

TUVALU NATIONAL STRATEGIC ACTION PLAN FOR CLIMATE CHANGE AND DISASTER RISK MANAGEMENT 2012-2016



Foreword



The Government of Tuvalu is dedicated to building Tuvalu's capacity at all levels to adapt to climate change. This dedication is reflected in the political will to drive national adaptation programmes and to ensure climate change impacts and disaster risk considerations are fully integrated into all our policies, plans, budgets, and decision-making processes at all levels of government and communities. The Regional Framework for Adaptation to Climate Change, 2005-2015 provides guiding principles for developing a holistic, whole-of-country approach to climate change adaptation and mitigation.

Similarly, Tuvalu has made a commitment under the Pacific Plan to operationalise the Disaster Risk Reduction and Disaster Management Regional Framework for Action, 2005-2015, which we endorsed with our fellow Leaders from the region in Madang, in 2005.

Tuvalu needs financial commitment to implement the National Strategic Action Plan (NSAP) in order to build a safe, secure and resilient Tuvalu. Tuvalu's national resources are limited and thus we need the support of our development partners and support from the whole international community. We also need long-term commitment and support from our regional organisations and development partners.

Tuvalu is pleased to acknowledge the assistance provided by Secretariat of the Pacific Regional Environment Program (SPREP), Secretariat of the Pacific Community (SPC) and United Nations Development Programme (UNDP) to develop this NSAP as the implementation plan for *Te Kaniva*: National Climate Change Policy. This task was carried out in collaboration with our National Expert Team. I would like to commend the dedication of the National Expert Team and the high level of support provided by the Regional Organisations for this process in Tuvalu. This National Action Plan provides a prioritised programme of action that the Tuvalu Government will implement over the next five years. The NSAP provides a range of actions requiring commitment and a coordinated joint effort within government, and with the private sector and civil society. We need to maintain the momentum that has already been generated this year and with your technical and financial support, we will commence implementation.

The ownership of the process and the responsibility for the success of our endeavors must remain with us. However, there is too much at stake for us given our very limited capacity. With all your continued support and assistance together we will protect Tuvalu's status as a nation and its cultural identity, and build its capacity to ensure a safe, resilient and prosperous future.

Hon. Apisai Ielemia

Minister of Foreign Affairs, Trade, Tourism, Environment and Labour

Acknowledgements

This National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) describes the people of Tuvalu's priorities for immediate actions. The active participation of the *Island Kaupule*, *Falekaupule*, the Government, Civil Societies and NGOs are gratefully acknowledged.

Similarly, to the Tuvalu National Expert Team led by the Secretary of Foreign Affairs, Trades, Tourism, Environment and Labour, Mr Tapugao Falefou and the Director of Environment Mr Mataio Tekienene are gratefully acknowledged for driving this process. It is expected that you will continue with the implementation of this important Strategic Plan to ensure Tuvalu's resilience to the risk of climate change and disasters.

SPREP and the SPC (SOPAC Division) provided technical and financial support throughout the whole development process of this NSAP. We are looking forward to your continued support to ensure timely implementation and monitoring. UNDP also supported the process and is gratefully acknowledged.

Contents

Foreword	1	Chapter IV	35
Acknowledgements	2	Implementation Strategy	
Contents	3	Institutional Arrangements for the NSAP	38
List of Acronyms	4	Costing Methodology and Indicative Costing	39
Executive Summary	7	Gross Indicative Costs	40
Chapter I	11	Financing strategy	42
Background		References	43
Key Geographical and Geological Features	11	TABLES	
Communications	12	Table 1 Total population size, change, distribution and density, by island, 1991–2002	12
Populations	12	Table 2 Resource Costs by Goal	40
Strategic Planning	13	Table 3 Resource costs by Goal including contingency	41
Economy	13	Table 4 National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) 2012–2016	44
Governance	14	FIGURES	
Climate Change and Disaster Risk Context	15	Figure 1 DRM Arrangements for Emergency	36
Driver of Tuvalu’s Climate and Weather	15	Figure 2 Schematic of the Institutional Arrangements of National Climate Change Programmes	37
Climate change in Tuvalu	17	Figure 3 NSAP Implementation Arrangements	38
Disaster Risk Context	19	MAPS	
Other Anthropogenic Risks	19	Map 1 Tuvalu	11
Chapter II	21	Map 2 Locations where tropical cyclones formed over the South Pacific Ocean during 1969–2006.	15
Development of the National Strategic Action Plan for Climate Change and Disaster Risk Management Rationale		Map 3 The main climate drivers influencing the climate of Tuvalu	16
National inputs to Relevant Regional and International Frameworks	22		
Development Process for the NSAP	23		
Chapter III	27		
The National Strategic Action Plan for Climate Change and Disaster Risk Management	27		
Linkages with the Tuvalu Climate Change Policy – Te Kaniva	27		
Vision	28		
Summary of Goals and Outcomes	29		



List of Acronyms

CCA	Climate Change Adaptation
DCC	Development Coordination Committee
DoE	Department of Environment
DRM	Disaster Risk Management
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ENSO	El Nino Southern Oscillation
GHG	Greenhouse gas
IDC	Island Disaster Committee
IWRM	Integrated Water Resource Management
ISP	Integrated Strategic Plan
MCTPU	Ministry of Communications, Transport and Public Utilities
MFATTEL	Ministry of Foreign Affairs, Trade, Tourism, Environment and Labour
MFED	Ministry of Finance, Economic Development
MHARD	Ministry of Home Affairs and Rural Development
MNR	Ministry of Natural Resources
MOA	Ministry of Education
MOH	Ministry of Health
MSL	Mean sea level
NAPA	National Adaptation Programme of Action
NCCAC	National Climate Change Advisory Council
NDC	National Disaster Committee



NDMO	National Disaster Management Office
NDPWG	National Disaster Preparedness Working Group
NGO	Non-government Organisation
NMS	National Meteorological Services
OPM	Office of the Prime Minister
PACC	Pacific Adaptation to Climate Change
PCCR	Pacific Climate Change Roundtable
PICT	Pacific Island Countries and Territories
PIFACC	Pacific Islands Framework for Action on Climate Change
NSAP	National Strategic Action Plan for Climate Change and Disaster Risk Management
NSAPCC	National Strategic Action Plan for Climate Change and Disaster Risk Management Coordination Committee
SNC	Second National Communications
SOPAC	Pacific Applied Geoscience Commission Division
SPC	Secretariat of the Pacific Community
SPCZ	South Pacific Convergence Zone
SPREP	Secretariat of the Pacific Regional Environment Program
TANGO	Tuvalu Association of NGOs
TCCP	Tuvalu Climate Change Policy
TTF	Tuvalu Trust Fund
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change



Executive Summary

The preparation of this National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) was coordinated by the Secretariat of the Pacific Regional Environment Programme (SPREP), the Pacific Applied Geoscience and Technology Division (SOPAC) of the Secretariat of the Pacific Community (SPC) and United Nations Development Programme (UNDP) through relevant national climate change related projects. SPREP and SOPAC both provided technical support as well as funding support.

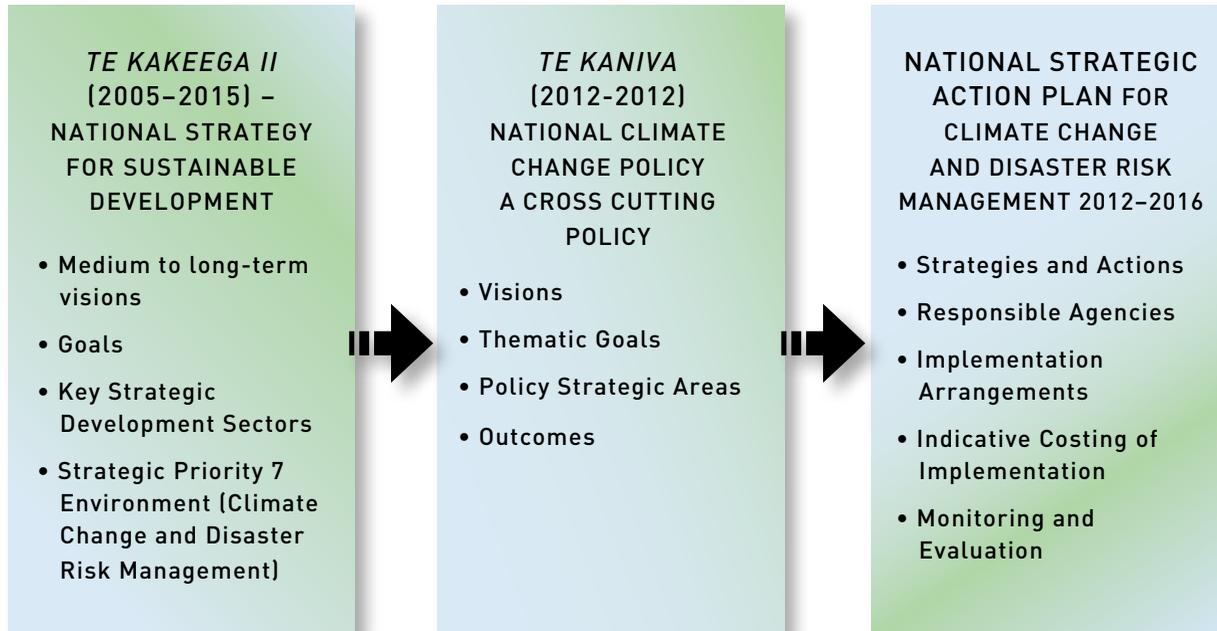
A Tuvalu National Expert Team was identified to lead in this work which comprises of the national steering committees for the following national projects:

- Pacific Adaptation to Climate Change (PACC)
- Integrated Water Resource Management (IWRM)
- National Adaptation Programme of Action (NAPA)
- Second National Communications (SNC)
- Disaster Risk Management (DRM).

Two major national summits were held to contribute to the development process of the Tuvalu Climate Change Policy (TCCP), the NSAP and an integrated water management policy.

Both the TCCP and the NSAP followed a comprehensive consultation and participatory process that include government, civil societies, non-government organisations (NGOs), and all outer islands. The process followed detailed situation analysis, issues identification, prioritisation and a problem and solution tree analysis. The priority issues were then confirmed in the National Climate Change Summit.

The NSAP arrangement has direct links to the *Te Kakeega II*, the climate change policy and the disaster risk management plan.



Based on Tuvalu's climate change and disaster risks context, seven thematic goals were developed. These covered adaptation, mitigation and disaster risk management and they are of equal priority and require urgent implementation as follows:

GOAL 1

Strengthening Adaptation Actions to Address Current and Future Vulnerabilities

GOAL 2

Improving Understanding and Application of Climate Change Data, Information and Site Specific Impacts Assessment to Inform Adaptation and Disaster Risk Reduction Programmes.

GOAL 3

Enhancing Tuvalu's Governance Arrangements and Capacity to Access and Manage Climate Change and Disaster Risk Management Finances

GOAL 4

Developing and Maintaining Tuvalu's Infrastructure to Withstand Climate Change Impacts, Climate Variability, Disaster Risks and Climate Change Projection

GOAL 5

Ensuring Energy Security and a Low Carbon Future for Tuvalu.

GOAL 6

Planning for Effective Disaster Preparedness, Response and Recovery

GOAL 7

Guaranteeing the Security of the People of Tuvalu from the Impacts of Climate Change and the Maintenance of National Sovereignty



From these priority thematic goals, each goal has strategies and key actions (refer Table 1). These actions were costed to provide an estimate of what it will take to fully implement the NSAP.

