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State
Of the
Environment
Report

Tokelau



Tokelau

**State
Of the
Environment Report
1994**

USP Library Cataloguing-in-Publication data:

Ioane, Makalio K.

Tokelau : state of the environment report :
1994 / prepared by Makalio K. Ioane in collaboration
with members of the National Task Force for
Environmental Management and Sustainable
Development and staff of the Environment Policy Unit,
Tokelau.—[Apia, Western Samoa : SPREP, 1994].

xiv, 27 p. : 29 cm.

“Report for the South Pacific Regional
Environment Programme (SPREP) as documentation
in support of the Tokelau Environmental
Management Strategy (TEMS).”

“Produced with financial assistance from the United
Nations Development Programme (UNDP).”

ISBN 982-04-0072-4

1. Ecology—Tokelau 2. Marine resources—Tokelau
3. Tokelau—Economic conditions 4. Tokelau—Social
conditions I. South Pacific Regional Environment
Programme II. Title

QH541.I62 333.72'099615

Prepared for publication by the South Pacific Regional
Environment Programme, Apia, Western Samoa

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Cover design by Peter Evans based on an original design
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Cartographic material
Jacaranda Wiley Ltd, Brisbane, Australia

Typeset in New Baskerville and Gill Sans
Printed on 110 gsm Tudor R. P. (100% recycled) by
ABC Printing, Brisbane, Australia

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Office for Tokelau Affairs, Apia, Western Samoa.

**Produced with financial assistance from the
United Nations Development Programme (UNDP)**

*Cover photograph: The 'Faka-Tokelau' is still dear to the hearts
of all Tokelauans. Today, however, modern changes are having a
significant influence on the traditional lifestyle and values of the
people living on these isolated atolls. (photo: Daphne Hougard)*

Tokelau

State Of the Environment Report 1994

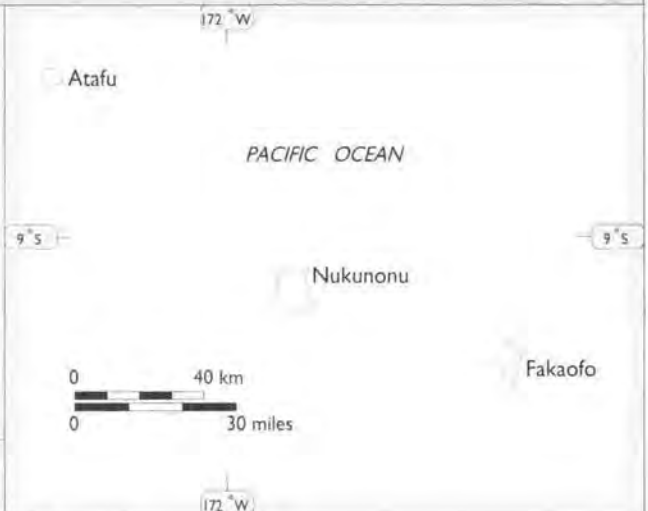
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*Report for the South Pacific Regional
Environment Programme (SPREP)
as documentation in support of the
Tokelau Environmental Management Strategy (TEMS)*

**Produced with financial assistance from the
United Nations Development Programme (UNDP)**





Foreword

This document represents a concise report on the state of the environment for Tokelau. It was prepared as a major component of the National Environmental Management Strategies (NEMS) Project. The NEMS Project was instigated to address sustainable environmental development and planning issues in a number of Pacific Island countries, namely, Kiribati, Nauru, Niue, Palau, Tokelau, Tuvalu and Western Samoa. It has been funded by the United Nations Development Programme (UNDP) and implemented through the South Pacific Regional Environment Programme (SPREP) as part of a broader UNDP assistance programme called PMI: Planning and Implementation of Pacific Regional Environment Programme which concentrates on regional and in-country institutional strengthening and training of environmental managers.

The State of the Environment Report for Tokelau was a major background document for the preparation of the draft Tokelau Environmental Management Strategy (TEMS) and forms an important reference document for the National Seminar held in Tokelau to further refine and develop the TEMS. The Report summarises the current state of knowledge about the environment of Tokelau in areas such as terrestrial environment, marine resources, cultural and archaeological re-

sources, and socio-economic environment, and outlines the environmental challenges facing Tokelau. The State of the Environment Report also provides an important vehicle for raising awareness within the communities on each of the three atolls about the importance of environmental issues and how these issues should be integrated into future decision-making processes.

I would like to thank Mr Makalio Ioane, Atoll Environment Coordinator for Nukunonu who prepared this State of the Environment Report in collaboration with members of the Tokelau National Task Force for Environmental Management and Sustainable Development, and staff of the Environment Policy Unit.

SPREP looks forward to working with the Tokelauan people and with other regional and international organisations in tackling the environmental issues identified in this State of the Environment Report.



Vili A. Fuavao
Director
South Pacific Regional
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Preface

As atoll environments are delicate environments, and as our survival in Tokelau depends on maintaining them in a pristine and productive state, we are asking you as Tokelauans to examine this document carefully. As we currently undertake our development path, we realise that constraints must be put in place that will assure Tokelau of an ecologically sensitive, sustainable development.

Therefore, on behalf of the three Councils of Elders, we, the Faipule of each atoll, are grateful to those who have made a valuable and detailed input into this latest environmental report, with special thanks to the members of the National Task Force for Environmental Management and Sustainable Development who have helped identify Tokelau's environmental needs.

What we all want now is the best environmental planning possible. Fortunately, there has been in more recent times an awakening to the relationship between our surroundings, our culture and our current development path. While this awareness is new to most of us, reports like this will help us to evolve a type of modern-day development that will not damage our natural resources, that will not drastically alter our culture, and that will preserve our environment for future generations.

We can now look forward to those changes that

will bring about a greater awareness of our traditional culture and its relationship to our natural resources, and of changes that will provide a permanent partnership between development and environmental trends.

This State of the Environment Report now serves as the official government document that will guide us with the implementation of the Tokelau Environmental Management Strategy (TEMS) Project. The TEMS Project would not have been possible had it not been for the generous assistance and advice from SPREP, UNDP, the New Zealand Government and other agencies which are assisting Tokelau along the path towards sustainable human development. Without such international assistance to small Pacific Island nations like Tokelau, our collective efforts to attain sound environmental management and sustainable development within the Pacific region would have only limited effectiveness.

It is now our hope that the proposed Tokelau Environmental Management Strategy will not only prevent Tokelauans from making some regrettable development decisions, but will also hasten our attainment of sustainable development. To those who have guided us, we are eternally grateful.



Salesio Lui

Members of the Council of Faipule, Tokelau



Keli Neemia



Lepaio Simi

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A financial year spans the period 1 July to 30 June.

Acronyms

DAF	Department of Agriculture and Fisheries (Tokelau)
DH&E	Department of Health and Environment (Tokelau)
EEZ	Exclusive Economic Zone
EPU	Environment Policy Unit (Tokelau)
FAO	Food and Agriculture Organization of the United Nations
NEMS	National Environmental Management Strategy
SOE	State of the Environment Report
SPBCP	South Pacific Biodiversity Conservation Programme
SPC	South Pacific Commission, Noumea, New Caledonia
SPREP	South Pacific Regional Environment Programme, Apia, Western Samoa
TEMS	Tokelau Environmental Management Strategy
TPS	Tokelau Public Service
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNFPA	United Nations Family Planning Association
WHO	World Health Organization

Glossary

Tokelauan words

Faipule	Island Chief on each atoll.
faka-Tokelau	Tokelauan way of life.
fala	Pandanus tree suitable for weaving and used as source of edible fruits.
inati	Village sharing of foods/fish catches, etc.
kaiga	Family.
kanava	Large native hardwood tree, ideal for carving or house posts.
motu	Islet or island.
puapua	Plant with small fragrant white flowers.
puka	Large native softwood tree suitable for bird nesting.
pulaka	Swamp taro.

