ACRONYMS

ADB	Asian Development Bank
CBD	Convention of Biological Diversity
CHM	Clearing House Mechanism
CPD	Central Planning Department
CSD	Commission on Sustainable Development
DOE	Department of Environment
DCL	Department of Crown Law
GEF	Global Environment Facility
GHG	Green House Gases
GOT	Government of Tonga
MAFFF	Ministry of Agriculture, Food, Forestry and Fisheries
MD	Meteorological Division
MDG	Millennium Development Goals
MEA	Multilateral Environmental Agreement
MFA	Ministry of Foreign Affairs
MLNRSE	Ministry of Lands, Survey, and Natural Resource and Environment
MOW	Ministry of Work
MSP	Medium Sized Project
NAP	National Action Plan
NCSA	National Capacity Self-Assessment
NECC	National Environment Coordination Committee
NESC	National Environment Steering Committee
NGOs	Non-Governmental Organisations
PACD	Plan of Action to Combat Desertification
PASA	Pesticide Awareness and Sustainable Agriculture
PC	Project Coordinator
POPs	Persistent Organic Pollutants
SDP8	Sustainable Development Plan 8
SLM	Sustainable Land Management
SPBCP	South Pacific Biodiversity Conservation Programme
SPREP	Secretariat of the Pacific Regional Environment Programme
SRA	Strategic Result Area
TCDT	Tonga Community Development Trust
TEMPP	Tonga Environment Management and Planning Project
TWG	Technical Working Group
TVB	Tonga Visitors Bureau
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USP	University of the South Pacific

1. INTRODUCTION

NCSA Background

Context

The National Capacity Self Assessment for Global Environment Management (NCSA) is a tool to help the government of Tonga to assess its current level of capacity to meet its obligations under the UNCBD, UNFCCC and UNCCD. Implicit in this is the notion that, with a little guidance and the right tools, the agencies and organizations with direct responsibilities for implementing Tonga's obligations under the conventions will be capable of self reflecting and identifying their own strengths and weaknesses to meet these obligations. This then becomes the starting point for intentional organizational improvement initiatives which should, in turn, allow adequate planning for future growth and development that capitalizes on current strengths while addressing current limitations.

The National Capacity Self-Assessment Project is a Global Environment Facility (GEF) initiative supported by the UNDP Country Office in Fiji and implemented by the Department of Environment. The project document was prepared and endorsed by the Government of Tonga in November 2004. The NCSA was initiated in September 2005 with the recruitment of the NCSA project management unit staff.

Goals and objectives for the NCSA

Under the three UN conventions: UNCBD, UNFCC, UNCCD, parties are required to comply with articles in each. Difficulties have been identified especially in small island development states as well as those with economies in transitions, with their commitments because of lack of capacity to address the issues. The goal of the NCSA project is to identify, through a country-driven consultative process, priorities and needs for capacity building to help protect the national and global environment.

The NCSA project had the following key objectives:

1 review priority issues for action within the three thematic areas of biodiversity, climate change and land degradation,
2 explore related capacity needs within and across the three thematic areas,
3 link country and international actions to the broader environmental management and sustainable development framework, and
4 analyze targeted and coordinated action and future external and internal assistance.

The NCSA project helped identify national capacity building needs at the individual, institutional and systematic levels of the participating government agencies and NGOs in Tonga. A *National Capacity Development Action Plan for Environmental Management* (NCDAP) was developed to improve the ability of individuals, institutions and systems to address articles under the Rio conventions.

Definition of 'Capacity'

The GEF *Resource Kit for National Capacity Self Assessment*, (UNDP: Global Support Program, 2005: v), defines 'capacity' as "the abilities of individuals, groups, organisations and institutions to address the priority environmental issues as part of efforts to achieve sustainable development."

Capacity for what?

In order to meet MEA responsibilities, countries are required to manage the following 6 functions:

1 to mobilize information and knowledge;
2 to build consensus and partnerships among all stakeholders;
3 to formulate effective policies, legislation, strategies and programmes;
4 to implement policies, legislation, strategies, programmes and projects, including mobilising and managing human, material and financial resources; and
5 to monitor, evaluate, report and learn.

For a country to perform these functions successfully, it needs capable individuals and effective institutions and organisations, and for participants to work together in a well-functioning political, economic and social system, sometimes called "the enabling environment". Adequate capacity is required at each of three "levels of intervention" – individual, institutional and systemic levels, as discussed below

Levels of Capacity Development

At the individual level, capacity development aims to:

- improve the ability of individuals to manage and protect the environment, working as individuals, within organizations and within the larger society;
- change individual attitudes, knowledge, behavior and actions, through increasing their awareness, understanding and skills on relevant topics; this is often done through awareness-raising, education, training, learning-by-doing and peer learning;
- improve individual performance through promoting greater participation,
- ownership, motivation, incentives and morale; and
- improve individual performance through better human resources development, performance management and accountability systems.

At the institutional level, capacity development aims to:

- clarify and improve organizational structures and processes, such as mandate, mission, responsibilities, accountabilities, communications, and deployment of human resources;

- improve an organisations performance and functioning to make it more effective, efficient and responsive to change; this includes management, strategic planning, and implementation of programmes and projects;

- increase coordination and collaboration among groups or departments within the organization;

- build better relationships with the outside environment(other organizations within or outside the country); and

- provide better information systems, infrastructure and equipment to support the organisations work.

Note: This level is sometimes called the organisational level as it includes government institutions, e.g., ministry, department, state company, as well as civil society and private organisations, e.g., NGO, association, private company.

At the systemic level, capacity development aims to:

- create enabling environments, i.e., societal support, for better environmental management in all sectors of society;

- improve the overall political, economic, legislative, policy, regulatory, incentive and accountability frameworks within which organizations and individuals operate;

- improve formal and informal communication and collaboration among organizations and individuals; and

- promote the participation of all sectors of society in reaching environmental goals, through improved awareness, education and involvement and increased government transparency and accountability.

National Response to the RIO Conventions:

The table below provides a brief summary of the national response thus far to the obligations of the Conventions.

	UNFCCC	***UNCBD***	***UNCCD***
Convention adopted	June 1992	June 1994	June 1992
Convention signed	20 July 1998	19 May 1998	25 September1998
Ratified	1998	1998	24 December 1998
Operational National Focal Point	MLSNRE	MLSNRE	MAFFF
Political Focal Point	MFA	MFA	MFA
Coordinating Unit	GEF funded SNC Climate Change Project, Environment Department	Environment Department, MLSNRE	* MAFFF, Environment Department
National Steering Committee	2005 (NECC)	2005 (NECC)	2005 (NECC)
National Task Force/ Technical Working Group	SNC (2007)	NBSAP(2004 - 2007)	NAP (2006)
Public Participation	1st National Communication, SNC National Workshop (2007)	National Consultations Workshops (2004, 2005, 2006)	Via NCSA
Reporting to COP	First National Communication (2005)	NBSAP (2006) First National Report (2006)	First National Report, Second National Report, Third National Report
National Inventories	GHG Emissions , Vulnerability Assessment (2005) Stocktaking for SNC (2007)	Biodiversity Stocktaking Report (2004)	
Awareness	Ongoing	Duration of NBSAP	Via NCSA
Implementation of national programs of action/ recommendations	*National Climate Change Policy (2007)	* NBSAP	*Draft NAP (2006)
Financial Supporters	GEF, UNDP, AUSAID	GEF, UNDP, NZAID	GEF, FAO, VENZUELA

UNFCCC

Tonga acceded to the UNFCCC on 20th July 1998 and accepted the commitments to take positive actions to fulfill its obligations under the UNFCCC. On becoming a non- Annex 1 Party to the convention Tonga accepted the commitments to take positive actions to comply with the convention's requirements, particularly Articles 4 and 12.

Since accession to the UNFCCC Tonga has taken steps to contribute to global mitigation actions and begin to strengthen its adaptation capacity. An Initial National Communications has been completed recently with a complete inventory of GHG emissions. Although the rate of emissions is insignificant by world standards Tonga is committed to contributing to mitigation actions particularly in assessing the options for using appropriate renewable energy technologies. The Honourable Ministers of Cabinet has approved submission for Tonga to sign the Kyoto Protocol. The Department of Environment currently awaits the final approval of the said submission by His Majesty's Council. Preparation for Tonga's Second National Communication has commenced in 2007.

UNCBD and the Cartagena Protocol on Biosafety

Article 6 of the UNCBD "General Measures for Conservation" requires parties to formulate a strategy and plan of actions for biodiversity. Tonga has recently completed its National Biodiversity Strategic Action Plan (NBSAP). The NBSAP Project started June 2003 and was completed in June 2006. The main outputs of this project were to produce Tonga's NBSAP and its First National Report to the Conference of Parties (COP).

Tonga ratified the Cartagena Protocol on Biosafety to the UNCBD on 18 May 2003. The protocol binds party countries to a framework to address Biosafety issues and to develop national framework.The Government approved that a National Biosafety Framework be developed for Tonga in order to ensure safety in the field of safe transfer, handling and use of living modified organisms (LMOs) resulting from modern biotechnology, that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account risks to human health, and specifically focusing on transboundary movements. A draft Biosafety Bill was submitted in 2004 to the Crown Law Department and awaits enactment.

It is evident that the level of biodiversity conservation work in Tonga is still at an early developmental stage. There are no legislations in place specific for biodiversity conservation, however there are existing legislation which indirectly address biodiversity. The NBSAP Project which started 2003 has assisted in raising national awareness about biodiversity conservation. Tonga's NBSAP further supports other environmental conservation plans such as the *Environmental Management Plan for the Fanga'uta Lagoon System* and the *'Eua National Park Management Plan.*

UNCCD

Tonga acceded to the UNCCD on September 25 1998 and ratified in December 24 1998. Under the CCD all parties to the Convention are expected to meet their and international commitment to implement key activities. The objective of this Convention is "to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported

by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas." Desertification is the degradation of land in arid, semi-arid, and dry sub-humid areas. It is caused primarily by human activities and climatic variations. Desertification does not refer to the expansion of existing deserts. It occurs because dry land ecosystems, which cover over one third of the world's land area, are extremely vulnerable to over-exploitation and inappropriate land use. Poverty, political instability, deforestation, overgrazing, and bad irrigation practices can all undermine the land's productivity. Over 250 million people are directly affected by desertification. In addition, some one billion people in over one hundred countries are at risk. These people include many of the world's poorest, most marginalized, and politically weak citizens.

The national progress to date showed very little has been made with respect to Tonga meeting its obligation for UNCCD other than attending COP meetings and regional workshops. Tonga's National Capacity self-Assessment presents a timely opportunity for the nation to identify and characterized critical capacity constraints relevant to effective environmental management in Tonga, and to develop a national plan of action to address these constraints, in a co-ordinated manner to fulfil its obligation under the United Nation Convention to Combat Desertification (UNCCD).

NCSA Process

The NCSA followed a broad-based consultative approach. The following steps were undertaken to conduct Tonga's National Capacity Self Assessment.

Main steps	**Main activities carried out**.
Inception	Establishing the project management unit, obtaining high-level support, raising awareness, holding an inception workshop for stakeholder representatives and running training activities.
Stock-take	Identifying priority climate change, biodiversity conservation and land degradation problems, doing an inventory of past and current capacity building activities to address climate change issues, related convention requirements and identify gaps.
Thematic Assessment	Use the gaps from the stock-take exercise to assess their root causes or capacity issues.
Cross-cutting Assessment	Identify cross-cutting environmental and capacity issues and how they are or can be addressed at the national level

Action Plan and Final NCSA Report	Develop an Action Plan for addressing priority capacity needs within the thematic area as well as the cross-cutting issues.