The estimate cost for the NSAP is AUD8,402,529 of which AUD6,338,004 is the financial cost and AUD1,664,404 the in-kind contribution of local and regional organisations. The cost of establishing a NSAP management team to provide the secretarial role for the NSAPCC within the Department of Environment is not included in this estimated cost. Costing of the management unit is straight forward and could easily be done.

An institutional arrangement was also included where the National Climate Change Advisory Committee (NCCAC) and the National Disaster Committee (NDC) are to merge for the purpose of coordinating and driving the implementation of the NSAP. This will be called the National Strategic Action Plan Coordinating Committee (NSAPCC). It was also recommended that a NSAP Management Team be established within the Department of Environment to drive the NSAP implementation and provide the secretariat functions for the NSAPCC instead of the already stretched Climate Change Unit of the Department of Environment.

CHAPTER I Background

The background information given in this section is a summary only. This document does not contain the information that could easily be found in other documents or reports such as a detailed analysis of the population, economy and governance.

Key Geographical and Geological Features

Tuvalu is an independent constitutional nation in the southwest Pacific Ocean between latitudes 5 degrees and 11 degrees south and longitudes 176 degrees and 180 degrees east (Map 1). Tuvalu consists of nine small islands scattered over 500,000 sq km of the western Pacific. The islands include Niulakita, Nukulaelae, Funafuti, Nukufetau, Vaitupu, Nui, Niutao, Nanumaga and Nanumea. The total land area is only 27 sq km and all of the islands are less than five meters above sea level (Tuvalu NBSAP 2009).

Six of the islands are low lying atolls made up of motus (islets) fringing the edges of lagoons. These are made up of young, poorly developed, infertile, sandy or gravel coralline soils. Nanumaga, Niutao and Niulakita are raised limestone reef islands. Similarly, soils are generally of poor quality, supporting a limited variety of flora.



MAP 1 Tuvalu

Source: Draft Tuvalu DRM Arrangements (2010)

Communications

Funafuti is the capital of Tuvalu. Most administration offices are all located in Vaiaku village on Fogafale Islet, Funafuti atoll. Funafuti atoll has a regular telephone service, and there are connections to all the outer islands through the post offices. Communications with the outer islands is also available by radiophone. Internet services have been available since late 1999. The main roads of Funafuti are the only sealed roads in Tuvalu, constructed in the late 1990s. There are regular air services from Funafuti International Airport to Suva, Fiji. Radio Tuvalu is the only local radio station. It broadcasts 40 hours per week, in English and Tuvaluan. The government publishes the only newspaper, *Tuvalu Echoes*. Tuvalu also has cargo services via Fiji or Kiribati and an inter-islands boat services between Funafuti and the rest of Tuvalu.

Populations

The 2002 population census of Tuvalu was its second decennial census. Tuvalu's population counted 9,561 which was distributed amongst 11,579 households. Out of the total population 4729 were males and 4,832 were females. As to be expected, the capital Funafuti is the most populous and has the highest population density. Its population was 4,492 which accounted for 58% of the total population. The population of the outer islands was 5,069(42%). The biggest island of the group is Vaitupu which only has 1,591 (16.5%) (See Table 1)

TABLE 1 Total population size, change, distribution and density, by island, 1991–2002

ISLAND	AREA (km ²)	TOTAL POPULATION		POPULATION CHANGE (1991–2002)			POPULATION DISTRIBUTION (%)	DENSITY (persons per km ²)
		1991	2002	Total	%	r ^o	2002	
Funafuti	2.79	3,839	4,492	653	17.0	1.4	47.0	1,610
OUTER ISLANDS	22.84	5,204	5,069	-135	-2.6	-0.2	53.0	222
Nanumea	3.87	824	664	-160	-19.4	-2.0	6.9	172
Nanumaga	2.78	644	589	-55	-8.5	-0.8	6.2	212
Niutao	2.53	749	663	-86	-11.5	-1.1	6.9	262
Nui	2.83	606	548	-58	-9.6	-0.9	5.7	194
Vaitupu	5.60	1,202	1,591	389	32.4	2.5	16.6	284
Nukufetau	2.99	751	586	-165	-22.0	-2.3	6.1	196
Nukulaelae	1.82	353	393	40	11.3	1.0	4.1	216
Niulakita	0.42	75	35	-40	-53.3	-6.9	0.4	83
Tuvalu	25.6	9,043	9,561	518	5.7	0.5	100.0	373

Source: SPC (2005), Tuvalu 2002 Census.

Strategic Planning

Te Kakeega II (2005 – 2015) is Tuvalu’s National Sustainable Plan. It contains eight themes and strategic actions including:

- good governance
- strengthening macroeconomic stability
- improving the provision of social services
- improving outer islands development and Falekaupule
- creating employment opportunities and enhancing private sector development
- improving capacity and human resource development
- developing Tuvalu’s natural resources
- improving the provision of support services
- mainstreaming of women in development.

Te Kakeega II is undergoing a mid-term review¹ where implementation progress and impacts made will be identified as well as constraints to achieving the objectives of the *Te Kakeega II*.

Economy

Tuvalu’s economy is small, fragmented and highly vulnerable to external economic influences. This has led to a heavy reliance on outside development assistance and a degree of complacency in fiscal and financial management. The economy is unusual in that a substantial amount of both government revenues and private incomes are generated from overseas. The government revenues come primarily from the income of the capital of the Tuvalu Trust Fund² (TTF), the assets of the ‘dotTV’ internet domain and from fishing license fees paid by foreign fishing vessels (natural resources), and sales of stamps and coins. For families the income derives from remittances from seamen (and other less formal remittances from other Tuvaluan resident overseas). There are very little exports and semi-subsistence farming and fishing are the primary economic activities. Fewer than 1,000 tourists, on average, visit Tuvalu annually.

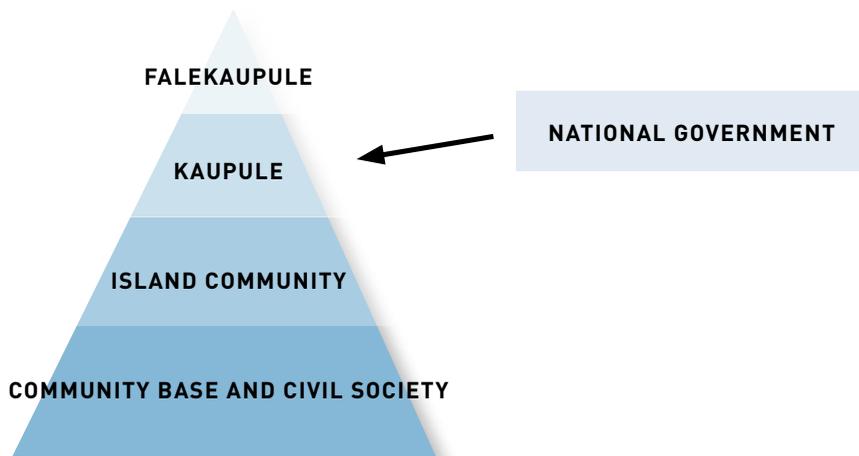
1 The review is expected to be completed in the last quarter of 2011.

2 The TTF was established in 1987 by Australia, NZ, and the UK and also supported by Japan and South Korea.

Governance

The National Government is the focal point of all national issues including climate change adaptations. These adaptation activities are to be undertaken at the *Falekaupule* level taking into account the *1997 Community Governance Arrangements*. After December 12 1997, a new form of governance was established for all Island communities in Tuvalu. The new form of governance (Falekaupule Act of 1997), passed by the Parliament of Tuvalu, devolved the authority to the *Falekaupule* and *Kaupule* (two separate bodies) to work together in addressing community affairs in order to promote decentralization to decrease domestic urban drift.

The *Falekaupule* is the product of the fusion of the traditional leadership and the introduced governing system. It functions as the decision making body on the island. The *Kaupule* is the executive arm of the *Falekaupule*. The central Government links directly to the *Kaupule* as shown below.



The Department of Environment has implemented several environmental programmes and projects. Each programme has established task committees or teams with representation from relevant and major Governmental departments, Non-governmental Organisations (NGOs), religious bodies and stakeholders.

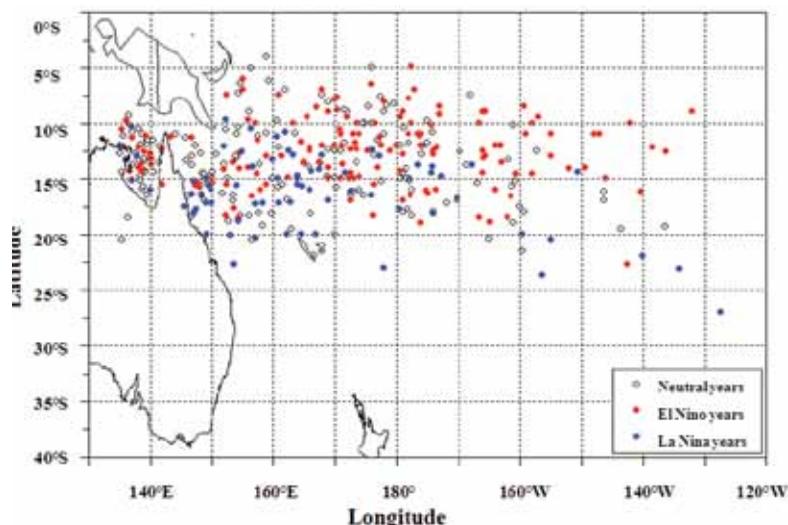
The Development Coordinating Committee (DCC) that was setup under the Office of the Prime Minister, and chaired by the Secretary to Government assesses draft policies, projects and programmes prior to submission for approval by Cabinet.