General

aquaculture	The farming of marine or freshwater plants and animals.
biodiversity	The variety of plants and animals in an area. Biodiversity refers not only to the number of different species but to the full range of genetic variation within each species.
conservation	Managing the way people use natural resources so that they give the greatest sustainable benefit today, while keeping their full potential to meet the needs and aspirations of future generations.
consumption	Spending on everyday items, for example, food, petrol, rent, clothing etc.
degradation	The result of poor resource use which pollutes, damages or reduces the quality of resources available to future generations.
demography	Measures of change in size and age structure of a population.
development	The introduction of new ways to use natural resources to meet human needs and wants.
ecology	Branch of biology which deals with the relation of plants and animals to their environment.
ecosystem	A community of plants and animals and the environment they inhabit.
endangered species	Species that are in danger of disappearing.

endemic	An animal or plant which is found only in one region or country and is not present naturally in any other part of the world.
environment	All the living and non-living things in a particular place or on the earth generally, and the way they interact or work together.
erosion	The wearing away of the earth's surface (for example, soil) by the action of water, wind etc.
fauna	Animals.
geology	The science of the earth, including the composition, structure and origin of its rocks.
geomorphology	The study of the physical features of the earth's surface and their relation to its geological structure.
habitat	The natural home of a plant or animal species.
hydrological	Something to do with water, whether surface water in rivers or groundwater available in wells.
imports	Goods and services purchased from overseas countries and foreigners.
indigenous	Something that originally occurred in a particular area.
introduced species	A species which does not naturally occur in a particular area but rather has been brought in from outside.
investment	Spending on projects or activities which are expected to provide long-term benefit.
leachate	Water carrying impurities which has percolated through the earth, a rubbish tip, mine waste etc.
management	Controlling the way something is used or done.
natural resource	A naturally occurring stock or supply which can be used to help meet human needs and wants.
nutrient	A substance providing essential nourishment for the maintenance of life.
pelagic fish	Fish that live in the open ocean rather than close to shore.
planning	Developing a detailed method by which something is to be done.
productive, productivity	The capacity to produce something of benefit, for example, crops, goods, services, craft, art etc.
public sector	Activities and enterprises run by government.
recycle	To convert something to reusable material instead of throwing it away.
remittance	Money transferred between countries, for example, Tokelauans abroad sending money to their families at home.
resource	A stock or supply which can be used to help meet human needs and wants.
species	A scientific name given to each different type of animal or plant.
strategy	A plan to help achieve certain goals.
subsistence	Producing mostly for own consumption, for example, farming which directly supports the farmer's household without producing a significant surplus for trade.
sustainable	Using a resource in such a way that its supply and quality are maintained indefinitely into the future.
terrestrial	Relating to the earth.
toxic	Poisonous.
traditional	Based on past custom.
vascular plant	A plant with conducting tissue.

Fakamatalaga pukupuku

O na ko Tokelau e manakomia lahi he puipuga lelei mo to na hikomaga, na hakili fehoahoani ai ki te Fakalapotopotoga a te Pahefika mo na Polokalame tau te Hikomaga (SPREP) ma te Fakalapotopotoga tau Atiake a Malo Kaufakatahi (UNDP).

Ko tenei lipoti kua uma te fakapatino mai i loto na fakafitauli tau te hikomaga ei Tokelau nei. Ko tenei lipoti foki e taumafai ke fakaali mai te kino lahi o ie tahi fakafitauli, ma pe fofo foki vehea e ki tatou. Ko na fakamatalaga o ienei fofo ei loto o na Iloiloga mo na Pulepulega tau te Hikomaga i Tokelau (TEMS).

Ko na Taupulega takitahi, fakatahi ai ma ni tukutukuga ma na nuku takitahi, kua fakatagi ke fehoahoani ki te Polokalame o te Hikomaga ke:

- ◆ fakailoa na fakafitauli tau te hikomaga i Tokelau,
- ◆ fakapatino lelei ienei fakafitauli,
- ◆ hakilikili ni fofo ki ienei fakafitauli, ma
- ◆ fehoahoani ki te fakagaoioiga o ni polokalame fakapitoa.

Kua uma te hakili o ni ietahi fehoahoani ki te peleniga ma te pulepulega o te hikomaga (kikila ki te Fakaopoopoga A-E). Kua tuku atu nei ki na tino takitahi ke pahia ienei fautuaga.

Ko tenei lipoti, na fai ke fehoahoani ki te fakale-

leia atili o te iloa lautele tau te hikomaga o te nuku ma to latou malohi ke tatali atu na manakoga tau te hikomaga. E lahi na ata ei loto o tenei lipoti mo na tupulaga kehekehe. I te agaigai ki luga o te tatou iloa ki te hikomaga e tatau foki ke agaigai ki luga to tatou iloa ki te kikilaga fakalelei. Kua tatau ai na fakalapotopotoga takitahi ke i loto o te polokalame tau te hikomaga ma mafai ai ke iei he latou hao ki te fakaleleiga o te ola malolo o te nuku ma te tulaga o te olaga i Tokelau.

Mulimuli, ko tenei lipoti e tatau ke kitea ve he fakafouga o te lipoti a Tokelau mo te Fonotaga a Malo Kaufakatahi ki te Hikomaga ma na Atiakega te na haunia ke tuku fakatahi atu ve he lipoti e tali atu ai te Pahefika i Haute i te 1991 ma tuku atu ai i Pahili ia Iuni 1992.

Ona ko te manakomia e Tokelau he fakaleleiga atili o te taukikilaga o tona hikomaga ma ke tumau pea te agaigai ki mua o ona tagata ki te 2000 tauhaga i mua. Kua iei ai ni taumafaiga ke hakilikili mai ni fehoahoani fakapitoa mai te SPREP, UNDP ma te WHO. E tatau la ona iei ni galuega fakatahi ma te atunuku, e kitea tenei fakatauaga i te faka-hoahoaga ona mea tau tupe ina tauhaga e 5 koi hau.

Summary

This State of the Environment (SOE) Report includes all those environmental problems that have been identified to date in Tokelau. This Report also serves to illustrate the severity of some of these problems, and how we may expect to resolve them. More specific details of actions which will address these environmental problems are included in the Tokelau Environmental Management Strategy (TEMS).

Each Council of Elders, in close collaboration with community groups, was asked to assist the environment programme by:

- ◆ identifying environmental problems in Tokelau;
- ◆ accurately defining each problem;
- ◆ proposing solutions to such problems; and
- ◆ assisting with the implementation of specific projects.

Further assistance with our environmental planning and management in Tokelau has already been sought. It is now the responsibility of all parties to ensure that the most appropriate recommendations are adopted.

This SOE Report, therefore, has been designed to assist the whole community to increase its

environmental awareness as well as its capacity to respond to Tokelau's immediate environmental needs. Numerous illustrations have been included in this Report for the benefit of all age groups. As our understanding of the environment grows, then our ability to manage it should also grow. Each community group is now being expected to become involved with the environment programme and thus make a contribution to improving community health and the general standard of living in Tokelau.

Finally, this Report should be seen as an update to the Tokelau Country Report for the United Nations Conference on Environment and Development (UNCED) which was prepared in 1991 for incorporation into a South Pacific regional report presented in Brazil in June 1992.

As Tokelau desires better management of its environment, and is seeking to attain sustainable human development by the year 2000, specific assistance is being sought, primarily from SPREP, UNDP and WHO. A concerted effort must now be made at a national level, and this commitment will become evident in budgetary allocations over the next five years or so.



Introduction

1.1 History

Tokelau was first reported by Westerners in 1765 with the sighting of Atafu by early European and American sailing vessels. Nukunonu was not sighted by foreign vessels until 1791, with Fakaofu only being located in 1835.