Participatory and Broadbased Consultations:

The NCSA followed a participatory approach with multi-stakeholder groups participating through consultations in all phases of the project. Various stakeholder groups consulted include line ministries, NGOs, local government officials, schools, community groups such as churches, women and youth. Consultations also included the main island groups of 'Eua, Ha'apai and Vava'u.

Summary of main findings of the Thematic Assessments:

Thematic assessment of UNFCCC:

The NCSA UNFCCC assessments identified the following priority issues and bottlenecks to be addressed:

a) Mainstreaming of Climate Change issues, particularly adaptation, into national and sector planning and decision-making processes
b) Conducting detailed vulnerability assessments to guide planning and implementation of adaptation programs and activities.
c) Ratification of the Kyoto Protocol
d) Strengthening the links between government, NGO's and communities and empower communities to be more active participants in climate change related programs and activities
e) Improving the integration of climate change issues into the national formal and non-formal education curricula.
f) Establishing mechanisms and capacity to assess technology options that can contribute to mitigation measures
g) Strengthening enforcement of legislation that can contribute to increased mitigation
h) Strengthen coordination and collaboration mechanisms to achieve synergies while addressing cross-cutting environmental and capacity issues
i) Sustaining government services to support climate change work.
j) Improving data collection, analysis, storage and accessibility

The areas of priority capacity development needs include:

- Increasing awareness amongst decision and policy makers
- Capacity to seek and secure resources for climate change programs and initiatives including; funding both from national and , human resources, appropriate infrastructure and technical equipment.
- Raising and increasing awareness amongst local stakeholders to influence a change in attitudes and an increased involvement by stakeholders in environmental issues
- Improve availability of climate change information and exchange through networking locally and regionally

- Increase cooperation and coordination among relevant stakeholders
- Develop an appropriate mechanism to ensure long term monitoring and evaluation of climate change impacts and effectiveness of actions taken to address them.
- Strengthen capacity for better law enforcement

Thematic assessment of UNCBD:

Tonga's recently endorsed NBSAP (2006) addresses almost all of the UNCBD obligations. However, implementation of the NBSAP has yet to commence. In an effort to implement the NBSAP, human and financial resources are required. Tonga as a small developing country relies heavily on donor aid for funding environmental projects. Furthermore, there is a shortage of trained individuals and local experts to implement the eight theme areas of the NBSAP. The following table summarises the 8 theme areas of the NBSAP and assesses the resources required to implement these.

Resources required for implementing the theme areas of the NBSAP

Theme Areas	Required Actions	Required Resources
1.Forest Ecosystems	- Arresting Agro-deforestation - Integrated land use planning - Sustainable Forestry Management - Conservation Areas - Information Research and Monitoring - Public Awareness and Education	Human Resources (trained) - Botanist - Taxonomist Financial Resources Facilities National Forestry Policy
2. Marine Ecosystems	- Managing impacts of land based activities - Marine conservation areas - Sustainable management of marine biodiversity - Information Research and monitoring - Public awareness and education	Trained Human Resources - Marine Biologists - Researchers Financial Resources Facilities Equipments Enforcement of Marine Resources Act Implementation of Fanga'uta Lagoon Environment Management Plan Surveillance and monitoring capacity of marine reserves
3. Species Conservation	- Protection of priority species - Sustainable use and management of species - Invasive species control - Research and monitoring - Public awareness and education - Capacity Building	Trained Ecologists - Terrestrial - Marine Financial Resources Enactment of National Biosafety Law
4. Agro-biodiversity	- Conservation and sustainable use of threatened agro-biodiversity - Research and development - Public awareness and education	Trained Human Resources - Agriculturalists -

	- Capacity building	Financial Resources Facilities Capital
5. Civil communities and civil societies	- Local communities and resource owners - Civil society - Schools	Environment NGO's Environmental trained human resources - Conservation Capacity Financial Resources
6. Access of benefit sharing and traditional ecological knowledge	- Access to genetic resources - Fair and Equitable sharing of benefits - Traditional Ecological Knowledge - Public Awareness and education	Human Resources - Environmental Lawyers - Researchers (Traditional Knowledge) Financial Resources
7.Mainstreaming biodiversity conservation	- Legislations, policies and plans - Multi-sectoral collaboration - EIA - Economic Valuation	Capable Committed human resource Environmentally informed decision makers Economic valuation of biodiversity for decision makers Functional system Policy and Legal framework

The following key capacity needs require action:

- Relevant ministries to cooperate in implementing the NBSAP
- Funding mechanism required to implement the NBSAP
- More biodiversity training required at tertiary level and specialized fields
- More awareness programs required specific to different sectors
- Facilities for activities identified in NBSAP to be established
- Establish biodiversity conservation legislation and relevant policies
- Establish environmental governance structure on the community/village level to carry out local conservation
- Gaps identified to be addressed

Thematic assessment of UNCCD:

ISSUES

1. The absence of a Unit for Convention's Implementation, and the non- operation of a National Committee to combat drought, land degradation and desertification. Current activities by some of the key ministries are on ad hoc basis, and lack co-ordination.

2. The lack of a clear National Strategy to Combat Drought, Land Degradation and no National Action Programme (NAP) drawn up yet as requested of member countries. The major activities developed at present in CCD relevant fields rely exclusively on general sectoral policies or strategies in only some of the respective Ministries.

3. There is low level of awareness or lack of knowledge of UNCCD in key agencies and stakeholders.

4. There is no specific system in place for early warning of drought and land degradation to respond to the drought effects prevention and lack of any system for monitoring land degradation, ecosystems condition, and social condition in the affected areas.

5. Lack of programmes and specific measures for raising public awareness of the effects of drought, land degradation or desertification.

6. Lack of specific measures for improving the economic environment in the areas affected by drought, land degradation or desertification.

7. Lack of research programmes for problems specific to drought, land degradation and desertification.

8. Lack of a system for data collecting, transmitting, processing and periodical reporting of the implementation status for the National Action Programme; lack of transparency of the relevant institutions.

9. Reduced knowledge and insufficient implementation of long-lasting practices for land usage in the areas affected by drought, land and ecosystems degradation and desertification.

10. Lack of system of parameters to evaluate risks and identify the areas affected by degradation.

11. Deficiencies in the educational system of schools, and inappropriate school curricula and education programmes as regards the social and economic issues, market requirements at the local and national level.

12. Insufficient number of permanent education and improvement programmes for the active specialists in the field of agricultural and environmental consultancy as regards drought, land degradation and desertification related issues.

13. Insignificant activities carried on by nongovernmental organizations for CDD specific fields and lack of communication and cooperation with the public authority so that the measures for dissemination and raising public awareness could be efficient.

UNCCD Capacity Needs:

1. That a special unit should be set up and supported by a proactive Working Committee/Task Force. The Committee will be responsible for the expeditious development of the NAP and other key activities of UNCCD. Proposed Working Committee should comprised:

   Focal Point - Ministry of Agriculture and Food
   Secretariat - Department of Environment
   Member - Ministry of Forestry
   Member - Ministry of Lands, Survey and Natural Resources
   Member - Ministry of Work/ Disaster Management Committee
   Member - Representative from NGOs/Private Sector
   (can co-opt members from others when required)

2. That the Working Committee/Task Force be responsible for the expeditious development of the National Plan of Action and reporting commitments of UNCCD.

3. Adequate resources allocated to support appropriate researches by relevant ministries in area of land degradation, mitigation and rehabilitation.

4. Strengthening school curricula and adult education programmes for environmental protection and land management planning.

5. Coordination of effective dissemination of information relevant to awareness raising and enhancing technical competence.

6. Capacity building of communities, NGOs and other implementing agencies through technical workshops and practical training.

7. Promotion and empowerment of community action groups to enhance participation in community planning and decision making.

8. Promotion strategy that re-instigates and invigorates use of radio and other media.

9. Identify key land user such as farmers and ensure involvement in planning, implementing and monitoring of land management programs.

10. Financing and funding support by the Secretariat to assist stakeholders in accessing financial mechanisms in support of UN CCD related activities;

11. Government support activities under the Conventions; and other financial mechanisms and incentives.

National Institutional Framework

The Tonga SDP8 2006/7 – 2008/9 under goal 7 and strategies 1,2, and 3, are all relevant to the NCSA project.

Goal 7 – Ensure environmental sustainability and disaster risk reduction, with strategies

Strategy 1: Complete and enforce the legislative framework for environmental conservation and management.
Strategy 2: Integrate environmental costs and benefits into Government decision-making procedures covering policies, projects and private investment proposals.
Strategy 3: Implement environmental education programmes and engage communities in remedial measures.
Strategy 20: Implement and ensure sustainability of the Nuku'alofa Waste Management Project.

In this institutional context, the Department of Environment's Corporate Plan addresses the need for capacity development in all areas of environmental management. The Department's vision which **is "the people of Tonga are better able to plan and manage the use of their environment for sustainable development of present and future generations"** clearly indicates the main tool to achieve the vision is capacity development.

The roles put forward by the department to support the above vision are:

a) to promote meaningful public involvement in relation to issues of environmental management;
b) to ensure the observance within the Kingdom of Tonga of its international obligations relating to the protection of the environment;
c) to promote the concept of sustainable utilization and management of the environment and the natural resources of the Kingdom of Tonga;
d) to facilitate and conduct research and assessments of the impacts of any activity on the environment;
e) to formulate appropriate environmental legislative framework and policies;
f) to strengthen environmental legislation and policies as well as their enforcement;
g) to promote the understanding, management

These strategies and objectives are embodied in the NCSA National Capacity Action Plan.

Rationale for National Capacity Development Action Plan

The National Capacity Development Action Plan is intended as Tonga's national agenda for environmental capacity development for the five year period.

- To summarise the capacity development goals, objectives, strategies and priority actions that will lead to measurable improvements in the management of national and global environmental issues.
- To follow-up to the NCSA, by specifying implementation frameworks and strategies for the Action Plan, including monitoring and evaluation.
- To mobilize support for environmental capacity development from national and international sources.

Partnership for Capacity Action Plan Implementation

The Capacity Action Plan is intended to be implemented by many organizations and individuals working for sustainable development in Tonga and the global environment. Key players include the Ministry of Lands, Survey, Natural Resources and Environment, line ministries, planning and development agencies, private sector, businesses, local on-governmental organizations, including churches, women's and youths groups' community leaders and development groups, individual and community resource owners, regional and international organizations, private donors, bilateral and multilateral agencies.

The DOE will be the coordinating organization responsible for overseeing the implementation of the plan. An evaluation and monitoring schedule will be elaborated on at a later section.

2. VISION

The people of Tonga have full capacity to sustainably manage their environment in present and future generations.

3. MISSION

To achieve sustainable development by building Tonga's capacity to address national and international environmental obligations.

Components of the Capacity Action Plan

The Capacity Action Plan has four main components, each with a key objective that serves as benchmarks for measuring the progress and achievements for the duration of the Plan period. These are:

Thematic Area	Objectives
1. Climate Change	To be confimed by FCCC team
2. Biodiversity Conservation	To protect, conserve and enrich Tonga's biological diversity and natural resources to be appreciated and enjoyed by the present and future generation
3. Land Degradation/ Desertification	To adopt and promote sustainable land management practices that minimize land degradation, drought and desertification in the kingdom of Tonga
4. Crosscutting Issues	To be confirmed

Action Plan Principles

In keeping with the NCSA values and principles, the NCDAP is committed to delivering its programs with emphasis on:

- **Ensuring that the NCDAP is nationally owned and led, with high level political commitment,** utilizing national expertise and has high level support.

- **Using existing coordinating structures and mechanisms,** such as national committees and technical working groups involved with MEAs or national environmental plans.