Climate Change and Disaster Risk Context

Driver of Tuvalu's Climate and Weather

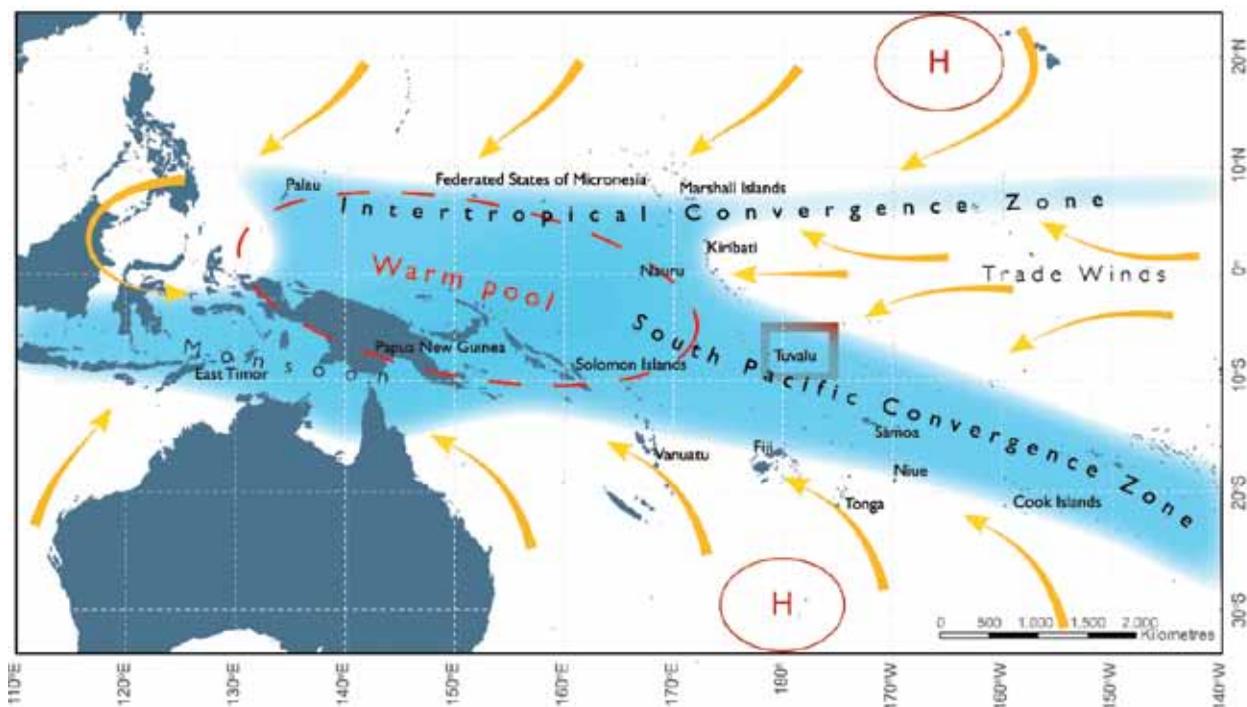
Tuvalu experiences a hot, humid tropical maritime climate, between the inter-tropical and South Pacific convergence zones, with near constant temperatures throughout the year. There is significant seasonal variability in precipitation with a May to October dry season and a November to April wet season. The average annual rainfall 3,000mm but rainfall can exceed 4,000 mm per annum at times, though Tuvalu often experiences droughts because of its location near the Pacific equatorial dry zone. Dry periods are more severe in the northern than the southern islands, notably in the months of August to October. Dry years in Tuvalu are associated with a positive Southern Oscillation Index (the cold phase of ENSO). There are frequent thunderstorms in the wet season. Tropical cyclones mainly develop in the Tuvalu area and move to higher latitudes with a few hitting the islands in the warm, rather than the cold phase of ENSO (Vavae, 2009), (refer Map 2).

Spring tides and tropical cyclones are the main extreme events. In the 41 year period between 1969 and 2010, 33 tropical cyclones passed within 400 km of Funafuti. Over this period, cyclones occurred more frequently in El Niño years.



MAP 2 Locations where tropical cyclones formed over the South Pacific Ocean 1969–2006.

MAP 3 The main climate drivers influencing the climate of Tuvalu



The average positions of the climate features in November to April. The yellow arrows show near surface winds, the blue shading represents the bands of rainfall (convergence zones with relatively low pressure), and the red dashed oval indicates the West Pacific Warm Pool. H represents the typical positions of moving high pressure systems. Note the location of Tuvalu (box).

The West Pacific Monsoon

Moves north to mainland Asia during the Northern Hemisphere summer and south to Australia in the Southern Hemisphere summer. The seasonal arrival of the monsoon usually brings a switch from very dry to very wet conditions. It affects countries in the far western Pacific and the Maritime Continent.

The South Pacific Convergence Zone

A band of high rainfall stretching approximately from the Solomon Islands to east of the Cook Islands. It is strongest in the Southern Hemisphere summer and affects most countries in the south Pacific.

Sub-tropical and high latitude influences

These include sub-tropical high pressure systems and associated South-east and North-east Trade Winds, and cold fronts.

The El Nino phenomenon event usually happens once in every three to seven years. As the warm sea surface temperatures move eastwards during El Nino, moisture and water vapour required for cloud formation also migrate eastward and this causes droughts. The major impact of drought is on the rain-water catchment reserve. There is no surface water in Tuvalu and the underground water lens is small or nonexistent.

Climate change in Tuvalu

Based on known information, maximum temperatures in Funafuti have increased at a rate of 0.21°C per decade since 1950. These increases are consistent with the pattern of global warming. Data for Funafuti and Nanumea since 1950 show no clear trends in annual or seasonal rainfall, although there is substantial variation from year to year. Since 1993, sea level near Tuvalu has risen by about 5mm per year; this is larger than the global average. Ocean acidification has been slowly increasing in Tuvalu's waters since the 18th century (PCCSP, 2011)

The most recent climate change projections for Tuvalu prepared by the Pacific Climate Change Science Program and discussed in detail in *Climate Change in the Pacific: Scientific Assessment and New Research*³ are based on extensive analysis of the 24 global climate models from the Coupled Model Intercomparison Project Phase 3 (CMIP3) together with dynamic and statistical downscaling. The main results for Tuvalu may be summarised as follows:

- Projections for all emissions scenarios indicate that the average annual air temperature and sea surface temperature will increase in the future. By 2030 4 under a high (A2) emissions scenario this increase in temperature is projected to be in the range 0.4-1.0°C.
- There will also be a rise in the number of hot days and warm nights, and a decline in cooler weather.
- Almost all the global climate models project an increase in average annual and seasonal rainfall around Tuvalu over the course of the 21st century. This is due to the expected intensification of the South Pacific Convergence Zone (Refer Map 4).
- Projections show extreme rainfall days are likely to occur more often.

3 Australian Bureau of Meteorology and CSIRO. 2011. *Climate Change in the Pacific: Scientific Assessment and New Research*. Volume 1: Regional Overview, Volume 2: Country Reports.

4 Projections are provided for 20-year time slices centred around 2030 (2020-2039), 2055 (2045-2064) and 2090 (2080-2099)

- In the Tuvalu region projections show a decrease in the frequency of tropical cyclones by the late 21st century and an increase in the proportion of the more intense storms.
- Sea level is expected to continue to rise in Tuvalu. By 2030 under a high (A2) emissions scenario the rise in sea level is projected to be in the range 4-14cm; by 2090 under a high (A2) emissions scenario the rise is expected to be in the range 19-58cm.
- Under all three emissions scenarios (low, medium and high) the acidity level of sea waters in the Tuvalu region will continue to increase impacting the health of coral ecosystems.

Disaster Risk Context

Subsequently Tuvalu is at extreme high risk⁵ for the following climate change impacts and associated disasters:

- Intense storms and tropical cyclones and associated damages to livelihoods, infrastructures, biodiversity, and erosion and inundation
- Droughts and associated health and economic impacts including damages to livelihoods and ecosystems
- Extreme rainfall and associated flooding and health implications (any of the health implications could reach epidemic if not managed early and from the root causes)
- Sea level rise and increased erosion and inundation, impacts on marine systems such as coral reef, sea grass and mangroves
- Increase in temperature and consequent health impacts, land and marine systems respond to the increase of temperature may increase algae bloom, coral bleaching which in turn have impacts on resources relying on these ecosystems for habitat
- Increase ocean acidification and its impacts on calcium carbonate (calcification), which will affect the growth and life cycle of corals, crustaceans and shellfish.

The implications and consequences of the above risks are huge for a small atoll nation like Tuvalu. For example, the average elevation in Tuvalu is one metre above mean sea level (MSL), with the highest being less than five metres above MSL. The islands are highly vulnerable to cyclones and sea level rise including tsunamis. Tuvalu is one of the most vulnerable countries in the world to climate change and

⁵ "Risk" equals exposure to hazard and levels of vulnerability.



rising sea levels (GoT, 1999). The population of Fogafale, Funafuti, where nearly half of the country's population is concentrated, is on average less than 100 metres wide, making it extremely vulnerable to inundation from sea level rise.

To address Tuvalu's climate change risks, a Climate Change Policy has been developed (Tuvalu Climate Change Policy (2011)).

Other Anthropogenic Risks

Tuvalu is also vulnerable to the following 'technical or anthropogenic' events or situations⁶.

- Air disaster
- Maritime disaster (including oil spill)
- Fire or explosion
- Air
- HIV/AIDS and other disease outbreaks
- Migration from islands
- Families with no access to land
- Deteriorating natural environment
- Waste management
- Pollution control
- Hazardous Material / Toxic release
- Declining rural production
- Urbanisation (in particular Funafuti)

6 Tuvalu National Disaster Management Plan (2010)



Transporting emergency water supplies during a drought in Tuvalu, 2011.

CHAPTER II Development of the National Strategic Action Plan for Climate Change and Disaster Risk Management

Climate change as used here means climate change adaptation and mitigation⁷ unless specifically defined. Disaster risk management covers disaster risk reduction, mitigation⁸, minimisation, transfer and disaster management which are preparedness, response, recovery and rehabilitation.

Rationale

Several climate change and related national projects such as Tuvalu Pacific Adaptation to Climate Change (PACC), Integrated Water Resource Management (IWRM) and National Adaptation Priority for Actions (NAPA) have outcomes to develop a National Climate Change Policy. Similarly the Environment Act (2008) Part VIII: Responses to Climate Change also called for the development of a Climate Policy.

Tuvalu's current national development plan, *Te Kakeega II: National Strategy for Sustainable Development 2005 – 2015* is the overarching framework that drives Tuvalu's development path and resource allocation. Strategy 11.4 outlines the key policy directives for the environment. One of the priorities is to “*Establish national climate change adaptation and mitigation policies*”. The development of a Tuvalu National Climate Change Policy (TCCP) and its implementation plan (this plan) known as the National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) and a review of the Disaster Risk Management are inline with the Te Kakeega II priorities. The activities in this NSAP will strengthen adaptation, mitigation and disaster risk reduction and disaster management including mainstreaming climate change and disaster risk reduction into sector plans. This plan is a direct response to achieving *Te Kakeega II* goals and objectives thus contributing to Tuvalu's sustainable development.

7 Reducing greenhouse gas emissions

8 Used in the context of disaster – mitigation means any strategies (non structural or structural) use to reduce minimise or manage the impacts of disasters.



Because of the close and overlapping responsibilities in responding to climate change impacts and disasters, it makes sense to consider and implement them in a systematic and integrated manner. Climate change impacts in an atoll country like Tuvalu contribute to most of the hazards and subsequent disastrous or emergency situations. At the same time there are also areas distinct to each such as earthquake or tsunami risks and the mitigation strategies used to reduce risks. In the context of climate change, mitigation strategies to reduce greenhouse gas (GHG) emissions may consider the use of a renewable energy option to reduce emissions from diesel electricity generators.

The Government of Tuvalu requested technical support from the Secretariat of the Pacific Environment Programme (SPREP) and the Applied Geoscience and Technology Division (SOPAC) of the Secretariat of the Pacific Community (SPC) in March 2011 during the Pacific Climate Change Roundtable (PCCR) in Niue. SPREP and SOPAC Divisions responded to the request in May 2011. Other partners such as UNDP (Samoa and Fiji offices) were also able to provide technical support especially in the latter half of the process.

National inputs to Relevant Regional and International Frameworks

This NSAP is also part of Tuvalu's response to their commitments made under the Pacific Islands Framework for Action on Climate Change (PIFACC) and the Regional Framework for Action on Disaster Risk Management endorsed by the Pacific Leaders in 2005. These two inter-related regional frameworks document regional and national priorities for actions. The two regional polices also guide Pacific Islands Countries and Territories (PICTs) on the types of issues that national polices and action plans could consider. Through the implantations of regional frameworks and national action plans, Tuvalu also contributes to the implementation of the Hyogo Framework for Action 2005-2015 and meeting their obligations under the UNFCCC. Similarly, some of the priorities in the Regional Meteorological Strategy important to Tuvalu are picked up in this NSAP such as priority activities for the Tuvalu National Meteorological Services (refer Goal 2 in the action matrix).