Tokelau suffered a great tragedy in the 1860s when 76 women and children, and virtually all the able-bodied men on the islands (177 men in total), were taken by Peruvian slave-trading ships. These slave-traders were also responsible for introducing fatal epidemics of diarrhoea. The taking of the men, plus the impact of disease, resulted in the population (of between 400 and 500) being almost halved.

Several foreign traders, mainly of Portuguese descent, settled in the islands in the later 1800s and through inter-marriage established family lines that can be traced to present-day Tokelauans.

Christianity was first given recognition in Atafu in 1858 with the later establishment of the Catholic and Protestant faiths in the early 1860s.

In 1889, the islands became a British protector-

ate which was annexed by Britain in 1924. Tokelau was known then as the Union Islands. Beginning in 1925, Tokelau was administered through the New Zealand administration of Western Samoa until the islands were formally incorporated as a territory of New Zealand at the beginning of 1949.

This status continues today with Tokelauans being entitled to New Zealand citizenship. Currently, steps towards a form of self-government are being taken by the Councils of Elders. This will eventually give Tokelau a status similar to that of Cook Islands and Niue.

1.2 Background and scope

As more and more national responsibilities are undertaken by the Elders in Tokelau, the future management of Tokelau by the Elders will require a good understanding of the relationship between environmental planning, environmental management and budgetary allocations. On that basis, each Village Council is participating in a series of workshops on the Tokelau Environmental Management Strategy (TEMS). These workshops have been designed to:

- (1) gain an accurate understanding of the state of the environment in Tokelau (as expressed in this State of the Environment Report);
- (2) ascertain the best response to those environmental challenges which have been identified; and
- (3) help prioritise, implement and monitor those programmes and projects which will enhance environmental planning and management in Tokelau.

Wise environmental management will depend on our understanding of environmental changes



Islet of Tokelau. (photo: Guy Edwards)

occurring in Tokelau. This SOE Report serves as the latest assessment of the current state of the environment in Tokelau.

The preparation of this SOE Report has provided us with the opportunity to monitor our progress in improving our environmental management capabilities since the first environmental report (the Tokelau Country Report for the United Nations Conference on Environment and Development, 1991) was compiled by Humphries and Collins (1991). While numerous recommendations were made in this UNCED Report, the TEMS Project will provide the whole community with the opportunity to:

- (1) commence implementing such recommendations;
- (2) propose further recommendations; and
- (3) provide an opportunity to reassess our priorities regarding these identified environmental challenges.

More importantly, this SOE Report is steering us towards improving our environmental planning so that serious impacts on our environment can be prevented; in other words, a proactive, rather than reactive, approach has been emphasised.

It can also be generally argued that every sound environmental endeavour is designed to improve our health. On that basis, not only is the Environment Policy Unit (EPU) an integral part of the Department of Health and Environment (DH&E), but within each community there is now more priority being placed on preventive medicine rather than just curative medicine: a healthier environment means healthier people. In fact, sound environmental planning and environmental management are in themselves the best approach to preventive medicine. On this basis, the Elders support the initiatives of the DH&E to provide in-service environmental training to its health workers.

More suitably qualified community health workers, medical staff and environmental officers are urgently needed in Tokelau. While this is a relatively new priority for Tokelau, it will need to continue as a top priority if we are to attain ecologically sensitive, sustainable development within the foreseeable future. This will not be possible without the expert cooperation of organisations like FAO, SPC, SPREP, UNDP, UNFPA and WHO, to name just a few.

Environmental management is becoming a

highly technical discipline, and one with which the Elders will undoubtedly need outside assistance, advice and direction. As Trudgill (1990) pointed out, it is important to identify exactly what are the barriers to improving the environmental planning and environmental management in Tokelau.

Finally, this SOE Report serves to both clarify and simplify the new environmental management processes. A special effort has also been made throughout the document to highlight specific problems, responses and recommendations. This will expedite the adoption of these new approaches by the Elders, and assist them in their efforts to manage this nation soundly.

1.3 Geography

Tokelau is a tropical country within the South Pacific comprised of three tiny atolls located between latitudes 8° and 10° south, and longitudes 171° and 173° west, 480 km north of Western Samoa. The total area of the three lagoons is 187 sq km, and covers a wide variety of rich marine resources. The three atolls of Atafu, Fakaofu and Nukunonu are comprised of 127 islets or 'motu'. These 'motu' vary in length from 90 m to 6 km, and vary in width from a few metres to 200 m. They cover a total land area of 12.7 sq km, and at no point rise any higher than 5 m above sea level. Therefore, the physical features in Tokelau are very limited indeed.

1.4 Air and climate

Tokelau lies just outside the South Pacific equatorial dry zone. Rainfall is variable with an annual mean of 280 cm, and the most rain recorded from October to March. The average mean temperature is 28°C.

Tropical cyclones have hit Tokelau in the past years, three of them in the last six years: Tusi in 1987, Ofa in 1990 and Val in 1991, with Ofa being the worst in living memory.

Tokelau's dominant prevailing winds are the south easterlies, bringing with them the welcomed cooling sea breezes from about April to September, with northerly or variable winds present during the hotter months of the year (Thompson 1986).



Terrestrial environment

2.1 Geology and geomorphology

2.1.1 Soils

These atolls are composed of calcium carbonate reef, sands and rock. Atoll soils are generally highly porous and nutrient-poor; they have a low humus content and high surface salinity, and are of very high alkalinity. These porous soils have prevented agricultural development beyond a subsistence economy.

2.1.2 Minerals

There has been no mineral exploration survey conducted in Tokelau and there is no known mineral wealth existing.

2.1.3 Construction minerals

Sand, rocks and coral gravel are extensively mined

for construction purposes, for example, housing, septic tanks etc.

2.1.4 Water and hydrology

All water for local use is obtained from roof catchments as no surface water is available on any of the atolls. Water may occasionally be collected from wells near each village, but this practice has almost ceased except in times of severe drought. While rainwater catchment adequately caters for most domestic and construction needs, it is insufficient to meet the needs of an increasing number of flush toilets.

2.2 Vegetation

2.2.1 State of knowledge

In the Pacific, terrestrial and marine biodiversity



Coral soils are coarse, highly alkaline and deficient in certain nutrients essential for plant growth.

decreases from west to east. Therefore, for relatively species-poor ecosystems like those as far east as Tokelau, the degradation and loss of biodiversity should be regarded very seriously (Lear 1989).

No islands remain today with totally undisturbed vegetation, primarily because of the limited land resources available. *Cocos nucifera* (coconut tree) is now the dominant tree species on most islands, with an understorey of native trees, shrubs and ground cover species present. While there is some variation in the composition of native species from island to island, Lear (1989) attributed this to likely differences in past management practices, for example, clearing for coconut replanting. Fortunately, this practice of extensive clearing has been modified so as to conserve remaining ecosystems.

A comprehensive conservation strategy is urgently needed in Tokelau so that native terrestrial and marine species, as well as entire ecosystems, can be protected from pollution, siltation, over-exploitation and the impact of frequent storms and cyclones. Many of these issues are regional as well as local, for example, the protection of marine turtles.

2.2.2 Diversity and endemism

None of the plant species recorded in Tokelau are known to be endemic as they are widespread throughout the Pacific. Preliminary plant surveys have been conducted by Wodzicki (1973) and Dahl (1986), both of whom report that the vegetation in Tokelau has very low diversity. There is now a total of 67 vascular plant species recorded in Tokelau which includes 16 naturalised weeds, 13 introduced cultivars, and an as yet unknown number of non-vascular plants.

2.2.3 Rare, endangered and introduced plants

There has been no assessment of the rare and endangered plants, but Lear (1989) reported that a number of plant species are already in decline, and that the loss of genetic stock from Tokelau is a serious issue. For example, *Cordia subcordata* ('kanava') and some species of pandanus (for example, 'kiekie') have been heavily relied upon in the past for traditional craft-making. (Recently, a project was commenced by the Women's Committees to



Coconut seedlings for a replanting scheme. (photo: Daphne Hougard)



Harvesting of the 'kiekie' (pandanus).

replant more pandanus for local food and craft-making purposes.)

