Tuvalu
National Biodiversity Strategy and Action Plan
2012-2016

Prepared for the Government of Tuvalu
With the assistance of UNDP

FOREWORD

I am happy to present the National Biodiversity Strategy and Action Plan (NBSAP) of Tuvalu to the people of Tuvalu and so as our dear friends and partners "in-development" from all over the world. Tuvalu was among the first to sign the Convention on Biological Diversity (CBD) at the first ever Summit of Leaders – United Nations Conference on Environment and Development (UNCED) held in 1992 at Rio de Janeiro, Brazil. It took eighteen years for Tuvalu to finally produce its NBSAP. Prior to this, the main guiding document for environmental consideration and development in Tuvalu was the National Environmental Management Strategy (NEMS) formulated through the assistance of SPREP and was published in 1997. Since Rio, Tuvalu had been preoccupied mainly with the climate change phenomenon given its imminent disappearance should the rate of global warming and sea-level rise continue at the 1990s levels. This however does not mean biodiversity was not considered important by Tuvalu. Biodiversity like many other dynamics of sustainable development at large are integral part and parcel of Tuvalu's traditional and cultural practices. On a number of islands, it has been a traditional practice to declare certain areas of the surrounding seas 'closed' for fishing to allow for regeneration of species. However, I should not deny the fact that one of the major reasons for our slowness in fulfilling of our obligations under the CBD is the lack of capacity at many levels. This Plan therefore will now institute mechanisms that would augment the necessary capacities required for the effective execution of essential biodiversity development activities for the benefit of the people of Tuvalu and the world at large. There is also the need to build on the existing wealth of traditional knowledge and cultural practices on biodiversity. I am aware that we may be the second last country in the Pacific to produce our NBSAP but I want to regard this lateness as a 'blessing in disguise' since we had been fortunate to learn from experiences of the previous NBSAPs and to take into account some of the emerging issues that are imminent and relevant to Tuvalu's biodiversity conservation. I now commend Tuvalu NBSAP to all and call on the dedication and commitment of all key stakeholders to ensure the conservation and sustainable use of Tuvalu's natural resources.

"Tuvalu Mo Te Atua"

Hon Apisai Ielemia

Minister for Foreign Affairs, Trade, Tourism, Environment and Labour.

EXECUTIVE SUMMARY

Tuvalu was among the first to sign the Convention on Biological Diversity (CBD) at the 1992 Rio de Janeiro United Nations Conference on Environment and Development (UNCED). It ratified the CBD in 2002 and eight years later, the Tuvalu National Biodiversity Strategy and Action Plan (TNBSAP) is now in place. Although it is among the last Pacific Island countries to formulate its TNBSAP, biodiversity was already part and parcel of Tuvalu's development framework, at least on an *ad hoc* basis. As discussed later in the main body of the report, conservation and the sustainable use and management of natural resources were integral elements of Tuvalu's culture and traditional lifestyles.

All these years since UNCED, Tuvalu had concentrated on climate change given its imminent disappearance under water should global warming continue at its present rate. But there had never been a formal plan on climate change to account for mitigation and adaptation purposes. This is because Tuvalu will never accept its disappearance under water. The majority of the people of Tuvalu believe Tuvalu will continue to exist as a nation and it will not be moved. Tuvalu NBSAP is therefore a great stepping stone forward to manage and preserve the biological diversity of Tuvalu so it continues to contribute to the earth's biodiversity.

Apart from the NEMS which was the official guiding document for environmental management and development including conservation, this Plan, is the first formal consolidated attempt to address biodiversity issues and constraints in Tuvalu in a comprehensive manner. The fact that Tuvalu may be the second last Pacific Island country to prepare its NBSAP, in a way, Tuvalu is blessed to learn from the lessons of previous Pacific NBSAPs. Pacific regional review of previous NBSAPs was well considered in the formulation of TNBSAP and thus its features may be unique from other Pacific NBSAPs.

In the consultation process with stakeholders, culminated in the Stakeholders National Workshop on Funafuti from 27 to 30 April 2010, a total of thirteen (13) thematic areas were confirmed as priority focus of the Tuvalu National Biodiversity Strategy and Action Plan.

Out of these thirteen, five were categorized as cross-cutting issues[1]: (1) Capacity Building, Education, Training, Awareness and Understanding; (2) Sustainable Development and Environment Management; (3) Mainstreaming and Financing Mechanisms; (4) Legal Framework for Biodiversity and Law Enforcement; and (5) Monitoring and Evaluation. There is no specific ranking as to which of these five thematic areas is more important – all of them are equally important and they must first be addressed before any serious project activities are implemented.

[1] Discussed below under the chapter on TNBSAP and section on "cross-cutting issues" and also further elaborated in Annex 1.

The remaining eight of the thematic areas constitute the heart of the TNBSAP and are presented in Table 2 below in order of priority ranking by Stakeholders. These include:

1. Climate Change and Disaster Risk Management
2. Traditional Knowledge, Cultural Practices and Indigenous Property Rights
3. Conservation of Species, Ecosystems (Marine, Coastal, Land Terrestrial) and Genetic Diversity
4. Community – Empowerment, Involvement, Awareness, Understanding and Ownership
5. Sustainable Use of Natural Resources
6. Trade, Biosecurity and Food Security
7. Waste and Pollution Management
8. Management of Invasive Species

It is acknowledged that the proposed activities for each theme as presented in Table 2 are inter-connected and thus is the need for a well constructed integrated approach towards the implementation of this plan.

TNBSAP is truly a product of sustainable development planning where stakeholders were fully consulted right from the inception planning process through to the adoption of agreed biodiversity priority issues, constraints and possible solutions. This TNBSAP is therefore fully owned by the people of Tuvalu. Nonetheless, there is still the need to sensitise entities at the national level, in particular government and non-government stakeholders, so that this Plan when implemented receives the full support and attention of all relevant implementing stakeholders.

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ACRONYMS

CBD: Convention on Biological Diversities
EEZ: Exclusive Economic Zone
EIAs: Environmental impact assessment
FAO: Food and Agricultural Organization
GEF: Global Environment Fund
KIS: Key implementing stakeholders
KPIs: Key performance indicators
MDGs: Millennium Development Goals
MSL: Mean sea level
NAPA: National Adaptation Programme of Action for Climate Change
NGOs: Non Governmental Organization
NSSD: National Strategy for Sustainable Development
OPM: Office of the Prime Minister
SPREP: Secretariat for the Pacific Regional Environment Programme
SPC: Secretariat for the Pacific Community
UNDP: United Nations Development Programme
UNFCCC: United Nations Framework Convention on Climate Change
UNCED: United Nations Conference on Environmental and Development
USP: University of the South Pacific
WSSD: World Summit on Sustainable Development
WWF: World Water Forum

1. INTRODUCTION

1.1 SINCE THE CONVENTION ON BIOLOGICAL DIVERSITY 1992

At the Rio de Janeiro Summit in 1992, Tuvalu was among the first countries to sign the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). Climate Change continued to top the national priorities of Tuvalu at the regional and international levels especially when it was recognized that sea level rise, if allowed to continue, would result in the disappearance of Tuvalu under water. It was only in 2006 (14 years after the signing by Tuvalu of CBD), that ground work for the implementation of CBD commenced in Tuvalu. For the first time, in 2009, Tuvalu submitted a National Report, the Tuvalu CBD 4th National Report.

Recent years have witnessed a broadening of development thinking and greater emphasis on integrated work methods and sustainable development planning. Global conventions and agreements have altered the way development is viewed since the 1992 Rio de Janeiro Summit of Leaders on Development and Environment where the Convention on Biological Diversity was signed.

Photo 1: Tepuka Islet, Funafuti.

Other conventions such as the Millennium Development Goals (MDGs, 2000), the World Summit on Sustainable Development (WSSD, 2002), the 3rd World Water Forum (2003), and the review of the Barbados Programme of Action for Small Island Developing States (BPoA+10, 2004) held in Mauritius further consolidate a new outlook into how development should be pursued.

In preparation and response to this broadening development focus, the Pacific island nations and states were called to prepare a series of national review reports assessing in

a holistic manner, for the first time, a broad perspective of issues, problems and priorities.

The starting point was Tuvalu's National Report to the United Nations Conference on Environment and Development (UNCED) held in Brazil in 1992 where "… *the need for sustainable development-socially responsible economic development that protects the resource base and the environment for the benefit of future generations"* was highlighted. Prior to the WSSD, each Pacific Island Country was called upon to create a National Assessment Report, with the aim of summarising in one document all the critical sustainable development issues faced by each country. Through these international processes extensive documentations were undertaken. Annex III carries an extensive list of documents and information papers related to Tuvalu's environment and sustainable development at large.

From all the documentations listed in Annex III, the most common thematic concerns for Tuvalu since UNCED include:

Environmental Concerns:

- Global warming and sea-level rise
- Unsustainable use of marine and terrestrial natural resources
- Waste management
- Pollution control
- Supply and quality of freshwater
- Coastal erosion

Social Concerns:

- Population growth, densities and distribution
- Deficiencies in environmental education and public awareness
- Decline of traditional resource management practices
- Inadequate institutional and legislative arrangements
- Urbanization

Economic Concerns:

- Energy dependence
- Achieving sustained long term economic growth

The same concerns, while they may not exactly expressed in the same wording, were all endorsed by the stakeholders' consultative process when formulating this Plan (refer Table 3). This time, the issues have been established clearly and as well as quite specific in terms of objectives, action plans and set targets.

1.2 THE NBSAP PROCESS

Figure I below show the sequence of events in the process of formulating Tuvalu's NBSAP. It took roughly one year to complete the processes involved and the following show the actual timelines when the events were actually executed:

- **Inception Workshop** March, 2009
- **Identifying Stakeholders** (Mar-April, 2009)
- **Biodiversity Concerns/Causes.** It was a Stock Assessment activity, reviewing of literature (April 2009)
- **Island Consultations** (Establish the truth)- (May-Sep 2009)
- **Combine problems analysis, solution, actions /National workshop**- April, 2010.

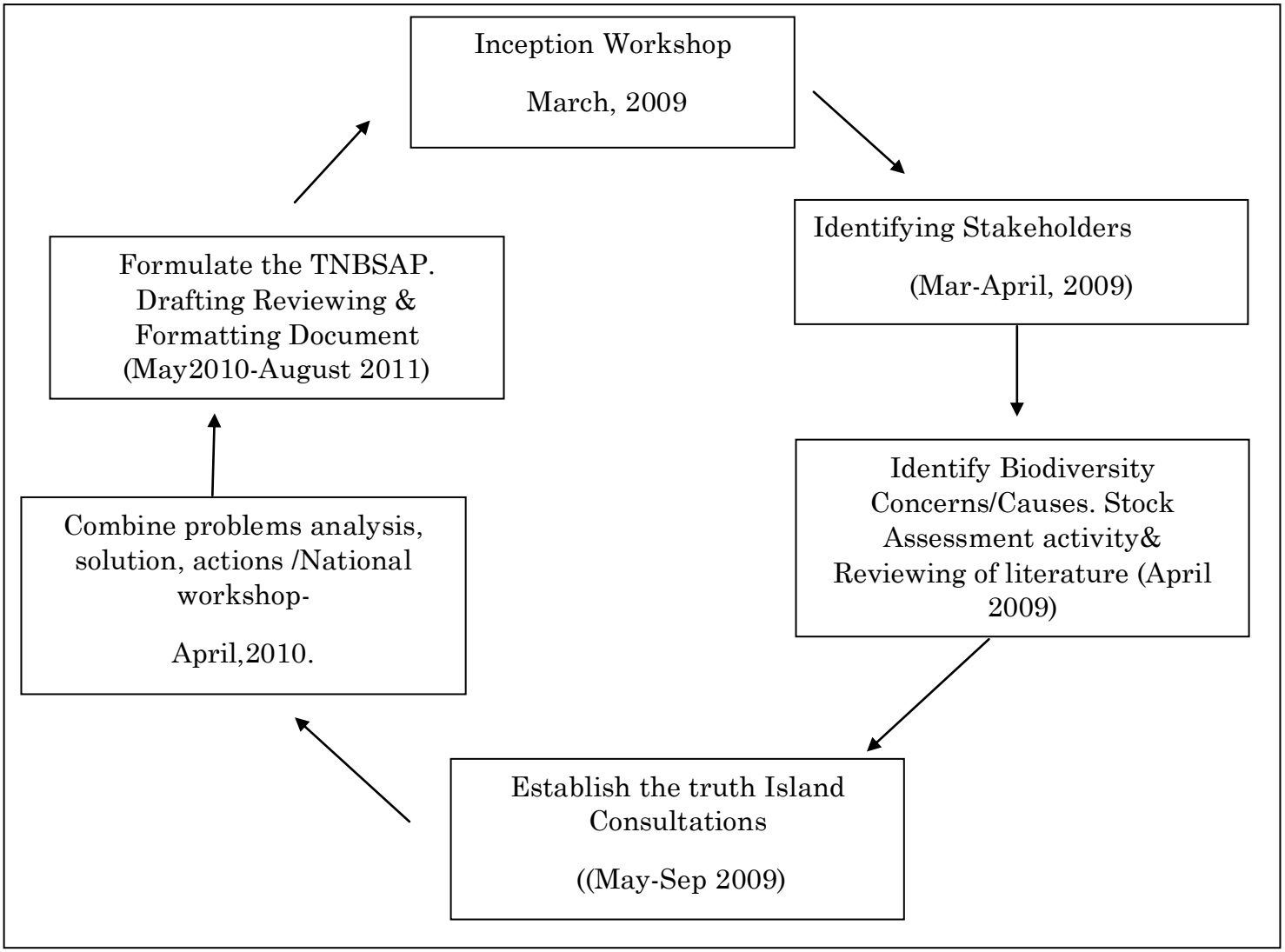

Figure I: ***Sequence of events in the formulation of Tuvalu's NBSAP***

The signed Project document provided for a Board to oversee the overall process of meeting Tuvalu's obligations under the CBD, a Steering Committee to make decisions and provide guidance to the implementation process, and a Planning Committee as the main working committee to carry out the required tasks to culminate in the production of this Plan.