- **Building on past capacity development work,** including GEF-supported enabling activities, national reporting to conventions and non-GEF initiatives.

- **Paying due attention to the provisions and decisions of the three conventions**, especially those related to capacity development.

- **Ensuring multi stakeholder participation, consultation and decisionmaking.**

- **Adopting a holistic approach to capacity development** that addresses capacity needs at the systemic, institutional and individual levels, and integrates capacity development into wider sustainable development efforts.

- **Adopting a long-term approach to capacity development** as part of national and global sustainable development initiatives integrated with other Multilateral Environmental Agreements; Millennium Development Goals; and national development priorities, such as poverty alleviation, economic transition and sectoral strategies.

4. NATIONAL CAPACITY BUILDING ACTION PLAN

4.1THEMATIC AREA 1:CLIMATE CHANGE ADAPTATION AND MITIGATION

Objectives

A resilient natural environment to support sustainable development and livelihood in the Kingdom of Tonga

Current Situation

The Kingdom of Tonga is extremely vulnerable to the adverse effects of climate change, climate variability and sea level rise. It is evident that Tonga will be among the first to

suffer due to its physiographic, ecological and socioeconomic characteristics. In addition, climate change, climate variability and sea level rise also affects Tonga's biodiversity, agriculture, fisheries, health and water supplies. It is very difficult for Tonga to adapt to these unfavourable conditions due to its low adaptive capacity and high sensitivity to climate change, climate variability and sea level rise. Failure to implement immediate adaptation to climate change, climate variability and sea level rise will indeed lead to high social and economic costs in Tonga.

Coastal Vulnerability

Much of the northern coastline of Hahake (Niutoua to Nukuleka) is eroding. To date there are no known details of coastal erosion rates. The villages of Kolonga, Manuka and Nukuleka, and much of the road are exposed to coastal erosion. A large number of ad hoc and poorly constructed seawalls (all in a damaged state) provide little protection. Detailed study of erosion and inundation on eastern coast of Hihifo (Kolovai to Ha'atafu) by Tappin (2003) showed erosion (loss of land) linked to inundation of low-lying areas and episodic (tropical cyclone) events. Strong north-easterly winds (albeit infrequent) can also cause wave conditions at high tide which cause erosion along this coast.

A priority environmental issue in Tonga is deforestation, particularly the removal of native forest, coconut woodlands and mangrove forests. Soil erosion is a serious environmental problem in part of Tonga, and is often associated with deforestation and/or agricultural development particularly in steep land areas. The subdivision and clearance of mangrove areas in Tongatapu and Vava'u are of considerable concern. When these mangroves are reclaimed for housing and agricultural purposes, the land is rarely raised to a sufficient height in order to avert the danger of flooding which normally accompanies storms and unusually high tides. The environmental and biological functions of mangrove ecosystems are therefore lost hence resulting in coastal erosion and decreasing productivity.

Throughout Tonga, informal beach sand mining is a common practice, causing many problems. Prominent among these is the shoreline erosion being exacerbated by removal of the protective beach cover. If these protective ecological systems continue to be placed under stress, the process of deterioration will be greatly accelerated with future climate change.

Poor Waste Management

Solid waste disposal is also realized as a serious problem in Tonga, particularly in Nuku'alofa where the main garbage dump for household wastes and other non-hazardous wastes, including septic sludge, is situated in a mangrove area. The outer islands of 'Eua, Ha'apai and Vava'u require improved waste disposal facilities and services. Vava'u stakeholders expressed concern about the current location of their dump which is on mangroves wetlands.

Heavy reliance on imported petroleum

There is also a heavy reliance on the imported petroleum predominantly used for transportation and power generation. In 1993, a total of 9.79 million litres of diesel oil was consumed, of which 4.29 million litres was used in the power sector, 3.85 million litres for the transportation sector and the rest in the agricultural, industrial and residential/commercial sectors. A total of 5.62 million litres of gasoline was consumed in 1993 where 96% was consumed in the transportation sector and the rest was used up in the agricultural sector. Electricity generation will continue to rely mostly on petroleum products and will definitely be the most important secondary energy sources.

National Actions

Outcome 1: Enhance the adaptive capacity of the people and environment of Tonga to the adverse effects of climate change, variability and sea level rise

Outputs:

1.1 Climate Change Legislation
1.2 Climate Change adaptation projects /policy
1.3 National Coastal Management Plan
1.4 Communities involvement in planning, management and implementation of adaptation measures
1.5 In depth vulnerability and adaptation assessment of various sectors to climate change, variability and sea level rise impacts
1.6 Mainstream adaptation into local, sectoral and national plan/ programme
1.7 Data management system
1.8 Water resources adaptability
1.9 Agricultural sector adaptability

Outcome 2: Promote sustainable management, conservation and enhancement of carbon sinks (biomass, forests, ocean)

Outputs

2.1 Inland and coastal tree planting

Outcome 3 Assess viable options to mitigate concentrations of GHG emission
Outputs

3.1 Renewable energy and energy efficiency projects
3.2 Technology needs and assessment (TNA)

Outcome 4 :Promote climate change educational training and awareness programmes

Outputs

4.1 Communication strategy
4.2 Training and workshops
4.3 Human Resource development

Outcome 5: Improve disposal of solid wastes throughout Tonga.
Outputs
5.1 Law enforcement
5.2 Well managed landfill throughout Tonga

Outcome 6: Ensure preparedness to natural disasters /extreme weather events
Outputs
6.1 Building Code and standards Act
6.2 National Emergency Management Bill
6.3 Mainstream disaster risk reduction into local, sectoral and national development plan and programmes
6.4 Warning systems for extreme weather events

4.2 THEMATIC AREA 2: BIODIVERSITY CONSERVATION

Objectives

To protect, conserve and enrich Tonga's biological diversity and natural resources to be appreciated and enjoyed by the present and future generation.

Current Situation

Biological diversity means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. The kingdom of Tonga's biological diversity is under threat, both from anthropogenic and natural pressures. Flora and fauna are rapidly exploited to some extend that some are vulnerable, threatened and becoming extinct.

Tonga has few if any endemic and native species of global scientific interest. However since biodiversity is the basis for sustainable development, biodiversity conservation is paramount. Biodiversity conservation efforts tend to be concentrated on endemic and rare species and ecosystems with global scientific significance. However species and ecosystems with ecological and cultural importance must also be given equal opportunity for conservation.

Tonga is known to have a rich agricultural biodiversity of which many species and varieties are endangered and threatened of being extinct. Classification of Tonga's agro-biodiversity includes root crops, fruit & food tree crops, fruits, vegetables, traditional crops and livestock. However most of Tonga's agro-biodiversity was introduced. Threats to agro-biodiversity includes clearing of areas through agricultural development, dying of senile trees without any replacement planting and absence of any proper conservation program to save endangered species and varieties.

In terms of Terrestrial Fauna, invertebrate studies in Tonga have been in the field of agriculture due to its importance to the economy and society. Invertebrates studied were mainly insect pests introduced to the country. Vertebrate studies concentrated on birds, herpetofauna, Tongan fruit bat, rodents and feral cats. Seventy-four birds have been recorded in Tonga, with two being endemic, which are Tongan whistler, hengehengan (*Pachycephala jacquinoti*) and the Tongan megapode, malau (*Megapodius pritchardii*).

Twenty known species makeup the herpetofauna of Tonga. The South Pacific Banded Iguana (*Brachylophus fasciatus*) is considered to be endangered with the skink (*Tachygia microlepsis*) considered to be extinct. The Tongan fruit bat (*Pteropus tonganus*) colonies are abundant in Tonga. The Tongan fruit ban is forbidden from being harvested, therefore maintaining the longest standing colony in the Pacific. The types of rodents and feral cats found in Tonga were also documented due to the damage to other biodiversity. Threats and pressure to the terrestrial fauna of Tonga includes destruction of natural habitats of terrestrial fauna, intensity of agricultural practices for commercials agriculture and rodents and feral cats.

The original vegetation of Tonga was tropical rain forest, is near extinction. Only small remnants remain on Tongatapu, Vava'u and 'Eua and estimated 11% remaining. Three species have been confirmed as endemic to Tonga, which includes langakali vao (*Aglaia heterotricha*), mo'otamea (*Dysoxylum tongense*) and uhiuhi (*Podocarpus pallidus*). There are other plant species likely to be endemic to Tonga but it is not yet confirmed. Plant biodiversity in Tonga is being used for sawn timber, fuel wood, minor forest products (such as food plants), cultural uses, medicinal, ornamental and income generation (handicrafts).

The marine area surrounding Tongs is approximately 400,000sq km, and as a result the people of Tonga continue to depend heavily on marine life of coastal waters for food and income. Apart from the pelagic sector in Tonga several marine ecosystems exists in Tonga, such as coral reefs, mangroves and lagoons. These ecosystems support millions of species. The only recorded endemic species in the coral reefs of Tonga is the giant clam *Tirana Tesoro*. Several studies have identified endangered and threatened marine species in Tonga. It is evident that the biodiversity known to the people of Tonga are those of cultural and economic value. However there is a need to also value biodiversity that are of ecologically important.

National Actions

Objective 1: To conserve Forest Ecosystems in Tonga

Actions/Activities

1) Identify all forest ecosystems

2) Document forest species found in Tonga
    a) Classify forest species according to habitats
    b) Identify threatened forest species

c) Identify forest invasive species
d) Identify culturally and economically valued species
e) Identify forestry threats and pressures

3) Review and establish a National Land Use Plan
   a) Identify areas for forest protected areas
   b) Arrest deforestation of any kind including burning
   c) Identify and limit agricultural lands
   d) Ensure sustainable agricultural practices and methods are used

4) Establish Forest conservation legislations
   a) Establish a National Forest Policy

5) Establish a National Forest Management Plan
   a) Review and incorporate the Forest Ecosystem thematic area of the NBSAP into the National Forest Management Plan
   b) Develop and incorporate into the Forest Management Plan a Forest Monitoring Programme.
   c) Facilitate implementation of Forest Management Plan

6) Establish new forest protected areas
   a) Develop Forest Protected areas management plan for each protected areas
   b) Establish forest protected rangers
   c) Increase fines for destruction of protected areas

7) Coordinate national forestry research and training
   a) Promote forestry research to avoid duplication

8) Promote community based forestry projects
   a) Promote establishing of community nurseries
   b) Promote replantation

9) Provide awareness programmes for line ministries, NGO's local communities and schools on the following forestry issues
   a) forestry related legislations
   b) forestry species and threatened species
   c) Sustainable conservation methods

2. MARINE ECOSYSTEMS PROTECTION

Objective 2: To protect Marine Ecosystems for the benefit of the people of Tonga

<u>Actions : Support implementation of Marine Conservation Action Plan</u>

1) Reduce the impact of land based activities
   a) Prohibit dumping of solid waste into the sea

b) Prohibit chemical discharge into the sea
c) Prohibit sand mining
d) Conduct Environment Impact Assessment on development activities around costal areas
e) Promote activities that reduce the run off soil erosion into the sea
- Prohibit over ploughing of sloping areas
- Prohibit clearing of coastal vegetations
- Install proper drainage system

2) Increase the number of marine conservation areas
a) Promote traditional tenure open access nature
b) Enforce compliances with existing conservation areas legislations
- Promote community involvement and consultation

3) Promote sustainable management of marine ecosystems
a) Prohibit illegal fishing
b) Promote implementation of existing marine management plans
c) Prohibit destructive fishing methods
d) Prohibit off shore dredging
e) Prohibit illegal sandmining