2.2.4 Non-timber forest resources

Forest resources are still used for house and canoe building, construction of pig pens, and a variety of traditional uses such as wood-craft, weaving, dyes and traditional medicines. Unfortunately, there has been no recording or documentation of the usage and names of individual plants.

2.3 Fauna

2.3.1 Birds

The avifauna is relatively rich with at least 26 species, of which 15 species are sea birds, 8 are shore birds and 3 are land birds. Of these, 7 sea bird species and one land bird species (the Pacific pigeon, *Dueula pacifica*) breed in Tokelau. The populations of these locally breeding species are at present in decline because they are hunted for food and their eggs are collected (Wodzicki & Laird

1970). Noddies, terns and pigeons are particularly sought after. However, some Elders say that pigeons are now conserved because of their rarity.

2.3.2 Reptiles

Apart from some unidentified species of sea snakes ('fau ote kolo'), lizards and geckoes, marine turtles are the only reptiles regarded to be of real significance to Tokelau (see Section 3.5).

2.3.3 Mammals

The only native terrestrial mammal (apart from human beings) recorded in Tokelau is the Polynesian rat (*Rattus exulans*) which may have arrived at the time of early human settlement.

2.3.4 Insects

A total of 150 species of insects in 83 families, including several agricultural pests, are recorded as being the most widely distributed South Pacific species (Humphries & Collins 1991).

2.3.5 Crustaceans

Land crabs are also common but, as with most of the nation's fauna, they have been studied very little. As they are quite easy to catch, coconut crabs ('uga uga'), traditionally a primary source of protein, are now declining not only in size but in number. This indicates they are being harvested at an unsustainable level.

2.3.6 Introduced animals

Pigs and chickens were first introduced by early settlers as a source of food. Only recently, certain breeds of pigs and poultry were again introduced by the Department of Agriculture and Fisheries (DAF) for the purpose of cross-breeding. Goats were also introduced by DAF as a source of fresh milk and meat. This goat project, funded by the UNDP, was unsuitable for Tokelau and has since been abandoned. Agricultural pests (for example, rhinoceros beetle, brontispa and white fly) were also introduced, but there is no knowledge or information as to when or how they were introduced.

The only marine animal known to be introduced to Tokelau is the trochus shell (*Trochus niloticus*), a gastropod mollusc.



Marine resources

A comprehensive inventory of the marine species is yet to be compiled. This is somewhat surprising in that Tokelau's greatest natural asset is its marine resources. The lagoon, reef and deep-sea resources are rich and varied, with fishing remaining the mainstay of the Tokelauan diet. Fish forms the major component of the diet, with the lagoon and reef fishery accounting for 55 per cent of all animal protein consumed (Gillett & Toloa 1988).

3.1 Fish

Fisheries comprise an inshore lagoon and reef fishery, and an offshore pelagic and deep-water fishery. The lagoon fishery is used mainly for domestic consumption, although there is a small-scale commercial component consisting of a few individuals who wish to supplement their income, while others send salted or frozen fish to relatives in Western Samoa. The main fish species in the lagoon and reef fisheries are great trevally ('aheu'), bigeye scad

('atule'), goatfish ('memea' and 'moaga'), reef cod ('gatala'), garfish ('ihe'), parrot-fish ('kamutu' and 'uhu') and surgeon fish ('manini' and 'pone'). In the offshore fishery, tuna and tuna-like species are the main species caught, and they account for 19 per cent of animal protein taken for consumption in Fakaofu (Gillett & Toloa 1988). The deep-water fishery comprises mainly snapper ('palu makomako'), shark ('mago'), grouper ('fapuku') and emperor ('filoa').

Information on the state of fish stocks is limited as there is no regular monitoring programme except for tuna and trochus. Likewise, information on offshore stocks does not exist, but it is believed that there is considerable scope for the further commercialisation of the offshore fishery.

3.2 Molluscs

Because of the economic aspects of trochus shells, they are commercially the most important gastro-



Fish catches are often plentiful.



Clams are a favourite with visitors — for eating as well as for viewing while snorkelling. (photo: Daphne Hougard)

pod mollusc in the Pacific (Heslinga & Hillman 1981). Because of this, it was recommended that DAF, with funding from the Integrated Atoll Development Project, commence the transplanting of trochus shells to Tokelau (Gillett 1986). This project was first implemented on Fakaofu in 1986, then again on Atafu and Nukunonu in 1990. Trochus shell transplants have since been successful, but harvesting has not yet begun.

3.3 Aquaculture

Brayley (1989) states that clams ('faisua') need protection, regardless of their size, and recommends that marine reserves be established on each atoll lagoon for the purpose of clam conservation.

3.4 Mammals

Numerous species of whales and dolphins are

sighted regularly in Tokelau, but very little is known about them.

3.5 Turtles

Very little information has been published on the status and ecology of marine turtles in Tokelau (see Balazs 1983; Daly 1990; Groombridge & Luxmoore 1989).

Three species of marine turtles occur in Tokelau, with the most common being the green turtle (*Chelonia mydas*), which is a seasonal breeder, and present mostly from September to November. During this time mating pairs appear a short distance off the ocean side of the reef, and nesting occurs on certain sandy beaches. For the rest of the year, adults are far less frequently seen. However, young immature turtles (about 40–60 cm in carapace length) continue to be present in the outer reefs and lagoons. The hawksbill turtle (*Eretmochelys imbricata*) is also known on all three atolls. The



Turtles, which are considered a delicacy in the Tokelauan diet, are no longer plentiful. (photo: Daphne Hougard)

loggerhead turtle (*Caretta caretta*) is the third species known in Tokelau, but does not commonly breed there.

The total number of nesting green turtles estimated to be present each season is about 70 at

Nukunonu, 30 at Fakaofu, and 20 at Atafu (Balazs 1983). However, according to local fishermen, their numbers have greatly declined in the last decade.



Cultural and archaeological resources

4.1 'Faka-Tokelau'

