable development, environmental protection must constitute an integral part of the development process and cannot be considered in isolation from it.
5. The Government of Samoa and all its citizens (with the support of other governments as deemed necessary) shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to provide equitable standards of living and better meet community needs and aspirations.
6. To achieve sustainable development and a higher quality of life for all citizens, the Government of Samoa should intervene to reduce and eliminate unsustainable patterns of production and consumption, and promote appropriate demographic policies.
7. Environmental issues are best handled with the participation of all concerned citizens, at the relevant levels. The Government of Samoa shall provide easy access to publicly held information on the environment and development, encourage community participation in decision-making processes, and promote public awareness and participation by making information widely available.
8. The Government of Samoa shall enact effective legislation, with environmental standards, management objectives, and priorities which reflect the appropriate local context to which they apply.
9. The Government of Samoa shall develop national laws regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within its jurisdiction or control.
10. In order to protect the environment, the precautionary approach shall be widely used by the Government of Samoa according to its capabilities. Where there are threats of serious irreversible damage, lack of scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.
11. The Government of Samoa should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.
12. Environmental impact assessment (EIA) as a national planning instrument, shall be undertaken for development proposals with due regard for the public interest and without distorting international trade and investment.
13. Women have a vital role in environmental management and development, and their full participation is essential to achieve sustainable development.
14. The creativity, ideals, and other attributes of youth should be mobilized to achieve sustainable development and ensure a better future for all.
15. Traditional arts and cultural practises should be recognized and supported as an integral part of the sustainable development process.
16. Peace, development and environmental protection are interdependent and indivisible.
17. Where any environmental or development activities affect or involve other countries, the Government of Samoa shall do all in its power to:
  - Ensure that these activities do not cause damage to areas beyond the limits of its jurisdiction, in accordance with the Charter of the United Nations and the principles of international law.
  - Communicate its special needs in the field of environment and development and those of similar regional nations, at international forums; and do whatever is possible to address the interests and needs of other countries.
  - Cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the earth's ecosystems; and to take responsibility for any pressures placed on the global environment through local factors.
  - Cooperate with other countries to strengthen internal structures for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development , adaptation, diffusion, and transfer of technologies, including new and innovative technologies.

- Cooperate to promote a supportive and open international economic system which would lead to economic growth and sustainable development, and to better address the problem of environmental degradation;
- Cooperate with other countries in an expeditious and more determined manner to develop further international law for liability and compensation for adverse effects of environmental damage caused by activities beyond their jurisdiction.

## Appendix 2: NESP Advisory Committee Representatives

1. Ministry of Agriculture & Fisheries
2. Ministry of Commerce Industry & Labour
3. Ministry of Communications & Information Technology
4. Ministry of Education Sports & Culture
5. Ministry of Foreign Affairs & Trade
6. Ministry of Finance
7. Ministry of Justice & Courts Administration
8. Ministry of Natural Resource & Environment
9. Ministry of Health
10. National Health Services
11. Ministry Women Community & Social Development
12. Ministry of Works & Infrastructure
13. Ministry of the Prime Minister & Cabinet
14. Attorney General
15. Public Service Commission
16. National University of Samoa
17. Electric Power Corporation
18. Samoa Bureau of Statistics
19. Samoa Land Corporation
20. Samoa Tourism Authority
21. Samoa Water Authority
22. Land Transport Authority
23. Chamber of Commerce (+ SAME )
24. Scientific Research Organization of Samoa
25. SPREP
26. University of the South Pacific/Alafua
27. SUNGO

