

# **THE FEDERATED STATES OF MICRONESIA**

## **PRELIMINARY NATIONAL REPORT TO THE SECRETARIAT OF THE CONVENTION TO COMBAT DESERTIFICATION**



FSM DEPARTMENT OF ECONOMIC AFFAIRS

OCTOBER 15, 2002

## Table of Contents

1. INTRODUCTION.....	3
THE FEDERATED STATES OF MICRONESIA .....	3
2. THE MARINE ENVIRONMENT.....	4
3. THE TERRESTRIAL ENVIRONMENT.....	5
4. THREATS LEADING TO LAND DEGRADATION .....	7
5. LEGISLATION AND INSTITUTIONAL FRAMEWORK.....	8
6. CONSTRAINTS TO NATURAL RESOURCE MANAGEMENT.....	9
7. FINANCIAL ASSISTANCE FOR LAND DEGRADATION.....	9

# **THE FEDERATED STATES OF MICRONESIA**

## **PRELIMINARY REPORT TO THE SECRETARIAT OF THE CONVENTION TO COMBAT DESERTIFICATION**

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### **1. INTRODUCTION**

This is a preliminary report by the Federated States of Micronesia (FSM) to the Committee on the Review of the Implementation of the Convention (CRIC) for the Convention to Combat Desertification (CCD). This preliminary report is based on the FSM State of the Environment Report, the FSM Nationwide Environmental Management Strategies (NEMS) (SPREP 1993), the Proceedings of the Second FSM Economic Summit (1999), the proceedings of the Coastal Fisheries Consortium (FSM 2000), the National Planning Framework (2002) and primarily on the National Report to the Biodiversity Convention. The FSM is currently in the process of formulating its First National Report as required under article 26.1 of the Convention with financial assistance from the Secretariat of the Convention. This National Report will be submitted at a later date and information will be based upon State-wide consultations as part of the process of preparing the Report. It will also include a review of agencies and programs whose work relates to the FSM UNCCD Report. This preliminary report, however, provides basic information on the nations land resources, threats and constraints to the conservation and sustainable use of land resources. The legislation and institutional framework relating to land degradation is also presented.

#### The Federated States of Micronesia

The Federated States of Micronesia is a young nation derived from part of the former United Nations Trust Territory of the Pacific Islands (TTPI). It is allied with the United States through a Compact of Free Association initiated in 1986. The FSM became a full member of the United Nations in 1991 and signed the Convention to Combat Desertification on December 12, 1994.

Located in the Central and Western Caroline archipelago, the FSM consists of the four states of Kosrae, Pohnpei, Chuuk and Yap. With an Exclusive Economic Zone that extends from approximately 1 degree S to 14 degrees N latitude and 135 to 166 degrees E longitude, this nation of small islands extends over an area of approximately 2,978,000 sq. km. The total land area of the FSM is only 4,840 square km. There are 30 high islands, one raised coral island and 33 atolls whose individual islets bring the total number of islands to over 600. These islands range from islets barely above sea level to the high island of Pohnpei which reaches 791 meters above sea level. The total population recorded in the 1994 census was 105,506, with a distribution of 50.5% in Chuuk State, 32% in Pohnpei State, 10.5% in Yap State and 7% in Kosrae State.

The per capita GDP for the FSM in 1996 is \$1,835. This is in an economy that has subsistence farming, wholesale and retail and government services as its main activities. Government services dominate the economy at 43% of GDP with expenditures totaling \$173 million in FY91. This is supported mainly by the Compact of Free Association with the United States. Some of the financial provisions of the Compact will expire in 2001 but is also being renegotiated.

The climate is tropical marine with daily temperatures ranging from about 24 °C (mid 70's F) to 29°C (mid 80's F) with little average variation throughout the year. Rainfall ranges from 304cm (120 inches) per year for drier islands, and over 1,016 cm (400 inches) per year in the mountains of Pohnpei. Humidity averages over 80 per cent. Northeast trade winds prevail from about November to May when conditions may be drier on western islands of the FSM. The region is affected by storms and typhoons which are generally more severe in the western islands, and by periods of drought and excessive rainfall associated with the "El Nino" (ENSO) phenomena. In recent times, the droughts of 1982-1983 and 1997-1998 were especially severe.

Ownership of land and marine areas varies between States. In Kosrae and Pohnpei, land is both privately and state owned, while marine areas are owned by the State. In Chuuk most land and marine areas are privately owned and acquired through inheritance, gift or, recently, by purchase. In Yap almost all land and marine areas are owned or managed by individual estates and usage is subject to traditional control of heads of estates or in some areas, is restricted to residents of a particular village or municipality and those who have been granted permission to utilize the area in a particular way, sometimes to harvest only particular species. In all states, land cannot be sold to non-citizens of the FSM. These land and marine ownership patterns greatly influence the use and management of land resources.