Ground work started way back in 2006 when the Project document was signed but only after the recruitment of the Project Coordinator that activities moved on track. The main body which did most of the work was the Planning Committee which also had permanent sitting members whereas membership for the Steering Committee changed from time to time depending on the availability of representatives from government ministries and other bodies. The Board was however more or less redundant and its role was played mainly by the Department of Environment in close collaboration with the Permanent Secretary and Minister for the Environment.

1.3 BIODIVERSITY CONCERNS BY ISLAND BASIS

Table 1: Prioritisation of Biodiversity Concerns by each Island

Issues and Constraints as Prioritised by the 8 Islands of Tuvalu	Nanumea	Nanumaga	Niutao	Nui	Vaitupu	Nukufetau	Funafuti	Nukulaelae
Overharvesting, no sustainable use of resources mechanisms in place, too many people, etc.	4	5	7		3	2	1	3
Non-degradable waste – batteries, leakages from power stations, sewage waste leakages into lagoon	5	2	4	4		3	4	4
People ignorance of biodiversity, lack of training, knowledge and skills in biodiversity	2	3		1	5	1	5	2
Absence of biodiversity legislation and weak law enforcement especially at the island levels			5	2		4	7	
Climate Change, salt-water intrusion into pulaka pits, coastal erosion and droughts (inadequate water storage)	1	4	1	5	4	9	8	1
Trade and Income Generation from Biodiversity						7		
Invasive Species	3	6	3	3	1	5		5
Natural Disasters		1	6	6		10		
Too much development without environment assessment impacts, and use of outside non-sustainable technologies and knowledge	6		2			8	2	
Non-sustainable cultural and traditional practices such as traditional feasting leading to waste of food and resources							6	

At the start of the consultation process, each island was able to identify biodiversity issues that are important to them. Table 1 above show the ranking of these priority issues by each island – number 1 indicates top priority and 10 is the lowest. These issues were further synchronized at the Stakeholders Workshop held on Funafuti from 27 to 30 April 2010.

After the synchronization process, the same issues were further assessed with the view to align them with the standard phrasing and interpretations used commonly at the global level while of course maintaining the Tuvalu context as much as possible. The result of this analysis is shown in Tables 2 and 3 below which now constitutes the main component of the Tuvalu National Biodiversity and Strategy and Action Plan.

Photo 1: Mangrove plantation in Funafala islet, Funafuti. An adaptation project funded by Tuvalu Overview (NGO).

2. BACKGROUND

2.1 GEOGRAPHY AND PHYSICAL ENVIRONMENT

Tuvalu is a small island state located in the Central Pacific 5-110S, 176-1790E, comprising nine atolls and low islands (Nanumea, Niutao, Niulakita, Nanumaga, Nui, Vaitupu, Nukufetau, Funafuti and Nukulaelae) with a total land area of only 26 sq km. The present population was estimated to be 11,636 (July 2005), growing at an annual rate of 1.47 percent per annum, excluding ex-patriot communities mainly in Australia, New Zealand and Kiribati. Nearly 50% of the population is located on Funafuti, on Fongafale motu (the main settlement area). It has a land area of about 1.9 sq. km with an estimated population of 4, 418, giving a population density of 2, 325 persons/ sq. km[2].

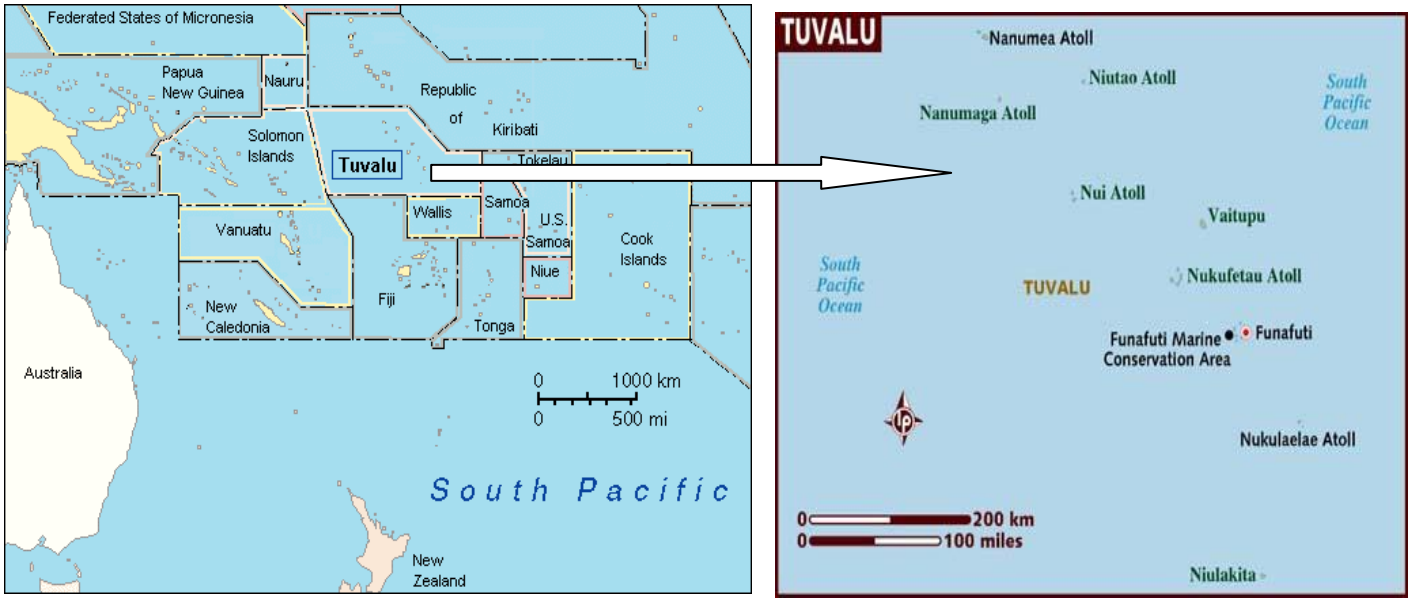

Photo 3 & 4: Map showing Tuvalu and its islands

Six of the islands are low lying atolls made up of motu (islets) fringing the edges of lagoons, made up of young, poorly developed, infertile, sandy or gravel coralline soils. Nanumaga, Niutao and Niulakita are raised limestone reef islands. Soils are generally of poor quality, supporting a limited variety of flora. Indigenous plants are rare, partly because of habitat modifications such as the extensive planting of coconuts and other food plants by early settlers. Just over 300 species have been recorded, of which about 65 are native species; the rest are introduced. Most are ornamentals and shrubs[3]. There are probably no indigenous land mammals. Twenty eight species of indigenous birds are known, approximately 20 species being sea birds, a few of which are migratory. There are also insects, land crabs and a few species of lizards of which only one has been confirmed to be endemic[4].

[2] UNDP, 2007
[3] Government of Tuvalu, 1999
[4] CBD, 2009

Tuvalu experiences a hot, humid tropical maritime climate, between the Inter-tropical and South Pacific convergence zones, with near constant temperatures throughout the year. Easterly trade winds prevail except in the wet season when winds blow from the west or north. There is a significant seasonal variability in precipitation with a May to October dry season and a November to April wet season. The average annual rainfall is 3,000 mm although 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-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[5]. As the average elevation in Tuvalu is one metre above mean sea level (MSL), with the highest being less than 5 metres MSL, the islands are highly vulnerable to cyclones and tsunamis. Tuvalu is one of the most vulnerable countries in the world to climate change and rising sea levels. 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 susceptible. The marine environment is comprised of six major ecosystem types (oceanic, outer reef, lagoon, back reef, lagoon floor, patch reefs and natural channels between the ocean and lagoon). These ecosystems produce the sediment required for island building and maintenance and support communities of corals, other invertebrates, algae, plankton, fish and marine mammals and reptiles. Approximately 350 species of fish have been recorded. As a result of the spread of islands over a vast expanse of sea, Tuvalu's Exclusive Economic Zone (EEZ) covers an oceanic area of approximately 900,000 sq km.

2.2 HISTORY AND EVOLUTIONARY TRENDS

In the 1980s environment was not considered a national priority and hence the absence of a specific 'department of environment' in the government's establishment. Events leading up to the signing of the Convention on Biological Diversity (CBD) were not well understood then by the government and more over by the people of Tuvalu. Even the terminology used in the local language initially was vague: when the phenomenon of climate change became a top priority for Tuvalu in the late 1980s, the word 'environment' was translated right away to include weather and 'living things in our surroundings[6]'. The latter obviously inferred a 'biodiversity' dimension although at that point in time knowledge and understanding of the people on biodiversity was very limited. Over time and following the inception of ground work for biodiversity, the phrase now used for biodiversity is 'living things[7]' while environment is better understood now as the absolute composite of all living and non-living things including weather, and climate change.

[5] Vavae, 2009

[6] 'mea ola i tou tafa'

[7] Note the disappearance of the words 'in our surroundings' and the phrase now reads in Tuvalu as 'mea ola' i.e. living things.

In the early 1990s, Tuvalu was hit by a number of cyclones, at one time 2 in one year – Cyclones Ofa and Nina in 1990. These events coincided with preparations at the global level for the first summit ever of World Leaders held in Rio de Janeiro in 1992. Following the devastating damages across the nation from the two cyclones, climate change dominated Tuvalu's agenda both at the regional and international levels. Saltwater intrusion into 'pulaka[8]' pits throughout the nation plus the erosion of shorelines resulting in the loss of landmass were seen then as main issues threatening the sustainable development and 'survival' of Tuvalu. While these processes were taking place, their connections to biodiversity were not understood – which indicates at that time absolute lack of understanding both at government and community on 'biodiversity'.

Nonetheless, at the Rio de Janeiro Summit proper in 1992, Tuvalu was among the first countries to sign the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). Climate Change continued to top the national priorities of Tuvalu at the regional and international levels especially when it was recognized that sea level rise, if allowed to continue, would result in the disappearance of Tuvalu under water. It was only in 2006 (14 years after the signing by Tuvalu of CBD), when ground work for the implementation of CBD commenced in Tuvalu. Project document for biodiversity was signed in 2008 and in 2009, the Project Coordinator arrived in Tuvalu when serious 'work' for biodiversity commenced. For the first time in 2009, Tuvalu submitted a National Report, the Tuvalu CBD 4th National Report[9].

2.3 BIODIVERSITY INITIATIVES PRIOR TO THE TNBSAP

As alluded earlier the NEMS provided a framework for environmental efforts in Tuvalu which enabled the development of key environmental policies that have guided the management of Tuvalu's limited resources over the last 12years. Tuvalu has established ten conservation areas (CA) on eight of its nine islands, only one of which has been established under formal legislation; the rest have been established by local communities and managed by traditional systems. The Funafuti Marine Conservation Area (FMCA) was established with the assistance of the South Pacific Biodiversity Conservation Programme (SPBCP - a GEF funded initiative), AusAID and SPREP. The CA is managed by the kaupule.