## Appendix 3 - Strategy for the Development of Samoa 2012 - 16 - Environment Sector

SDS Key Outcome 13: Environment Sustainability Strategic Areas	SDS Key Outcome 14: Climate and Disaster Resilience Strategic Areas	NESP Development Outcomes
<ol style="list-style-type: none"> <li>1. Sustainable management of natural resources;</li> <li>2. Improve coordination of environmental initiatives through the development of an appropriate framework for the environment sector through the Statement of the Environment (SOE);</li> <li>3. Support scientific research and data collection for better management;</li> <li>4. Promote green growth technologies;</li> <li>5. Protection of critical ecosystems and species;</li> <li>6. Promote the use of good land use management practices;</li> <li>7. Development of an urban agenda and policy;</li> <li>8. Strengthen community engagement in environmental management;</li> <li>9. Effective waste management strategies to support sustainable development; and</li> <li>10. Effective assessment and monitoring of water resources.</li> </ol>	<ol style="list-style-type: none"> <li>1. Mainstream climate change and disaster risk management;</li> <li>2. Undertake climate change and hazard risks analysis and vulnerability assessments on sector plans and major investment initiatives to identify potential impacts to determine best options for implementation;</li> <li>3. Encourage the use of ecosystem based approach to adapt to potential climate change impacts;</li> <li>4. Strengthen awareness and consultation on climate change and disaster risk management;</li> <li>5. Strengthen disaster preparedness and response capacity;</li> <li>6. Improve provision of accurate and timely information and warnings;</li> <li>7. Improve monitoring of climate change through centralized collection of data;</li> <li>8. Develop an appropriate national mitigation plan for Samoa to meet carbon trading;</li> <li>9. Implement revised coastal infrastructure management plans; and</li> <li>10. Develop financing modalities for CCA and DRM.</li> </ol>	<ol style="list-style-type: none"> <li>1. Habitats and species within protected areas, sanctuaries and KBAs are protected and maintained in natural (pristine) condition.</li> <li>2. Restoration of degraded habitats and threatened species of economic and conservation importance to healthy states and viable populations.</li> <li>3. Environmental resources such as forests land, water and fisheries are managed sustainably to protect them from natural threats, and contamination.</li> <li>4. The rural and urban built environment is sustainable and resilient against extreme climate induced events and longer term climate induced changes.</li> <li>5. Knowledge of Samoa's biodiversity and natural resource is enhanced and kept up to date through science based assessments and ongoing monitoring.</li> <li>6. Promote Low Carbon Development in the Energy Sector through the establishment of a Nationally Appropriate Mitigation Action Programme.</li> <li>7. Stakeholder engagement and involvement (in decision making) in implementation of environmental management initiatives is strengthened.</li> <li>8. Reinforce an enabling environment that promotes sustainable financing and partnerships with international organizations to ensure the provision of better support towards environmental sustainability and disaster resilience.</li> <li>9. Strengthened institutional</li> </ol>

		<p>framework with improved governance and capacity at all levels to promote integrated decision making, improve monitoring and enforcement ( SOE ), and strategic environmental assessment.</p> <p>10. Promote and mainstream an integrated habitat-based approach towards environmental assessments to support climate change adaptation and mitigation.</p>
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## Strategy for the Development of Samoa 2012-16 - Environment Sector

PRIORITY AREA IV: THE ENVIRONMENT			
KEY OUTCOME 13: ENVIRONMENTAL SUSTAINABILITY			
STRATEGIC AREA	INDICATOR	IMPLEMENTING AGENCY	IMPLEMENTING AGENCY
1. Sustainable management of natural resources;	1. Increase percentage of land area covered by forest;	Environment Sector	Ministry of Natural Resources and Environment, Ministry of Women, Community and Social Development, Samoa Water Authority, Scientific Research Organisation of Samoa
2. Improve coordination on environmental initiatives through the development of an appropriate framework for the environment sector through the State of the Environment (SOE) report	2. Proportion of land area planted under the community forestry programme;		
3. Support scientific research and data collection for better management;	3. Increase number of terrestrial and marine areas and critical ecosystems and species protected;		
4. Promote green growth technologies;	4. Number of species threatened with extinction decreased		
5. Protection of critical eco-systems and species;	5. Proportion of invasive species eradicated;		
6. Promote the use of good land use management practices;	6. Expansion of ground water monitoring network;		
7. Development of an urban agenda and policy;	7. Percentage of rehabilitated degraded lands and improved critical landscapes;		
8. Strengthen community engagement in environmental management;	8. Legislation and tracking system for chemicals and hazardous waste developed and implemented;		
9. Effective waste management strategies to support sustainable development;	9. Increase community awareness on water catchment areas and risk of unsustainable methods of farming;		
10. Effective assessment and monitoring of water resources;	10. Increase land areas declared as water catchment reserves;		
	11. Improve compliance with land used management plans;		

