TUVALU

INTRODUCTION

Area: 25.11 sq.km.
Population: 8,600 (1987).

Tuvalu, formerly the Ellice Islands, comprises a 570 km chain of nine atoll systems and raised coral islands in the southwest Pacific between 5° and irs and 176° and 180°E. The islands lie about 1,050 km north of Fiji. Funafuti (254 ha), Nukufetau (307 ha), Nukulaelae (166 ha), Nanumea (361 ha) and Nui (337 ha) are atolls, generally with narrow strips of land in the east and reefs with scattered islets in the west. Niutao (226 ha), Nanumanga (310 ha) and Niulakita (41 ha) are limestone islands with enclosed brackish to saline lagoons. Vaitupu (509 ha) is intermediate in type, with two virtually land-locked internal lagoons. The maximum elevation is about 4 m above sea level.

The climate is humid tropical, with no marked seasonal variations. Temperatures average about 28°C. The average annual rainfall varies from about 2,800 mm to 3,600 mm, depending on the island. Trade winds from the east moderate conditions for much of the year. The islands are occasionally affected by hurricanes, the hurricane season being from October to March.

Tuvalu is one of the smallest sovereign countries in the world. The islands were declared a British protectorate in 1892, and administered as a colony jointly with the Gilbert Islands (now Kiribati) from 1915. Separate constitutions for the Ellice Islands, renamed Tuvalu, and the Gilbert Islands came into force in 1975, and in October 1978 Tuvalu became a fully independent nation. The inhabitants are almost entirely of Polynesian origin, and have close ties with the Samoans and Tokelauans to the south and east. The population density is very high (340 persons per sq.km in 1987), as is the growth rate (2.8% per annum in 1987). About 25% of the population live on Funafuti, the capital island, and there are villages on all eight of the outlying islands. The principal activity is fishing. Agriculture is very limited because of the poor quality of the soil which is composed largely of coral sand and rock fragments. The main food crops are coconuts, pulaka, pandanus fruits, bananas and pawpaws. Copra is the only natural resource exported. The chief source of income is remittances from Tuvaluans working abroad (chiefly in Nauru), and the economy is heavily dependent on British and Australian aid. About a quarter of Government revenue comes from the sale of postage stamps to collectors.

The marine systems have recently been described by UNEP/IUCN (1988). The dominant terrestrial vegetation is atoll/beach scrub, and there is no forest on the islands. Small stands of mangrove occur on at least five of the islands. Some 86 vascular plants have been recorded, of which 44 are indigenous, but none is endemic. One endemic species of endodontid snail and four endemic species of charopid snail have been described, but their present status is unknown (Pearsall, 1991). Sea-birds have traditionally been harvested for food, and as a consequence, populations are rather low. However, there are colonies of most of the common species of terns, noddies and boobies on relatively undisturbed islets. The investigation of suitable islets for sea-bird protection has been identified as a priority (Hay, 1985; TCSP, 1990).

Most of the natural vegetation has been cleared for coconuts and gardens, and virtually all land suitable for agriculture is now under cultivation. Overgrazing is a serious problem on some of the islands, and there have been recent signs of over-fishing on Funafuti and Vaitupu (Dahl, 1986; UNEP/IUCN, 1988). No protected areas have been established, and because of the very high population density and scarcity of undisturbed terrestrial vegetation, there is now limited scope for creation of reserves. Nevertheless, remaining areas of atoll scrub should be considered for protection, perhaps in association with sea-bird or turtle areas (TCSP, 1990).

An ESCAP Environmental Mission in 1988 identified the major environmental problems as coastal erosion,

environmental impacts of land reclamation activities, degradation of fishery resources, inefficient land use practices, pollution from the absence of a sewerage system and inadequate garbage disposal, and uncontrolled exploitation of flora and fauna, especially turtles and coconut crabs (ESCAP, 1988).

The islands are subjected to occasional cyclones which have caused extensive damage to reefs in the past. Cyclones, together with rising sea levels, put the continued future existence of Tuvalu as a viable entity in some doubt (TCSP, 1990). Rising sea level has already resulted in increased saline intrusion into the groundwater, contaminating a part of the nation's very limited freshwater supplies, and in recent years, there has been increased flooding in parts of Funafuti during the high tides of February and September. In the event of severe sea level rise, the loss of freshwater resources, erosion and increased episodic destruction through hurricanes may force the evacuation of the country (Pernetta, 1988).

Summary of Wetland Situation

There are no permanent, natural freshwater bodies on the islands. However, small ponds have been constructed on some of the limestone islands for the cultivation of tam. Groundwater is present on all but two of the islands, and this, together with rainfall, provides the inhabitants with the bulk of their freshwater supply (CSC, 1984).

There are enclosed brackish to saline lagoons on Niutao, Nanumanga and Niulakita, and two small brackish tidal lagoons on Vaitupu, connected to the sea by narrow channels. Mangroves occur on three of the limestone islands (Vaitupu, Nanumanga and Niutao) and two of the atolls (Funafuti and Nui). Two species are present, *Rhizophora stylosa* and *Lumnitzera littorea,* often in association with the shrub *Pemphis acidula* (Woodroffe, 1987). On Funafuti, a shingle barrier has totally impounded the mangroves on the main islet, forming an inland mangrove swamp. Inland mangroves also occur around the land-locked lagoons on Niutao and Nanumanga. On the latter island, the lagoon is surrounded by an extensive woodland of *Rhizophora* covering about 28.5 ha. On Vaitupu, mangroves occur on the shores of both lagoons, and are almost entirely cut off from the sea. These mangroves reach about six metres in height and cover about six ha. Small stands of mangrove occur in sheltered bays on three of the islets in Nui Atoll, in total covering only about 1.7 ha (Woodroffe, 1987). The mangroves of Tuvalu were listed as a threatened ecosystem by Dahl (1986).