4) Promote information dissemination, research and monitoring
a) Coordinate and centralised marine information for dissemination
b) Promote marine ecosystem research
c) Establish a system for accessing of information (i.e. website)
d) Establish a monitoring programme for ecologically, economically and culturally significant marine species and ecosystems
e) Provide appropriate training for required capacity in the marine industry

5) Promote marine public awareness
a) Increase the number of well designed marine public awareness programmes
b) Promote public involvement for ensure commitment

3. SPECIES CONSERVATIONS

Objective 3: ***To promote and increase species conservation***

Actions

1) Promote the protection and conservation of rare and threatened species
a) Identify and establish suitable areas for species conservation
b) Enforce Parks and Reserves Act and other protected areas related legislations.
c) Increase facilities and resources for species protection and conservation

2) Promote sustainable use and management of species
    a) Coordinate and documentation of species management
    b) Review and establish threatened species monitoring and evaluation system

3) Reduce the number of invasive species
    a) Ensure quality quarantine inspection and assessment
    b) Widely disseminate technical information on invasive species control to the public

4. AGRO-BIODIVERSITY CONSERVATION

Objective 4: ***To conserve and increase agro-biodiversity in Tonga***

Actions/activities

1) Promote replanting of different agro biodiversity
    a) Increase the germplasm collection at the regional level and establish a national germplasm
    b) Promote propagation of endemic traditional species
    c) Responsible ministry to make available seedlings for the public

2) Increase the promotion of organic farming, mixed farming and agro forestry
    a) Establish programmes to promote organic farming, mixed farming and agro forestry
    b) Seek economic incentives for small farmers
    c) Train human resources for certification of produce

3) Prohibit unsustainable farming practices
    a) Establish a policy to limit the usage of chemicals
    b) Limit the import of resources for alternative farming practices
    c) Ensure legislations related to conservation of agrobiodiversity

4.3 THEMATIC AREA 3: DESERTIFICATION AND LAND DEGRADATION

Objectives

To adopt and promote sustainable land management practices that minimize land degradation, drought and desertification in the Kingdom of Tonga

Current Situation

Land degradation represents serious environmental problem for Tonga. Tonga's limited land, coupled with a high population growth rate in the urban center has put considerable pressure on the country's natural resources. However, land degradation and desertification

in Tonga occurs in the form of increasing clearance of forest land for farming; wind and water caused soil erosion; overgrazing of roaming pigs; overuse of land and agricultural chemicals causing low fertility, serious drought, and increasing mining of sand from coastal area. The issue of land degradation is more common and easily visible in Tonga as compared to desertification and drought. Land degradation is accelerated by not only natural factors but also by anthropogenic factors such as agricultural development, infrastructure activities, harvesting of commercial tree and plant commodities have been the leading factor for decline of natural forest cover to a remaining 5.5 percent (Pacific Island Economies, 1995) of the total area for Tonga. The NCSA has also helped with the development of the CCD NAP, which elaborates Tonga's co-ordinated response to combat land degradation and desertification esertification.

A factor that hinders the activities to conserve forestry or land vegetation cover in Tonga is there is no formal National Forest Policy or Land Use Policy as of yet. This absence allowed massive forest degradation up to the present times. Furthermore existing forestry related policies are not sufficient to address the alarming rate of degradation. It was noted by town officers that because there is insecurity in short term leases for most farmers, there is a tendency for them to reap as much benefit as they could from the land in the shortest time ignoring any need for the long term sustainable management of the land. Land leasing of all forms need adequate review. There is however been a recent initiative funded by FAO to formulate a national forestry policy however under the NAP activities include undertaking nationwide consultations, securing political support to endorse draft document will further ensure the effectiveness of this policy when implemented.

Land degradation in the form of soil erosion is an adverse effect of clearance of forestry or land for the various uses mentioned. This coupled with high intensity rainfall often accompanied by tropical cyclones will accelerate the level of erosion especially in the outer islands of high and steeping landforms like 'Eua and Vava'u. Other ecosystems are affected such as marine when topsoil is transported in concentrations of sediment and debris that causes contamination of marine water and its inhabitants.

Desertification or desert ecosystems is not immediately associated with island countries such as Tonga however, Tonga is affected by desertification in the form of drought mainly brought about by the impacts of climate change most notably in its effect on water resources. Change in rainfall patterns during events associated with climate change where the two main causes of rainfall variation in Tonga are the occurrence of tropical cyclones, which can result in unusually wet periods, and an El Nino event which can cause prolonged droughts particularly in central and southern Tonga and enhanced cyclone activity. Long term records shows decreasing rainfall trend

Rainfall in the dry zone of Tonga mainly Ha'apai group of islands and Southern Tonga are lower than normal during the dry season. A few months of below average rainfall can cause drought condition. The persistence of prolonged droughts in Tonga is also associated with the El Nino event which also results in below average rainfall for Tonga. These conditions can be severe if the event is strong and particularly if the precipitation during the wet season has been lower than normal. The 1997/1998 strong El Nino event caused drought in Tonga especially affecting Tongatapu and Ha'apai groups.

Extreme events such as storm surges, high seas and gale force winds combined with projected mean sea level rises, will probably increase coastal erosion and inundation of low lying areas. There are already examples of these occurrences on Tongatapu especially during past El Niño episodes. Storm surges during 1982/1983 and 1997/1998, cyclone season (November–April) and El Nino events, caused inundation of some land in the low lying areas of the northern parts of Tongatapu, especially the western part of Nuku'alofa (Sopu, Hala'ovave and part of Kolomotu'a on the lagoon side). Overtopping by waves or inundation by high sea levels has caused seawater intrusion into freshwater lenses hence reducing the availability of potable freshwater.

Droughts can significantly retard the long-term economic growth of smaller countries like Tonga. Indirect and secondary effects on the local and national economy may include reduction in family income, decline in production and national income. Drought has caused severe economic lost and social disruption in Tonga according to past events. The 1997/1998 drought caused a loss in agricultural production and water shortages which was felt in most parts of Tongatapu and Ha'apai. Past records show a number of tropical cyclones and drought, which have severely affected Tonga causing extensive damages to agriculture and infrastructure and affecting 20 per cent of Tonga's population and economic loss. The initial relief and rehabilitation cost for Vava'u alone after tropical cyclone Waka was approximately T$80 (US$40) million and for the drought in 1997/1998, the government spend about T$270 000 to ship water to Ha'apai as it was experiencing water shortage. These costs are indicative of the huge burden on the Tongan Government and its people who go through periodic suffering and losses.

National Action

Naturally Induced Environmental Issues

Tropical Cyclones

- Establish a Meteorological Legislation to ensure that the functions of the TMS is clearly defined and agreed. It should also include the requirement for permission for all meteorological data collection and dissemination activities
- Upgrade meteorological instruments throughout the meteorological observing stations
- Strengthen national and international meteorological communication systems and links for efficient reception and dissemination of daily weather and climate information.
- Provide a modern and integrated Weather Forecasting System and support facilities for Tonga Meteorological Service office to be able to discharge its national weather forecasting and warning responsibilities.
- Develop human resource capability to enable the Tonga Meteorological Service office to operate its meteorological observing and forecasting systems and provide necessary services for the Kingdom.

Drought

- Same actions for Tropical Cyclones
- Introduce and implement effective systems for the forecasting of drought well in advance of beginning of drought period
- Construction of more village and household freshwater cisterns for storage of water in periods of drought
- Upgrading of village water supply systems for villages that have not yet received funding from donors for upgrade, if not seek donor funding for upgrade of village water supply systems
- Conduct workshops to empower village communities to take more ownership and responsibility for their water resources. This should hopefully empower communities to practice sustainable water use by taking necessary precautionary measures
- Conduct a quantitative and qualitative assessment of the underground water system; prepare water balances and carry out studies of desirable water systems.
- Strengthen evaluation and monitoring of water resources in Tonga
- Ensure the enactment of new legislations addressing national water resource concerns such as Water Resources Management Bill to ensure equitable access to water resources.
- Make amendments to existing legislation or conducting a comprehensive review of various acts and regulations that regulate water resource, water supply or water quality management.
- Formulate and avail research programmes for problems specific to drought, land degradation and desertification
- Develop methods to measure and collect data related to the water requirements of the different crops, and the water demands at the different stages of crop growth and development.

Sea-Level Rise

- Conduct coastal replantation
- Construct foreshore especially for low lying areas in Ha'apai, Tongatapu
- Review regulations and enforce sandmining fines
- Promote community monitoring of sand beaches to minimise illegal sand mining

Human Induced Environmental Issues

Soil Erosion

- To identify areas most at risk to land degradation
- Based on identification of land degradation risk areas, formulate land capability and soil suitability maps describing soil type and vulnerability of soil in particular area to land degradation,
- Formulation of database or guide book on type of agricultural activities best performed in an area based on land capability and soil suitability maps

- Land capability and soil suitability maps and database/guidebook easily accessible to public as a guide on what activities are beneficial for their areas and advice to landowner is available
- Promotion of planting grass on bare soil covered areas
- Promotion of planting hedgerows of plants across sloping land to reduce soil erosion
- Promotion of applying a thick layer of guinea grass mulch on sloping land to reduce soil erosion
- Distribute findings and promote planting of vanilla and pineapple on hill slopes in 'Eua and Vava'u to reduce soil erosion
- Minimise the use of mechanized land preparation on hill slopes regarding squash farming
- Construct drainage pathways in sloped islands ('Eua, Vava'u, Niua's) to reduce sheet-wash soil erosion

Clearance of forest and vegetative soil cover

- Update and conduct survey and assessments of forestry resources
- Hold a special land degradation national awareness day with relevant activities conducted eg. Tree planting (replantation)
- Formulation of a Land Use Policy that incorporates forest management

Population growth against available land

- Promote population control initiatives
- Development and distribution of soil profiles/maps mentioned in soil erosion induced by sloped topography issue
- Formulation of soil profiles/maps describing soil type and vulnerability certain land area

Monocropping

- Promotion of traditional farming practices
- Promotion of agro-forestry

Agricultural Chemicals

- Investigate the potential of using organic fertilizer on mass agricultural farming
- Promote use of both the mineral fertilizer and thick grass mulch as the answer to the problem of soil fertility decline
- Planting Mucuna beans

Mechanical agriculture

- Promote minimizing the use of mechanize cultivation during rain or just after a heavy down pour.

Short term lease land

- To identify areas most at risk to land degradation
- Based on identification of land degradation risk areas, formulate land capability and soil suitability maps describing soil type and vulnerability of soil in particular area to land degradation,
- Formulation of database or guide book on type of agricultural activities best performed in an area based on land capability and soil suitability maps
- Land capability and soil suitability maps and database/guidebook easily accessible to public as a guide on what activities are beneficial for their areas and advice to landowner is available
- Provide and promote policy advice at Ministry of Lands office when short lease is processed to landowners on their rights to determine the amount of land degradation and extent of agricultural activities on their land that borrowed for the purpose of agricultural activities

Livestock Grazing

- Develop and implement an integrated project to control roaming pigs
- Promote health foods such as vegetables, fish instead of eating pigs
- Use large fish for cultural presentations instead of pigs
- Formulate and promote community laws for livestock roaming

Policy Induced Environmental Issues

Land Use Policy

- Formulate Land Use Policy that incorporates forest management
- Promote sustainable practices to be conducted on land targeted for short term lease for agricultural purposes

Legislations

- Formulate a Meteorological Legislation
- Formulate specific legislation for UNCCD
- Review and amendment of existing legislations relevant to land degradation, desertification and drought
- Formulation of regulations for legislations relevant to land degradation, desertification and drought if non-existent

- Enforcement of existing legislation relevant to land degradation, desertification and drought
- Review of land tenure
- Enforcement and strengthening of laws related to illicit mining of sand activities which can contribute significantly to land degradation

4.4 THEMATIC AREA 4: CROSSCUTTING ENVIRONMENTAL ISSUES

4.4. 1 Crosscutting Environmental Issues

Objectives

ENVIRONMENTAL ISSUES

1. Vulnerability to extreme weather events
2. Coastal degradation – no integrated coastal zone management
3. Unsustainable agricultural practices
4. Unprecedented clearance of vegetation coverage/deforestation
5. Unsustainable land use practices
6. Lack of solid waste disposal facilities
7. Need for integrated urban and rural planning

National Action

Objective 1: Tonga to be resilient to Extreme Weather Events

Tropical Cyclones

Improve climatic observatory system in terms of :

a) Legislation in place outlining roles and functions
b) Upgrade weather forecasting system and facilities
c) Build the weather forecasting human resource capacity

Drought

1) Construct and expand more village and household water storage cisterns for periods of drought and for everyday use

Sea level rising

Improve and protect coastal areas

1) Assess the current coastal protection system (eg seawalls)
2) Construct seawalls in areas more vulnerable to sea level rising
3) Promote coastal replantation
4) Improve water quality in areas vulnerable to sea level rising

Objective 2: To protect coastal environment degradation

1) Prohibit illegal sandmining and enforce fines

Objective 3: To promote sustainable agriculture

1) Promote organic farming, mixed farming and agro-forestry
2) Minimize the use of mechanize cultivation during rain, after a heavy rain and on sloping areas.