<b>PRIORITY AREA IV: THE ENVIRONMENT</b>			
<b>KEY OUTCOME 14: CLIMATE AND DISASTER RESILIENCE</b>			
<b>STRATEGIC AREA</b>	<b>INDICATOR</b>	<b>IMPLEMENTING SECTOR</b>	<b>IMPLEMENTING AGENCY</b>
1. Mainstream climate change and disaster risk management 2. Undertake climate change and hazard risks analysis and vulnerability assessments on sector plans and major investment initiatives to identify potential impacts to determine best options for implementation; 3. Encourage the use of ecosystem-based approach to adapt to potential climate change impacts; 4. Strengthen awareness and consultation on climate change and disaster risk management; 5. Strengthen disaster preparedness and response capacity; 6. Improve provision of accurate and timely information and warning; 7. Improve monitoring of climate change through centralised collection of data; 8. Develop an appropriate national mitigation plan for Samoa to meet carbon trading; 9. Implement revised coastal infrastructure management plans; and 10. Develop financing modalities for CCA and DRM.	1. Percentage of GHGs emissions reduced; 2. Number of renewable energy technologies promoted and used; 3. A monitoring framework and base line data for climate change impacts and adaptation developed; 4. A monitoring and evaluation framework to monitor the effectiveness of DRM programmes at national, agency and village levels; 5. Level of investment in DRM and climate change adaptation measures; 6. Number of community disaster and climate risk management programmes completed; 7. Number of climate risk profiles updated; 8. Coastal infrastructure management plans implemented; 9. Number of ecosystems rehabilitated and or effectively managed; and 10. Appropriate financing modalities for CCA and DRR.	Cross Cutting Sector	Ministry of Natural Resources and Environment, Ministry of Finance