Other biodiversity initiatives include an Island Care project monitoring turtles, the establishment of a plant genetic collection by the Department of Agriculture, work on a Whale and Dolphin Action Plan and also the Regional Action Plan on Turtles in collaboration with the Secretariat of the Pacific Regional Environment Programme (SPREP). A local NGO, TANGO has been facilitating the planting trees and mangroves and has been working with Kaupule to establish CAs and to produce management plans for them. So far two management plans have been produced, whilst another two are

[8] Giant swamp taro 'Cytosperma chaminosis'
[9] There were no 1st, 2nd, and 3rd National Reports.

underway. The FMCA still does not have a plan though the CA was established ten years ago. There are many issues and conflicts to resolve, mainly arising out of the fact that there are increasing demands being placed on marine resources from residents (indigenous and non-indigenous) of Funafuti. Fishing and resource harvesting in the FMCA is banned (for both local indigenous residents living adjacent to the CA and to non-indigenous residents of Funafuti). However, illegal harvesting takes place. With the assistance of the SPBCP a patrol boat was purchased, but once the programme ended in 2001, a lack of funds led to the curtailment of patrols. These have only recently been resumed, with new funding support from GEF in 2009, which will last for two years.

Photo 5: An islet in Funafuti

2.4 BIOLOGICAL DIVERSITY: AN INTEGRAL ELEMENT OF TUVALU'S TRADITIONAL LIFESTYLES AND CULTURAL PRACTICES

Sustainable development and biodiversity are integral elements of Tuvalu's cultural practices and traditional lifestyles. For many years back, some islands had been applying conservation measures to allow for the regeneration and conservation of species for future consumption. These practices range from preservation and control of terrestrial flora and fauna, birds in the air, and marine resources.

On Nukulaelae Island for instance, spear fishing was prohibited in certain areas for over 40 years ago. The lagoon surrounding the main settlement of *Fagaua* was declared "koga tapu" (a conservation area) over 20 years ago and as a result variety of species of fish increased in great numbers and even became so tame that when people swim in the nearby lagoons, the fish do not get distracted from their normal cores. Likewise to allow for the sustainable consumption of coconut crabs, certain islets are closed for a period of six months and over, and people are not allowed to harvest coconut crabs in those closed islets. When these islets are opened for harvesting, others are closed and so forth. Now, coconut crabs are all over the islets and the community is even getting revenue from the sales of these crabs at the capital Funafuti.

The cultivation of the pulaka (giant swamp taro) in pits dug by earlier forefathers of the people of Tuvalu is a very classic demonstration of the Tuvaluan owned concept of sustainable development, environment management and sustainable use of resources. Pulaka is cultivated using organic manure and almost each family has its 'secret' ways of feeding their crops. Unlike conventional cropping, pulaka crops are planted very close to each other and spacing is not an important consideration. The size of a pulaka plot varies from two to about 20 square metres and rarely do a nuclear family own more than ten plots each. Not all crops mature simultaneously and when a farmer goes to harvest pulaka for food, he or she will randomly choose the most matured and just enough to feed the family. The same crop shoots that were harvested are planted at the same plots and manured over time. No pulaka pit will be empty of crops unless the owner is lazy. This manner of cultivation and harvesting as well as the replanting process demonstrates the Tuvalu way of sustainable farming and use of resources.

With the NBSAP of Tuvalu now in place, there is now the platform upon which the traditional lifestyles, knowledge, and cultural practices become the baseline upon which 'modernised' technologies and approaches are developed to address biodiversity concerns of Tuvalu.

2.5 AN OVERVIEW OF THE CONVENTION ON BIOLOGICAL DIVERSITY

Objectives:

The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding (*Article 1)*

Obligations:

The Convention obliges governments to take a number of measures, these include:

- Monitoring and identification of biodiversity
- Environmental Impact Assessments;
- National Strategies, plans or programmes to conserve and use the components of biological diversity sustainably; and
- The integration of biodiversity policy into relevant sectoral or cross sectoral plans, programmes and policies.

A Process:

The Convention is not a static treaty, but rather a process by which its Contracting Parties agree to take certain actions at the national level.

Some Features of the Convention:

- Recognition of national sovereignty over biodiversity and biological resources;
- Recognition that biodiversity is essential to our planetary life-support systems and that it makes an important contribution to a nation's economy;
- Requires developed countries to assist developing countries in biodiversity conservation;
- Recognition of the role of indigenous and local communities in protecting biodiversity;
- Promotes the fair and equitable sharing of the benefits arising from the use of genetic resources.

3. MAJOR THREATS AND CONSTRAINTS TO BIODIVERSITY CONSERVATION IN TUVALU[10]

The following excerpt from the 'Tuvalu National Strategy for Sustainable Development 2005 to 2015' (NSSD) highlighted the major threats and challenges facing biodiversity in Tuvalu.
The same challenges remain more or less the same up to present time and they include:

"**Environment**

Photo 6: Extreme high tide on Funafuti, 2005

Tuvalu is ranked one of the most environmentally vulnerable states in the region, largely because of its low relief and small land area. The key risks confronting the environment are:

- sea level rise as a result of climate change;
- rising population density in Funafuti;
- decline in traditional resource management;
- unsustainable use of natural resources; and
- poor waste management and pollution control."

The same NSSD document further stipulated the challenges to the environment as:

> 1) the numerous issues arising from the growing urbanisation of Funafuti, and

[10] For information on the status of biodiversity in Tuvalu, please refer to Tuvalu's Fourth National Report to CBD, pages: 19-20.

2) the national impacts associated with climate change and sea level rise, specifically salt-water inundation of pulaka pits, coastal erosion and flooding, which are blamed either wholly or partly on global warming.

3.2 INVASIVE SPECIES

Another major threat that Tuvalu is currently facing is Invasive Species. Through the NBSAP Project, awareness programs have been able to highlight the reality of invasive species and its impact as a threat to Tuvalu's biodiversity. What can be deduced from our workshop results is that there is a real need to implore communities on the importance of understanding both the positive and the detrimental effects of Invasive species. While it may be premature to assume that this is entirely a case of lack of awareness. Interviews with locals reveal that new discoveries of the medicinal value of floral invasive species such as the Mile-a-Minute (*Persicaria perfoliat)* makes it difficult for locals to acknowledge any negative impacts of invasive species. Another such example is the Yellow Dots (*Wedelia trilobata)* which is a popular ornamental plant used for making traditional head

Photo 7: Flooding at the Funafuti Power Station, 2006

garland *fou*. Due to the limited terrestrial species diversity people are naturally inclined to introduce new plants and crops for various purposes including diet supplementary (yam/sweet potatoe *Oxalis tuberosa***)**. *In*vasive plants are introduced either by women as ornamental plants or through agricultural ventures. Recently the development of the Sport Stadium on the Island of Funafuti has also introduced foreign species from Fiji where the soil was imported from.

Photo 8: Yellow dots (wedelia trilobata) found in Tuvalu

Tuvalu's 4th National Report to CBD describes additional direct and indirect threats and is detailed in pages 16 to 18 of the Report.

4. THE PLAN

4.1 VISION

In line with Tuvalu's National Vision "To achieve a healthier, more educated, peaceful and prosperous Tuvalu" the Tuvalu NBSAP's Vision is:

"By the year 2020, Tuvalu would have a clean and healthy environment, full of biological resources where the present and future generations of Tuvalu will continue to enjoy the equitable sharing of benefits of Tuvalu's abundant biological diversity"

4.2 MISSION

We shall apply our traditional knowledge, together with innovations and best practices to protect our environment, conserve and sustainably use our biological resources for the sustainable benefit of present and future Tuvaluans.

4.3 GOALS

Broad goals of the Tuvalu NBSAP shall be:

- To prevent air, land and marine pollution
- To control and eliminate invasive species
- To rehabilitate and restore degraded ecosystems
- To promote and strengthen the conservation and sustainable use of Tuvalu's biological diversity
- To recognize, protect and apply traditional knowledge, innovations and best practices in relation to the management, protection and utilization of biological resources
- To protect wildlife
- To protect seabed and control overharvesting in high seas and territorial waters

4.4 GUIDING PRINCIPLES

- Principle of human dignity: no life without (food) Biodiversity; those to whom it is denied are denied life.
- Principle of Participation: the people at all levels must be involved in the planning and management of Tuvalu's biodiversity.
- Principle of Solidarity: The inter-dependency and high reliance on one aspect of Biodiversity to another command for a holistic environment management approach.
- Principle of Human Equality: granting to all Tuvaluans their dues
- Principle of the Common Good: Biodiversity is common good to all.
- Principle of Stewardship: finding an ethical balance among using, changing, and safeguarding Tuvalu's Biodiversity.

Photo 10: A migratory bird found in Tuvalu

4.5 STRATEGY AND ACTION PLAN

This chapter constitutes the heart of the Tuvalu NBSAP. In a way, it is a blessing in disguise for Tuvalu to become one of the last countries to formulate its NBSAP so it could learn from the lessons of the earlier NBSAPs. Thus, in the formulation of Tuvalu's Strategy and Action Plan, careful consideration was given to the outcome of the regional review of NBSAPs[11] which resulted in the incorporation of Key Performance Indicators (KPIs) and Key Stakeholders to lead the implementation of agreed strategy goals and associated action plan. Furthermore, Tuvalu's NBSAP is presented in two (2) interdependent categories: (i) **Cross-Cutting Issues** and (ii) **Broad Themes, Strategy Goals and Objectives** and further discussed in the subsequent paragraphs.

4.5.1 CROSS-CUTTING ISSUES

Initially, stakeholders identified a total of fifteen (15) priority areas during the Workshop held at Funafuti from 27 to 30 April 2010. These priority areas were further analyzed then streamlined to the following five (5) of these priority areas as cross-cutting issues and they include:

1. Capacity Building, Education, Training, Awareness and Understanding
2. Sustainable Development and Environment Management
3. Mainstreaming and Financing Mechanisms

[11] Pacific Regional Review of NBSAPS by Eleanor Carter, 2007

4. Legal Framework for Biodiversity and Law Enforcement
5. Monitoring and Evaluation

Table 2 presents the five cross-cutting issues and their respective goals and objectives as agreed to by stakeholders. These cross-cutting issues are pertinent to the effective implementation of the NBSAP and must be addressed first prior to the execution of the agreed priority themes, goals and objectives presented in Table 3. Without the implementation of the necessary actions for each of the cross-cutting issue, the set targets outlined in the Strategy and Plan of Action in Table 3 will not be fully achieved and hence the expected status for biodiversity will remain underdeveloped.

Some priority strategic targets and actions for each of the cross-cutting issues:

Cross-Cutting Issue 1: Capacity Building, Education, Training, Awareness and Understanding

From the outset, analysis of the existing capacities pertinent for biodiversity both at the national and island levels ought to be undertaken. Integral components of this study include:

- identification of capacity and training needs at both levels together with associated proposed solutions to these needs;
- establish gaps between traditional knowledge and cultural practices with the state of the art practices in biodiversity;
- formulate training modules as well as relevant curricula streams – the latter for incorporation of teaching of biodiversity at all levels of schooling in the country, while the former is for national and community training workshops; and
- last but not the least is compiling of radio programmes and a newsletter to help keep the people abreast of biodiversity issues and programmes.

Cross-Cutting Issue 2: Sustainable Development and Environment Management

While environment is one of the three major pillars of sustainable development, specific mention of 'environment management' is made here to emphasise the importance of taking into full account the impact of any development activities on the environment. In particular, environmental impact assessment (EIA) must be a major considering factor in any development activity. Furthermore, the biological diversity dimension of any development activity must be well established right at the start of project

implementation and accounted for accordingly. Important priority actions for this particular cross-cutting issue include:

- make biodiversity one of the major benchmarks in the upcoming review of National Sustainable Development Strategy of Tuvalu to ensure priority ranking for biodiversity and the environment at large within the national policy framework;
- draft relevant legislation to enforce the application of EIA(s) for all development projects both at the national and island levels; and
- create an awareness programme for the people to appreciate and fully comprehend the contribution of biodiversity and environment management overall towards sustainable management.

Cross-Cutting Issue 3: Mainstreaming and Financing Mechanisms

Cross-cutting issues 1 and 2 discussed above are imperative prerequisites for the successful mainstreaming of biodiversity into the overall national policy and legal frameworks. Likewise, identification of financing sources together with the preparation of saleable project proposals also depends on the satisfactory accomplishment of 1 and 2 above. As in other Pacific Island countries, Tuvalu lack skills in good project formulation and thus is important to acquire at the earliest necessary skills in this area either by technical assistance through on-the-job training and academic education.

Cross-Cutting Issue 4: Legal Framework for Biodiversity and Law Enforcement

Following from 1, 2 and 3 above is the provision of the necessary legal framework to legally enforce agreed actions and hence timely achievement of targets. Annex II.5 shows the existing legal framework impacting on biodiversity – this is the legal baseline benchmark. Satisfactory mainstreaming of biodiversity with established clear goals and objectives will show areas lacking legal support and enforcement that will form the basis for building the necessary legal framework.