Objective 4: Minimise the destruction of forest ecosystems

1) Promote replanting and reforestation
2) Update and conduct a survey and assessment of forestry resources
3) Establish protected areas for remaining forests

Objective 5: Promote Integrated Land Use

1) Establish a National Land Use policy
2) Promote sustainable practices on short term lease land for agricultural purposes
3) Land Use Policy to incorporate forestry management

Objective 6: Proper Solid Waste Disposal

1) Prohibit improper disposal of solid wastes
2) Landfill for 'Eua and Ha'apai

Objective 7: Establish Integrated Urban and Rural Planning

1 Formulate Urban / Rural Planning Policy and Legislation
2 Enforce Urban / Rural Planning Policy and Legislation
3 Develop human resource capacity in urban / rural planning

Objective 8: Environmentally sustainable ecotourism operations

1 Formulate environmentally sustainable ecotourism guidelines for operators to adhere to

4.4.2 Crosscutting Capacity Needs

Objectives

ENVIRONMENTAL CAPACITY NEEDS

1. need for facilities, limited technical capacity
2. insufficient human resources – trained workforce and specialists, also availability of workers in the outer islands , general shortage of staff for environmental work
3. need for financial resources
4. lack of mainstreaming into government's priorities and activities

5. To develop and formulate environmental framework, legislation and policy
6. To conduct public awareness and educations in Tonga

National Action

1 FACILITIES

OBJECTIVE : To improve facilities of stakeholders for capacity development

Actions:

1. Carry out a comprehensive stocktake of existing and required facilities, and the status of facilities.
2. Identify and prioritize required facilities:
   2.1. upgrade existing facilities
   2.2. replace *existing* facilities
   2.3. purchase new facilities
3. Seek financial assistance for obtaining priority facilities
4. Procure prioritized facilities
5. conduct training on use of facilities
6. monitor maintenance of facilities

2) HUMAN RESOURCE DEVELOPMENT/ CAPACITY BUIDLING

Objective: To develop human resources and capacity of individuals, institutions and systems in Tonga

Actions:

1. Provide relevant training for different sectors and stakeholder groups such as line ministry employees, NGOs, community representatives, youth groups and women's groups.
   1.1. Formal training: scholarship for graduate and postgraduate level training.
   1.2. Short-term environmental training and attachments
   1.3. Community training: to be more practical learning and to include traditional knowledge.
2. Integrate environmental issues into school curriculum at all levels. (preschool, primary, secondary, tertiary) – Mainstream?
3. Ensure government support by establishing permanent posts in relevant ministries. *Establish a permanent post for MEAs officer.
4. Maintain existing expert human resource capacity. E.g. Existing GEF/ UNDP/ UNEP and donor funded project staff.

3) FINANCIAL RESOURCES

To identify financial resources for capacity development

Actions:

1. Implement NCSA Action Plan
   a. Seek funding sources:
      i. government ministries
      ii. NGOs/ CSOs
      iii. private sector
      iv. GBO
      v. Community/ women/ youth
      vi. Foreign aid

2 Increase government budget allocation for DOE

3 Regulation amendments to increase penalty fees for breaching environment legislations.

4 Enact Environment Tax Bill.

5 Promote revenue – generating ecotourism activities
   i. whale watching
   ii. National parks
   iii. diving and sight seeing
   iv. yachting and kayaking

6 Market DOE environment information. (social marketing)

7 Establish environmental trust funds. (Regional, national, local)

4) MAINSTREAMING

Objective 4: To mainstream capacity development into governments priorities and activities.

Actions:

1. Establish high level consultation and training program (decision makers).
2. Establish an information centre for regular dissemination of environmental information.
3. Activate the NECC.
4. Establish Island and Village level environment committees to work closely with DOE line ministries *that are operational focal points for environment conventions.*
5. Strengthen collaboration between, DOE and line ministries, NGOs, CSOs, GBOs, churches and community groups.
6. Integrate environmental issues, plans, legislations and programs into sectoral and national plans and programs.

7. Provide *professional development* capacity training for all relevant stakeholders.
8. Carry out an economic valuation of natural resources to indicate financial benefits and costs.
9. Ensure EIA Act and regulations are applied to all development activities.

5) POLICY/LEGAL

Objective 5: To develop and formulate environmental framework and policy

Actions:

1. Review existing environmentally related legislation and identify gaps.
2. Formulate new legislation and policy.
3. Amend existing legislation.
4. Speed-up process for enactment of environmental legislation. Ensure approval of EMB and other environmental bills that need enactment.
5. Strengthen enforcement capacities (Ministry of Police, DOE, line ministries).
6. Formulate village law. (Beautification and domestic animal maintenance – with village enforcement).
7. Establish monitoring mechanisms with participation of all stakeholders. (line ministries, NGOs, community groups)
8. Amend regulations (fines).
9. Enact Environmental tax Bill. (refer to financial resources)

6) AWARENESS

Objective 6: To conduct public awareness and education programs in Tonga

Actions:

1. Strengthen DOE Education and Information Unit as focal point for all environmental information.
   1.1.1. Update current information
2. Produce and distribute awareness material
3. Establish demonstration plot
4. Media coverage
5. Drama
6. Environmental week and exhibition
7. Wider community consultations, workshops etc

5. ACTION LOGICAL FRAMEWORK MATRIXES

5.1 Climate Change Action Log Frame

OBJECTIVE : A resilient natural environment to support sustainable development and livelihood in the Kingdom of Tonga	**INDICATORS**	**MEANS OF VERIFICATION**	**ASSUMPTION**
Outcome 1: Enhance the adaptive capacity of the people and environment of Tonga to the adverse effects of climate change, variability and sea level rise			
Outputs; 1.0 Climate change Legislation 1.1Climate change adaptation projects (coastal, water resources, agriculture, fisheries etc) 1.2 Coastal management plan 1.3 Communities involvement in planning, management and implementation of adaptation measures 1.4 In depth vulnerability and adaptation assessment of various sectors to climate change, variability and sea level rise impacts 1.5 Mainstream adaptation into local, sectoral and national plan and programme 1.6 Data management system 1.7 Water Resources adaptability 1.8 Agricultural sector adaptability		*proposals *reports	
Output 1.0 Climate change legislation Activities; *1.1 Amend or review the existing legislation to include climate change issues (climate change mitigation and adaptation)* *1.2 Enforce laws to prohibit human activities that are disastrous*	*climate change legislation in place *village laws o free ranging animals in place		

to the environment *1.3 Formulate climate change legislation* *1.4 Conduct training and awareness programmes* *1.5 Formulate village laws to free ranging animals*			
Output 1.1 Climate change adaptation projects /policy Activities; *1.1.1: Prepare climate change adaptation project proposals* *1.1.2: Consult relevant stakeholders* *1.1.3 Submit proposals to donors for approval* *1.1.4 Implement climate change adaptation projects both at national and community levels* *1.1.5 Implement climate change adaptation policy*	*proposals approved *projects implemented *cc adaptation policy implemented	*proposals *reports	*stakeholders support
Output 1.2. Coastal management plan Activities *1.2.1. Formulate coastal management plan* *1.2.2: Conduct consultation workshop to relevant stakeholders* *1.2.3: Submit to Cabinet for endorsement* *1.2.4: Conduct training and awareness programmes* *1.2.5 Review and reassess the current coastal protection systems* *1.2.6 Establish coastal mapping /GIS* *1.2.7 Investigate alternative sites for possible relocation of settlements from low lying vulnerable areas*	*coastal management plan approved by Cabinet *coastal mapping in place	*reports	
Output 1.3: Communities involvement in planning, management and implementation of adaptation measures Activities *1.3.1 Involve communities in planning, managing and implementing of adaptation measures* *1.3.2: Establish village committees to work closely with NECC, Department of Environment and Climate Change EA Project*	*projects implemented *adaptation measures integrated into communities work plan and programmes	*reports	*communities support

Output 1.4 : In depth vulnerability and adaptation assessment of various sectors to climate change, variability and sea level rise impacts Activities; *1.4.1 Conduct in depth vulnerability assessment of various sectors to climate change, variability and sea level rise impacts* *1.4.2 Conduct training and awareness programmes* *1.4.3 Strengthen human and institutional capacity to assess, plan and respond to climate-related risks*	Projects implemented	*reports	
Output 1.5: Mainstream adaptation into local, sectoral and national plan and programme Activities; *1.5.1 Strengthen networking amongst government, NGOs, private sectors/ organizations, communities* *1.5.2 Integrate CC issues into local, sectoral and national development plan and programmes* *1.5.3 Establish a system to link national teams with communities* *1.5.4 Ensure availability of adequate funds to facilitate and mainstream CC into activities* *1.5.5 Establish national climate change team for all relevant stakeholders to oversee and monitor work of CC* *1.5.6 Line ministries involved/implement specific activities related to CC*		*reports	*availability of funds
Output 1.6: Data management system Activities *1.6.1 Establish a system to manage and coordinate development of data and making data accessible to stakeholders* *1.6.2 Establish national database to avoid duplication of information*	*data management system in place *National database cared for by National CC team & base at DOE Website	* progressive report	