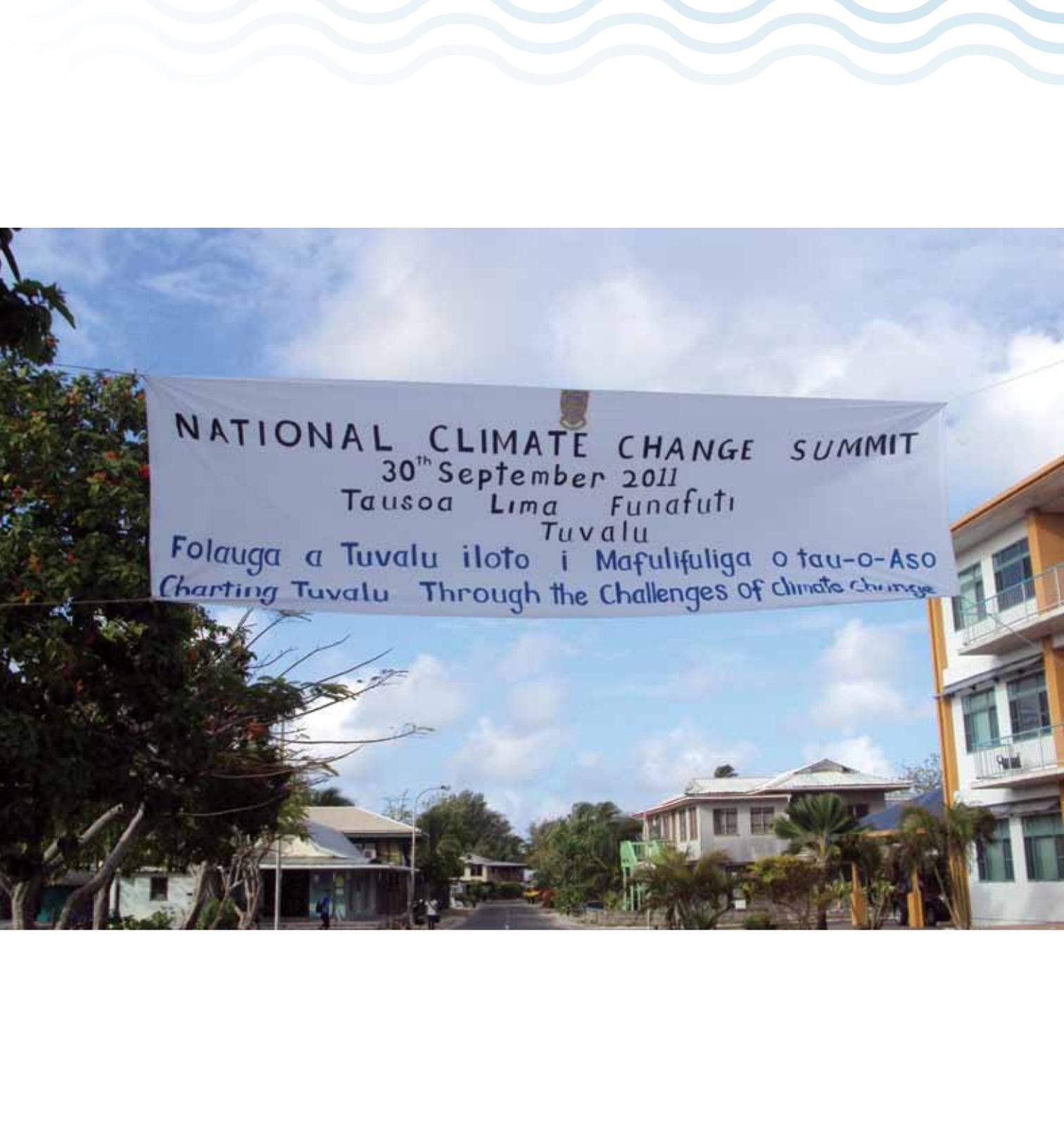
Development Process for the NSAP

The TCCP and the NSAP were developed simultaneously using the same methodologies and process. During the first country visit of SPREP and SOPAC Division to Tuvalu (in May 2011) a national expert team was identified to work with the SPREP and SOPAC Division advisers in developing the TCCP and NSAP. This national expert team was coordinated by the Director of Environment and comprised of members of national steering committees of the following national projects: PACC, IWRM, NAPA, SNC, as well as members of the National Disaster Management Committee. As to be expected, most of the members of each committee are the same people. Tuvalu has a six stage process. At each stage, several tasks had to be completed before the next stage could commence.

Unique to Tuvalu is the convening of a national climate change summit in Stage 4. All of the High Commissioners from Tuvalu's Diplomatic Offices participated, as did all of the islands *Kaupule*, governments, community groups, school representatives, youth and civil society. The key thematic goals of the TCCP and the NSAP were discussed and feedback was recorded for incorporation. The main output of the summit is a communiqué in support of the TCCP and NSAP signed by the Government, Island *Kaupule* and a representative of the community groups. The eventual approval by Cabinet and Parliament is procedural only. The detailed development process is as follows:

STAGES	TASKS	METHODS/PROCESS	OUTPUTS
STAGE 1 	Government Request	Discussions and exchange of letters of request and approval between the Government of Tuvalu and SPREP and SOPAC Division	Confirmed support from SPREP and SOPAC Division
	SPREP and SOPAC Division preparation and planning to engage with Tuvalu	Discussions of roles, resources, programme and timeline between Tuvalu, SPREP and SOPAC.	Time and resources identified Plan and programme for assisting Tuvalu approved Literature Review Completed
STAGE 2 (1st Country Visit1) – (6 days in May)	Establishment of a national expert team to lead the process Confirming of programme for development of policy and joint national action plan Situation Analysis Information collection Gap Analysis Introduction and defining key concepts	Literature Review Workshops with sectors (government) Workshops with Kaupule Call on Cabinet Ministers Radio programme and media coverage	National Expert Team named Templates (tables) of stocktaking, listing issues, stakeholders, activities/projects, policies, institutions and legislations by sectors Improved understanding of key climate change and disaster risk management concepts Raised community awareness of the process
STAGE 3 (July / August)	Outer Islands Consultation led by the National Expert Team	By boat to every island for consultation	List of issues from the outer islands Outer islands participation Raised outer islands' awareness of the process

STAGES	TASKS	METHODS/PROCESS	OUTPUTS
STAGE 4 (2nd country visits) (14 days in Sep-Oct)	<p>National Water Forum</p> <p>Confirming and sorting of key issues and problems</p> <p>Synthesising problems</p> <p>Prioritisation</p> <p>Visioning exercise</p> <p>Development of problem and solution trees</p> <p>Development of strategies and outcomes</p> <p>Development of action matrix</p> <p>Preparation for National Climate Change Summit</p> <p>Costing</p> <p>Drafting of text</p>	<p>National workshop</p> <p>Strategic Planning Process</p> <p>Key questions to guide clustering and prioritisation of issues</p> <p>Brain Storming</p> <p>Problem Tree Analysis</p> <p>Working Groups</p> <p>Presentation prepared based on consolidated issues and root causes of vulnerability</p> <p>Costing of activities based on current actual and assumptions</p>	<p>Water management issues identified and confirmed</p> <p>Clustering of similar problems under common thematic areas</p> <p>Vision developed</p> <p>Root causes identified</p> <p>High level goals and strategies developed</p> <p>Actions matrix developed</p> <p>3rd round of input from the community and outer islands that participated in the National Climate Change Summit</p> <p>Climate Change Summit Communiqué in support of TCCP and NSAP</p>
STAGE 5 (Nov 2011) Approval Process	<p>Review of draft</p> <p>Incorporation of inputs and finalisation</p> <p>Submission to Cabinet and Parliament</p>		Approved TCCP and NSAP
STAGE 6 (Early 2012)	<p>Donor roundtable and promoting to donors</p> <p>Presentation at regional and international meetings</p>	<p>Meeting and dissemination of the TCCP and NSAP</p> <p>Implementation commences</p>	Donor awareness and commitments



NATIONAL CLIMATE CHANGE SUMMIT
30th September 2011
Tausoa Lima Funafuti
Tuvalu
Folauga a Tuvalu iloto i Mafulifuliga o tau-o-Aso
Charting Tuvalu Through the Challenges of Climate Change

CHAPTER III The National Strategic Action Plan for Climate Change and Disaster Risk Management

Linkages with the Tuvalu Climate Change Policy – *Te Kaniva*

The National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) is a joint strategic action plan for climate change adaptation and mitigation and disaster risk management. The NSAP is also the operational (implementation) plan for Tuvalu's Climate Change Policy (TCCP, 2011) known as *Te Kaniva*. The NSAP and *Te Kaniva* should be read and considered together.

The *Te Kaniva* is a ten year policy (2011-2020) while the NSAP is a five year action plan (2012-2016). This is to ensure that the action plan is regularly monitored to keep it relevant to national priorities.

The linkages between *Te Kaniva* and NSAP are in the vision, goals, strategies and outcomes. Table 1 of the NSAP gives the goals, strategies, key actions and responsible agencies.

The *Te Kaniva* identified the following seven thematic goals:

GOAL 1

Strengthening Adaptation Actions to Address Current and Future Vulnerabilities

GOAL 2

Improving Understanding and Application of Climate Change Data, Information and Site Specific Impacts Assessment to Inform Adaptation and Disaster Risk Reduction Programmes.

GOAL 3

Enhancing Tuvalu's Governance Arrangements and Capacity to Access and Manage Climate Change and Disaster Risk Management Finances

GOAL 4

Developing and Maintaining Tuvalu's Infrastructure to Withstand Climate Change Impacts, Climate Variability, Disaster Risks and Climate Change Projection

GOAL 5

Ensuring Energy Security and a Low Carbon Future for Tuvalu.

GOAL 6

Planning for Effective Disaster Preparedness, Response and Recovery

GOAL 7

Guaranteeing the Security of the People of Tuvalu from the Impacts of Climate Change and the Maintenance of National Sovereignty

VISION

To protect Tuvalu's status as a nation and its cultural identity and to build its capacity to ensure a safe, resilient and prosperous future.

Summary of Goals and Outcomes

GOAL 1: STRENGTHENING ADAPTATION ACTIONS TO ADDRESS CURRENT AND FUTURE VULNERABILITIES

Outcomes

- Resilience and livelihoods strengthened.
- Increased awareness of the costs and implications of climate change and disaster risks.
- Gender disaggregated data and information are available for development planning.
- Food security.
- Coastal protection through re-planting programmes and other appropriate schemes.
- Water security (adequate water quality and quantity).
- Preparedness for droughts and other extreme events.
- Recognition and adaptability of the inter-linkages of systems (ecosystems) in adaptations and disaster risk reduction activities to strengthen resilience.
- Marine (offshore) and coastal resources are sustainably managed in the context of climate change to the benefit of the people of Tuvalu.
- Economic security, food and species diversity (biodiversity and ecosystems) for Tuvalu.
- Appropriate technology transfer and capacity building to support economic diversity initiatives.
- Climate change adaptation integrated into planning and development decision making including household daily activities.
- Improved coordination driven by relevant policies.
- Threats and impacts of climate change and disaster risks on biodiversity minimised and avoided (refer NBSAP, NAPA, NAP etc).
- Cost of re-building from the impacts of climate change are primarily borne by major GHG producing countries.