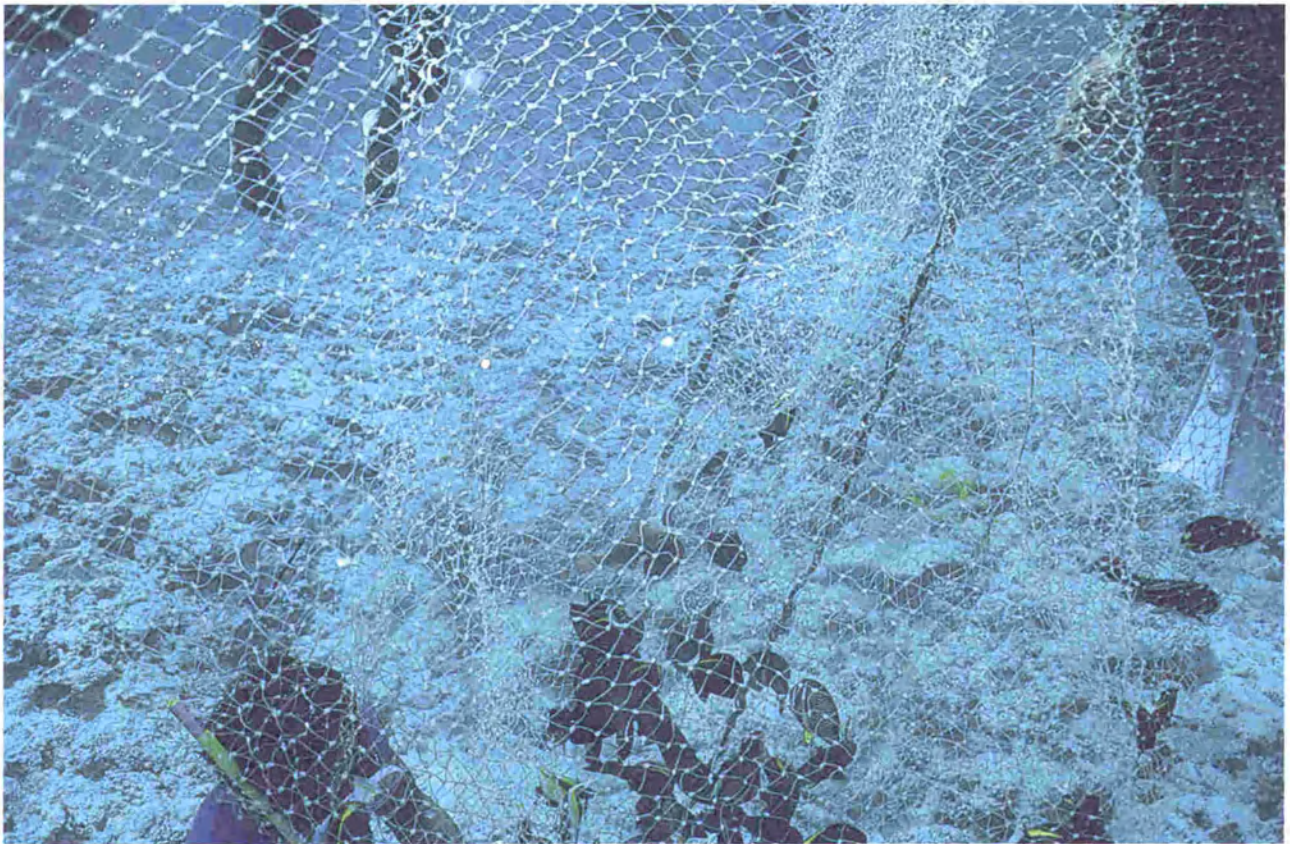
Tokelauans have a distinct language of their own and are fortunate in that they have managed to retain much of their traditional way of life (the 'Faka-Tokelau'). There is now much concern that, as the older generation dies, much of the traditional knowledge will be lost as values change and formal education increases. Some modern influences are now obvious, for example, Western dress, housing and diet, as well as the fact that some residents are now questioning the authority of the Councils of Elders.

While all three villages in Tokelau are still governed in a traditional manner, other changes are becoming apparent. For example, the traditional architecture has now been entirely replaced. New building materials, along with the need for a water-catchment roofing system and the need to build in a cyclone-proof manner, have meant that not only do the villages take on a totally new appearance, but the traditional skills once used for house building are slowly being lost.

Fishing techniques have also been markedly modernised with the introduction of aluminium



Despite influences from the outside world, traditional culture is still strongly encouraged in the three schools.



With the use of modernised fishing techniques such as monofilament gill nets, traditional methods are slowly disappearing.
(photo: Daphne Hougard)

boats with outboard motors, monofilament gill nets, steel fishing hooks, fish aggregation devices etc. Today, many individuals prefer to fish alone. The traditional practice of communal fishing has decreased, though it is still periodically organised by the village Elders.

As the men are still responsible for the bulk of the food gathering, the women, with the introduction of modern technology such as washing machines and kerosene stoves, have become accustomed to a more inactive lifestyle. Greater physical inactivity in general is now posing considerable health risks for Tokelauan men and women.

Finally, the way time is allocated these days has also changed markedly as Tokelau becomes more entrenched in the 'development economy'. While a considerable portion of time in the past was spent providing shelter and food for families, much of the working week today is spent employed on development projects such as the construction of sea walls, septic tanks, rainwater tanks, cyclone-proof housing, schools, hospitals and administration centres. The time required to maintain such facilities is also significant.

4.2 Archaeological resources

A number of private individuals have family collections of adzes, photographs, traditional fishing hooks, handicrafts etc. A community display, complete with recent scientific publications and videos, would be a cultural asset worthy of more consideration in the future. An initial archaeological survey and excavations were conducted by Best (1986).

4.3 Cultural viability

Throughout many Pacific countries, there has been a recent and swift decline of traditional cultures under the influence of a changed economy, industrialisation, urbanisation, colonial rule and Christianity. This transition has been equally significant in Tokelau, although probably more rapid in recent years.

The cultural environment in Tokelau, it is now realised, must be strengthened amidst all the outside influences which are evident today. The following policies which act to strengthen the 'Faka-Tokelau'



Traditional culture is an everyday aspect of the Tokelauan lifestyle.

and alter the rate of change have already been introduced:

- (1) promotion of Tokelau at Pacific cultural events such as the South Pacific Arts Festival;
- (2) use of the Tokelauan language as the medium of instruction for primary and secondary school students;
- (3) the practice of sending scholarship students to South Pacific countries rather than New Zealand;
- (4) the teaching of traditional values and lifestyle methods in schools and non-government community organisations;
- (5) the voluntary cessation of the Resettlement Scheme in New Zealand (which was instituted following a major cyclone in 1967): villages were being depleted of able-bodied men who were needed for communal village responsibilities such as fishing, food preparation, and construction;
- (6) recording the Tokelauan language and culture in written and video format;
- (7) retaining the Councils of Elders as the overall governing bodies for each village; and

- (8) retaining the 'inati' system of equal sharing of food and wealth to all families.

4.4 Communal self-sufficiency

The lifestyle in Tokelau still relies heavily on traditional communal self-sufficiency. The 'inati' system is still actively maintained, thus encouraging the whole community to work more closely in a cooperative manner. More specifically, most of the natural resources are still sufficiently abundant to allow communities to be self-sufficient in food items. Traditional foods still form a major portion of the diet, with a strong reliance on the rich marine resources, coconuts, pandanus, bananas, breadfruit, pawpaws, 'pulaka' and taro.

Also, sufficient local building materials are still available to meet local needs, although the demand is diminishing as traditional housing is being replaced by concrete and iron roof constructions.

The handicapped, disabled and aged are not institutionalised in Tokelau: all necessary care and supervision are provided within their extended families. Medical services and hospitalisation are



When fish are plentiful, they are shared amongst the villagers.



Many new houses are built with concrete water tanks beneath the flooring.

also free to all in Tokelau. In addition, an accident compensation fund and an old age pension are also available to members of each community.

Rainwater reserves today are almost sufficient to meet all needs on an annual basis. However, as

more modern dwellings are built with large concrete water tanks beneath the flooring, Tokelau will become even more self-sufficient in terms of water supply. However, droughts can still pose a serious threat.



Socio-economic environment

5.1 Population

The demography of Tokelau has been reported by Hooper and Huntsman (1973). The carrying capacity of the atolls must now be revised in the light of current demands and stresses on the surrounding natural resources. A New Zealand Government report in 1926 (cited in Prior & Stanhope 1980) recommended that the population should not exceed 1250 people: that is, Atafu 350, Fakaofu 400 and Nukunono 500. According to the latest Tokelau Census of Population and Dwellings (1991), the current human population is 1577, with an annual growth rate of -1.3 per cent between 1986 and 1991. The population in 1993 seems to have stabilised, with natural increase being offset by annual emigrations (Figure 5.1).