Cross-Cutting Issue 5: Monitoring and Evaluation

Absence of an established monitoring and evaluation framework is a major contributing factor to the failure of projects and more specifically the achievement of set targets. In the case of Tuvalu, the Department of National Planning is expected to undertake regular monitoring and evaluation of projects and the overall national development process. It is proposed nonetheless that a monitoring and evaluation framework for the Tuvalu NBSAP is constructed right from the outset and that the following activities

are imperative prerequisites for an effective biodiversity monitoring and evaluation framework:

- designate the Department of Environment as the lead agency to conduct regular monitoring and evaluation of all biodiversity projects emanating from this Tuvalu NBSAP;
- as a matter of priority and before any serious NBSAP project activities are implemented a *logframe* (also called 'Results or Output Based Matrix') must be jointly constructed by relevant stakeholders immediately following the approval of the Tuvalu NBSAP. (This is the baseline data for the regular monitoring of the Tuvalu NBSAP. ; and
- conduct relevant training for all stakeholders on the application of this Output-Based Matrix in the monitoring and evaluation process.

Of paramount importance in any strategic plan is the flexibility to adapt to unexpected events and thus the Tuvalu NBSAP is a living document for which the monitoring and evaluation process is crucial to its dynamicity and adaptability.

Photo 11: salt intrusion into pulaka pits causing it to die/wilt.

Table 2

Cross-Cutting Issues[12] Necessary for the Effective Implementation of the Agreed Priority Thematic Areas, Goals and Objectives of the Tuvalu NBSAP

Theme	Strategy Goal	Objectives	Actions
1. Capacity Building, Education, Training, Awareness and Understanding	To enable the people of Tuvalu to understand, appreciate and have the necessary know-how to conserve and sustainably use biodiversity resources	1. Establish biodiversity priorities for each island, non-government organizations and the national government at large	1. Undertake needs assessment surveys for each island to clearly establish island priorities in terms of capacity 2. Secure funding for island activities 3. Formulate relevant training modules 4. Training of the Trainers 5. Conduct island training workshops
		2. Strengthen the capacity of people, especially those directly responsible for the development, management and conservation of biodiversity	1. Establish concise island plans for biodiversity 2. Develop action plans for each island 3. Prepare project proposals for each island 4. Continue training of the trainers programme as required
		3. Increase number of Tuvaluans trained in environmental science and biodiversity in	1. Increase number of scholarships for environmental studies each year 2. Streamline biodiversity into primary and secondary

[12] Identified and agreed by Stakeholders Consultation Workshop on Funafuti held from 27th -30th April 2010

		particular	curricula 3. Ensure adequate funds is available for biodiversity activities
		4.Establish necessary networking both within and outside entities to assist facilitate effective development and management of biodiversity	1. Commence actions to document and store all forms of traditional knowledge, skills and cultural practices on biodiversity 2. Sharing experiences and knowledge between islands on implementation of their respective biodiversity plans 3. Establish key supporting stakeholders for the implementation of island biodiversity plans 4. Identify technical assistance requirements both from within and outside Tuvalu
		5. Take into full account biodiversity in all aspects of planning and development on each island	1. Undertake analysis of potential contribution by biodiversity to island and national economic development overall 2. Increase awareness of people not only by training workshops but more over radio programmes and newsletter 3. Improve know-how of people working directly for biodiversity so they could undertake their respective roles effectively
2. Sustainable Development and Environment Management	For all development activities across the nation to take full account of the	1. All development activities regardless of its nature and magnitude must be subjected first to an	1. Institute legislation (if none available yet) on EIA so to ensure its enforcement and application accordingly 2. Continue exposing people to impacts of development on biodiversity and how best to control the risks

	impacts on biodiversity of Tuvalu and take appropriate steps to control the risks	EIA	involved
		2. Consolidate all national efforts and activities under international conventions related to the environment in order to meet Tuvalu's obligations and thus strengthen its position to attract international assistance	1. Designate an entity in Government that will oversee the fulfillment of Tuvalu's obligations under all conventions related to biodiversity and environment at large 2. Develop relevant programmes to inform the people of the status of each convention and how Tuvalu is benefitting from each convention 3. Establish clear priorities for Tuvalu under each convention and pursue them accordingly
3. Mainstreaming and Financing Mechanisms	To integrate priority biodiversity benchmarks into the national policy framework and simultaneously institute appropriate funding levels	1. Review feasibility of establishing a National Trust Fund for Biodiversity	1. Commission a study on the potential of establishing a National Trust Fund for Biodiversity 2. Explore other alternative funding for biodiversity in Tuvalu should the concept of a National Trust Fund deemed not feasible such as: • Introduction of green taxes • Tax for all visitors to Tuvalu for enjoying the clean air and biodiversity of Tuvalu • All researchers other than Tuvaluans conducting research in Tuvalu must pay a certain fee • Etc.

		2. Review all documentations related to environment in Tuvalu and build baseline data for mainstreaming biodiversity into Tuvalu's overall national policy framework	1. Further consolidate all documentations presented in Annex III of the Plan and extract essential benchmarks as baseline data to proceed with the mainstreaming process 2. Formulate an integrated national policy on biodiversity for Tuvalu
4. Legal Framework for Biodiversity and Law Enforcement	Consolidate all biodiversity related legislations into a one legislation and to put in place enforcement mechanisms	1. Review all legislations impinging on biodiversity with the view to consolidate all into one legislation	1. Review list of existing legislations presented in Section 5 of Annex II and further ascertain if there are more not yet included in the list 2. Explore possibility of drafting a consolidated biodiversity legislation 3. Draft Biodiversity legislation
		2. Review status of all bye laws relating to biodiversity and where possible amend the relevant national legislations in order to enforce the bye laws	1. Establish inventory by island of all bye laws related to biodiversity 2. Analyse status of each bye law and establish which that lack enforcement and the reasons for such 3. Establish which national legislations that are being contradicted by these bye laws and explore potential for amending them to allow application of bye laws 4. Amend relevant national legislations 5. Conduct necessary training for island magistrates as and where required

		3. Increase public awareness and understanding on the law and how important especially to comply	1. Prepare posters/brochures, radio programmes/video scripts for distribution 2. Strictly enforce all bye laws 3. Inform the public of the fines and penalties for breaching the bye laws and as well as related national legislations
5. Monitoring and Evaluation	To establish an effective monitoring and evaluation framework for the Tuvalu NBSAP	1. Construct the NBSAP logframe	1. Firstly construct the NBSAP logframe at the national level 2. Since each island will have its own biodiversity plan i.e. at least a work plan in particular, each island must also construct a corresponding logframe at the island level 3. From the NBSAP national logframe, priority action plan will be determined upon which biodiversity development activities will follow
		2. To undertake regular reviews of the NBSAP	1. Designate a Unit each at the national and island levels responsible for the regular monitoring and evaluation of project activities 2. Establish clear time frame and benchmarks for the purposes of monitoring an evaluation 3. Where necessary conduct training workshops on monitoring and evaluation
		3. Establish clear coordinating	1. Clearly establish roles for each organization within and outside Tuvalu in supporting implementation of

	framework among the national, regional and international organizations	Tuvalu's NBSAP 2. Orient and train nationals (Tuvaluans) in the processes involved in securing technical and financial assistance from relevant and regional and international organsiations

4.5.2 BROAD THEMES, STRATEGY GOALS AND OBJECTIVES

Table 3 summarise the agreed broad themes, strategy goals and objectives agreed to by the stakeholders workshop conducted on Funafuti from 27 to 30 April 2010. These constitute eight themes altogether and are further elaborated by specifying associated goals and objectives. Additional features of the Tuvalu NBSAP shown in the same Table 3 (which emanated from the Pacific 2007 Review of NBSAPs by Eleanor Carter) include proposed actions to achieve each objective; key performance indicators (KPIs) to help measure the level of attainment; and allocation of key stakeholders responsible for the respective actions.

At the Funafuti Stakeholders Workshop in April, 2010 participants prioritised the themes as follow (refer the Table 3):

i. Climate Change and Disaster Risk Management
ii. Traditional Knowledge, Cultural Practices, Indigenous Property Rights
iii. Conservation of Species, Ecosystems (Marine, Coastal, Land terrestrial) and Genetic Diversity
iv. Community Empowerment, Involvement, Awareness, Understanding and Ownership
v. Sustainable Use of Natural Resources
vi. Trade Biosecurity and Food Security
vii. Waste and Pollution Management
viii. Management of Invasive Species

While each theme may have been prioritized as shown in the ranking above, they are all inter-connected one way or another. It is important therefore to clearly establish the linkages between the actions proposed for each theme in order to optimize the use of resources when come to implementation. A most essential stepping stone in this direction is the construction of the *logframe* or "Output-Based Matrix" well before any activities is implemented. This *logframe* will clearly establish priority outcomes and outputs upon which the actions or project activities will follow. In this logframe as well, estimated costing for each activity should also be included.

Table 3

Tuvalu's National Biodiversity Strategy and Action Plan (NBSAP[13]) 2010 – 2015
Guiding Framework of Priority Themes, Goals and Objectives and Actions

Themes	Strategy Goals	Objectives	Actions	Key Performance Indicators (KPIs)	Key Implementing Stakeholders (KIS)
1. Climate Change and Disaster Risk Management  ***May 2009 Northeast side of Nanumaga, Block Seawall weathered loosing sharp edges.***	Build resilience of biodiversity to manage, control and reduce the risks and impacts of climate change and natural disasters	1. Improve knowledge on the impact of climate change and natural disasters on biodiversity	1. Conduct assessment of impacts of climate change and natural disasters on biodiversity 2.Riase awareness of meteorologists and climatologists on the linkages between climate information and biodiversity conservation 3. Assess and establish effective coordination arrangements to facilitate the mainstreaming of biodiversity conservation into climate change and disaster risk management policies and programmes by 2011 4. Document and disseminate key information on the impact of climate change and natural disasters on biodiversity 5. Develop and conduct awareness and understanding programmes on the inter-connections between biodiversity, climate change and natural disasters targeting all levels: national, islands,	•At least 2 qualified meteorologists by year 2014 •At least 2 qualified climatologists by year 2014 •Coordination mechanisms and arrangements agreed to by all relevant agencies	Met Office Foreign Affairs Planning Environment Falekaupule OPM

[13] Debated and endorsed by NBSAP's Stakeholders Workshop held on Funafuti from 27th -30th April, 2010.

	community groups and non-government organizations	
2. Ensure meteorology and climate change information systems are relevant to biodiversity protection and conservation.	1. Work closely with the Met Office to develop information systems that are relevant to biodiversity 2. Build capacity to understand met and early warning information systems and their relevance to biodiversity 3. Identify potential donors for implementation of above actions and prepare relevant project proposals	• All IT and other relevant infrastructure within Met Office reflect biodiversity information by year 2015 • Funding secured to implement biodiversity related met activities by year 2013
3. Develop contingency plans to ensure biodiversity, culture and traditions of Tuvalu are preserved and protected in time of extreme events of climate change and natural disasters	1. Contribute to dialogue and planning for adaptation and mitigation purposes should Tuvalu be relocated due to impacts of climate change and natural disasters 2. Identify options for ecosystem based adaptation 3. Identify ex-situ options for conservation of Tuvalu biodiversity 4. Collect, research, document, record and store traditional knowledge on impacts of climate change and natural disasters on biodiversity	• Paper prepared and submitted to cabinet on options for biodiversity conservation in response to • impacts of climate change and natural disasters • Ex-situ Strategy Biodiversity for Tuvalu in place by year 2015 • Data base on all

				traditional knowledge established by year 2015	
2. Traditional Knowledge, Cultural Practices, Indigenous Property Rights  *Fou(headwear) made from fresh flowers and other plant materials, is a traditional wear for special occasion & daily.*	Increase the use of traditional knowledge and practices in the conservation and management of biodiversity in Tuvalu as well as the equitable sharing of benefits	1. Foster and promote the use of traditional knowledge and cultural practices in the conservation and management of biodiversity in Tuvalu	1. Integrate traditional knowledge and cultural practices into the education curriculum for all levels of education in Tuvalu 2. Conduct research and document all traditional knowledge and cultural practices pertinent to biodiversity 3. Undertake a comprehensive analysis of all unsustainable cultural practices that degrade the value of biodiversity (such as excessive feasting, fishing methods, and harvesting practices) 4. Conduct awareness programmes to increase understanding on the value of traditional knowledge and sustainable cultural practices	•Publish a book on all sustainable traditional knowledge and cultural practices by year 2016	Environment Education Home Affairs Agriculture Fisheries Health Falekaupule
		2. Preservation of traditional knowledge and cultural practices pertinent to the conservation and management of Tuvalu	1. Conduct research and document all traditional knowledge and cultural practices pertinent to biodiversity 2. Develop training and awareness programmes targeting the young generations of Tuvalu to enable them learn and practice traditional skills	•Strategy for mordenisation of relevant traditional knowledge and cultural practices in place by year 2014	

		biodiversity	3. Conduct research on dimensions of traditional knowledge and cultural practices which could be modernized by adapting to complement outside technologies	•Sustainable traditional knowledge taught in schools by year 2015	
		3. Foster and promote the equitable sharing of benefits derived from biodiversity	1. Conduct analysis to identify elements of biodiversity which could be commercialized 2. Develop strategic plans for the management and implementation of indigenous property rights 3. Establish benchmarks for the equitable sharing of benefits derived from biodiversity	•At least 1 to2 indigenous property rights would have been instituted by year 2015	
3. Conservation of Species, Ecosystems (Marine, Coastal, Land terrestrial) and Genetic Diversity `	Protect and conserve biological diversity of ecosystems, species and genetic resources	1. To protect and conserve diversity of ecosystems	1. Conduct inventory and assessment of ecosystems requiring protection and conservation (to establish baseline data and information on ecosystems) 2. Develop integrated ecosystems management plans 3. Promote ecosystem based adaptation and conduct training and awareness on EIA 4. Conduct training and awareness programmes on ecosystems management 5. Formulate appropriate policies and	•Published ecosystems management plans by year 2014 •Policy paper and legislation in place for ecosystems services by year 2014	Environment Fisheries Agriculture Trade Falekaupule SPC FAO USP SPREP SOPAC