GOAL 2: IMPROVING UNDERSTANDING AND APPLICATION OF CLIMATE CHANGE DATA, INFORMATION AND SITE SPECIFIC IMPACTS ASSESSMENT TO INFORM ADAPTATION AND DISASTER RISK REDUCTION PROGRAMMES.

Outcomes

- Strong NMS with legislation, relevant policy and protocols for data sharing and usage are available and implemented to guide the use and sharing of weather and climate services data including historical data
 - Capacity for climate change monitoring is available in the meteorological services
 - Old equipment is replaced and maintained
 - Capacity to service the needs of end users (e.g. agriculture, fisheries, tourists operators, aviation sector, general public)
 - Improved public awareness of weather and climate information
-
- Inter island communications is improved to receive warnings and send observations
-
- High level of awareness in school age children (pre-schools, primary, secondary, vocational and tertiary levels).
-
- Informed adaptation and mitigation programmes.
-
- Tuvalu continues to be visible and have an impact in international negotiations

GOAL 3: ENHANCING TUVALU'S GOVERNANCE ARRANGEMENTS AND CAPACITY TO ACCESS AND MANAGE CLIMATE CHANGE AND DISASTER RISK MANAGEMENT FINANCES

Outcomes

- There is capacity in each ministry and department to integrate climate change and disaster risks into project development and project monitoring and evaluation
- Climate change and disaster risks are incorporated in each sector's/agency's policies, plans and budgetary processes and in all new and ongoing development programmes
- Effective and responsive island governance where climate change and disaster risks and impacts are integrated into Island Strategic Plans
- Diversifying gender specific climate resilient livelihoods and enhanced hazard response capacity of the Kaupule.
- Donor confidence in national procedures and governance arrangements.
- High level of professionalism in financial management in central and line agencies including Island Kaupule to access and report on financial and technical support.
- National policies and by-laws are enforced to provide the policy driven support for coordinated climate change and disaster risk management targets and outcomes.
- Strong coordination of planning, implementation, monitoring and evaluation evident in government agencies implementing climate change and disaster risk management programmes.
- High level of awareness amongst agencies and communities on climate change finance.
- Sustainable and predictable funding available for immediate, medium and long term climate change and disaster risk management planning and implementation of adaptation, mitigation and disaster risk reduction priorities.
- Improved coordination, sharing of expertise, data and information.
- Good lessons learned and best practices are gathered, replicated and shared.
- A ministry to encompass climate change, disaster risk management and Meteorology thus raising their visibility and role in national sustainable development planning.

GOAL 4: DEVELOPING AND MAINTAINING TUVALU'S INFRASTRUCTURE TO WITHSTAND CLIMATE CHANGE IMPACTS, CLIMATE VARIABILITY, DISASTER RISKS AND CLIMATE CHANGE PROJECTION

Outcomes

- Key infrastructures (e.g. power station, telecom, meteorological services, airport, wharfs, roads, hospital, schools, churches and Falekaupule in Funafuti and outer islands etc) are secure and functional at all times.
- Improved and coherent physical planning
- Physical planning integrated into the Island Strategic Plan (ISP).
- Building code is enforced for key infrastructure and construction of houses (wooden and concrete) in the context of climate change adaptation.
- Increased public and community awareness on climate change and disaster risks issues impacting on their properties.
- Coastal protections and causeways constructions followed best practices appropriate for Tuvalu's situation and reduce vulnerability to the impacts of climate change, climate variability and geological hazards.

GOAL 5. ENSURING ENERGY SECURITY AND A LOW CARBON FUTURE FOR TUVALU.

Outcomes²

- Realise the target of 100% of electricity generation through renewable energy technologies (TNEP 2009)
- Enhanced access to safe, secure, clean, efficient, and affordable energy supplies
- Maximising the GHG reduction from local energy sources

GOAL 6: PLANNING FOR EFFECTIVE DISASTER PREPAREDNESS, RESPONSE AND RECOVERY

Outcomes

- Well coordinated disaster management institutional arrangements at all levels.
- Advanced preparedness at all levels (national, island and community) to cope with the impacts of climate change and disaster risks.
- Timely and coordinated response arrangements to alleviate suffering to victims.
- The needs of the most vulnerable groups and those with special needs are given priority in emergency preparedness and response planning and implementation.

GOAL 7: GUARANTEEING THE SECURITY OF THE PEOPLE OF TUVALU FROM THE IMPACTS OF CLIMATE CHANGE AND THE MAINTENANCE OF NATIONAL SOVEREIGNTY

Outcomes

- Tuvalu's constitution and legislations are amended to address Tuvalu's sovereignty taking into consideration climate change impacts and projections on Tuvalu's EEZ.
- A resilient Tuvalu.
- Tuvalu's preparedness for any migration or displacement due to climate change impacts
- Tuvaluans have a secured place to live.



Taro plantation impacted by drought conditions in Tuvalu.

CHAPTER IV Implementation Strategy

The key strategy for the implementation of *Te Kaniva* and NSAP is to ensure an all of government and community integrated approach to the implementation of the priorities identified in these two national policy and strategy documents.

Leadership is crucial and expected to come from the Government of Tuvalu, coordinated by the Department of Environment as mandated by the 2008 Environment Act where the Minister responsible for environment is also responsible for climate change, Environmental Impact Assessment (EIA), waste management, conservation and protected areas, and sustainable development of land and marine areas and resources.

This chapter presents the institutional arrangements for implementation of the TCCP and NSAP.

Institutional Arrangements for Implementation

The implementation arrangements for *Te Kaniva*: Tuvalu Climate Change Policy (TCCP) and the National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) partly follow the currently established arrangements and suggest a merging of the two national committees responsible for coordinating climate change and disaster risk management in Tuvalu. The suggested merging was developed through consultations with the Tuvalu expert team working on the TCCP and NSAP and through consultation with a number of Chief Executives and senior officials within Government.

Currently, climate change and disaster risk management have two separate institutional arrangements although the positions and the holder inside these two arrangements may be the same. The National Disaster Management Act stipulates the institutional arrangements for disaster risk management (DRM). In the event of an emergency or disaster the structure is:

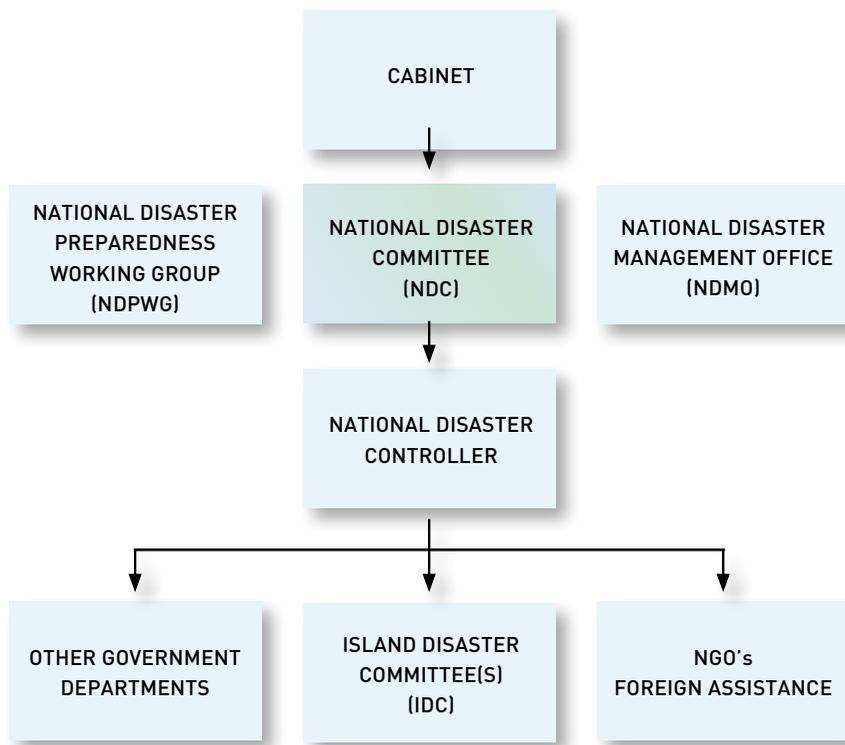


FIGURE 1 DRM Arrangements for Emergency

Source: Tuvalu National Disaster Plan (2nd Draft, 2010)

The National Disaster Committee (NDC) is coordinated by the National Disaster Management Office (NDMO) which is housed in the Office of the Prime Minister. The Minister responsible to Government on all disaster related matters shall ensure that all government agencies have taken adequate measures to mitigate, prepare, respond to and recover from disasters and foster the participation of non-government agencies in disaster risk management arrangements taken by government (*Part 2 National Disaster Management Act*).

As mentioned above, the climate change portfolio is under the Department of Environment as provided by the provisions of the 2008 Environment Act. The Department of Environment provides the overarching coordination and advisory role for climate change related projects through

a National Climate Change Advisory Committee (NCCAC) (refer Figure 2). The NCCAC is an inter-ministerial/department and sectoral committee that also has members from the civil society and NGOs, as well as outer islands representatives. The Development Coordination Committee (DCC) is under the Ministry of Finance where projects for donor funding are priorities and submitted to Cabinet for approval. Under the umbrella of the NCCAC, there are climate change and relevant projects that are coordinated by other government agencies (refer Figure 2).

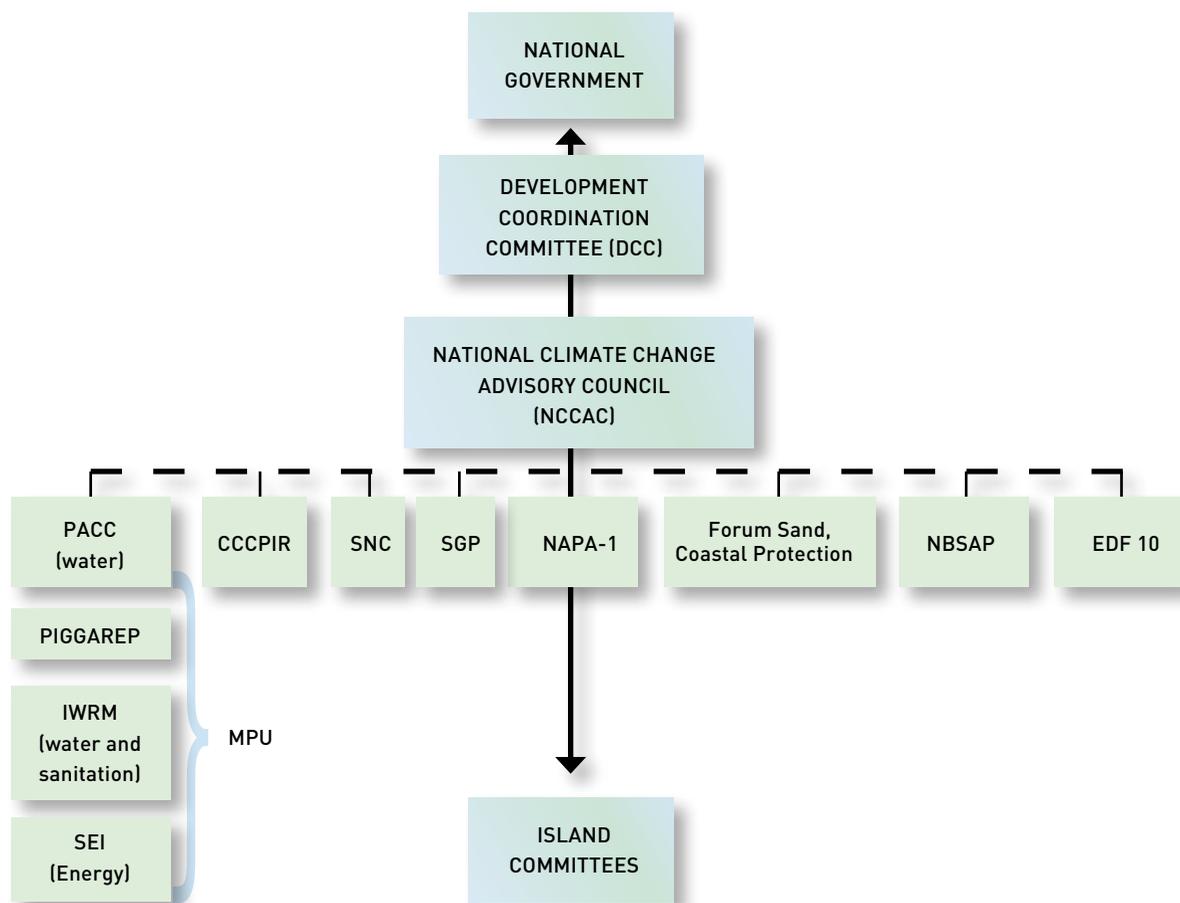


FIGURE 2 Schematic of the Institutional Arrangements of National Climate Change Programmes showing some National Projects as examples.