While there is no population policy in exist-

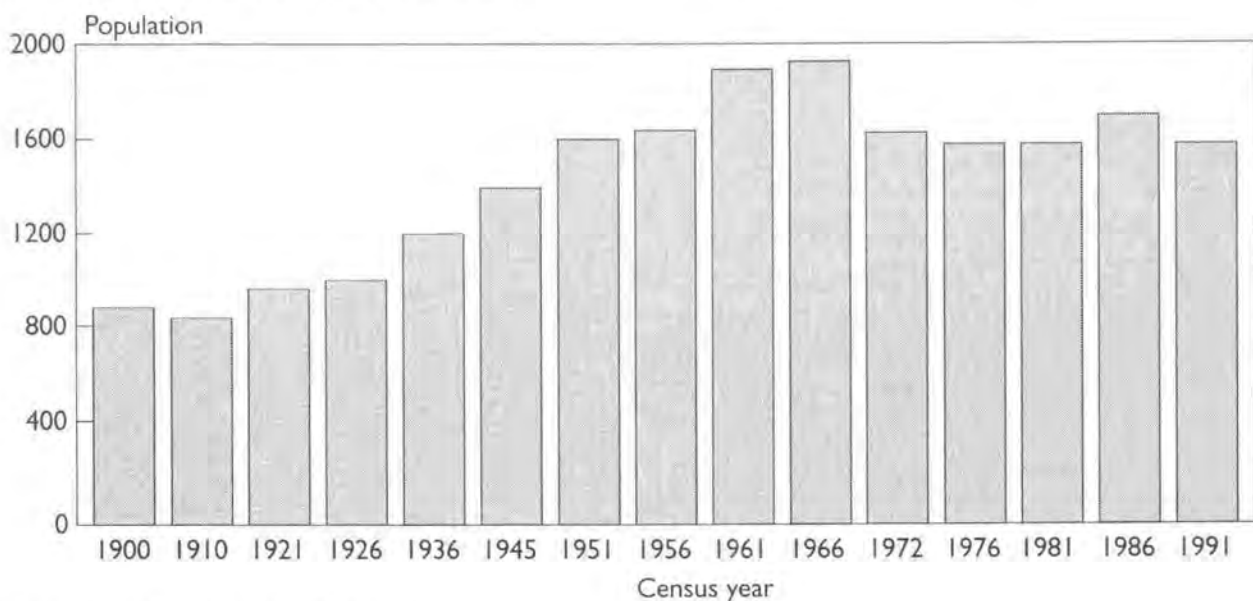
ence in Tokelau today, a Mother/Child Health Care and Family Planning Programme is in place.

Finally, an Environmental Audit and Natural Resource Inventory is being carried out which will provide the vital knowledge of ecological limits by specifying a number of critical economic, environmental, cultural and resource parameters. The TEMS will then provide the options or alternatives available with respect to the most appropriate and sustainable levels of exploitation. Only then can long-term self-sufficiency be assured.

5.2 Economic change

The introduction of Western education, external budgetary support, and the public service structure

Figure 5.1 Population change, 1900–1991



Source: Statistics New Zealand 1993b

Table 5.1 Source of income by household annual income, 1991

Income source	Household annual income 1991 (\$NZ)								
	Nil	1-499	500-999	1,000-1,499	1,500-1,999	2,000-2,999	3,000-3,999	4,000-4,999	5,000 or more
TPS salaries	140	1	4	2	4	18	11	17	55
Casual TPS wages	63	22	45	29	38	26	14	6	9
Honoraria	188	45	9	3	2	4	0	0	1
Overseas remittances	179	47	14	6	1	3	2	0	0
Tokelau remittances	200	43	7	2	0	0	0	0	0
Copra sales	251	0	1	0	0	0	0	0	0
Handicraft sales	200	49	1	0	1	0	0	1	0
Livestock sales	227	24	1	0	0	0	0	0	0
Old age pension	153	92	5	0	1	0	0	0	1
Govt. superannuation	228	18	3	0	0	2	1	0	0
Other	207	22	5	8	1	1	2	3	3

(1) One household that did not answer the household income question has not been included in this table.

Source: Statistics New Zealand 1993a

into the traditional and family systems in Tokelau have caused dramatic social and economic changes. These influences have encouraged more individualistic behaviour and a move away from the traditional principles of equal sharing. The change to a cash-driven economy has made Tokelauans increasingly dependent on imports for their current needs.

The economy in Tokelau has only been monetised in the past 20 years, and adaptation has been relatively straightforward. However, in 1976 the New Zealand government instituted a Tokelau Public Service (TPS) system which now provides employment for about 10 per cent of the adult population. Unfortunately, difficulties have arisen because of the very wide difference in pay scales between TPS members and village-based workers (Table 5.1). This problem may be further compounded when the departmental offices are relocated from Apia to Tokelau.

Attempts have been made in the past to redistribute the wealth amongst the community by the imposition of a 10 per cent Community Services Levy on all Tokelauan Public Service members. Job rotation for paid casual workers within each village is also aimed at retaining the traditional principle of equal sharing. In the past, income generated from copra production (the only cash crop which has existed in Tokelau) was distributed among all those who had rights to the land. As incomes are used for consumption rather than investment,

there has not been an increased demand for land and sea resources in Tokelau.

The greater part of the land is owned by family groups known as the 'kaiga' and a small amount is leased to the Tokelauan Administration for hospitals, schools and public buildings. Certain areas of each atoll are designated as communal land and are worked by communal labour. Remaining lands are in the hands of the churches.

In light of such factors, a TPS review in 1985 went so far as to recommend the devolution of the TPS system to help minimise the social impacts caused by such differences in income.

On each atoll there is a cooperative store which acts as a distribution point for imported products. Sales across the three atolls totalled \$1.2m over 1989/1990. Domestic consumption is growing annually as reflected in the rising level of imports over the past thirty years.

5.3 National budget

Annual financial assistance from New Zealand has amounted to \$4.1m (1989/1990) or \$2,426 per capita. A further \$0.64m was generated in 1989/1990 by the collection of duties on selected imported commodities, the provision of public services, stamp and coin sales, and externally generated income from Exclusive Economic Zone (EEZ) access fees.

5.4 Foreign aid and remittances

Remittances were in the order of \$200,000 over 1989/1990 or about \$120 per capita, while direct aid, provided mainly by UNDP, totalled about \$600,000 over the same period.

As Tokelau is not economically self-sufficient at present, it is essential that there is wise expenditure of the New Zealand budgetary assistance and donor funds in order to ensure that the welfare of all Tokelauans is maximised.

5.5 Employment

Of the total population of around 1600 people, wage and salary earners make up only 10 per cent, or about 160 people. However, more than 40 per cent of people aged 15 years and over (at least 420 people) earn some kind of income — making up about 60 per cent of the total labour force (paid and unpaid) of 700–800 people. About 22 per cent of the total number of people aged 15 years and over (that is, about 200 of the 900 adults in Tokelau) are not part of the workforce (Figure 5.2).

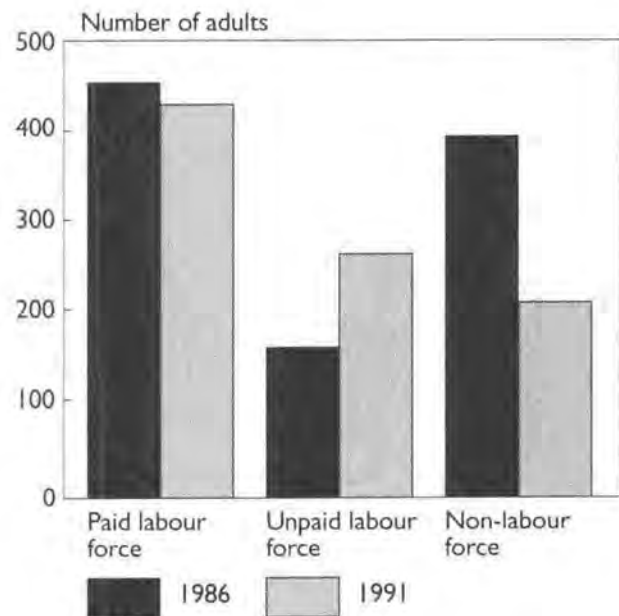
Overall, between 1986 and 1991, the number of paid workers dropped slightly, the number of unpaid workers increased by about 70 per cent, and the number of non-working people dropped by about 45 per cent.