1.6.3 Strengthen capacity for research, data management, data collection and data update *1.6.4 Make available technical equipment & capital* *1.6.5 Making available of information & long term data*	*Budget allocations *Proposal for technical equipment		
Output 1.7: Water resources adaptability Activities *1.7.1 Expand water collection systems especially to rural areas and outer islands* *1.7.2 Improve water quality particulary in vulnerable areas to sea level rise* *1.7.3 Implement desalinization projects*	*water resources projects implemented	*project proposals * reports	
Output 1.8 : Agricultural sector adaptability Activities *1.8.1 Introduce salt tolerant and temperature tolerant crops* *1.8.2 Improve disease and pest management* *1.8.3 Formulate degraded lands restoration policy* *1.8.4 Promote agricultural diversification /agroforestry* *1.8.5 Promote usage of organic farming practices* *1.8.6 Promote usage of biological control*	*salt and tolerant crops planted *agricultural diversification/agroforestry in place *organic farming practices implemented	*reports	
Outcome 2 Promote sustainable management, conservation and enhancement of carbon sinks (biomass, forests, ocean)			
Outputs; 2.1 Inland and coastal tree planting	*nursery in place *tree planting implemented *land use policy in place	*nursery sites *reports *documentary	*public support
Activities *2.1.1 Prepare nursery for subsequent tree planting* *2.1.2 Promote inland and coastal tree planting* *2.1.3Promote reforestation and afforestation* *2.1.4 Conduct training and awareness programmes* *2.1.5Enforce legislation to prohibit cutting down of trees*			

particuarly on steep and low lying areas *2.1.6 Formulate land use policy*			
Outcome 3 Assess viable options to mitigate concentrations of GHG emission			
Outputs 3.1 Renewable energy and energy efficiency projects Activities *3.1.1 Promote usage of renewable energy sources and energy effeciency* *3.1.2 Implement renewable energy and energy effeciency projects at both local and national levels* *3.1.3 Implement renewable energy policy* 3.2 Technology needs and assessment (TNA) Activities *3.2.1 Carry out technology needs & assessment for mitigation* *3.2.2 Identify barriers and ways to promote renewable energy technologies for renewable energy development* *3.2.3 Conduct training and awareness* *3.2.4 Develop capacity to identify and use appropriate technologies, methodologies and tools for assessment of mitigation options & development of mitigation scenarios particularly in sectors with significant mitigation potential*	*renewable energy and energy efficiency projects implemented *TNA conducted *TNA workshops conducted	*reports	*stakeholders support
Outcome 4 : Promote climate change educational training and awareness programmes			

Outputs 4.1 Communication strategy 4.2 Training and workshops 4.3 Human resources Activities *4.1.1 Establish communication mechanisms & partnerships with villages* *4.1.2 Integrate CC issues into school curriculum at secondary school level* *4.1.3 Conduct training & workshops* *4.1.4 Human resources with sufficient technical capability to address CC issues* *to be made available*	*Community based awareness programmes Weekly TV/Radio awareness programmes Brochures *Writing team – Curriculum Development Unit (CDU) with the Ministry of Education *Training & workshop programmes *Formal technical training (local or overseas – scholarship)	MOE Annual Report CDU progressive report Government & other donors scholarship reports	Fund availability Funds availability MOE approval Fund availability
Outcome 5: Improve disposal of solid wastes throughout Tonga.			
Outputs 5.1 Law enforcement Activities *5.1.1. Increase fines for improper disposal of solid wastes* *5.1.2 Promote training and awareness* 5.2 Well managed landfill throughout Tonga Activities *5.2.1 Establish well managed landfill throughout Tonga* *5.2.2 Ensure sustainability of the established landfill*	*clean environment * well management landfill throughout Tonga established	*reports	*public support
Outcome 6; Ensure preparedness to natural disasters /extreme weather events			
Outputs; 6.1 Building Code and standards Act	*regulations implemented	*reports	*stakeholders support

Activities *6.1.1 Implement Building Code and standards regulations* *61.2 Enforce the building code and standards* *6.1.3 Conduct awareness programmes to stakeholders* 6.2 National Emergency Management Bill Activities; *6.2.1 Enact national emergency management bill* *6.2.2 Conduct training and awareness programmes to stakeholders* 6.3 Mainstream disaster risk reduction into local, sectoral and national development plan and programmes Activities *6.3.1 Mainstream disaster risk reduction into local, sectoral and national development plan and programmes* *6.3.2 Conduct training and awareness programmes to stakeholders*			
Output 6.4 Warning systems for extreme weather events Activities *6.4.1 Strong Early Warning System for ENSO, tropical cyclones & droughts* *6.4.2 Conduct disaster preparedness training throughout Tonga* *6.4.3 Improve climatic observatory system*	*people of Tonga are better prepared for natural disasters and extreme weather events *life insurance in place *welfare in place		*public support

5.2 Biodiversity Conservation Action Log Frame

Intervention Logic	Means of Verification	Verifiable indicators	Assumptions
Objective: To protect, conserve and enriched Tonga's biological diversity and natural resources to be appreciated and enjoyed by the present and future generation	Recorded increase number of species		
Outcome 1. Biological diversity is sustainably managed and utilized to support Tonga socio-economic and environment.	Scientific Report		
Output 1.1 Forest Ecosystem is conserved and protected	Scientific Report Approved Land use plan Gazzetted Legislation Management Plan		
Actions 1.1.1 Identify all forest ecosystem 1.1.2 Document forest species found in Tonga 1.1.3 Review and establish a National Land Use plan 1.1.4 Establish forest conservation legislation 1.1.5 Establish a forest management plan 1.1.6 Establish protected areas 1.1.7 Coordinate national forestry research 1.1.8 Promote community based forestry projects 1.1.9 Awareness program for communities and stakeholders	Number of new Protected Areas approved		
Output 1.2 Marine Environment is well protected and Conserved	Research Report		
Actions 1.2.1 Reduce the impact of land based activities 1.2.2 Increase the number of marine conservation areas 1.2.3 Promote sustainable management of marine ecosystems	Report of community base Projects -Awareness report and		

1.2.4 Promote information dissemination, research and monitoring 1.2.5 Promote marine public awareness **Output** 1.3 Conserve Species Diversity **Actions** 1.3.1 Promote the protection and conservation of rare and threatened species 1.3.2 Promote sustainable use and management of species 1.3.3 Reduce the number of invasive species **Output** 1.4 Agro-biodiversity is conserved **Actions** 1.4.1 Promote replanting of different agro biodiversity 1.4.2 Increase the promotion of organic farming, mixed farming and agro forestry 1.4.3 Prohibit unsustainable farming practices	- Customer response report Increase number of species, and abundance Water quality report New conservation areas established Report on management tools Research and monitoring Report Awareness report Species diversity increase Awareness program report Promotion report Report Agro-biodiversity improved Document number of agro-biodiversity species Document soil fertility Guidelines in place		

5.3 Land Degradation Action Log Frame

Objective 1: Tonga to be resilience to extreme weather events			
	Performance Indicators	**Means of Verification**	**Assumptions**
Outcome1.1 Tropical cyclones:- Proper observatory system in place			
Output: 1.1.1 Climate Observatory Legislation **Activities** 1. Formulate, review, and enact Climate Observatory Legislation 2. Enforce Climate Observatory Legislation 3. Empower hosting institution of the legislation	Climate observatory legislation in place	Weather forecasting facilities in place Dissemination of weather forecast	A weather forecasting institution exist
Output 1.1.2. Weather forecasting and facilities in place **Activities** 1. Identify required forecasting facilities 2. Purchase forecasting facilities 3. Install forecasting facilities	Accurate, accessible and timely weather forecasting system		
Output 1.1.3. Build the weather forecasting human resources capacity **Activities** 1. Identify forecasting areas for capacity building 2. Identify suitable training whether short or formal 3. Identify suitable individuals 4. Agreement that chosen individuals will return work for the weather forecasting institution after completion	Number of trained and qualified human resource		
Outcome 1.2 Drought:- Every household to be more prepared with water storage cistern for when drought occurs			
Output 1.2.1 Water storage cistern in every	Local households supporting	Number of households	Durable storage cistern are

Output 1.3.4 Improved water quality in vulnerable areas to sea level rise **Activities** 1. Raise the public awareness about the importance of being prepared with adequate water storage cistern	Proper water storage in vulnerable areas	Provide of installing a water storage cistern	being utilized
Objective 2: To protect marine ecosystems			
Outcome 2.1 Illegal sandmining is prosecuted and fines enforced	**Performance Indicators**	**Means of Verification**	**Assumptions**
Output 2.1.1 Sandmining fines enforced	Number illegal sandminers prosecuted	Cases taken to court	Public are aware of the Act concerning sandmining and fines involved
Activities 1. Establish a community policing in coastal areas 2. Responsible ministry to issue permits to sandminers to be produced when question by the public 3. Encourage the public to report cases of illegal sandmining 4. Illegal sandminers to be prosecuted 5. Fines to be enforced			
Objective 3: Promote sustainable agricultural methods			
• **Outcome 3.1** Sustainable agricultural methods used			
Output 1.3.3 Replantation in coastal areas **Activities** 1. Identify all coastal areas 2. Identify suitable plant species to be planted 3. Purchase seedlings **4.** Replanting in coastal areas	Coastal land area covered in vegetation		
Outputs 1.3.1 Coastal Protection System assessed **Activities** 1. GIS maps of vulnerable costal areas 2. Identify sustainable protection systems 3. Assessment survey of Coastal Protection System **Output 1.3.2** Seawalls in areas vulnerable to sea level rise **Activities** 1. Secure funds for construction of seawalls in vulnerable areas 2. Construction of seawalls	Vulnerable areas identified Construction of seawall in identified areas	Coastal assessment reports Coastal monitoring reports	People are aware of the impact of climate change especially sea level rising

	Number of people participating in organic, mixed farming and agro-forestry programme	MAFF reports	Public are willing to participate in these programmes
Output 3.1.2 M about the effects of mechanise cultivation **1.** Incentive scheme for those minimizing the use of mechanise cultivation	Number of farmers using other form of cultivation		
Objective 4: Minimise the loss of forest ecosystems			
Outcome 4.1 Forest ecosystems protected and replantation promoted			
Output 4.1.1 Forestry assessment **Activities** 1. Secure funding for assessment studies 2. Identify forest topics of concern 3. Conduct study 4. Assessment reports to be adopted and implemented	Total area for replantation	Forestry assessment report Forest protected area management plans Number of visitors to forest protected areas	Public are aware of the importance of forest protected areas
Output 4.1.2 Active national replantation and reforestation **Activities** 1. Formulate national replantation workplan 2. Identify active groups 3. Establish incentive scheme for national	Land area covered in vegetation and forest		

replantation 4. Promote national replantation activities 5. Assessment and monitor national replantation activitivies			
Output 4.1.3 Forest protected areas established National forestry assessment **Activities** 1. Identify suitable remaining forests 2. Secure funding for establishing forest protected areas 3. Establish protected areas 4. Formulate protected areas management plan 5. Implement Forest Protected area management plan 6. Monitoring plan in place and to be implemented	Number of forest protected areas established		
Objective 5 An integrated land use approach adopted			
Outcome 5.1 Integrated Land Use policy and plan in place			
Output 5.1.1 National Land Use Policy in place **Activities** 1. National consultation to identify issues to be addressed in the Land Use Policy 2. National Land Use Plan to incorporate short term lease of land for agricultural purposes 3. National Land Use Plan to incorporate forestry management	National Land Use Plan formulated, adopted and implemented	GIS reports Relevant government ministries annual reports	Public and political support exist

4. Formulate Land Use Policy 5. National consultation about Land Use Policy draft 6. Finalise Land Use Policy			
Objective 6: Proper disposal of solid waste			
Outcome 6.1 Solid waste disposal system in place			
Output 6.1.1 Improper solid waste disposal charged and fine **Activities** 1. Raise the public awareness about the Solid Waste Act and.fines 2. Encourage the public to report improper solid waste disposal 3. Reported improper solid waster disposal fined and charged	Improper solid waste charged and fined	Amount of funds collected from this offense	Public are aware of the Solid Waste Act
Output 6.1.2 Proper landfill for 'Eua and Ha'apai **Activities** 1. Assessment survey for best site 2. Establish landfill 3. Recruit employee for day to day maintenance of landfill	Landfill established	Number of users	Consultation process for deciding the best site for landfill
Objective 7: Integrated Urban and Rural Planning			
Outcome 7: Integrated Urban and Rural Policy and Legislation in place			
Output 7.1 Formulate Urban and Rural Planning Policy and Legislation	Policy and Legislation formulated, adopted and implemented	Policy and Legislation Consultation reports	Build on top of existing urban and rural planning