Photo by Molipi Tausi: May 2009
Niutao NBSAP Consultation

	legislation on ecosystems services - coastal vegetation, coastal fisheries, mangroves, coral reefs, water, agriculture etc[14].	
2. To preserve, protect and conserve diversity of species	1. Conduct comprehensive inventory, and assessment of all species (terrestrial, and marine) 2. Conduct training and awareness programmes on species diversity 3. Establish management plans to improve and restore the status of threatened species (strategies, targets, activities, funding and monitoring etc.)	• Inventory of endangered species published by year 2014 • At least 2 training workshops conducted on species diversity by year 2014
3. To protect and conserve the genetic diversity of Tuvalu	1. Conduct inventory and assessment of genetic diversity of Tuvalu 2. Formulate policy on intellectual property rights and relevant legislation to protect and conserve the genetic diversity of Tuvalu 3. Conduct awareness and training programmes to enhance the understanding and management of genetic diversity	• At least 2 trained people (with academic qualifications) on species diversity by year 2015 • Management plans compiled on species diversity by year 2014 • Inventory of

[14] (for enjoying the clean air, cool fresh breeze, blue sky, blue and clean ocean, sunshine and free water and paying for the cost for sharing these ecosystems benefits and whatever damages they may cause) for people coming from overseas to enjoy the ecosystem diversity of Tuvalu.

				genetic diversity in place by year 2013 • integrated policy and plan of implementation on genetic diversity by the year 2014	
4. Community – Empowerment, Involvement, Awareness and Understanding and Ownership 	Enhance capacities of all islands (Falekaupule and NGOs) to empower them take the lead in the implementation of biodiversity strategy and action plan	1. Building capacities of Falekaupule and their respective people to manage and conserve their island ecosystems to provide sustainable benefits and livelihoods	1. Prepare training materials, posters, booklets etc. on biodiversity 2. Conduct at least one training workshop for all islands every 2 years 3. Conduct one national symposium ever 2 years where islands would share experiences and jointly review achievements of targets 4. Establish a financing framework for island biodiversity	• Government and Falekaupule would have provided at least $10,000 each in their annual budget by year 2014	Falekaupule Kaupule Education Personnel NGOs Environment Attorney-Gen Agriculture Fisheries
		2. Empowering communities to lead in the management and conservation of their island biodiversity	1. Mapping of island ecosystems, identifying endangered species, potential areas for conservation, processes involved and inter linkages among them 2. Develop and implement community awareness and understanding programmes on biodiversity 3. Create biodiversity champions to lead	• All islands should take full charge of the management and development of their island ecosystems by year 2015 • Funding	

			and advocate the importance of biodiversity 4. Conduct youth capacity training programmes on formulation and implementation of biodiversity activities 5. Formulate community-based monitoring and reporting systems 6. Establish a framework where islands would share experiences, lessons, sustainable practices, skills and knowledge by 2012	ascertained by 2014	
		3. Review of existing by-laws and relevant national legislations impacting on biodiversity and align them so communities are effectively empowered to protect and conserve biodiversity	1. Establish an inventory of all by-laws relating to biodiversity throughout the nation 2. Determine which ones that could not be executed due to clashes with national laws and a review them accordingly 3. Facilitate amendment of national laws to allow for the effective enforcement of biodiversity by-laws 4. Explore practicality of formulating a consolidated national law for biodiversity and if determined most suitable, formulate a National Biodiversity Law	• Falekaupule bye-laws on biodiversity fully enforced • National Biodiversity Law in place by year 2013-2014	
5. Sustainable Use of	Improve the	1. Augment the	1. Develop management plans for all	• All islands	Environment

Natural Resources  *Green coconuts, normally used by Tuvaluans for drinking*	sustainable management and use of existing conservation areas and establish more conservation areas throughout the nation	management of existing conservation areas throughout the nation	existing conservation areas by 2012 2. Formulate and enforce relevant legislation to enhance the protection of conservation areas 3. Conduct baseline surveys to determine potential areas throughout Tuvalu where conservation areas and protected areas could be established 4. Acquire the necessary equipment and funding to support the augmentation of the management of conservation areas.	would have conservation management plans by the year 2013 •Complete baseline survey for protected and conservation areas by 2013 •Number of relevant legislations reviewed and amended for the protection of conservation areas •Project funds should have been secured by 2013 •At least 1 to 2 workshops [15]would have been conducted by year 2013	Kaupule Attorney-Gen Fisheries Agriculture NGOs Women Youth Education Planning Trade SPREP USP SOPAC SPC FAO
		2. Increase the number of new conservation areas throughout	1. Train more people in the management of conservation areas so that by the year 2013 all islands will have trained people	•By the year 2015, at least 15% of the area of Tuvalu would	

[15] on the sustainable use of resources

	the nation	2. Establish necessary benchmarks whereby conservation areas are used and managed sustainably (for instance to know when to open them up for consumption and eco-tourism) 3. Establish protected areas throughout the nation to enhance biodiversity in Tuvalu[16] 4. Empower Kaupule member/capacity on management plan 5. Establish baseline data survey	have been protected and conserved • Implementation plan in place for the sustainable use of biodiversity by year 2013
	3. Create alternative livelihoods through the sustainable use of relevant biodiversity to provide sustainable livelihood and income to communities and families	1. Conduct an economic valuation of biodiversity 2. Mainstreaming of biodiversity into the national policy framework and sector plans 3. Conduct feasibility study on alternative livelihoods (aquaculture, eco-tourism, pearl farming etc. etc.) 4. Review EIAs and enforce relevant legislation to ensure protection and conservation of biodiversity	• Policy Paper in place by the year 2013[17] • Biodiversity priorities and issues integrated into Kakeega II review by end 2010 • Enforcement framework for EIAs in place by the year 2012

[16] Need to define protected areas from conservation areas

[17] showing clearly the linkages between sectors on biodiversity, and its overall status within the national priorities and policy framework

				• Development plan for commercialisation of relevant species by year 2014	
6. Trade, Biosecurity and Food Security[18]  *Tuna fish, catchment of a fisherman a day*	Revive the production and consumption of local food	1. Foster and promote traditional agriculture and agro forestry	1. Establish and encourage organic home-gardening so that all households have home gardens by the year 2012 2. Raise awareness and understanding on the importance of agro forestry and its contribution to biodiversity 3. Raise awareness and understanding on the value of organic farming as opposed to inorganic farming for example the use of chemical fertilizers and pesticides 4. Increase cultivation and preservation of traditional food crops 5. Integrate biodiversity into trade related policies 6. Work with relevant agencies and organizations to assess marketable food crops and other local produce and establish an inter-island trading network	• Replanting of local trees, coconuts plus cultivation of new pulaka pits would have covered an acreage of land up to 2 square kilometers • By the year 2015, all imported food would have been labeled clearly in English	Trade Finance Environment NGOs Health Education Agriculture SPC FAO

[18] Includes biosecurity, even correlates very closely with traditional agriculture and healthy eating, and even climate change

	7. Formulate, strengthen and enforce a biosecurity policy and legislation for the whole of Tuvalu covering inter- island transport and with outside	
2. Foster and promote the production and consumption of local food	1. Contribute to the review national food policy and strengthen those elements fostering biodiversity 2. Work with relevant agencies and organizations to document and disseminate the nutritious value of all local food crop 3. Document traditional food preservation and cooking methods and practices that are significant to biodiversity conservation 4. Establish a consumer protection and awareness and understanding programme that reduces the importation of non-nutritious and unhealthy food by 2012 5. To make it mandatory that all imported food items are clearly labeled showing ingredients, nutritious values and expiry dates in English and Tuvaluan	• Integrated Food Security Policy and Implementation Plan in place by year 2013 • Production and consumption of traditional food crops increased by 20% by year 2015 • Biosecurity Policy and Strategy in place by year 2014
3. To increase awareness and	1. Work with the Ministry of Agriculture to examine status of food security in	• Baseline data on food security

		understanding of the people on the linkages between food security and biodiversity	Tuvalu and contribute to the formulation of a National Food Security Policy that integrates biodiversity 2. Facilitate better coordination of key agencies with mandates impacting on biodiversity and food security 3. Conduct awareness and understanding activities at all levels of the society on the linkages between food security and biodiversity 4. Formulate, strengthen and enforce a biosecurity policy and legislation	status in Tuvalu in place by year 2013	
7. Waste and Pollution Management  *September 2009 an area designated for waste disposal Nukufetau*	Integrating key biodiversity conservation criteria into existing and new waste management policies, strategies and plans	1.To ensure the impacts of waste on biodiversity is minimized	1. Contribute to the review, of the 'waste management plan' for Funafuti to ensure biodiversity impacts from waste are reflected 2. Work with relevant agencies to integrate biodiversity criteria to the review of existing waste management plans and the formulation of new ones for all islands 3. Work with relevant agencies to encourage use of organic waste for composting purposes and production of biogas	• By 2013,all islands have Waste Management and Implementation Plans	Environment Home Affairs (Waste Unit) Public Works Division Health Kaupule Finance Planning Attorney-Gen
		2. Enhance capacity and	1. Formulate green taxes policy by 2011	• Execution and enforcement of	

		understanding on impact of waste on biodiversity	2. Put in place a relevant legislation framework for green taxes by 2011 3. Review importation and disposal mechanisms of goods that generate waste so to become more environment friendly by 2012 4. Conduct training and awareness activities on the impacts of waste on the impacts of waste on biodiversity 5. Conduct a survey and research on the impact of waste on biodiversity 6. Produce a policy paper to inform cabinet and other relevant agencies on the findings from the survey etc.	green taxes by year 2012 • Importation of motor vehicles reduced by 20% by year 2015 • Increase of use of bicycles to 20% by year 2015 • At least 2 training and nationwide activities conducted annually • Survey report completed and produced • Policy paper produced and approved by cabinet	
8. Management of Invasive Species	Manage and eradicate invasive species and enforce biosecurity to protect and conserve biodiversity of	1. Establish management plans to control and eradicate invasive species	1. Conduct surveys to identify invasive species and the extent of damage to biodiversity and economy of Tuvalu overall 2. Review, strengthen and enforce legislations to better manage and control invasive species	• Baseline data on benefits and extent of damage by invasive species by year 2013 • Management and	Environment Agriculture Customs Falekaupule Kaupule SPC FAO SPREP

 ***Wedelia trilobata a common invasive species throughout Tuvalu***	Tuvalu		3. Develop and implement invasive management plan(s)[19]	Implementation Plan for Invasive species compiled by year 2013
		2. Upgrade capacity, equipment and infrastructure to enforce biosecurity at all points of entry including inter island transportation	1. Training at least 2 to 4 personnel to effectively manage and execute the basic biosecurity routines 2. Acquire the necessary machines at the earliest preferably by the end of 2010 (through the preparation of a proper project proposal) 3. Review and upgrade existing legislation to manage and control the introduction of foreign, alien and invasive species 4. Develop awareness programmes and disseminate information to enhance understanding of the people on biosecurity	• By year 2013, all entry points from overseas now have "x-ray" machines to screen all goods brought from overseas • A least 3 to 5 personnel trained in the management of these "x-ray" machines by year 2013

[19] Taking into account: awareness, funding and project proposals, project activities, coordination, monitoring and evaluation.

5. IMPLEMENTATION, MONITORING AND EVALUATION

Monitoring and Evaluation is also discussed at the main section of the NBSAP under "Cross-Cutting Issues" above. For implementation, it is important to establish a very clear implementation plan right from the outset. Crucial to the successful achievement of biodiversity targets outlined in this Plan, is the commitment by the Government of Tuvalu to lead out in the overall implementation process.