Income is also earned by individuals from the making of handicrafts which are then sold privately or through the Women's Committees.

5.6 Development programmes

Tokelau's land-based resources are very limited. Not only is very little land available for commodity export production, but the conditions are also very harsh. Significant agricultural development is

Figure 5.2 Labour force status: 1986, 1991 (for persons aged 15 years and over)



Source: Statistics New Zealand 1993b

therefore unlikely, other than for the maintenance of self-sufficiency. At present, only coconuts are being exported for the production of coconut cream in Western Samoa. However, this only occurs when the demand is present.

The most promising income-generating opportunity in recent times has come from the commercial offshore fishery, and the potential for the aquaculture of trochus, giant clams and black pearl oysters. Catches by foreign-owned commercial fishing boats utilising Tokelau's EEZ totalled over \$1m for 1991/1992.

In addition, a small-scale tuna jerky enterprise (Kileva Fisheries) has operated in Atafu since 1989. While creating more employment for some of the community, this project has yet to generate profits.

Environmental challenges



6.1 Challenges to the natural environment

As there is strong reliance today on natural resources (wildlife, soil and forests) for food and other materials, it is being stressed that, to remain self-sufficient, Tokelau should be very careful not to over-exploit these resources. Some effort should be made to determine more precisely the sustainable yields of particular resources.

Unfortunately, some villages are reporting that

some wildlife species have already been over-exploited. The two best indicators are that fewer members of the species are remaining, and that the size of specimens is declining.

While it is important to determine the specific causes of over-exploitation, in Tokelau it is usually the result of using modern methods of capture. In rare cases, wasteful catches have also been taken.

The Councils of Elders need to encourage greater use of traditional and sustainable methods of capture, and encourage the enforcement of



Traditional fishing in Tokelau. (photo: Daphne Hougard)



A traditional and sustainable method of capturing sea birds. (photo: Daphne Hougard)

specific conservation measures designed to protect individual species, especially those within the marine environment (Toloa et al. 1989).

Modern Tokelauans must learn to live in harmony with their surroundings if they wish to retain their culture. This SOE Report will help to clarify environmental problems and their causes, possible responses to such problems, and the need to strengthen environmental management capabilities. Planning ahead is very important to help prevent the emergence of further environmental problems in Tokelau.

6.1.1 Over-exploitation of renewable resources

It is now apparent that there has been, and probably still is, over-exploitation of renewable resources. Reports of declining numbers of turtles, giant clams, black pearl oysters and coconut crabs are becoming more common. Even some important plant species are now less plentiful, or are rarely found today. This trend must be reversed.

The use of modern fishing techniques (for example, using fast boats, nets, spear guns and, more recently, chlorine) will continue to contribute to non-sustainable harvesting of specific species. Combined with this factor is the reduced authority of the Elders to impose management methods. This over-exploitation of local wildlife species indicates that the development of a biodiversity conservation programme for Tokelau should be seriously considered.

Loss of biodiversity in Tokelau must be prevented. The establishment of conservation areas is envisaged for each atoll in accordance with the Action Strategy for Nature Conservation in the South Pacific (SPREP 1989) and the South Pacific Biodiversity Conservation Programme (SPBCP) which is currently being administered by SPREP.

Forests

While Tokelau's forest resources are tiny, they are, nonetheless, very important as sources of rare hardwood and as specific habitats for bird breeding colonies. They are also an important component of



One of the many islets of Tokelau.

the terrestrial ecosystems, especially for some plant and insect species. These forests not only act as relatively safe wildlife refuges during cyclonic storms, but they also protect the islands from severe land erosion.

Timber collection in the past has been for local use only: no export industry has ever been established. Important timber species are 'kanava' (*Cordia subcordata*), 'puapua' (*Guertarda speciosa*), 'puka' (*Pisonia grandis*) and 'fala' (pandanus), but the exploitation of such species has been for local building and handicraft needs only.

However, on some islands, considerable portions of these tree species were removed when agricultural expansion efforts were undertaken. A coconut replanting scheme resulted in the overzealous clearing of some important forest areas (Lear 1989).

Soil

Over-exploitation of soils has resulted from over-clearing practices. As the soils are very fragile and shallow, every care should be taken to protect them.

The over-exploitation of coastal sand supplies is also having a serious impact. Since sand resources are renewed seasonally in specific locations on some atolls, these supplies could potentially be exploited without greatly affecting the natural beach-protection mechanisms in the immediate vicinity. However, too much sand is being taken within a short period of time. Coconut trees adjacent to the beach have been undermined, leaving them vulnerable to wind and wave damage. Unnecessary beach erosion is still occurring.

6.1.2 Pollution of freshwater lenses

While no monitoring of the quality of freshwater lenses is carried out, it is inevitable that freshwater lenses are being polluted from oil, diesel, insecticides and toxic household chemicals. Again, the public needs to be more informed about the wise use and disposal of such chemicals.

Since batteries were once disposed of on land, it is likely that some level of contamination by heavy



Tokelau's beaches have been severely damaged by cyclones.

Better management of household rubbish and other solid waste can prevent further pollution.



metals such as lead, mercury and chromium is present in the water and soil.

In the past, waste motor oil was also disposed of by pouring it into the ground. However, with the advent of oil recycling in Western Samoa, this practice has ceased.

6.1.3 Pollution of coastal waters

Pollution occurs either from land-based sources or from shipping. A waste management study conducted by SPREP (Tulega 1993) identified the following sources of pollution.

Human waste

The use of sea latrines is common in four of the five inhabited islands. The greatest problem associated with sea latrines is the risk of disease to swimmers. Alternatively, a safe, clean, septic waste overflow is very nutritious for plant life in close proximity.

Solid waste disposal

Past practices of disposing of plastic nappies, household rubbish, batteries and other non-biodegradable solid waste into the sea or onto outer islands have now been discontinued. The impact of storms and cyclones has resulted in huge volumes of household debris being deposited in the lagoons and over surrounding reefs.

Disposal of biodegradable waste

The practice of disposing of biodegradable waste into the sea, while not causing deleterious pollution, has now been discouraged. In preference,



Sea latrines are a health risk to swimmers.

people are being requested to compost all biodegradable waste in order to improve the fertility of the soil (burning is, of course, also discouraged).

Waste motor oil from ships

This source of marine pollution is a problem, although only a minor one. Visiting ships have been requested to stop disposing of their waste oil into the sea. Waste oil recycling facilities are now available in nearby Western Samoa, and all waste oil should be channelled to such a facility.



Scrap metal and other solid wastes are shipped to New Zealand for recycling.

6.1.4 Solid waste accumulation

Since it has become common practice to import modern building materials and household items as well as modern foods, the accumulation of solid wastes has posed a serious threat to the surrounding ecosystems. Practices in the past of disposing of this accumulating waste on outer islands, burying it, burning it, or even dumping some of it into the lagoons were thought to be the only options available. With only limited space, Tokelau is now facing a serious solid waste disposal problem.

In 1992 a recycling project was initiated by the Environmental Policy Unit (EPU) in the Department of Health and Environment. All aluminium cans, glass, copper, plastic, scrap metal, batteries etc. are packaged and shipped to New Zealand for recycling.

6.1.5 Hazardous waste and chemicals

There are currently no safe facilities for the disposal of toxic wastes, except for the recycling of batteries in New Zealand. Hospital wastes and other hazardous wastes have been either burnt or buried, with their leachates inevitably reaching the water lenses and surrounding marine environments. The spraying of the village with malathion has been

discouraged. It is now used only in outbreaks of vector-borne diseases.

6.1.6 Climate change and sea-level rise

While the Tokelau Country Report for UNCED (Humphries & Collins 1991) emphasised that some scientific reports (Pernetta 1990; Roy & Connell 1989) described drastic consequences for Tokelau as the proposed effects of the greenhouse effect were felt, more recent reports on climate change indicate a less pessimistic outcome over the next forty years. For example, an expected rise in the sea level of 5 cm over the next 40 years may be a little more manageable for Tokelau than the 60–600 cm rises which were being predicted by some scientists.