This NSAP includes an action that will look in detail at the institutional arrangements of DRM, Climate Change and Meteorology. There is value in these three institutions working collaboratively to ensure timely sharing of data, information and expertise to support adaptation and disaster risk reduction planning.

Institutional Arrangements for the NSAP

For the purpose of driving and coordinating the NSAP implementation, it is recommended that the NCCAC and the NDC be merged and called a NSAP for Climate Change and DRM Steering Committee (NSAPCC) (refer Figure 3). The DOE will provide the secretariat role for the NSAPCC. However, the DOE is thinly stretched and needs additional staff to coordinate the NSAP implementation. It is recommended that a new NSAPCC Management Team is established within the DOE consisting of a Coordinator, Technical Adviser, a Communication Officer and administration support. The initial functions of the NSAPCC could include the following:

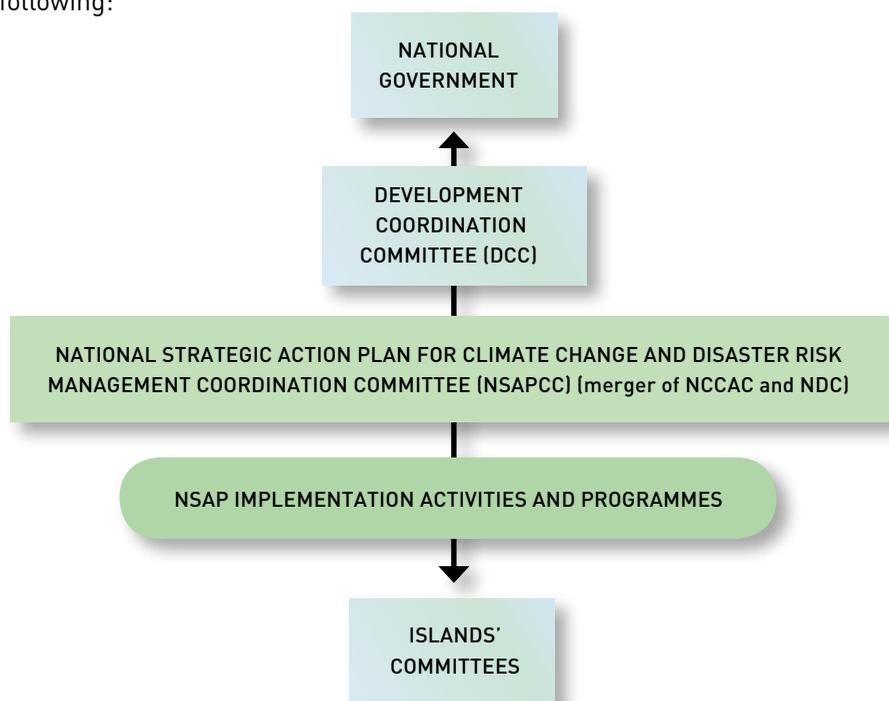


FIGURE 3 NSAP Implementation Arrangements

- Drive coordination and collaboration among the agencies in Tuvalu that have responsibilities for climate change and disaster risk reduction
- Package NSAP into funding proposals and facilitate requests for funding and technical assistance
- Liaise with donors, CROP agencies and UN agencies to support NSAP implementation
- Advocate NSAP, and monitoring and evaluation of NSAP activities.
- Assist Ministries to integrate NSAP actions into Corporate Plans and Annual Work Plans.
- Develop and implement a communication strategy to support NSAP implementation including the identification of the requisite resource requirements and associated costs
- Provide regular reports at a minimum of six month intervals to the DCC and Cabinet on NSAP implementation
- Submit reports and acquittals to donors and development partners in relation to any specific funding and technical assistance that may be provided for NSAP implementation.

Costing Methodology and Indicative Costing

Table 2 provides a total indicative cost to implement the DRM arrangements. The estimated cost includes both the financial cost of actions and the in-kind contributions made by the Government of Tuvalu and partners to execute actions. In the process of determining the costs certain assumptions were used so that they can be as close as possible to the real situations. The assumptions used are as follows:

- Costs including travel to the outer islands using the vessel that service these islands.
- Some community based actions – such as training – is envisaged to be conducted on each of the islands. There are nine islands that make up Tuvalu including Funafuti.
- Travel costs and purchase of equipment or assets are generally distinguished from other costs.
- In a few specific cases, an overseas consultant would be required to execute an action. In such cases, an overseas rate was applied. However, technical assistance from consultant would be sourced from Tuvalu wherever possible. The cost of a local consultant is often lower than the cost of an overseas consultant.
- Communications are normally provided as a package (e.g. so many advertisements on radio per week) and often work out cheaper when provided that way.
- Action 3.1 covers the recruitment of an additional officer in the National Disaster Management

Office to assist the lone officer in that office in the coordination of the implementation of this plan. NDC members suggested that this salary be costed provisionally for two years only. If the position was to be made permanent, costs would clearly need to be covered from the annual government budgetary estimates.

Gross Indicative Costs

The overall indicative resource costs to implement the NSAP over the period 2012-2016 are estimated to be AUD8,002,408 (Table 2). Of this, it is estimated that in-kind staff contributions would constitute 21 per cent of resource costs while the financial costs account for 79 per cent.

TABLE 2 Resource Costs by Goal

GOALS	FINANCIAL COST	IN KIND CONTRIBUTION	TOTAL
Goal 1	1,527,096	581,023	2,108,119
Goal 2	1,207,285	205,819	1,413,104
Goal 3	676,317	94,963	771,280
Goal 4	921,109	205,594	1,126,703
Goal 5	369,861	198,188	568,049
Goal 6	906,474	157,595	1,064,069
Goal 7	729,862	221,222	951,084
Total	6,338,004	1,664,404	8,002,408
% of total	79	21	100

The highest estimated cost is Goal 1 “Strengthening Adaptation Actions to Address Current and Future Vulnerabilities” which is around AUD2,108,119. It is also the highest in terms of the financial and in-kind contributions. The financial cost will be sourced from development partners while the in-kind contributions are provided by the Tuvalu Government and regional partners. The majority of these in-kinds are for staff time that will support the various initiatives.

To provide flexibility in planning for implementation activities, a contingency of 10 per cent has been applied to all financial costs. In this case, the total financial costs would increase to a potential AUD698,670 (Table 3).

TABLE 3 Resource costs by Goal including contingency

GOALS	FINANCIAL COSTS	IN-KIND CONTRIBUTIONS	TOTAL COSTS
Goal 1	1,527,096	581,023	2,108,119
Contingency	152,710	58,102	210,812
Goal 2	1,207,285	205,819	1,413,104
Contingency	120,729	20,582	141,310
Goal 3	676,317	94,963	771,280
Contingency	67,632	9,496	77,128
Goal 4	921,109	205,594	1,126,703
Contingency	92,111	20,559	112,670
Goal 5	369,861	198,188	568,049
Contingency	36,986	19,819	56,805
Goal 6	906,474	157,595	1,064,069
Contingency	90,647	15,760	106,407
Goal 7	729,862	221,222	951,084
Contingency	72,986	22,122	95,108
SUB TOTAL	6,338,004	1,664,404	8,002,408
TOTAL INC CONTINGENCY	6,971,804	1,830,844	8,802,649



Financing strategy

The financing of NSAP implementation is to be facilitated through three basic approaches:

- In-kind support from the Government largely through the dedication of staff time.
- Securing financial assistance through external donors and development partners including the funding of a Management Team. The DCC will coordinate this approach with the NSAPCC Management Team.
- The management and accountability for any new donors' funds for NSAP should follow the Government of Tuvalu's procedures.



References

Australian Bureau of Meteorology and CSIRO. 2011. Climate Change in the Pacific: Scientific Assessment and New Research. Volume 1: Regional Overview, Volume 2: Country Reports.

Government of Tuvalu 2008 Environment Act, Government of Tuvalu, Funafuti

Government of Tuvalu 2005 Te Kakeega II, Government of Tuvalu, Funafuti.

Tuvalu 2002 Population and Housing Census, Vol 1, Analytic Report, Secretariat of the Pacific Community.

Tuvalu 2010 National disaster management plan, SOPAC, Suva Fiji.

TABLE 4 National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP) 2012–2016

GOAL 1- STRENGTHENING ADAPTATION ACTIONS TO ADDRESS CURRENT AND FUTURE VULNERABILITIES			
Strategies	Actions	Lead Agency	Partner Agencies
1.1 Health and socio-economic implications (inclusive of gender) of climate change and disaster risks informing appropriate health and socio-economic adaptation programmes for each island.	<p>1.1.1 Conduct assessment of health and socio economic implications of climate change and disaster risks in each island</p> <p>1.1.2 Create awareness of results and make available in the database developed in 2.4.3 including gender disaggregated data and information</p> <p>1.1.3 Develop adaptation programmes for funding based on the recommendations of the assessment in 1.1.1</p> <p>1.1.4 Organise annual donor roundtables to discuss national projects</p> <p>1.1.5 Conduct ongoing monitoring and annual evaluation of project status to enhance project implementation and to inform new initiatives</p> <p>1.1.6 Upgrade and/or procure water quality testing equipment and make available to all islands</p> <p>1.1.7 Provide training for sanitation aids on the use of equipment (1.1.6)</p>	<p>Ministry of Health (MOH), Ministry of Finance and Economic Planning (MFEP)</p> <p>Ministry of Foreign Affairs, Trade, Tourism, Environment and Labour (MFATTEL), MFEP</p>	<p>TANGO, Red Cross</p> <p>MFEP, MCTPU, Office of the Prime Minister (OPM)</p>
1.2 Assessment and analysis of salt and/or heat tolerant food crops (e.g. pulaka) and tree species for coastal protection.	<p>1.2.1 Conduct research on current and other possible food crop and tree species on their salt and/or heat tolerance capability</p> <p>1.2.2 Develop nurseries to nurture selected food crop and tree species that are salt and heat tolerant</p> <p>1.2.3 Create awareness and distribute planting materials of the food crop and tree species that are salt and/or heat tolerant</p> <p>1.2.4 Support organic vegetable and food crops gardening and the use of composting</p> <p>1.2.5 Conduct applied research in collaboration with SPC and SPREP on pest management and control of invasive species</p>	<p>MFATTEL</p> <p>MOH</p> <p>MOH</p>	<p>MFEP, MOH</p> <p>MFATTEL</p>