One of the first priority tasks shall be the establishment of a clear coordination framework involving regional/international, national and islands agencies stipulating clearly the respective roles and responsibilities of each stakeholder. But this task must come after the **construction of "the NBSAP logframe"** as in the NAPA logframe. Not only would this NBSAP logframe be the standing benchmark for regular monitoring and evaluation of the Plan, but it will also serve as the major guiding framework for formulating work plans. The NBSAP logframe must be constructed jointly by key stakeholders as and where necessary immediately after the approval of the Tuvalu NBSAP. This is the logframe at the national level and since each island will have its own biodiversity plan, it is therefore important that each island also construct an island logframe. There is no such thing as a perfect logframe matrix. The best results come from considerable discussion among key stakeholders, guided by facilitators who have a good understanding of the project context and logframe planning. If the project strategy is put to use by stakeholders after the discussions, then not only the logframe matrix will simply becom a support and a reminder, but also providing the basis for project implementation, including the development of annual work plans and budgets.

Other priority tasks right after the endorsement of the NBSAP logframe would include:

- Scooping study of the biodiversity benchmarks requiring mainstreaming into the overall national policy framework;
- Undertake mainstreaming activities by way of the development of a 'national biodiversity policy' and develop project proposals;
- Draft the necessary legal biodiversity legislation to facilitate effective implementation of the project activities; and last but not the least
- Formulating a Project Proposal to kick-start the implementation process especially in terms of securing new funding for the next cycle.

Annexes:

Annex I

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Framework of Existing Activities impinging on Biodiversity of Tuvalu

1. United Nations Convention to Combat Desertification (UNCCD) Tuvalu National Action Plan

Actions that are relevant to the NBSAP[20]	**Providing enabling activities**	• review existing legislation related to land degradation, sustainable land management and drought at the national and local level; • strengthen existing legislation to support the programme and/or enacting new laws to support implementation of the programme if necessary; • conduct studies/research to collect and provide baseline information on Tuvalu's ecosystems to enhance sustainable land management efforts; • strengthen institutional capacity of institutions and organizations to effectively address land degradation and sustainable development; • promote public awareness aiming at all related stakeholders, on the importance of the programme and how they can contribute to the programme
	Land Degradation Inventory and Monitoring	• monitoring of soil erosion and sedimentation; • inventory and mapping of degraded land using GIS and hazard maps); • management of land degradation data; • identify root causes
	Prevention of Land Degradation	• establish guidelines and standards for soil conservation techniques; • promote soil conservation and its benefits, and the dangers of land degradation through trainings and awareness workshops;

[20] Emanating from the UNCCD

	• encourage and strengthen local participation in land degradation prevention projects; • promoting urban and community greenspace activities; • promote and support proper solid waste management practices; • encourage and support full integration of a nationwide network of protected areas with sustainable land management activities. • rehabilitate degraded lands; • rehabilitate improper solid waste disposal sites; • develop coastal erosion mitigation action plans; • strengthen local participation in reforestation and afforestation programs.
Rehabilitation of Degraded Land	• review completed and ongoing projects of land rehabilitation carried out in the country; • rehabilitate degraded lands; • rehabilitate improper solid waste disposal sites; • develop coastal erosion mitigation action plans; • strengthen local participation in reforestation and afforestation programs.
Establishment of Sustainable Land Management Plans	• provide assistance and capacity building to government and private organizations, island communities, traditional leaders, as well as individual landowners, on the benefits and techniques of development of sustainable land use plans; • develop sustainable land management plans.
Integrating of traditional knowledge into modern ways	• collate traditional knowledge from island elders and leaders and incorporate into sustainable land management practices

Pacific Plan	• Development and implementation of National Sustainable Development Strategies (NSDS), including the mainstreaming of regional policy frameworks or actions plans and using appropriate cross-cutting and Pacific relevant indicators in line with the Millennium Development Goals (MDGs) • Development and implementation of national and regional conservation and management measures for the sustainable utilisation of fisheries resources. • Development and implementation of policies and plans for waste management • Intensified implementation of the Pacific Islands Energy Policy and associated Strategic Action Plan to provide available, reliable, affordable, and environmentally sound energy for the sustainable development of all Pacific island communities • Development and implementation of the Pacific Regional Action Plan on Sustainable Water Management • Facilitation of international financing for sustainable development, biodiversity and environmental protection and climate change in the Pacific including through the Global Environment Facility • Harmonisation of approaches in the health sector under the *Samoa Commitment*, including:

Action Strategy for Nature Conservation: Key Objectives	**OBJECTIVE** 1: Ensure conservation has a development context that recognises, respects and supports sustainable livelihoods and community development aspirations **OBJECTIVE** 2: Identify, conserve and sustainably manage priority sites, habitats and ecosystems **OBJECTIVE** 3: Protect and recover threatened species and species of ecological, cultural and economic significance **OBJECTIVE** 4: Manage threats to biodiversity, especially climate change impacts and invasive

3. Relevant NAP Project Profiles (in Tuvalu)

Water Management	Project Title: Northern Islands (Nanumea, Nanumaga, Niutao and Nui) Rainwater Catchment Enhancement Project
Community Tree Care	Project Title: Tuvalu Community Tree Care Project
Water Catchment Development - Funafuti	Project Title: Funafuti Airstrip Water Catchment Development Project
Protected Area Survey	Project Title: Tuvalu Land-Based Protected Area Survey Project

4. National Adaptation Programme of Action (NAPA) Climate Change

Priorities relevant to Biodiversity and the NBSAP

Climate Hazards Description	**Sea Level Rise**	Rising Sea Level in coastal areas means the sea is increasingly encroaching higher ground on already eroded and vulnerable coastline. This dynamic increases the coastal area subjected to coastal erosion and flooding
	Saltwater Intrusion	Rising sea level and the porous soils of Atoll Islands create the ideal conditions for inland intrusion of saltwater, and the increasing salinity of groundwater lenses.
	Inundation	Rising Sea Level pushes water closer to the land surface resulting in upwelling at low lying areas across the Island – high frequency of inundation at pulaka pits.
	Drought	Increasing frequency of ENSO associated erratic rainfall and periods of low rainfall leads to household water shortage with increasing stress on groundwater lenses, affecting all biomes depending on groundwater resources.
	Cyclones	Severe destruction of vegetation, crops and humans from strong tropical cyclone wind force, and leads to flooding that increases breeding areas for vectors borne diseases.
	Rising sea surface temperatures	Rising sea surface temperatures has and will continue to affect coral bleaching, decreasing productivity of near shore coral reef ecosystems and affecting the communities
	Coastal	Increasing resilience of Coastal Areas and Settlement to climate change.

NAPA Projects in Tuvalu (to present)	**Agricultural**	Increasing subsistence pit grown pulaka productivity through introduction of a salt-tolerant pulaka species.
	Water	Adaptation to frequent water shortages through increasing household water capacity, water collection accessories, and water conservation techniques.
	Health	Strengthening of Community health through control of vector borne/climate sensitive diseases and promotion access to quality potable water.
	Fisheries	Strengthening of Community Based Conservation Programmes on Highly Vulnerable near-shore Marine Ecosystems.
	Fisheries	Adaptation to Near-Shore Coastal Shellfish Fisheries Resources and Coral Reef Ecosystem Productivity.
	Disaster	Strengthening Community Disaster Preparedness and Response Potential.

5. Environmental (existing) Legislation Framework

in Tuvalu

General environment protection provisions

FALEKAUPULE ACT 1997	**1. Agriculture, Livestock and Fisheries**
(Details are in 2.2)	(b) to control plant diseases, weeds and pests in accordance with the Plants Act;
	(c) to control or exterminate insect, animal or other pests detrimental to crops;
SCHEDULE 3 – FUNCTIONS OF FALEKAUPULE	(e) to regulate by bye-laws areas and methods of planting and types of crops and trees;
	(g) to prohibit, restrict or regulate by bye-laws the movement of livestock in or through the Falekaupule area;
	(h) to prohibit, restrict and regulate by bye-laws the keeping of livestock of any description;
	(i) to establish; maintain and control pounds, seize and impound any stray animal and provide bye-laws for the payment of compensation for damage done by any such animal;
	(j) to prohibit cruelty to animals and any specified acts of cruelty to animals in accordance with the Animals (Control of Experiments) Act;
	(k) to establish, erect, maintain and control slaughter houses;
	(l) to provide for the control, destruction and licensing of dogs in accordance with the Dogs Act;
	(m) to prevent and control the outbreak or the prevalence of any disease among animals in accordance with the Quarantine Act;
	(n) to provide for the improvement and control of fishing and related industries in accordance with the Fisheries Act;
	(o) to prohibit, restrict or regulate the hunting, capture, killing or sale of animals, reptiles, birds or fish in accordance with the Wildlife Conservation Act.

2. Building and Town or Village Planning

(a) to regulate and control by bye-laws the erection and construction, demolition, re-erection and reconstruction, conversion and re-conversion, alteration, repair, sanitation and ventilation of public and private buildings and structures;

(b) to provide bye-laws for building lines and the layout of buildings:

(c) to make advances, upon such conditions as may be approved by the Minister, for the purpose of enabling persons to build or buy dwelling-houses;

(d) to prepare and undertake by means of bye-laws control schemes for improved housing layouts and settlements;

(e) to prescribe the conditions to be satisfied by a site for any building or for any class of building;

(f) to prohibit by bye-laws the construction of any new building unless and until the approval of the Kaupule has been obtained;

(g) to provide for the demolition of dangerous buildings and for the recovery of any expenses incurred in connection with such demolition;

(h) to prohibit or regulate by bye-laws the use in any defined area of any inflammable material in the construction or repair of any building;

(i) to build; equip and maintain social or sporting centres; public libraries and museums, communal feeding centres, restaurants, rest houses, or buildings designed and used for public or educational purposes;

(j) to build, equip, maintain and let shops;

(k) to prohibit or regulate by bye-laws the making of pulaka pits or other excavations;

(l) to control and regulate by bye-laws the sitting of advertisements and hoardings or other structures designed for the display of advertisements,

(m) to regulate by bye-laws the use of natural building and construction materials;

(n) to establish, erect and maintain public monuments and to make collections of money towards the establishment or maintenance of them;

(o) to restrict by bye-laws the use of barbed wire and the use of broken glass or the like on fences and walls;

(p) to name streets and public places;

(q) to lay out and adorn any public place by any architectural scheme or ornamentation, including the erection of statues, fountains or other structures.

4. Forestry and Trees

(a) to establish, preserve, maintain, improve and control tree nurseries, forests and woodlands and to sell the produce from them;

(b) to plant and tend trees in, and remove trees from any public place.

5. Land

(a) to prevent and control erosion of land by the sea or other cause;

(b) to provide for the fencing of land and for the maintenance and repair of such fencing;

(c) to engage in and promote the reclamation of land from the sea on behalf of the Crown, in accordance with the Foreshore and Land Reclamation Act.

6. Relief of Famine and Drought

(a) to regulate by bye-laws the areas and methods of planting and types of crops in areas which are liable to drought or famine;

(b) in time of famine or drought to provide or arrange for the provision of appropriate relief.

10. Communications and Public Utilities

(a) to make, alter, divert and maintain roads, streets, parking areas, paths, culverts; causeways, bridges, drains and water-courses;

(h) by bye-laws to prohibit, restrict or control the access of motor traffic to any road or parking area maintained by the Falekaupule and to impose speed limits in respect of any road maintained by the Falekaupule in accordance with the Traffic Act,

(j) to regulate or prohibit by bye-laws the planting, cutting or destruction of any trees or vegetation growing along any street, road, path or in any public place;

(k) to provide bye-laws that the owners or occupiers of any land or premises maintain, clear and keep free from vegetation and rubbish such land or premises and the roads, streets, paths or public places adjoining them;

(l) to prevent damage or obstruction to any roads; streets, paths, or open spaces maintained by the Falekaupule.

12. Miscellaneous

(a) to establish, maintain and provide information and publicity programs;

(c) to promote and regulate the development of an arts and crafts industry;

(e) to establish and manage, and by bye-laws to regulate, recreation grounds, open spaces and parks;

(h) to perform any other function, whether similar to those set out in this Schedule or not, conferred upon the Falekaupule by the Minister in writing after consultation with the Falekaupule.

MARINE POLLUTION ACT 1991 (No. 1 of 1992)

Year passed – 1992

Effective from – No stated

Amended – No amendments

Laws repealed – No laws repealed

Administered by

Main object

To make provision for preventing and dealing with pollution of the sea, and to enable effect to be given to international conventions for the prevention of marine pollution and the protection of the marine environment.