However, climate changes in terms of increased frequency of storms (especially cyclones), rises in air and sea temperatures, and the impact on Tokelau's ecosystems are probably of more direct consequence. As mentioned in Section 1.3, cyclones are possibly appearing more frequently in Tokelau and perhaps with greater severity. The consequences of coastal erosion, damage to fresh-water lenses, and increased risk to human life need to be considered. Increased soil salinity could lead to decreased productivity of important crops such as coconuts, breadfruits and pandanus.

Sea wall on Nukunonu built to prevent further erosion caused by cyclones.



Disruption to the freshwater lenses could further modify the adjacent marine ecology (Buddemeier & Oberdorfer 1986). The biodiversity, and hence fishing potential, of the adjacent lagoons and reefs could be reduced, which could gradually but ultimately render the atolls uninhabitable. One recent response undertaken has been the construction of gabion basket seawalls (Shuma 1992; Brockliss 1990, 1992).

Some climate changes have already been noted by the Elders. For example, currents are faster, tides are more extreme, air temperatures are hotter, prevailing winds are unpredictable, and storms are more frequent and more severe.

In general, climate change will compound existing ecosystem/agricultural problems. Future management planning and strategies will need to take this into consideration in order to respond to climate change in a proactive manner.

6.1.7 Potential environmental emergencies

Oil spillage

An Oil Spill Contingency Plan has already been prepared for Tokelau. As stated in this Plan, the risks are low, but the damage caused by a large oil spill to reefs and lagoons could be serious.

Radiation contamination

The risk of radiation contamination is real, especially with the past nuclear testings in neighbouring French Polynesia. In addition, the effects of earlier

nuclear testing on Christmas Island may yet become apparent.

Tidal waves

Tidal waves are very rare in Tokelau. However, if one was to strike, the consequences could be very severe.

Earthquakes

Buildings in Tokelau may not be strong enough to withstand a severe earthquake. However, if an earthquake was to occur, structural damage to buildings, and the possibility of a tidal wave following, need to be considered.

Cyclones

Being situated in the tropical belt, Tokelau suffers serious effects from cyclones. Rainwater supplies can become contaminated with sea spray, food crops can be destroyed, and community hygiene standards can be markedly affected. A natural disaster preparedness programme needs to be formulated so as to minimise the potential impact of cyclones and other natural disasters on each community.

6.2 Other challenges to the environment

6.2.1 Declining cultural viability

Most Tokelauan people wish to retain their cultural identity. However, outside influences are steadily



Outside influences are slowly eroding efforts to conserve Tokelau's cultural environment. Traditional skills are being lost with the increasing use of modern materials such as corrugated iron.

eroding efforts to conserve the Tokelauan cultural environment. Indigenous peoples worldwide are facing the same dilemma, and are typically ill-equipped with the resources necessary to retain cultural viability.

6.2.2 Population growth

Even though the population has stabilised (with natural increase being offset by annual emigrations), this may not always be the case in the future. While no population policy is in existence in Tokelau, an environmental audit currently under way will hopefully provide the vital knowledge of ecological limits as well as the current state of natural resources. This

will assist Tokelau in determining how best to exploit its resources in a sustainable manner. Population growth is one of the major environmental challenges requiring attention and planning if Tokelau is to maintain its quality of life.

6.2.3 Land tenure system

The land tenure system in Tokelau poses no threat to the national environmental management capabilities because of the strong tradition of communal, cooperative effort. However, in the future if traditional practices are replaced by a more Western understanding of land ownership, environmental efforts may be thwarted.



Despite concern over the loss of traditional building skills, the extensive damage sustained from cyclones in recent years illustrates the need to build cyclone-proof houses using modern materials and appropriate construction methods.

6.2.4 Environmental awareness

Without a good understanding of environmental issues, the communities cannot be expected to respond promptly or adequately. Although general awareness levels of the communities have risen in recent years, there is still great opportunity for further increasing the overall awareness of the important environmental issues affecting Tokelau.

While a multi-sectoral response is required to increase the level of public awareness, the level of understanding of environmental issues in some departments is still low. If environmental planning and management were given greater consideration by some departments, more environmentally-friendly decisions could be made. Even village community groups have lagged in their responses to some environmental issues. It has been clear from discussions at community group meetings that some members still do not understand some of the important environmental issues.

Environmental information, advice and expertise has been very limited until recently. SPREP, UNDP and even organisations like WHO and SPC now have more knowledge and expertise concerning the environment, and their guidance in recent times has been greatly appreciated. Technicians, specialists, books, pamphlets, posters, videos and other forms of assistance have been made readily available. Frequent environmental workshops, seminars and conferences have also enhanced general awareness of environmental issues.

6.2.5 Environmental planning

Greater emphasis must be placed on environmental planning if decision makers are to solve problems more effectively. This is becoming increasingly apparent as some of the more pressing environmental issues are addressed, for example, waste management. The response in Tokelau to the issue of waste management has been very prompt. Even though serious waste disposal problems still exist, considerable planning has already gone into addressing this issue. However, with respect to many other environmental issues, insufficient or no planning effort has yet been made.

What is required is greater integration of environmental planning with overall government planning, at both TPS and Council of Elders levels. All too often, development planning processes lack important environmental considerations. This SOE Report has been designed to address this oversight,

and it has also been designed to be a catalyst for decision-making processes in which environmental considerations are an integral aspect.

6.2.6 Environmental management

Appropriately trained environmental staff are urgently required in Tokelau. Environmental issues facing Tokelau are becoming more and more technical in nature, and require appropriate expertise.

6.2.7 Environmental legislation

In the past, Tokelau's legislative and judicial systems were based on the Tokelau Act 1948 and its amendments. A more coherent body of law, which responds to current needs and gives due recognition to traditional customs, is being prepared by Hosea Kirifi of the Office for Tokelau Affairs.

SPREP has also commissioned an Environmental Legislation Review for Tokelau (Angelo 1993). This project was undertaken so that appropriate environmental legislation could be established to deal with the environmental issues which affect Tokelau. Tokelau's legal responsibilities to international environmental treaties and conventions are also clarified in the review.

At present, no national laws exist to deal with conservation and natural resource management. Each Council of Elders has, however, the ability under the Villages Incorporation Regulations 1986 to formulate its own village rules.

Without a good understanding of environmental issues affecting Tokelau, it is difficult to formulate environmental policies to address such issues. Without clear policies, it is difficult to enact appropriate and enforceable legislation to help guide environmental planning and management procedures.

6.2.8 Coordination between development and environment efforts

More integration with the central planning process, including budgetary allocation, is essential if environmental management expertise is to be maximised.

6.2.9 Political and public awareness

As Tokelau continues through the process of attaining self-government, more and more responsibility will rest with the Councils of Elders: they will, in fact, be the political bodies. This places undue

responsibility on the Elders as the decision makers. Modern influences have come rapidly in recent times, and many of the most important environment issues have only recently been defined; the Elders could not be expected to be informed on all

the technical details of such issues. Assistance is currently being provided by SPREP and UNDP to hasten this transfer of knowledge to the Elders as well as to the public sector.



Conclusions

This SOE Report outlines the state of the natural resources in Tokelau and of the 'Faka-Tokelau', as well as the environmental challenges which have been recognised so far. As understanding of the environmental challenges affecting Tokelau increases, the community can be expected to respond appropriately, albeit with outside expert advice from regional and international organisations.

With this SOE Report now in hand, a concerted effort must be made to improve our environmental planning and management in Tokelau. If this is done, Tokelau could expect to attain sustainable development by the year 2000 — an achievement that will not be possible for many other countries in the world. As well, the annual cost-savings to our limited budget could become quite significant over time.

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