GOAL 1- STRENGTHENING ADAPTATION ACTIONS TO ADDRESS CURRENT AND FUTURE VULNERABILITIES

Strategies	Actions	Lead Agency	Partner Agencies
<p>1.3 Integrated and coordinated water resources (including desalination) planning and management including preparedness and response plans for each island.</p>	<p>1.3.1 Assess water availability and feasibility of water security options including rain water harvesting, underground water and desalination on all islands.</p> <p>1.3.2 Implement improved rain water harvesting, access to underground water and install energy efficient desalination on all islands.</p> <p>1.3.3 Prepare awareness materials on water conservation and safety</p> <p>1.3.4 Implementation of these actions relevant to water resources are to be consistent with the National Water Policy, Integrated Waters Resource Management (IWRM) Plan and other water related plans, Public Health Act (Water Sector) and relevant recommendations from previous studies.</p> <p>1.3.5 Develop drinking water safety components for the Island Strategic Plans (ISPs)</p> <p>1.3.6 Develop a national IWRM Plan</p>	<p>Ministry of Communication Transport and Public Utilities (MCTPU), MFATEL</p> <p>MFATEL, MPU, MOH</p> <p>MOH, Ministry of Home Affairs and, Rural Development (MHARD)</p> <p>MCTPU, MOH</p> <p>As above</p>	<p>OPM, OPM MFATTEL OPM</p>
<p>1.4 Coordinated planning and management of marine, coastal and land resources and systems (Whole Island Systems Management/ Ecosystem base management).</p>	<p>1.4.1 Create awareness on the inter-linkages of marine, coastal and land ecosystems</p> <p>1.4.2 Integrate climate change adaptation into the programme of work on protected areas including the development of protected areas on all islands</p> <p>1.4.3 Review, update or develop new policies, local government by-laws and legislations on sustainable marine, coastal and land system management</p> <p>1.4.4 Build enforcement capacities in responsible agencies (e.g. Ministry of Lands and Survey, Department of Environment, Department of Fisheries, Department of Health, Department of Agriculture) to implement 1.4.3</p> <p>1.4.5 Conduct training for institutions responsible for coordinated planning and management in these areas.</p> <p>1.4.6 Conduct assessments on state of marine, coastal and land resources/ecosystems and share this information with relevant sectors, and translation for local communities</p> <p>1.4.7 Assess and address the impacts of land base practices including runoff and ground water leaching on the marine environment in context of climate change.</p> <p>1.4.8 Assess and seek international support for reducing the impacts of climate change (such as temperature increase, ocean acidification, changing pattern of circulation and ocean saturation) on coral reef, seagrass, algae, mangroves and other ecosystems.</p> <p>1.4.9 Undertake urgent coastal protection measures incorporating soft options, natural island formation and assessed structural protection where appropriate.</p>	<p>MFATTEL, Ministry of Natural Resources (MNR)</p> <p>MHARD, MFATTEL, MNR</p> <p>MNR, MFATELL</p> <p>MFATTEL</p> <p>MNR, MFATTEL</p> <p>MFATTEL, MNR, MPU</p> <p>MFATTEL, MCTPU</p> <p>As above</p>	<p>Ministry of Education (MOE)</p> <p>OPM</p> <p>MOE</p> <p>OPM</p> <p>OPM</p> <p>OPM</p> <p>OPM</p> <p>MNR</p> <p>As above</p>

GOAL 1- STRENGTHENING ADAPTATION ACTIONS TO ADDRESS CURRENT AND FUTURE VULNERABILITIES

Strategies	Actions	Lead Agency	Partner Agencies
<p>1.5 Responding to possible changes in migratory marine fish species movement due to climate change.</p>	<p>1.5.1 Conduct awareness workshops on recent scientific studies relating to the implications of climate change on tuna migratory patterns.</p> <p>1.5.2 Conduct a feasibility study on how Tuvalu may be affected by the tuna migratory pattern due to climate change taking into considerations technology, capacity and governance arrangements requirements.</p> <p>1.5.3 Develop an economic plan to adapt to possible changes in tuna movement within Tuvalu's EEZ</p> <p>1.5.4 Conduct research on possible impacts of climate change on Tuvalu's seamount resources.</p> <p>1.5.5 Develop Tuvalu's tuna fishing capacity to ensure food security and response to changes in migratory patterns</p>	<p>MFATTEL, MNR MNR MNR MNR</p>	<p>TANGO MFATTEL MFATTEL, MFEP As above</p>
<p>1.6 Awareness and empowerment programmes for each island relevant to the impacts of climate change and disaster risks in each sector.</p>	<p>1.6.1 Develop awareness materials and communication strategies for each sector on the impacts of climate change and disaster</p> <p>1.6.2 Conduct public awareness programmes on each island using popular media outlets.</p> <p>1.6.3 Analyse, compile and document traditional knowledge related to climate change and disaster risk management and make available to all communities within Tuvalu.</p> <p>1.6.4 Carry out an assessment to measure effectiveness of awareness programmes in all islands.</p>	<p>MFATTEL, OPM MFATTEL, OPM, MOE MFATELL, MHRD</p>	<p>MOE TANGO TANGO, OPM</p>
<p>1.7 Legislation and policies to govern sustainable resource management, (marine, coastal and land) in the context of climate change impacts.</p>	<p>1.7.1 Review and update relevant legislation, policies including coordination arrangements for climate change and disaster risk reduction programmes.</p> <p>1.7.2 Implementation of the action strategy should be linked to implementation of NBSAP, NAPA, NAP and other relevant policies and action plans.</p> <p>1.7.3 Conduct awareness of existing legislation and policies.</p>	<p>OPM MFATTEL MFATTEL</p>	<p>MFATTEL MNR OPM, MOE OPM</p>
<p>1.8 Appropriate insurance arrangement schemes to address loss and damage from the impacts of climate change.</p>	<p>1.8.1 Investigate and establish appropriate insurance arrangements to address loss and damage from the impacts of climate change.</p> <p>1.8.2 Seek funding to support the establishment of the approved arrangements based on the investigation on 1.8.1</p>	<p>MFATTEL, MFEP</p>	<p>OPM</p>

GOAL 2 - IMPROVING UNDERSTANDING AND APPLICATION OF CLIMATE CHANGE DATA, INFORMATION AND SITE SPECIFIC IMPACTS ASSESSMENT TO INFORM ADAPTATION AND DISASTER RISK REDUCTION PROGRAMMES.

Strategies	Actions	Lead Agency	Partner Agencies
2.1 Upgrading the capacity of the National Meteorology Services including stations on the outer islands.	2.1.1 Develop legislation for the Meteorological Services 2.1.2 Develop protocols for sharing weather and climate data 2.1.3 Train meteorological service on climate change monitoring and data analysis 2.1.4 Assess the status of the equipment currently in use 2.1.5 Implement the approved recommendations of the assessment in 2.1.4 2.1.6 Develop weather and climate products (weather maps, weather charts, tide predictions etc) for the use of the agriculture and fisheries sectors, tourists operators, women and men 2.1.7 Develop and conduct relevant public awareness of weather and climate information	MCTPU	MFATTEL, OPM
2.2 Reliable telecommunications with outer islands for weather and climate information.	2.2.1 Establish observing stations on all islands 2.2.2 Assess the outer island communications and weather station capacity and recommend the most feasible options through participatory and consultative process. 2.2.3 Implement the approved recommendations of the assessment in 2.2.2 2.2.4 Training of Kaupule, Falekaupule and civil servants in the outer islands to monitor and report weather station readings to Funafuti	MCTPU	MHARD, MFATTEL
2.3 Climate change and disaster risk management information are incorporated into school curriculum.	2.3.1 Consult and assess the curriculum in all education levels, with a view to incorporating climate change and disaster risk management programs. 2.3.2 Develop relevant programmes to strengthen the curriculum with the incorporation of climate change and disaster risk management materials 2.3.3 Develop relevant student study aids, teachers' teaching aids and resource material for the Curriculum Resource Development Unit relating to climate change and disaster risk management 2.3.4 Provide training for the Curriculum Resources Development Unit on climate change and disaster risk management	MFATTEL, Education	OPM
2.4 Further on the ground implementation of recommendations from the NAPA and the PACC projects.	2.4.1 Carry out vulnerability assessments to inform on the ground adaptation activities as prioritised from the NAPA and PACC 2.4.2 Create awareness of the assessment results in 2.4.1 2.4.3 Develop a shared database for assessment information to be used by all sectors in decision making, adaptation and mitigation planning	MFATTEL MFATTEL	OPM, Red Cross OPM
2.5 National capacities in international negotiations is strengthened.	2.5.1 Conduct regular national training on international negotiations 2.5.2 Create scholarships for Tuvaluans to build and strengthen their capacity and skills in climate change negotiations	MFATTEL, OPM	Education

GOAL 3 – ENHANCING TUVALU’S GOVERNANCE ARRANGEMENTS AND CAPACITY TO ACCESS AND MANAGE CLIMATE CHANGE AND DISASTER RISK MANAGEMENT FINANCES

Strategies	Actions	Lead Agency	Partner Agencies
3.1 Climate change and disaster risk management aspects are incorporated into the Te Kakeega II (and future national sustainable development plans), budgetary planning and into sector policies and plans.	<p>3.1.1 Conduct awareness workshop for MPs, PS and Directors on impacts of climate change and disaster risks on all sectors</p> <p>3.1.2 Conduct training for economic planners in all sectors on integrating climate change and disaster risks into project development, project monitoring and evaluation</p> <p>3.1.3 Conduct a stocktake on the level of integrating climate change and disaster risks on all sector policies, plans and budget allocation</p>	MFATTEL	OPM, MFEP
3.2 Island governance and leadership (Kaupule) strengthened.	<p>3.2.1 Conduct training for all eight Island Kaupule on integrating climate change and disaster risks into Island Strategic Plans.</p> <p>3.2.2 Conduct good governance programmes for Island Kaupule.</p> <p>3.2.3 Identify vulnerable members of the communities that may need special attention in the context of climate change and disaster risk reduction</p> <p>3.2.4 Implement actions to empower vulnerable members of the communities in diversifying their livelihoods.</p>	MFATTEL	MHARD
3.3 Robust financial management procedures and procurement policy for donor funded (or partnership supported) climate change and disaster risk management programmes	<p>3.3.1 Review existing Government financial management procedures and identify gaps that do not conform to donor funding requirements</p> <p>3.3.2 Implement recommendations from the review of the Government financial management procedures</p> <p>3.3.2 Conduct training on financial management to key staff in all line agencies including Kaupule</p> <p>3.3.4 Develop robust financial management software that can be shared with all climate change and disaster risk management projects</p> <p>3.3.5 Establish a National Implementing Entity (NIE) to access direct funding from the Adaptation Fund.</p>	MFEP	MFATTEL, MHARD

GOAL 3 – ENHANCING TUVALU’S GOVERNANCE ARRANGEMENTS AND CAPACITY TO ACCESS AND MANAGE CLIMATE CHANGE AND DISASTER RISK MANAGEMENT FINANCES