HARBOURS ACT (CAP. 88)

Year passed – 1957

Effective from – 5th June 1957

Amended – 1968, 1971, 1972, 1974 and 1987

Laws repealed – No laws repealed

Administered by

Section 24 Derelict vessels can be cleared from the harbour.

Section 44 It is an offence to throw anything into a harbour or to allow it to fall in, whether it comes from land or from a vessel. It is also offence to let something fall on to land from where it may enter a harbour. Timber and vessels no longer fit for service must not be placed or left in a harbour. **HARBOURS REGULATIONS**

Year made - 1958

Regulation 9 It is an offence for the master or owner of a vessel or shore installation to discharge oil into a harbour, or allow oil to enter into a harbour.

SHIPPING ACT (CAP. 89)

Year passed: 1957

Date of effect: 1st January 1958

Amended: 1958, 1971 (2 amendments), 1972, 1975 and 1987

Repealed – No laws repealed

Administered by

Main objects

To provide for the control and safety of shipping on lagoons and inland waters of Tuvalu.

Conservation and Protection

WILDLIFE CONSERVATION ACT (CAP. 47)	PROHIBITED AREAS ACT (CAP. 76)	CLOSED DISTRICTS ACT (CAP. 75)	CONSERVATION AREAS ACT 1999 (No. 3 of 1999)	FALEKAUPULE ACT 1997
Year passed: 1975 Date of effect: 29th May 1975 Amended: No amendments Repealed the following laws: No laws repealed Administered by <u>Main objects</u> To provide for the conservation of wildlife.	Year passed: 1957 Date of effect: 22nd March 1957 Amended: 1968 Repealed the following laws: No laws repealed Administered by <u>Main objects</u> To provide for certain islands and their territorial waters to be prohibited areas.	Year passed: 1936 Date of effect: 8th December 1936 Amended: 1968 and 1971 Repealed the following laws: No laws repealed Administered by <u>Main objects</u> To provide for the declaration of closed districts.	Year passed – 1999 Effective from – Not stated Amended – No amendments Laws repealed – No laws repealed Administered by <u>Main object</u> To make provisions for the declaration and management of conservation areas.	(Details are stated in 2.2) Schedule 3 – FUNCTIONS OF THE FALEKAUPULE 1. Agriculture, Livestock and Fisheries (o) to prohibit, restrict or regulate the hunting, capture, killing or sale of animals, reptiles, birds or fish in accordance with the Wildlife Conservation Act. 33

Animals

ANIMALS (CONTROL OF EXPERIMENTS) ACT (CAP. 48)

Year passed: 1957

Date of effect: 11th September 1957

Amended: 1968 and 1971

Repealed the following laws: No laws repealed

Administered by

Main objects

To control experiments on animals.

FALEKAUPULE ACT 1997

(Details are stated in 2.2)

Schedule 3 – FUNCTIONS OF THE FALEKAUPULE

1. Agriculture, Livestock and Fisheries

(g) to prohibit, restrict or regulate by bye-laws the movement of livestock in or through the Falekaupule area;

(h) to prohibit, restrict and regulate by bye-laws the keeping of livestock of any description;

(i) to establish; maintain and control pounds, seize and impound any stray animal and provide bye-laws for the payment of compensation for damage done by any such animal;

(j) to prohibit cruelty to animals and any specified acts of cruelty to animals in accordance with the Animals (Control of Experiments) Act;

(k) to establish, erect, maintain and control slaughter houses;

(l) to provide for the control, destruction and licensing of dogs in accordance with the Dogs Act;

(m) to prevent and control the outbreak or the prevalence of any disease among animals in accordance with the Quarantine Act.

Quarantine Arrangements

QUARANTINE ACT (CAP. 34)

Year passed: 1929

Date of effect: 1st January 1931

Amended: 1931, 1940, 1946, 1952, 1967, 1968, 1969, 1971, 1972, 1973, 1974

Repealed the following laws: Nil

Administered by

Main objects

To make comprehensive provision in relation to quarantine.

PLANTS ACT (CAP. 39)

Year passed: 1976

Date of effect: 1st March 1977

Amended: No amendments

Repealed the following laws: No laws repealed

Administered by

Main objects

To provide for the protection of plants and the imposition of quarantine arrangements to control the importation of plants, and to prevent the introduction and spread of plant diseases.

LIVESTOCK DISEASES ACT (CAP. 43A)

Year passed – 1985 (Act No. 1 of 1985)

Effective from – Not stated

Amended – No amendments

Laws repealed – No laws repealed

Administered by

Main object

To control the spread of disease amongst livestock and to empower the isolation of infected areas and the destruction of infected animals.

IMPORTATION OF ANIMALS ACT (CAP. 43)

Year passed: 1919

Date of effect: 17th July 1919 (in part) and 3rd June 1964

Amended: 1954, 1964, 1971 and 1972

Repealed the following laws: No laws repealed

Administered by

Main objects

To regulate the importation of animals into Tuvalu.

Importation of Animals Regulations

Year made: 1965

Main objects

To place prohibitions and controls of the importation of animals, manure and fodder, litter, fittings and other things which have come into contact with animals.

PESTICIDES ACT (CAP. 39A)

Year passed – 1990

Effective from – 1st January 1991

Amended – No amendments

Repealed the following laws – No laws repealed

Administered by

Main objects To control the importation and sale of pesticides.

Natural Resources

NATIVE LANDS ACT (CAP. 22)

Year passed: 1956

Date of effect: 14th March 1957

Amended: 1959, 1967, 1968, 1969, 1971 (3 amendments), 1972, 1973, 1974, 1985, 1988, and 1989

Repealed the following laws: No laws repealed

Administered by

Main objects

To make comprehensive provision in relation to native land and the registration of title to native lands

FORESHORE AND LAND RECLAMATION ACT (CAP. 26)

Year passed: 1969

Date of effect: 10th June 1969

Amended: 1972, 1974 and 1978

Repealed the following laws: Nil

Administered by

Main objects

To declare ownership of the foreshore and to regulate reclamation projects.

FORESHORE LICENCE REGULATIONS 1979

Year made – 1979

CROWN ACQUISITION OF LANDS ACT (CAP. 24)

Year passed: 1954

Date of effect: 25th June 1954

Amended: 1968, 1972 and 1974

Repealed the following laws: No laws repealed

Administered by

Main objects

To make provision for the acquisition of lands by the Crown for public purposes.

MARINE RESOURCES ACT 2006 (Act No. 3 of 2006)

Year passed – 2006

Effective from – 31st August 2006)

Amended – No amendments

Laws repealed - Fisheries Act, Fisheries (Foreign Fishing Vessels) Regulations 1982 and Foreign Fishing Vessels Licensing Order (U.S. Treaty) Order 1987

Administered by

Main object

To ensure the long term conservation and sustainable use of the living marine resources for the benefit of

FORESHORE AND LAND RECLAMATION ACT (CAP. 26)

(Details are stated in 2.5.1)

Section 3 The removal of sand, gravel, reef mud, coral, rock and other similar substances may only be taken from foreshore areas with the approval of the relevant island council.

These Regulations provide for

- Applications for licences to reclaim – regulation 2
- Powers of Island Council - regulation 3
- Form of licences - regulation 4
- Fees for licences - regulation 5
- Special provisions for government and local councils – regulation 6

the people of Tuvalu.

FISHERIES (TROCHUS) REGULATIONS 1990

Year made – 1990

Under these regulations trochus niloticus may not be taken and Tuvalu is designated as a prohibited fishing area for this species.

Water Resources

WATER SUPPLY ACT (CAP. 40)

Year passed – 1967

Effective from – 24th July 1967

Amended – 1971, 1972 (2 amendments) and 1975

Laws repealed – No laws repealed

Administered by

Main object

To make provision for water supplies.

PUBLIC HEALTH ACT (CAP. 35)

(Details are stated in 2.4)

Section 3 Regulations may be made to prevent the pollution of any rain, stream, well or other water supply.

TUVALU CULTURAL COUNCIL ACT 1991

Effective from – Not stated

Amended – No amendments

Laws repealed – No laws repealed

Administered by

Main object

To establish the Tuvalu Cultural Council Year passed – 1991

Inventory of Documentation and Information on Environment in Tuvalu

Pacific Environment Information Network [PEIN] Country Profile and Virtual Environment Library

Tuvalu

Source: http://www.sprep.org/publication/pein_tuvalu.asp (**SPREP LIBRARY & INFORMATION RESOURCE CENTRE)**

Compiled by the SPREP IRC and Library the Pacific Environment Information Network [PEIN] Country Profiles are a browsable compilation of country profiles , national environment reports , technical reports and academic literature for the countries of the Pacific Islands. Contributions of weblinks and documents, whether in hardcopy or digital form are welcome and can be sent to irc@sprep.org .

[*Note that many of the documents below are large pdf files and may be difficult to load. Some pdf files may only be compatible with version 6.0 of adobe acrobat or higher. The issue should be resolved by upgrading to the latest Adobe Reader software. The Reader version 8 is free software available on the Adobe website at www.adobe.com/products/acrobat/readstep2.html .

Documents can be requested from irc@sprep.org .

Contents

Overview

* Excerpt from 'Tuvalu National Strategy for Sustainable Development: 2005 - 2015'

Environment

Tuvalu is ranked one of the most environmentally vulnerable states in the region, largely because of its low relief and small land area. The key risks confronting the environment in are:

sea level rise as a result of climate change;

rising population density in Funafuti;

decline in traditional resource management;

unsustainable use of natural resources;

poor waste management and pollution control.

Key Policy Objectives from 2005-2015

Stop unregulated development and degradation of the environment - especially on Funafuti.

Increase the number of marine and terrestrial conservation areas.

Minimise climate change impacts.

Waste management is one of the most pressing problems and has direct implications for human and ecosystem health, especially in Funafuti. If collected and disposed of properly, this will lead to less potential pollution of lagoon waters and less accumulation of waste that is a latent source of disease and other public health issues.

Environmental management must confront two key challenges:

1) the numerous issues arising from the growing urbanisation of Funafuti, and

2) the national impacts associated with climate change and sea level rise, specifically salt-water inundation of pulaka pits, coastal erosion and flooding, which are blamed either wholly or partly on global warming.

Priorities and strategies for the environment from 2005 to 2015.

Develop and implement an urban and waste management plan for Funafuti.

Establish national climate change adaptation and mitigation policies.

Encourage international adoption of Multilateral Environmental Agreements, including the Kyoto Protocol.

Increase the number of conservation areas and ensure regulatory compliance.

Country Profiles

Adaptation Learning Mechanism [climate change adaptation] country profiles
Tuvalu

Asian Development Bank Country Profiles and Strategies
Tuvalu

Biosafety Profiles [CBD Biosafety Clearinghouse Mechanism]
Tuvalu

Birdlife [Avifauna] Profiles

see Avibase - Bird Checklists of the World - browsable by country and by individual island within the Pacific region - excellent data source

see also a checklists of birds of FIJI, AMERICAN SAMOA, NIUE, SAMOA, TOKELAU, TONGA, TUVALU AND WALLIS & FUTUNA compiled by Dick Watling

see also Species profiles [*For the Globally Threatened Birds (those evaluated as Critically Endangered, Endangered and Vulnerable), each factsheet contains a summary account, range map and an illustration, plus additional data tables. For Extinct, Extinct in the Wild, Near Threatened, Least Concern and Data Deficient species, each contains a concise summary paragraph and some additional data tables.] [Birdlife International]
Tuvalu

see also Endemic Bird Areas [EBAs] of the Pacific [incl. Aitutaki (secondary area) ; East Caroline Islands ; Fiji ; Gilbert Islands (secondary area) ; Henderson Island ; Mariana Islands ; Marquesas Islands ; Marshall Islands (secondary area) ; Nauru (secondary area) ; Niuafo'ou (secondary area) ; Niue (secondary area) ; Northern Line Islands (secondary area) ; Palau ; Pitcairn (secondary area) ; Rapa (secondary area) ; Rimatara ; Rotuma (secondary area) ; Samoan Islands ; Society Islands ; Southern Cook Islands ; Tonga (secondary area) ; Tuamotu archipelago ; Wake Island (secondary area) ; Wallis and Futuna (secondary area) ; Yap Islands] [Birdlife International]

see also Pacific regional overview [Birdlife International]
see also Globally Threatened Birds (those evaluated as Critically Endangered, Endangered and Vulnerable) of Oceania [Birdlife International]
see also State of the World's birds website and report [Birdlife International] - including Pacific country case studies

Country Climate Profile [UNDP]
* Sourced from the Adaptation Learning Mechanism, a knowledge sharing platform developed by UNDP in partnership

with the Global Environment Facility, the United Nations Framework Convention on Climate Change, the World Bank, and the United Nations Environment Programme.