Wetland Research

Some studies have been carried out on the mangrove communities (Woodroffe, 1985 & 1987; Woodroffe & Moss, 1984).

Wetland Area Legislation

The Ordinance to Provide for the Conservation of Wildlife (1975, revised 1978) gives full protection to 32 species of birds, and protection to six migratory species during certain months of the year. The Ordinance also provides for the declaration of wildlife sanctuaries, but no reserves have as yet been gazetted (TCSP, 1990; IUCN, 1991). The Fisheries Ordinance (1978) controls fishing methods and seasons, and allows for designation of areas where fishing is prohibited. However, the Ordinance does not provide guidelines as to management or development of such areas, and is thus inadequate for establishing and developing marine reserves (TCSP, 1990). Recent legislation also covers pollution, regulation of sand and coral removal, and waste disposal, but implementation and enforcement are reported to be poor (UNEP/IUCN, 1988).

The Fourth Development Plan 1987-1991 contained a chapter entitled Land Management, Environment and Conservation, which stated that the Government's general aim was to bring about improved "environmental control through better utilisation of the country's very meagre land and environmental resources" (IUCN, 1991). There is as yet no environmental impact assessment legislation in Tuvalu, although this has been

recommended (IUCN, 1991).

Tuvalu is a member of the South Pacific Regional Environment Programme (SPREP). It has signed the Convention for the Protection of the Natural Resources and Environment of the South Pacific (SPREP Convention) and the Convention on Biological Diversity, but neither of these has been ratified. Tuvalu has not as yet joined the Convention on the Conservation of Nature in the South Pacific (the Apia Convention), World Heritage Convention, Man and the Biosphere Programme or Ramsar Convention.

Wetland Area Administration

Not applicable.

Organizations involved with Wetlands
The Ministry of Commerce and Natural Resources is the government body responsible for natural resources.

WETLANDS

Tuvalu has very few wetlands, and only the small, isolated stands of mangrove (here treated as a single site) would appear to be of international importance on the basis of the Ramsar Criteria. The following site account has been compiled from the literature.

Wetland Name: Tuvalu Mangroves
Country: Tuvalu
Coordinates: 6°05'-8°45'S, 176°15'-179°10'E
Location: on the islands of Nanumanga, Niutao, Funafuti, Nui and Vaitupu.
Area: Over 40 ha.
Altitude: Sea level.
Overview: Small stands of mangrove on five of the Tuvalu islands, including inland mangroves around enclosed saline lagoons.
Physical features: Small stands of mangrove occur on at least five of the nine islands in the Tuvalu group: Nanumanga, Niutao, Funafuti, Nui and Vaitupu. Niutao (226 ha) and Nanumanga (310 ha) are limestone islands with enclosed brackish to saline lagoons. Mangroves occur as fringes around these lagoons, and are entirely cut off from the sea. On Nanumanga, the lagoon is surrounded by an extensive woodland of *Rhizophora* covering about 28.5 ha. Funafuti (254 ha) and Nui (337 ha) are atolls, with a number of small islets scattered around a large, marine lagoon. Small patches of mangrove (covering 1.7 ha) occur in sheltered bays on three of the islets in Nui Atoll, while in Funafuti Atoll, there is an inland mangrove swamp on the main islet, cut off from the sea by a shingle barrier. Vaitupu (509 ha) is intermediate in type, with two virtually land-locked lagoons connected to the sea by narrow channels. Mangroves occur on the shores of both lagoons, and in total cover about 6.0 ha (Woodroffe, 1987).

The climate is humid tropical, with an average annual rainfall of about 2,800 to 3,600 mm, depending on the island. The islands are occasionally affected by hurricanes between October and March.

Ecological features: Mangrove communities with two species of mangrove: *Rhizophora stylosa* and *Lumnitzera littorea.* In some areas, the shrub *Pemphis acidula* grows in association with the mangroves (Woodroffe, 1987). On Vaitupu, the mangroves grow to a height of about six metres. The dominant terrestrial vegetation in adjacent areas is atoll/beach scrub and coconut palms.

Land tenure: Customary ownership.
Conservation measures taken: None.
Land use: No information is available on the utilization, if any, of the mangroves. All of the islands are inhabited, with fishing being the principal activity.
Disturbances and threats: The mangroves of Tuvalu were listed as a threatened ecosystem by Dahl (1986). Major environmental problems in the islands include coastal erosion, degradation of fishery resources, pollution

from the absence of a sewerage system and uncontrolled garbage disposal (ESCAP, 1988), but the extent to which these affect the mangrove communities is unknown. The principal long-term threat is possible sea level rise as a result of global warming (Pernetta, 1988).

Hydrological and biophysical values: No information.
Social and cultural values: No information.
Noteworthy fauna: No information.
Noteworthy flora: These very isolated stands of mangroves, and especially the inland mangrove swamps on Nanumanga, Niutao and Funafuti, are of considerable botanical interest.
Scientific research and facilities: Some studies have been carried out on the mangrove communities (Woodroffe, 1985 & 1987; Woodroffe & Moss, 1984).
Management authority and jurisdiction: Ministry of Commerce and Natural Resources.
References: Dahl (1986); ESCAP (1988); Pernetta (1988); Woodroffe (1985 & 1987); Woodroffe & Moss (1984).
Reasons for inclusion: ld, 2b. The mangroves are of considerable interest because of their isolation.
Source: See references.

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