Strategies	Actions	Lead Agency	Partner Agencies
<p>3.4 Enabling policies and tools to strengthen the coordination role of the Aid Coordination Unit, the National Climate Change Advisory Council (NCCAC) and the National Disaster Committee (NDC)</p>	<p>3.4.1 Review and update legislations, policies and bylaws relevant for enforcement of coordination in delivering climate change and DRM programmes/projects.</p> <p>3.4.2 Conduct awareness programmes of the updated policies and by laws for all agencies and Kaupule to ensure that coordination is effectively carried out.</p> <p>3.4.3 Build the capacity of the Aid Coordination Unit with appropriate tools and processes that are effective and efficient to monitor coordination among donor agencies.</p> <p>3.4.4 Develop and implement regular sector and community awareness programmes addressing climate change and disaster risk reduction finances.</p>	<p>MFATTEL, MFEP</p>	<p>OPM</p>
<p>3.5 A National Trust Fund to support adaptation, and mitigation actions in to respond to climate change impacts and disaster risks</p>	<p>3.5.1 Develop a policy and plan (based on lessons learned from existing national trust fund (TTF and FTF) for establishing a National Climate Change and Disaster Risk Management (DRM) Trust Fund and National Implementing Entity (NIE) in consultation with potential donors.</p> <p>3.5.2 Establish a functional unit to manage the National Climate Change and DRM Trust Fund with appropriate management procedures</p> <p>3.5.3 Establish a transparent and accountable process with criteria for the use of the fund for immediate, medium and long term climate change and disaster risk management priorities</p>	<p>MFEP, MHARD</p>	<p>MFATTEL, OPM</p>
<p>3.6 Strengthen institutional arrangements for climate change, disaster risk management and meteorology to enhance coordination.</p>	<p>3.6.1 Conduct an institutional arrangements analysis for climate change, meteorology and disaster risk management to ensure close coordination and collaboration amongst agencies</p> <p>3.6.2 Implement approved recommendations of the institutional analysis conducted in 3.6.1</p> <p>3.6.3 Develop a framework for coordination and sharing of expertise, data and information on climate change and disaster risks management</p>	<p>MFFATEL, MCTPU</p>	<p>OPM, MFEP</p>

GOAL 4 - DEVELOPING AND MAINTAINING TUVALU'S INFRASTRUCTURE TO WITHSTAND CLIMATE CHANGE IMPACTS, CLIMATE VARIABILITY, DISASTER RISKS AND CLIMATE CHANGE PROJECTION

Strategies	Actions	Lead Agency	Partner Agencies
4.1 Climate proof and secure key infrastructure considering climate change impacts, climate variability, disaster risks and projected climate change.	<p>4.1.1 Assess the safety of key infrastructure (e.g. power station, telecom, meteorological services, airport, wharfs, roads, hospital, schools, churches and Falekaupule in Funafuti and outer islands) from climate change impacts, climate variability and projected climate change and disaster risks</p> <p>4.1.2 Implement the approved recommendations of the findings of the assessment in 4.1.1</p> <p>4.1.3 Develop purpose built shelters for all islands starting from the most vulnerable islands.</p> <p>4.1.4 Incorporate the assessment findings in 4.1.1 into 4.2.6 (building code).</p>	MCTPU	MFATTEL, OPM, Health, Education, Home Affairs
4.2 Physical planning and development control for Funafuti and the Outer Islands	<p>4.2.1 Prepare a land use zoning policy and plan for Funafuti in consultation with landowners linked to the SLM and NAPA processes</p> <p>4.2.2 Review the process for development and monitoring of the ISP for incorporation of climate change and disaster risk management considerations as well as proper land use and zoning</p> <p>4.2.3 Carry out awareness of the zoning completed for Funafuti</p> <p>4.2.4 Implement and enforce the approved zoning</p> <p>4.2.5 Review the issues of the existing building code in consultation with all key stakeholders to determine its implementation.</p> <p>4.2.6 Conduct a study on the most appropriate type of buildings (housing) suitable for the situation in Tuvalu that use less sand and gravel.</p> <p>4.2.7. Establish building code for climate resilient housing (linked to 4.1.4)</p> <p>4.2.8 Create awareness of the recommendations from the study in 4.2.6</p> <p>4.2.9 Develop and conduct public and community awareness on climate change and disaster risk issues impacting on their properties</p> <p>4.2.10 Conduct site specific assessment (including assessment of lagoon water quality, circulation and lagoon water chemistry) to inform planning for coastal protections and causeways constructions.</p> <p>4.2.11 Enforce the EIA provisions of the Environment Protection Act for infrastructure development taking into considerations current climate variability and projections</p>	MNR MPU, MHARD MFATTEL MFATTEL, MNR	MFATTEL, MHARD Education MPU

GOAL 5. ENSURING NATIONAL ENERGY SECURITY AND A LOW CARBON FUTURE FOR TUVALU

Strategies	Actions	Lead Agency	Partner Agencies
5.1 Reduce reliance on fossil fuels by providing opportunities for renewable energy (RE) and energy efficiency (EE)	<p>5.1.1 Conduct training and awareness programmes and demonstrate energy efficiency and conservation measures and practices.</p> <p>5.1.2 Promote and encourage the use of solar Photo Voltaic systems and other appropriate renewable energy sources</p> <p>5.1.3 Install solar PVs in all islands based on the result of feasibility studies</p>	MPU,	MFATTEL MHARD, MFATTEL
5.2 Promote energy efficiency and conservation programmes	<p>5.2.1 Develop awareness materials and programmes suitable for the schools (including vocational) in Tuvalu.</p> <p>5.2.2 Develop awareness material and communication strategy for the public and communities including outer islands and deliver these programmes to ensure wide outreach and maximise the use of available media outlets.</p>	MPU	MFATTEL OPM
5.3 Energy legislations and regulations promoting and supporting EE and RE	<p>5.3.1 Review and/or develop enabling legislation and regulations to promote and enforce energy efficiency (EE) and renewable energy (RE) opportunities.</p> <p>5.3.2 Review other relevant legislation impacting on energy sector to align with the energy policy.</p> <p>5.3.3 Develop an Energy Bill.</p>	MPU	OPM
5.4 Mitigation plans for the agriculture and waste management sectors to reduce greenhouse gas emissions.	<p>5.4.1 Conduct feasibility studies on using landfill and pig waste to generate methane</p> <p>5.4.2 Implement methane recovery and use projects on all islands</p> <p>5.4.3 Conduct training on technology know how and maintenance.</p>	MPU	MFATTEL

GOAL 6 – PLANNING FOR EFFECTIVE DISASTER PREPAREDNESS, RESPONSE AND RECOVERY

Strategies	Actions	Lead Agency	Partner Agencies
6.1 Strengthen the coordination and operational arrangements for Disaster Management (at national, sector, island and community levels)	<p>6.1.1 Provide personnel (additional staff) support to the National Disaster Management Office (NDMO)</p> <p>6.1.2 Develop a disaster management plan for Island Disaster Committees to be included in their ISP.</p>	MHARD, OPM	OPM
6.2 Enhance preparedness to disaster risks	<p>6.2.1 Procure appropriate equipment for the National Coordination Centre (NCC) (e.g. computers, server, VHF handheld radios, backup generator etc)</p> <p>6.2.2 Develop Standard Operation Procedure (SOP) for NCC and Island Disaster Centres</p> <p>6.2.3 Conduct training at national and island level to support efficient disaster management services (e.g. Introduction to Disaster Management, Emergency Operation Centre, Initial Damage Assessment, Exercise Management etc)</p> <p>6.2.4 Review and develop hazards support plan (e.g. tsunami, cyclone, drought, pandemic, oil spill)</p> <p>6.2.5 Develop agency response plan</p> <p>6.2.6 Review fire safety in all schools, hospital, power stations, key offices and conduct relevant training on equipment use and maintenance</p> <p>6.2.7 Improve fire fighting equipments and training at airport to meet IATA audit requirements</p> <p>6.2.8 Procure portable pump to assist refilling of fire truck</p> <p>6.2.9 Investigate and procure appropriate technology to supplement existing Early Warning System (EWS) arrangements and communications</p> <p>6.2.10 Conduct exercise annually to test warning and response systems</p> <p>6.2.11 Conduct disaster awareness programmes and to culminate in the International Disaster Reduction Day (Oct 13th)</p> <p>6.2.12 Develop database on baseline data</p>	OPM MHARD MCTPU OPM	MHARD, MFATTEL OPM OPM MHARD, MCTPU
6.3 Effective disaster response system capability	<p>6.3.1 Formulate external aid procedure (review and establish procedures for humanitarian aid and personnel for better coordination)</p> <p>6.3.2 Construct storage facilities for relief supplies in the remaining seven islands</p> <p>6.3.3 Conduct training in Disaster Victim Identification procedures</p>	OPM Red Cross OPM	MHARD OPM MHARD
6.4 Strengthen disaster recovery systems	<p>6.4.1 Conduct training for key stakeholders on preparation of disaster recovery plans, costing and project proposal development</p>	OPM	MHARD

GOAL 7: GUARANTEEING THE SECURITY OF THE PEOPLE OF TUVALU FROM THE IMPACTS OF CLIMATE CHANGE AND THE MAINTENANCE OF NATIONAL SOVEREIGNTY

Strategies	Actions	Lead Agency	Partner Agencies
7.1 Secure the EEZ of Tuvalu (approved coordinates) as belonging to the Government and People of Tuvalu regardless of any loss of coastal areas or islands due to impacts of climate change such as sea level rise.	7.1.1 Review and amend Tuvalu's constitution and relevant legislation to address Tuvalu's sovereignty of its EEZ regardless of projected impacts of climate change 7.1.2 Conduct public awareness programme on Tuvalu's constitution and legislation 7.1.3 Finalise determination of Tuvalu's EEZ	OPM OPM	MFATTEL MFATTEL
7.2 Ensure that Tuvalu continues to have the capacity to remain as a nation.	7.2.1 Continue international climate change negotiations to ensure a global reduction in greenhouse gas emissions 7.2.2 Secure and access fast start funds and/or other financial commitments to support timely implementation of this plan (NSAP) to increase resilience	MFATTEL	OPM
7.3 Special Pacific Access Category (PAC) for Tuvaluans considering climate change vulnerability and forced climate migrants	7.3.1 Conduct investigations and recommend revisions on the opportunities available under the PAC. 7.3.2 Explore and secure other migration schemes including an expansion of the PAC 7.3.3 Establish professional training programmes in key identified occupations to allow for employment in neighbouring countries if climate change migration is necessary 7.3.4 Conduct awareness on the requirements and conditions of PAC, any revised conditions and other schemes specific to Tuvalu	MFATTEL	OPM
7.4 Climate change migration/resettlement plan for each island in view of climate change impacts worst case scenario.	7.4.1 Determine the point of forced migration/relocation through sound scientific and socio-economic assessments including any relevant studies. 7.4.2 Conduct a feasibility study on the costs of relocation due to climate change impacts taking into consideration the findings of 7.4.1 7.4.3 Develop a climate change migration/resettlement plan (in consultation with possible host nations, if appropriate)for each island in view of climate change impacts in consideration of the following: Maintaining Tuvalu's identity and integrity of its traditions and customs Most vulnerable communities 7.4.4 The Government of Tuvalu to solicit support from the UN Security Council, General Assembly and the UNFCCC on the issue of forced migration (climate displaced people). 7.4.5 Develop relevant awareness material/programme for use in public and community awareness on the outcomes of 7.4.1-7.4.4	MFATTEL, MCTPU MFATTEL, OPM MFATTEL	OPM MHARD OPM