Earthtrends Thematic Country Profiles [WRI]
Agriculture and food, Biodiversity and protected areas, Climate and atmosphere, Coastal and marine ecosystems, Economics, business and the environment, Energy and resources, Environmental governance and institutions, Forests, grasslands and drylands, Population, health and human well-being, Water resources and freshwater ecosystems.

Ecoregion Profiles [World Wildlife Fund]
Tropical Moist Forests
Western Polynesia [Tokelau, Tuvalu, Kiribati]

Environment Statistics - Country Snapshots [UN; 2009]
Tuvalu

Environmental Vulnerability Index - Country Profiles [SOPAC / UNEP]
Tuvalu

EU Pacific Country Environment Profiles

see also EU Country Partnership Profiles [incl. environment and EDF10 strategies]
Tuvalu

FAO Country Profiles and Mapping Information System
Tuvalu

FAO Fisheries and Aquaculture Country Profiles
Tuvalu

Fishbase Biodiversity Country Profiles (all fish)
Tuvalu

Forestry Country Profiles
Forestry Department Country Profiles [FAO]
Tuvalu

see also State of the World's Forests 2007: Asia and the Pacific [FAO] (2008; 1.77mb)
see also Tropical and subtropical forest profiles prepared by the World Wildlife Fund

see also Mongabay Rainforest profiles:
Tuvalu

Global Biodiversity Information Forum [GBIF] Country Profiles
Tuvalu

***see also* GBIF Google Earth Country Links**
Tuvalu

Global Environment Facility (GEF) Country Profiles
Use the drop down menu to go to the individual profiles - includes GEF-4 Allocation and Utilization , Approved Projects and Projects Under Preparation

Integrated Water Resource Management Profiles [SOPAC]
Tuvalu

Invasive Species : Country Profiles [ISSG]
Tuvalu

Land-based pollutants inventory for the South Pacific region: Part 2: Regional summary and country profiles [SPREP] (1993; 19mb)

Laws and legislation

Pacific islands Environmental Laws [Commonwealth Secretariat]
Tuvalu

SPREP National Laws and Legislation clearinghouse
Tuvalu

see also 'Legislative reviews' in Country Reports (below)

Mangrove and Wetlands Profiles

see also: A Directory of Wetlands in Oceania [1993]
see also: Wetlands of the Pacific Island Region (2008; 882kb)
see also: IWMI Global Wetlands - Interactive Web Map Server - includes countries of Oceania

Marine Resource Profiles

see :

Reefbase Country Profiles (coral reefs, reef fish, biodiversity)
Tuvalu

see also:

Status of Coral Reef Systems of the World: 2008 (2008; 20mb)

Chapter 12 - Status of the Coral Reefs in the South West Pacific: Fiji, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu (2008; 1.79mb)

see also GIS data for corals in the Pacific from Reefbase - browse by country and reef profile
see also GIS data for marine protected areas in the Pacific from Reefbase - browse by country and ecosystem

MPA Global Profiles (marine protected areas database)
Tuvalu

see also Millennium Coral Reef Mapping - South Pacific products
IMARS Geomorphological classification is publicly available on the University of South Florida web site from http://www.imars.usf.edu/MC/output_south_pacific.html . Vanuatu, Tuvalu, Kiribati, Tonga, Samoa, New Caledonia, Cook Is, French Polynesia and East Solomon are there (PNG will hopefully be coming shortly). Files are distributed as Shapefiles (ArcGIS) and can be opened in MapInfo.

Mapservers containing country level data on land utilisation, forestry, minerals etc.
Tuvalu

Pacific Biodiversity Information Forum Country Data:
Tuvalu

Pacific Regional information System - PRISM [SPC]
Environmental and Climate Statistics
Tuvalu

Political Reviews [Contemporary Pacific]
Tuvalu plus Tuvalu update

Protected Areas

~Pacific Protected Areas database (PBIF)
Tuvalu

~World Database on Protected Areas - Pacific site profiles
Tuvalu

see also GIS data for marine protected areas in the Pacific - browse by country and ecosystem
see also MPA Global Profiles (marine protected areas database) above

SOPAC Country Profiles:
Tuvalu

SPREP Country Profiles: Exchange of Information by Members:
National Developments related to Natural Resource Management Priority of the Action Plan [2007]
see Agenda Item 6.1: Country Profiles of the Report and record of the 18th SPREP Meeting of Officials in Apia, Samoa on 11th to 14th September 2007

Sustainable Development Profiles (UN Agenda 21)
Tuvalu

Threatened species: Summary of species on the 2008 IUCN Red List
Tuvalu

UNCCD Country Profiles:
Tuvalu

UNEP Country Profiles *[* poorly maintained and little information available]*
Tuvalu

Water Resource Profiles [SOPAC - Pacific water - http://www.pacificwater.org/]
Tuvalu

WHO Environmental Health Profiles
Tuvalu

World Factbook Country Profiles [CIA]
Tuvalu

World Ocean Database 2005 [NOAA]
Geographically sorted data for the Pacific Ocean [datasets]

see also Environmental indicators: South Pacific (UNEP: 2004; 6.23mb)
see also Polynesia / Micronesia Biodiversity Hotspot Ecosystem Profile (2007; 1.16mb)

see also Paciifc Biodiversity Information Forum website and databases

Country Reports

Barbados Programme of Action + 10 (BPoA)
National Assessment Reports: Tuvalu (2003; 57kb)

Pacific Environment Outlook (2005; 30.99mb)

The Conference on Small Island Developing States (Barbados Conference, 1994) highlighted the importance of island biodiversity as an ecological corridor linking major areas of biodiversity around the world. The conference called for international co-operation and partnership to support the Small Island Developing States (SIDS) in their efforts to conserve, protect and restore their ecosystems. The Barbados Plan of Action recognizes the importance of the coastal zone as a source of subsistence and economic development.

Country Strategy Papers and National Indicative Programmes [European Union - EDF9]
Tuvalu (2002-2007; 1.17mb)

Country Strategy Papers and National Indicative Programmes [European Union - EDF10]
Tuvalu (2008-2013; 2.98mb)

Least Developed Country [LCDs] reports
Tuvalu (2006?; 389kb)

see also 'Voices of the Least Developed Countries of Asia and the Pacific' (2005; 1.46mb)

Legislative Reviews
Tuvalu (1994; 9.22mb) / Tuvalu (2007; 240kb)

Millenium Development Goals National Reports
Tuvalu (2006; 1.09mb)

Pacific Islands Regional MDG - Goal 7: Ensure environmental sustainability (2004; 324kb)
Pacific Islands Regional MDG Full Report

see also ADB Key Indicators 2006 for progress towards Millenium Development Goal 7: ensuring environmental sustainability (2006)

see also Millenium Ecosystem Assessment Website and Reports

Montreal Protocol: National Compliance Action Strategies to implement the Montreal Protocol on Substances that Deplete the Ozone Layer
Tuvalu (111kb)

National Action Programmes (NAP) to combat land degradation [UNCCD]
Tuvalu (2006; 636kb)

National Capacity Self Assessment (NCSA)
NCSA Status (NCSA website)
Tuvalu

National Environment Management Strategy (NEMS)
Tuvalu (1997; 8.86mb)

National Integrated Water Resource Management : Diagnostic Reports - drafts only [SOPAC]
Tuvalu (2007; 815kb)

National Invasive Species Strategy

see Invasive alien species in the Austral-Pacific region: national reports and directory of resources [GISP] (2002; 3.75mb)

see also Invasives Species on Pacific Islands [reports] **-** HEAR / PIER project website

National [Sustainable] Development Plans / Strategies [ForumSec]
Tuvalu : Tekakeega II 2005-2015 (2005; 1.36mb)

National Assessment Reports: Tuvalu (2003; 826kb)

ADB Reports: Tuvalu (2003; 325kb)

see also:

SPC Country Joint Country Stategies in support of National Strategies for Sustainable Development :
Tuvalu

Pacific Adaptation to Climate Change [PACC] - report of in-country consultations
Tuvalu (2009; 116kb)

Pacific Regional Energy Assessment: Country Reports (PIREP)
Tuvalu (2004; 1.81mb)

Regional overview report (2004; 2.59mb)

Peristant Organic Pollutants (POPs): Country Plans
Tuvalu (2003; 313kb)

National Implementation Plans (NIPs)
Tuvalu (2008; 1.2mb)

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention, 1989), the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention, 1998) and the Stockholm Convention on Persistent Organic Pollutants (POPs) (Stockholm Convention, 2001) together provide an international framework for the environmentally sound management of hazardous chemicals throughout their life cycles.

Sea Level & Climate: their present state: Country reports
Tuvalu (2006; 2.14mb)

Ships' Waste Management in Pacific Islands Ports: Country reports
Tuvalu

Solid Waste Characterisation and Management Plans
Tuvalu (2000; 240kb)

State of the Environment Reports
Tuvalu (1993; 9.2mb)

see also State of the Environment of the South Pacific 1983 (UNEP: 1983; 1.66mb)
see also State of the marine environment in the South Pacific Region (1990; 3.48mb)
see also State of the Environment of the South Pacific 2005 (2005; 382kb; see also ~
http://www.unescap.org/esd/environment/soe/2005/mainpub/ ~)
see also Regional perspectives: Asia and the Pacific (UNEP, GEO-4. 2007; 382 kb)

see also the archive of SPREP Country Reports between 1980-1983 as follows*:*
Tuvalu (1981; 589kb)

United Nations. Common Country Assessments
Tuvalu (2002; 828kb)

see also United Nations. Development Assistance Frameworks 2003-2007:
Tuvalu (2002; 464kb)

United Nations Conference on Environment and Development (UNCED: Brazil, 1992)
Country Reports **:** Tuvalu (1992; 42mb)

The United Nations Conference on Environment and Development (UNCED, 1992) and the Rio Declaration highlighted the need for sustainable development-socially responsible economic development that protects the resource base and the environment for the benefit of future generations. The Convention on Biological Diversity (CBD), which was one of the outcome instruments of the UNCED process, also highlights the need for conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

United Nations Convention on Biological Diversity (UNCBD)
National Reports: Tuvalu 4 (2009; 570kb)

see also Country profiles compiled by the Secretariat for the UNCBD.

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United Nations Convention to Combat Desertification (Land Degradation) (UNCCD)
First National Reports:Tuvalu (2000; 482kb)

Second National Reports: Tuvalu (2002; 42kb)

National Action Programmes (NAP) to combat land degradation
Tuvalu (2006; 636kb)

see also UNCCD Country Profiles:
Tuvalu

see also UNCCD Reports clearinghouse mechanism

The United Nations Convention to Combat Desertification is an agreement to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.

United Nations Framework Convention on Climate Change (UNFCCC)
(i) National Communications and In-depth Reviews
Tuvalu (1999; 5.37mb),

(ii) National Action Plans on Adaptation (NAPA)
Tuvalu (2007; 2.2mb)

The United Nations Framework Convention on Climate Change (UNFCCC,1992) is concerned with global warming and the consequent rise in sea levels that may result in the flooding of coastal areas, and submerging islands, which could adversely affect coastal communities. The treaty aims at reducing emissions of greenhouse gas in order to combat global warming. Although the treaty as originally framed set no mandatory limits on greenhouse gas emissions for individual nations and contained no enforcement provisions; it did include provisions for updates (called "protocols") that would set mandatory emission limits. The principal update is the Kyoto Protocol.

Technical Reports

Reports available online from the SPREP Library and IRC database
Reports available online from SOPAC [Pacific Islands Applied Geoscience Commission]
Reports available online from ReefBase Pacific

search also SPC Coastal and Oceanic Fisheries Digital Library

Multimedia - posters, videos etc

Video: Tuvalu - Islands on the frontline of Climate Change
- With photography by Robin Hammond of Panos Pictures, this multimedia piece looks at the island nation of Tuvalu, as the Tuvaluan people become some of the first environmental refugees, a direct result of man-made climate change.

Academic literature and research

via Google Scholar

Websites

Alofa Tuvalu [climate change website]

Tuvalu - Dept. of Environment

Tuvalu Meteorological Office

see also:

The Pacific Environment Information Network [PEIN] Regional Frameworks and Strategies Directory [SPREP]

SPREP Library and IRC collection [SLIC] - includes online full text access to a wide range of Pacific environment materials.

The Pacific Environment Information Network [PEIN] Virtual Library - full text publications from SPREP, SOPAC, SPC and other CROP agencies, Pacific govt. environment depts. , regional institutions, and NGOs active in the area of environment conservation.

Pacific Environment Databases and Recommended Internet Resources

see also*:*

SPREP's International Instruments' webpage
"International instruments relevant to SPREP's work in the areas of Sustainable Economic Development, Ecosystems Management, Climate Change, and Waste Management."