**Appendix 4: Indicators Used by Habitat Type in the SOE Review**

Habitat-type	Habitat	Indicators and metrics
Marine/Offshore habitats	Corals and reefs	<ul style="list-style-type: none"> <li>Area coverage               <ul style="list-style-type: none"> <li>- % change in area coverage relative to baseline</li> </ul> </li> <li>Abundance/biomass               <ul style="list-style-type: none"> <li>- % change in biomass relative to baseline</li> </ul> </li> <li>Species richness –               <ul style="list-style-type: none"> <li>- no. of incidences of occurrences of species in sample population</li> </ul> </li> <li>Coral community structure –               <ul style="list-style-type: none"> <li>- subjective assessment based on expert observation</li> </ul> </li> </ul>
	Fish	<ul style="list-style-type: none"> <li>Abundance/Biomass               <ul style="list-style-type: none"> <li>- % change in biomass relative to baseline (MSY)</li> </ul> </li> <li>Species richness               <ul style="list-style-type: none"> <li>- no. of incidences of occurrences of species in sample population</li> </ul> </li> </ul>
Coastal habitats	Mangroves	<ul style="list-style-type: none"> <li>Area coverage –               <ul style="list-style-type: none"> <li>- Total area coverage</li> <li>- # of viable mangrove communities</li> </ul> </li> <li>Species richness –               <ul style="list-style-type: none"> <li>- % of native species with viable populations</li> </ul> </li> </ul>
	Beaches	<ul style="list-style-type: none"> <li>- volume (m<sup>3</sup>) of sand approved for mining/year;</li> <li>- # of sand mining licences granted/year;</li> <li>- # of new beaches mined / year</li> </ul>
Lowland habitats	Lowland forests	<ul style="list-style-type: none"> <li>- % of lowland areas under forest cover</li> <li>- % of lowland forests dominated by non-native species</li> <li>- % of lowland forest areas affected by <i>Merremia peltata</i> vine</li> <li>- % of native bird/mammal species present</li> </ul>
	Cultivated areas	<ul style="list-style-type: none"> <li>- % of cultivated areas using inorganic fertilizers and agricultural chemicals</li> <li>- % of cultivated areas using organic fertilizers only</li> <li>- % of cultivated areas under multiple cropping systems</li> </ul>
Upland habitats	Upland & Cloud forests	<ul style="list-style-type: none"> <li>- % of upland areas under forest cover</li> <li>- % of upland forests dominated by non-native species</li> <li>- % of upland forest areas affected by <i>Merremia peltata</i> vine</li> <li>- % of native bird/mammals species present</li> <li>- % of native bird/mammal spp with increasing or stable populations</li> </ul>
Built environment	Population	<ul style="list-style-type: none"> <li>- annual growth rate less than 1.0%</li> <li>- population density in urban/ rural areas</li> </ul>
	Waste	<ul style="list-style-type: none"> <li>- % change in waste generation rate per capita per day relative to an established baseline;</li> <li>- % of hh waste reaching landfill relative to total waste generated</li> <li>- % total hh population accessible to public-funded waste collection system;</li> <li>- % increase in vol of solid waste recycled relative to baseline</li> </ul>
	Sanitation	<ul style="list-style-type: none"> <li>- % of hh with improved sanitation systems</li> <li>- % increase in households etc. using biogas digesters</li> <li>- % change in confirmed cases of diarrhea</li> </ul>
	Environmental safeguards	<ul style="list-style-type: none"> <li>- % of development consents issued over total application received</li> <li>- % of proposals modified on environmental grounds relative</li> </ul>

		<ul style="list-style-type: none"> <li>- to annual total</li> <li>- % of proposals for DC declined on environmental grounds</li> </ul>
	Energy	<ul style="list-style-type: none"> <li>- % petroleum products imported</li> <li>- 10 - 20% in RE generation for consumption relative to total energy used.</li> <li>- % of improved energy efficiency and conservation implemented</li> </ul>
Rivers and Streams	Water Quantity	<ul style="list-style-type: none"> <li>- % change in average flow/discharge rates of rivers and streams</li> <li>- change in groundwater level</li> <li>- No. of perennial streams with minimum environmental flow requirements defined</li> </ul>
	Water Quality	<ul style="list-style-type: none"> <li>- % of village springs with <i>E.coli</i> count exceeding national standards</li> <li>- Turbidity</li> <li>- DO</li> <li>- pH</li> <li>- Trends in freshwater abundance/biomass</li> </ul>
	Watershed health	<ul style="list-style-type: none"> <li>- % of catchment areas with forest cover exceeding 70% of total catchment area</li> <li>- % increase in area (ha) of watersheds rehabilitated (fenced, planted and with human activities effectively controlled)</li> <li>- No. of watershed management plans approved and under implementation</li> </ul>
Protected Areas	KBAs, parks and reserves	<ul style="list-style-type: none"> <li>- Area coverage</li> <li>- % of area designated as protected area with legal status</li> <li>- % of total KBAs with legal status</li> <li>- % of total KBAs with management plans.</li> </ul>
	Species of high conservation value	<ul style="list-style-type: none"> <li>- As per IUCN RedList categorization and assessment</li> </ul>
Atmosphere Weather and Climate	GHGs	<ul style="list-style-type: none"> <li>- Net GHG emitted (emission minus removals)</li> </ul>
	Ecosystem based adaptation (NAPA etc implementation)	<ul style="list-style-type: none"> <li>- # of climate adaptation and mitigation projects completed and under implementation</li> </ul>
	ODS	<ul style="list-style-type: none"> <li>- # compliance companies and technicians</li> <li>- 10% by 2015 (HCFC)</li> </ul>