Activities 1. Draft policy and legislation 2. Public consultation 3. Finalise policy and legislation 4. Submit to Parliament and Cabinet for endorsedment		Cabinet approval	
Output 7.2 Enforce Urban and Rural Planning Policy and Legislation **Activities** 1. For responsible institution to implement and enforce policy and legislation	Policy and Legislation enforced	Responsible ministry annual report	Public and political support
Output 7.3 Develop human resource capacity in urban and rural planning **Activities** 1. Identify priority areas in urban and rural planning requiring trained personnel 2. Identify relevant short term and long term training 3. Identify suitable candidates that will return to the responsible institution	Trained staff	Training reports	Chosen candidates return to the responsible institution to utilize knowledge and skills gained.
Objective 8: Environmentally sustainable ecotourism			
Outcome 8 Environmentally sustainable ecotourism guideline in place			
Output 8.1 Formulate an environmentally sustainable ecotourism guideline **Activities**	Environmentally sustainable ecotourism guideline in place	Environmentally Sustainable Ecotourism Guideline	Ecotourism Operators support Government support

1. Consultation with ecotourism operators on issues to be described in guideline 2. Draft environmentally sustainable ecotourism guideline 3. Consult ecotourism and the public on the draft guideline then finalise.		Cabinet approval Consultation Reports	Private sectors's and civil societies support

5.4 Crosscutting Environmental Issues Action Log Frame

Objective 1: Tonga to be resilient to extreme weather events					
Outcome	**Output**	**Activities**	**Responsible Institution**	**Timeframe**	**Resources (TOP$)**
1.1Tropical Cyclones: proper observatory system in place	1. Climate Observatory Legislations	1. Formulate, review, and enact Climate Observatory Legislation 2. Enforce Climate Observatory Legislation 3. Empower hosting institution of the legislation	Ministry of Transport	5 years	10,000
	2. Weather forecasting facilities in place	1. Identify required forecasting facilities 2. Purchase forecasting facilities 3. Install forecasting facilities	Ministry of Transport	1 year	100,000
	3. Build weather forecasting human resources capacity	1. Identify forecasting areas for capacity building 2. Identify suitable training whether short or formal 3. Identify suitable individuals 4. Agreement that chosen individuals will return work for the weather forecasting institution after completion	Ministry of Transport	Ongoing	100,000
1.2 Drought:- Every household to be more prepared with water storage cistern	1. Water storage cistern in every household	1. Raise the public awareness about the importance of being prepared with household water storage cistern 2. Identify financial mechanism for water storage cistern	General Public MOW (Natural Disaster)	Ongoing	10,000
1.3 Sea level rise: Protected coastal areas to withstand sea level rise	1. Coastal Protection System assessed	1. GIS maps of vulnerable costal areas 2. Identify sustainable protection systems 3. Assessment survey of Coastal Protection System	MOW MLSNE (Environment)	1 year	10,000
	2. Seawalls in areas vulnerable to sea level rise	1. Secure funds for construction of seawalls in vulnerable areas 2. Construction of seawalls	MOW, MSLNE (Environment)	5 years	500,000
	3. Replantation in coastal areas	1. Identify all coastal areas 2. Identify suitable plant species to be planted 3. Purchase seedlings	MAFF (Forestry)	Ongoing	100,000

		4. Replanting in coastal areas	MSLNE (Environment)		
	4. Improved water quality in vulnerable areas to sea level rise	1. Assessment study of vulnerable areas to sea level rising 2. Vulnerable areas to be priority areas for Tonga Water Board 3. Vulnerable areas to organize community water quality initiatives	Tonga Water Board MSLNE (Environment) Vulnerable areas	Ongoing	300,000
Objective 2: To protect all coastal ecosystems					
2.1 Illegal sandmining is prosecuted and fines enforced	1. Sandmining fines enforced	1. Establish a community policing in coastal areas 2. Responsible ministry to issue permits to sandminers to be produced when question by the public 3. Encourage the public to report cases of illegal sandmining 4. Illegal sandminers to be prosecuted 5. Fines to be enforced	MAFF (Fisheries) MLSNRE (Environment) Ministry of Police	Ongoing	50,000
Objective 3: Promote sustainable agricultural methods					
3.1 Sustainable agricultural methods used	1. Organic farming, mixed farming and agroforestry	1. Promote organic, mixed farming and agroforestry 2. Establish a organic farming, mixed farming and agroforestry programme 3. Establish an incentive scheme for people joining the programme	MAFF	Ongoing	100,000
	2. Mechanise cultivation minimised	1. Raise the awareness about the effects of mechanise cultivation 2. Incentive scheme for those minimizing the use of mechanise cultivation	MAFF	Ongoing	100,000
Objective 4: Minimise the loss of forest ecosystems					
4.1 Forest ecosystem proteted and replantation promoted	1. Forestry assessment studies	1. Secure funding for assessment studies 2. Identify forest topics of concern 3. Conduct study 4. Assessment reports to be adopted and implemented	MAFF (Forestry)	5 years	100,000
	2. Active national replantation and	1. Formulate national replantation workplan 2. Identify active groups	MAFF (Forestry)	Ongoing	300,000

	reforestation	3. Establish incentive scheme for national replantation 4. Promote national replantation activities 5. Assessment and monitor national replantation activitivies	MLSNRE (Environment		
	3. Forest protected areas established	1. Identify suitable remaining forests 2. Secure funding for establishing forest protected areas 3. Establish protected areas 4. Formulate protected areas management plan 5. Implement Forest Protected area management plan 6. Monitoring plan in place and to be implemented	MAFF (Forestry) MLSNRE (Environment)	5 years Monitoring to be ongoing	400,000
Objective 5: An integrated land use approach adopted					
5.1 Integrated land use plan and policy in place	1. National Land Use policy and plan in place	1. National consultation to identify issues to be addressed in the Land Use Policy 2. Formulate Land Use Policy 3. National consultation about Land Use Policy draft 4. Finalise Land Use Policy	MAFF MSLNRE Crown Law General Public	3 years	100,000
	2. National Land Use plan to incorporate short term lease of land for agricultural purposes	Refer to acitivies in formulating Land Use policy and Plan above	Same as above		
	3. National Land Use Plan to incorporate forestry management	Refer to acitivies in formulating Land Use policy and Plan above	Same as above		
Objective 6: Proper disposal of solid waste					
6.1 Solid waste disposal system in place	1. Improper solid waste disposal charged and fined	1. Raise the public awareness about the Solid Waste Act and.fines. 2. Encourage the public to report improper solid waste disposal 3. Reported improper solid waster disposal fined and charged	MLSNRE (Environment)	Ongoing	50,000

5.5 Crosscutting Capacity Needs Action Log Frame

Intervention Logic	Means of Verification	Verifiable indicators	Assumptions
Objective: To develop and enhance capacity of Tongans in all levels, individual, institution, and system.			
Outcome: Capacity of Tonga in all levels are developed		Stocktake report	Resources are available
Output 1.1 Improved Facilities		report	"
Actions 1.1.1. Carry out a comprehensive stocktake of existing and required facilities, and the status of facilities.		Letter and report	
1.1.2 Identify and prioritize required facilities: - upgrade existing facilities - replace *existing* facilities - purchase new facilities		Procurement and document Training report	"
1.1.3 Seek financial assistance for obtaining priority facilities		Monitoring report	
1.1.4 Procure prioritized facilities 1.1.5 conduct training on use of facilities 1.1.6 monitor maintenance of facilities			
Output 1.2. Human Resources Development		Report Number of new scholars	
Actions 1.2.1 Provide relevant training for different sectors and stakeholder groups such as line ministry employees, NGOs, community representatives, youth groups and women's groups.		Number of new post created	
- Formal training: scholarship for graduate and postgraduate level training. - Short-term environmental training and attachments			"

- Community training: to be more practical learning and to include traditional knowledge. - Integrate environmental issues into school curriculum at all levels. (preschool, primary, secondary, tertiary) – Mainstream? - Ensure government support by establishing permanent posts in relevant ministries. *Establish a permanent post for MEAs officer. - Maintain existing expert human resource capacity. E.g. Existing GEF/ UNDP/ UNEP and donor funded project staff. **Output** 1.3. Financial Report **Actions** 1.3.1 Complete NCSA project 1.3.2 Implement NCSA Action Plan - Seek funding sources from government ministries,NGOs/ CSOs, priivate sector, GBO,Community/ women/ youth, Foreign aid 1.3.3. Increase government budget allocation for DOE 1.3.4.Regulation amendments increase penalty fees for breaching environment legislations. 1.3.5 Enact Environment Tax Bill. 1.3.6 Promote revenue – generating ecotourism activities ; whale watching, National parks, diving and sight seeing, yatching and kayaking 1.3.7 Market DOE environment information. (social marketing) 1.3.8 Establish environmental trust funds. (Regional, national, local) **Output** 4. Mainstreaming		Report and output Action Plan and new proposals Budget increase New regulation endorse by crown law and parliament Draft Bill endorse by the Parliament Report financialy, number of tourist visted Tonga Report and number of people used the information Approve by cabinet and government Report and number of attendence Report and building	

Actions 1.4.1 Establish high level consultation and training program (decision makers). 1.4.2 Establish an information centre for regular dissemination of environmental information. 1.4.3 Activate the NECC. 1.4.5 Establish Island and Village level environment committees to work closely with DOE line ministries *that are operational focal points for environment conventions.* 1.4.6 Strengthen collaboration between, DOE and line ministries, NGOs, CSOs, GBOs, churches and community groups. 1.4.7 Integrate environmental issues, plans, legislations and programs into sectoral and national plans and programs. 1.4.8 Provide *professional development* capacity training for all relevant stakeholders. 1.4.9 Carry out an economic valuation of natural resources to indicate financial benefits and costs. 1.4.10 Ensure EIA Act and regulations are applied to all development activities. **Output** 5 Political and Legal issues **Actions** 1.5.1Review existing environmentally related legislation and identify gaps. 1.5.2 Formulate new legislation and policy. 1.5.3 Amend existing legislation. 1.5.6 Speed-up process for enactment of environmental legislation. Ensure approval of EMB and other environmental bills that need enactment. 1.5.7 Strengthen enforcement capacities (Ministry of Police,		NECC meeting report Committee report Number of meetings attended by relevamt ministries Integrated National Plan Report Number of proposed development granted a permit Report of legislation review Draft Bills Amendment approved by Cabinet and Parliament Report	

DOE, line ministries) 1.5.8 Formulate village law. (Beautification and domestic animal maintenance – with village enforcement). 1.5.9 Establish monitoring mechanisms with participation of all stakeholders. (line ministries, NGOs, community groups) 1.5.10 Amend regulations (fines). 1.5.11 Enact Environmental tax Bill. (refer to financial resources)		Gazette village law Report Gazette Law	
Output 6 Awareness		Reports, materials and articles	
Actions 1.6.1 Strengthen DOE Education and Information Unit as focal point for all environmental information. - Update current information 1.6.2 Produce and distribute awareness material 1.6.3 Establish demonstration plot 1.6.4 Media coverage 1.6.5 Drama 1.6.6 Environmental week and exhibition 1.6.7 Wider community consultations, workshops etc		Number of organisations, individuals being distributed Approved by Cabinet Consultation report	Resources and information in polace “ Resources availability resources