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**Appendix 5: References Used**


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1. Atherton, J and Bruce, J. 2013. *Rapid Biodiversity Assessment of Upland Savaii, Samoa*
2. Bauer, Laurie B and Kendall, M.S. 2011. *Seamounts within the Exclusive Economic Zones of Samoa and American Samoa*. In: Kendall, M and Poti, Matthew (eds.). *A Biogeographic Assessment of the Samoan Archipelago*. NOAA. NOAA Technical Memorandum NOS NCCOS 132. NOAA –US Department of Commerce.
3. Boulding, K. 1966. "The economics of the coming spaceship Earth." In: Holden, P and Ehrlich, P.R. (eds.) 1971. *Global Ecology: Readings Towards a Rational Strategy for Man*. Harcourt Brace Jovanovich, Inc. New York. P. 180-187.
4. Conservation International – Pacific Islands Programme, Ministry of Natural Resources and Environment, Secretariat for the Pacific Regional Environment Programme. 2010. *Priority Sites for Conservation in Samoa: Key Biodiversity Areas*. Apia. Samoa. 32 pp.
5. En.wikipedia.org/wiki/Coastal\_Strand. Downloaded 20 August 2012.
6. FAO. October, 2009. National Fisheries Sector Overview. FAO.
7. Global Environment Facility, UNDP, SOPAC and UNEP. 2007. Samoa IWRM – National Diagnostic Report - Independent State of Samoa. Final Draft.
8. Government of Samoa. 2012. *Strategy for the Development of Samoa 2012 – 2016*. Ministry of Finance. Apia.
9. Government of Samoa. 2011. *Samoa National Infrastructure Strategic Plan*. PIAC, Sydney Australia.
10. Government of Samoa, UNDP and Global Environment Facility (GEF). 2005. *National Adaptation Programme of Action – Samoa*. MNRE, Apia.
11. Government of Samoa. 2008. *Strategy for the Sustainable Development of Samoa 2008-2012*. Ministry of Finance, Apia.
12. Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan: Keep the Remainder of the Basket*. Government of Samoa, Apia.
13. Hay, J. & Suaesi, T. 2006. *Samoa: Country Environmental Analysis – Mainstreaming Environmental Considerations in Economic and Development Planning Processes*. ADB TA:6204-REG. pp. 61.
14. Horseman, N and Mulipola, A. (1995). *Catch data and collection from market surveys in Western Samoa*, (BP. 65). In: Dazell, P and T. Adams (Eds). *South Pacific Commission and Forum Agency Workshop on the Management of South Pacific Inshore Fisheries*. Manuscript collection of country statements and background papers Volume 1. Integrated Coastal Fisheries Management Project Technical Document No. 12. SPC, Noumea, New Caledonia.
15. International Union for the Conservation of Nature (IUCN). *2012 IUCN Redlist of Threatened Species*. (<http://www.iucnredlist.org>). IUCN.
16. ISF-UTS. 2011. *Samoa Water, Sanitation and Hygiene Sector Brief*, prepared for AusAID by the Institute for Sustainable Futures, University of Technology Sydney, October 2011.
17. Jeffries, B., Atherton, J. and Foliga, S.T. 2012. "Enhancing Knowledge and understanding of the Biodiversity of Upland Central Savaii". BioRAP Survey Debriefing to MNRE, October, 2012.
18. Jenkins, A.P., Kieth, P., Marquet, G., Mailautoka, K.K., 2008. A preliminary survey of Samoan freshwater macro-faunal biodiversity. Wetlands International-Oceania & Paris Museum of Natural History. 32pgs
19. Kendall & Poti (eds.). 2011. *A Biogeographic Assessment of the Samoan Archipelago*. NOAA, USA.
20. Langley, Adam. M. 2006. *The South Pacific Albacore Fishery: A summary of the status of the stock and fishery management issues of relevance to Pacific Islands Countries and Territories (PICTs)*. Technical Report 37. Noumea, New Caledonia: Secretariat of the Pacific Community.
21. Langley, A.D. 2006. *The South Pacific albacore fishery: a summary of the status of the stock and fishery management issues of relevance to Pacific Island countries and territories*. Technical Report 37. Noumea, New Caledonia: Secretariat of the Pacific Community.
22. Latu, F; Amosa, P; Imo, T; and Taufao, V. 2012. "The Microbiological survey of potential water borne pathogens in fresh water springs of the selected community located in the Upolu Island, Samoa." National University of Samoa.
23. Lopeti, E and T.Foliga. undated. *Samoa Country Report*. MNRE/MAF-Fisheries. Unpublished report.
24. Iakopo. M. 2006. *Mangroves of Samoa: Status and Conservation*. Ministry of Natural Resources, Environment and Meteorology, Samoa. 40pp.
25. Ministry of Agriculture (MAF) and Samoa Bureau of Statistics (SBS). 2012. *Agricultural Census Analytical Report 2009*. Economic Statistics Division, SBS, Ministry of Finance. Apia.
26. Ministry of Agriculture and Fisheries. 2011. *Samoa Tuna Management and Development Plan 2011 – 2015*. Fisheries Division, Apia.

27. Ministry of Agriculture and Fisheries. 2005. *Samoa Tuna Management and Development Plan 2005 – 2009*. Fisheries Division, Apia.
28. Ministry of Agriculture and Fisheries. 2011. *Agriculture Sector Plan 2011-2015*. Vol 1. MAF Apia.
29. MAF-Fisheries Division. June 2003. Marine Resources II.
30. MAF Fisheries(a). 8 June 2003. Marine Resources I – Educational materials. Fisheries Division.
31. Mulipola, A. 2002. *Marine Resources of Samoa – Report prepared for Samoa’s National Report for the World Summit on Sustainable Development, Johannesburg, South Africa, July 2002*. MAF-Fisheries. Apia.
32. MAF-Fisheries(b). 1 June 2002. Marine Environments – Educational materials. Fisheries Division.
33. Martel, F. J. Atherton and T. Dewulf. 1997. “Pilot Community Deforestation Survey: Western Samoa and Niue – Final Report.” SPREP.
34. Ministry of Finance. 2007. *Samoa National Energy Policy 2007*. Economic Policy and Planning Division. Government of Samoa.
35. Ministry of Finance. 2009. *Samoa Energy Review*. MOF. REEEP [www.reeep.org](http://www.reeep.org). Downloaded 31 Oct. 2012.
36. Ministry of Finance. 2007. *Samoa National Energy Policy*. Economic Policy and Planning Division. Government of Samoa. Apia.
37. Ministry of Health (Samoa), Bureau of Statistics (Samoa), and ICF Macro. 2010. *Samoa Demographic and Health Survey 2009*. Apia, Samoa: Ministry of Health, Samoa.
38. MNRE. 2010. “Samoa’s Second National Communication to the United Nations Framework Convention on Climate Change.” GEF/UNDP; Government of Samoa.
39. MNRE, 2008. State of the Environment Report for Samoa. Government of Samoa
40. MNRE. 2013. Samoa 2013 State of the Environment Report. Government of Samoa
41. MNRE. 2011. *Solid Waste Characterization and Generation Study 2011 - Vaitele*. Waste Division. MNRE.
42. Premus, Marc; Ward, Juney; Penaia, Lillian; Ifopo, Pulea; and Pesaleli, Toetu. 2007. *Report on dolphin and whale watching feasibility survey in Samoa and biopsy training, May-June 2007*. Unpubl. SPREP, Samoa.
43. MNRE. 2008. *National Invasive Species Action Plan 2008-2011*. Division of Environment and Conservation, MNRE.
44. O’Meara, J.T. 1987. “Samoa: Customary Individualism.” Pp. 74-113 in R.G. Crocombe (ed.). *Land Tenure in the Pacific*. University of the South Pacific, Suva, Fiji.
45. O’Sullivan, A and Sheffrin, S.M. 2003. *Economics: Principles in action*. Pearson Prentice Hall, New Jersey.
46. Rath, Amitav. 2011. “Acceleration of Millennium Development Goals in Samoa: Policy Analysis with a Focus on Requirements for Industrial Growth”. Final Report Prepared for UNDP – Samoa & UNDP Pacific Centre. UNDP.