6. IMPLEMENTATION STRATEGIES

6.1. Climate Change Implementation Strategy

OBJECTIVE	OUTCOME	OUTPUT /ACTIVITIES	RESPONSIBLE INSTITUTION	TIME FRAME	RESOURCES (USD$)
A resilient natural environment to support sustainable development and livelihood in the Kingdom of Tonga	1. Enhance the adaptive capacity of the people and environment of Tonga to the adverse effects of climate change, variability and sea level rise	**Output 1.0 Climate change Legislation** *Activities;* *1.5 Amend or review the existing legislation to include climate change issues (climate change mitigation and adaptation)* *1.6 Enforce laws to prohibit human activities that are disastrous to the environment* *1.7 Formulate climate change legislation* *1.8 Conduct training and awareness programmes* *1.9 Formulate village laws to free ranging animals* **Output 1.1 Climate change adaptation projects /policy** *Activities;* *1.1.1: Prepare climate change adaptation project proposals* *1.1.2: Consult relevant stakeholders* *1.1.3 Submit proposals to donors for approval* *1.1.4 Implement climate change adaptation projects both at national and community levels* *1.1.5 Implement climate change adaptation policy* **Output 1.2. Coastal management plan**	 DOE /Crown Law Ministry of Police DoE/Crown Law DoE Villages /DoE/Crown Law DoE DoE DoE DoE DoE and relevant ministries	 1-2yrs Long term 1-3yrs 1-2yrs 1yr 1yr 1yr 1yr 1-4yrs	 5000.00 5000.00 5000.00 13,000.00 15,000.00 200,000.00

		Activities *1.2.1. Formulate coastal management plan* *1.2.2: Conduct consultation workshop to relevant stakeholders* *1.2.3: Submit to Cabinet for endorsement* *1.2.4: Conduct training and awareness programmes* *1.2.5 Review and reassess the current coastal protection systems* *1.2.6 Establish coastal mapping /GIS* *1.2.7 Investigate alternative sites for possible relocation of settlements from low lying vulnerable areas* **Output 1.3: Communities involvement in planning, management and implementation of adaptation measures** *Activities* *1.3.1 Involve communities in planning, managing and implementing of adaptation measures* *1.3.2: Establish village committees to work closely with NECC, Department of Environment and Climate Change EA Project* **Output 1.4 : In depth vulnerability and adaptation assessment of various sectors to climate change, variability and sea level rise impacts** *Activities*;	DoE/Geology/MLSNRE DoE/Geology DoE/Geology DoE/Geology DoE/Geology/Geodetic DoE/Geology DoE/communities DoE/communities	1-4yrs 1yr 1yr 1yr 1-2yrs 1-2yrs 1-2yrs 1-3yrs 1-4yrs	20,000.00 10,000.00

		1.9.1 Conduct in depth vulnerability assessment of various sectors to climate change, variability and sea level rise impacts *1.9.2 Conduct training and awareness programmes* *1.5.3 Strengthen human and institutional capacity to assess, plan and respond to climate-related risks*		1-2yrs	
		Output 1.5: Mainstream adaptation into local, sectoral and national plan and programme <u>*Activities;*</u> *1.5.1 Strengthen networking amongst government, NGOs, private sectors/ organizations, communities* *1.5.2 Integrate CC issues into local, sectoral and national development plan and programmes* *1.5.3 Establish a system to link national teams with communities* *1.5.4 Ensure availability of adequate funds to facilitate and mainstream CC into activities* *1.5.5 Establish national climate change team for all relevant stakeholders to oversee and monitor work of CC* *1.5.6 Line ministries involved/implement specific activities related to CC*	DoE and relevant ministries /agencies DoE and relevant ministries/agencies DoE and relevant ministries/agemcies	1-4yrs 1-3yrs 1-4yrs	100,000.00
		Output 1.6: Data management system	DoE/and relevant ministries/agencies	1-4yrs	10,00000

		Activities *1.6.1 Establish a system to manage and coordinate development of data and making data accessible to stakeholders* *1.6.2 Establish national database to avoid duplication of information* *1.6.3 Strengthen capacity for research, data management, data collection and data update* *1.6.4 Make available technical equipment & capital* *1.6.5 Making available of information & long term data* **Output 1.7: Water resources adaptability** *Activities* *1.7.1 Expand water collection systems especially to rural areas and outer islands* *1.7.2 Improve water quality particulary in vulnerable areas to sea level rise* *1.7.3 Implement desalinization projects* **Output 1.8 : Agricultural sector adaptability** *Activities* *1.8.1 Introduce salt tolerant and temperature tolerant crops* *1.8.2 Improve disease and pest management* *1.8.3 Formulate degraded lands restoration policy*	DoE & relevant ministries/agencies DoE DoE DoE DoE & line ministries DoE DoE DoE	1-4yrs 1-4yrs 1-4yrs 1-2yrs 1-4yrs 1-4yrs 1-2yrs 1-4yrs	20,000.00

		1.8.4 Promote agricultural diversification /agroforestry *1.8.5 Promote usage of organic farming practices* *1.8.6 Promote usage of biological control*	DoE DoE DoE/Gelogy/TWB /MoH DoE/MAFFF MAFFF MAFFF	1-4yrs 1-4yrs 1-4yrs 1-4yrs 1-4yrs Long term Long term 1-2yrs Long term Long term	30,000.00 30,000.00

			MAFFF	Long term	
	2. Promote sustainable management, conservation and enhancement of carbon sinks (biomass, forests, ocean)	**Outputs 2.1: Inland and coastal tree planting** *Activities* *2.1.1 Prepare nursery for subsequent tree planting* *2.1.2 Promote inland and coastal tree planting* *2.1.3Promote reforestation and afforestation* *2.1.4 Conduct training and awareness programmes* *2.1.5Enforce legislation to prohibit cutting down of trees particuarly on steep and low lying areas* *2.1.6 Formulate land use policy*	DoE/MAFFF DoE/MAFFF DoE/MAFFF MoP DoE/MAFFF	1-4yrs 1-4yrs 1-4yrs Long term 1-2yrs	30,000.00
	3. Assess viable options to mitigate concentrations of GHG emission	**Outputs 3.1: Renewable energy and energy efficiency projects** Activities *3.1.1 Promote usage of renewable energy sources and energy effeciency* *3.1.2 Implement renewable energy and energy effeciency projects at both local and national levels* *3.1.3 Implement renewable energy policy* **3.2: Technology needs and assessement**	EPU/MLSNRE EPU/MLSNRE EPU/MLSNRE	Long term 1-4yrs 1-4yrs	50,000.00

		(TNA) *Activities* *3.2.1 Carry out technology needs & assessment for mitigation* *3.2.2 Identify barriers and ways to promote renewable energy technologies for renewable energy development* *3.2.3 Conduct training and awareness* *3.2.4 Develop capacity to identify and use appropriate technologies, methodologies and tools for assessment of mitigation options & development of mitigation scenarios particularly in sectors with significant mitigation potential*	DoE DoE/EPU DoE/EPU DoE/EPU	1-2yrs 1-2yrs l-2 yrs 1-2yrs	30,000.00
	Outcome 4. Promote climate change educational training and awareness programmes	**Output 4.1: Communication strategy** **Output 4.2 : Training and workshops** **Output 4.3: Human resources** *Activities* *4.1.1 Establish communication mechanisms & partnerships with villages* *4.1.2 Integrate CC issues into school curriculum at secondary school level* *4.1.3 Conduct training & workshops*	DoE/communities	1-2yrs	10,000.00

		4.1.4 Human resources with sufficient technical capability to address CC issues to be made available	DoE/MoE DoE	1-2yrs 1-2yrs	
	Outcome 5: Improve disposal of solid wastes throughout Tonga.	**Outputs : 5.1 Law enforcement** *Activities* *5.1.1. Increase fines for improper disposal of solid wastes* *5.1.2 Promote training and awareness* **5.2 Well managed landfill throughout Tonga** Activities *5.2.1 Establish well managed landfill throughout Tonga* *5.2.2 Ensure sustainability of the established landfill*	DoE/MoH DoE/MoH DoE/MoH DoE/MoH	Long term Long term 1-4yrs Long term	10,000.00 250,000.00
	Outcome 6. Ensure preparedness to natural disasters	**Outputs**; 6.1 Building Code and standards Act			

	/extreme weather events	*Activities* *6.1.1 Implement Building Code and standards regulations* *61.2 Enforce the building code and standards* *6.1.3 Conduct awareness programmes to stakeholders*	MoW/relevant ministries/agencies MoW	1-4yrs Long term 1-2yrs	30,000.00

6.2 Biodiversity Conservation Implementation Strategy

6.3 Land Degradation Implementation Strategy

6.4 Crosscutting Environmental Issues Implementation Strategy

6.5 Crosscutting Capacity Needs Implementation Strategy

7. ANNEXES

Land, Natural Resources and Environmental Regulatory Regime

(source: MLSNRE Corporate Plan, 2007-2009: 6-7)

Legislation and Regulations	Year Passed	Last amended	Objective
EIA Act 2003	2003		To provide for the application of environmental impact assessment to the planning of development project within Tonga
Roads Act (CAP.155	1920	1980	To make provision in relation to public roads
Waste Management Act 2005	2005		To manage and oversee the function of the Waste Management Authority
Parks and Reserves Act 1976	1976	1988	To provide for the establishment of a Parks and Reserves Authority and for the establishment, preservation and administration of parks and reserves.
Birds [and Fish] preservation Act	1915	1988	To make provision for the preservation of wild birds (the references to fish were deleted in 1989).
Land Act 1927	1927	1988	To make comprehensive provision in relation to land
Land (Removal of sand) regulations 1936	1936	1983	To regulate the removal of sand
Minerals Act 1949	1949	1978	To establish the ownership and provide for the control of minerals found within the Kingdom
Petroleum Mining Act 1969	1969	1988	To make provision in relation to the exploration, prospecting and mining for petroleum. Deletes all reference to petroleum exploration and mining in the Minerals Act.
Petroleum mining regulations 1985	1985		To make further provision in relation to the exploration and mining of petroleum
Land (quarry) regulations 1985	1985		To regulate quarrying on lands - tax allotments
Petroleum Act	1956	1981	Petroleum handling and storage

Lands, Natural Resources and Environmental Bills and Draft Regulations

(source: MLSNRE Corporate Plan, 2007-2009:7)

Bills and draft regulation	Current Status/Date submitted to Crown Law Department
Environment Management Bill 2000	2000
Ozone Depleting Substances Bill 2005	2005
Biosafety Bill 2004	2004
EIA Regulations	2006
Water Resources Bill 2006	Under Consultations
Chemical Substances Bill 2006	Under Consultations
National Renewable Energy Bill	Drafting
Survey Regulation	Drafting

Multilateral Environmental Agreements (MEAs)

Tonga is a Party to several international environmental agreements of which the MLSNRE is the National Focal Point or the Implementing Agency

(source: MLSNRE Corporate Plan, 2007-2009: 11)

International Agreements	Date Signed	Date Acceded/Ratified	Role of the MLSNRE
Convention on Biological Diversity		19 May 1998	Implementing Agency
Cartagena Protocol on Biosafety		18 May 2003	Implementing Agency Competent Authority, Clearing House Mechanism
United Nations Convention to Combat Desertification		20 July 1998	Implementing Agency
United Nations Framework Convention on Climate Change		20 July 1998	Implementing Agency
Vienna Convention for Protection on Ozone Layer		29 July 1998	Implementing Agency
Montreal Protocol		29 July 1998	Implementing Agency
London Amendment		26 November 2003	Implementing Agency
Copenhagen Amendment		26 November 2003	Implementing Agency
Montreal Amendment		26 November 2003	Implementing Agency
Beijing Amendment		26 November 2003	Implementing Agency
Stockholm Convention on Persistent Organic Pollutants	22 May 2002		Implementing Agency
Marine Pollution Convention (MARPOL)		1 May 1996	Implementing Agency
Protocol to the Convention on the Prevention of Marine Pollution by Dumping Wastes and other Matters		18 September 2003	Implementing Agency
Waigani Convention	16 September 1995	22 May 2002	Focal Point
Agreement Establishing SPREP	15 September 1995		Focal Point