47. Saifaleupolu, T.S. and Elisara, FM. 2011. *Biodiversity Audits for the Mangrove Stands in Matafaa-Faleseela, Tiavea-tai and Taelefaga Villages*. Unpubl. OLSSInc.
48. Samoa Bureau of Statistics. 2011. *Population and Housing Census 2011*. Ministry of Finance. Apia.
49. Samuelu-Ah Leong, Joyce and Sapatu, Maria. 2008. *Status of Reefs in Samoa 2007*. In: Whippy-Morris (ed.). 2009. *South-West Pacific Status of Coral Reefs Report 2007*. Coral Reefs Initiative for the Pacific. SPREP, USP, GCRMN and ReefBase Pacific. SPREP, Apia.
50. Schuster, C; Whistler, A., Tuaillemafua, T Siuli. 1999. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*. Division of Environment and Conservation, Department of Lands, Surveys and Environment, Apia.
51. Sesega, S. 2005. “Deforestation and Forest Degradation in Samoa”. Working Paper FAO/SAPA SAM DEFOR 01/05.
52. Skelton, P.A. 2005. *A survey of the benthic marine algae of the Apia District, Samoa, South Pacific*. (Thesis for the Degree of Doctor of Philosophy. University of the South Pacific). 628pp.
53. Skelton, P; Bell, L; Mulipola, A; and Trevor, A. 2000. *The Status of Coral Reefs and Marine Resources of Samoa*. Internal Report, Fisheries Division. MAF, Apia.
54. SMEC. April 2011. *Preparing the Afulilo Environmental Enhancement Project*. ADB TA: 7121 SAM. Phase 1 Final Report. SMEC International Pty Ltd.
55. SPC-SOPAC. September 2011. *Country Risk Profile – Samoa*. Pacific Catastrophe Risk Assessment and Financial Initiative. SPC, Noumea.
56. SPREP. 1994. Assessment of coastal vulnerability and resilience to sea-level rise and climate change: case study- Yasawa Islands, Phase II. South Pacific Regional Environment Programme, Apia.
57. Tuivavalagi, N.S. & Morrison, J. 2004. Land based activities and impacts on coral reefs and the marine environment of Pacific Islands. In H. Yukishira (eds.), *Towards the Desirable Future of Coral Reefs and the Western Pacific, 23-26 July 2003* (pp. 69-88). Palau PICRC.
58. UNEP. 2011. *Pacific Environment and Climate Change Outlook*. In collaboration with SPREP, SPC, SOPAC, USP and IUCN Regional Pacific Office. Draft Report. Pp 167.

59. Whistler, A. 1992. National Biodiversity Review of Western Samoa. Unpublished Report for SPREP Apia, Western Samoa. 1992.
60. Whistler, A. 1992. *Flowers of the Pacific Islands Seashore: A guide to the littoral plants of Hawaii, Tahiti, Samoa, Tonga, Cook Islands, Fiji and Micronesia*. Univ of Hawaii Press. Hawaii, USA.
61. Zann, L. P. (1991). *The inshore resources of Upolu, Western Samoa: coastal inventory and fisheries database*. Report prepared for the Government of Western Samoa. FAO/UNDP SAM/89/002 Field Report. Unpubl.