## **2. The Marine Environment**

The major coastal marine communities are mangrove forests, sea grass beds, lagoons and coral reefs. These ecosystems are linked physically and biologically: reefs serve as breakwaters that allow coastal mangroves to develop; the calcium carbonate of the reef provides the sand and sediment in which mangroves and sea grasses grow; and the mangroves and sea grass communities settle silts from the land and provide nutrient inputs into the coastal ecosystem and serve as spawning, rearing, and foraging habitat for the many species associated with the reefs. It is known that the FSM has approximately 300 species of corals, 1,000 species of fish and 1,200 species of mollusks. Other marine groups are not as well documented and further studies are needed to collect such data.

Mangrove forests provide rich nurseries for many species of shrimps, lobsters and fishes. They also provide a home for birds which feed on fishes, crabs and other prey. Mangroves protect coasts from erosion and serve as a filter/buffer on the effects of runoff sedimentation and pollution. They also serve as a source of building materials, fuel wood and craft wood. Seagrass beds are an important habitat lying seaward of mangrove forests. Their roots help to stabilize sediments and their leaves provide shelter and food to many organisms as well as a source of detritus which becomes an important food

source for life of the coral reefs. Seagrass beds also serve to moderate currents and as a nursery ground for some invertebrates and fish. Lagoons are important for they provide the primary source of food for the inhabitants of the coral reefs. They are the home of many kinds of large plankton blooms. Baitfish feed on the plankton and the larger carnivores in turn feed on the baitfishes.

All major types of coral reefs are found within the FSM including barrier reefs, fringing reefs, atolls and submerged reefs. Common reef habitats in the FSM include lagoon reefs (pinnacle, patch), passes, channels, shallow reef flats, terraces, submerged reefs, slopes, reef holes, embayments, quasi estuaries, seagrass beds, mangroves, mud and sand flats. Climatic conditions, especially on the larger volcanic islands produce high yearly rainfall which provides additional freshwater and nutrients to the adjacent reef system. These terrestrial inputs increase reef habitats and reef biodiversity within these islands. Coral reef biodiversity and complexity is high within the reefs of the FSM and this diversity increases notably from east to west within the region. Using stony corals as an example, approximately 150 species are known from Kosrae, 200 from Pohnpei, and 300 from Chuuk. Reef biodiversity is highest in the Indo-Western Pacific, which is also thought to have the world's highest overall marine biodiversity. Over half the world's coral reefs are located within this region of which the FSM is part.

Coral reefs are noted for some of the highest levels of gross productivity on earth. The net productivity of coral reefs is approximately 2,500 grams of carbon per square meter per year, compared to 2,200 grams of carbon per square meter per year for tropical forests and only 125 grams of carbon per square meter per year in the open ocean. Coral polyps -- the thin layer covering reef structures -- provide much of the energy that fuels these communities. These tiny animals contain algae which convert sunlight to fuel, obtaining nutrients from the polyp wastes.

Reef-building corals and certain calcareous algae, which may constitute more than half of a coral reef's stony substance, lay down a foundation of calcium carbonate. Over generations this accumulation results in often massive structures, providing homes and hiding places for countless other creatures. Coral reefs are the net result of thousands of years of growth. As such, many are among the earth's oldest living communities.

The oceanic waters of the FSM also contain a diversity of environments from the productive pelagic surface waters to the benthic environment of some of the deepest waters on the planet. Due to these extremes of environment and their very different accessibility, there is a large difference in the amount known of the environments within the ocean waters. The pelagic oceanic waters produce a very rich pelagic fishery, exploitation of which currently is the FSM's most valuable economic resource. As a result there exists considerable information of the biological diversity of this environ, however the benthic environ is poorly known. There has been little consideration of the deeper water biota and hence it is also not so well documented.

### **3. The Terrestrial Environment**

The terrestrial environment stretches from high tide level to the tops of the highest mountain. It includes a considerable range of vegetation types, including the following

types arranged roughly from mountainous island interiors out to coastal mangroves or sandy beaches: Cloud forest, upland forest, palm forest, plantation forest, agroforest, areas dominated by Merremia vines, savannas, native secondary forest, thickets of introduced trees, cultivated areas, freshwater marsh, swamp forest, Nypa swamp, mangroves, atoll forest, forest of rocky coasts and beach strand.

Basic vegetation types that could be readily discerned on 1:10,000 black and white aerial photographs taken in 1974 - 1976 have been mapped for the high islands of the FSM. Types that were under 1 hectare in area or difficult to discern using photo interpretation were not included. The distribution of major types based on this data is given in Table 1.

**Table 1. General vegetation types of FSM high islands (in hectares) (adapted from Whitesell et al 1986, MacLean et al 1987, Falanruw et al 1987a&b)**

	Kosrae	Pohnpei	Chuuk*	Yap
	1983	1983	1976	1976
Mangrove	1,562	5,525	306	1,171
Swamp Forest	345	214		155
Upland Forest	5090	12,548	677	2,556
Palm Forest		1,383		
Agroforest ***	2,585	11,865	2,378	2,538
Secondary vegetation	1,272	1,843	252	553
Grasslands		1,476	174	2,175
Marsh		149	234	165
Other nonforest **	263	490	149	403
Total Area	11,186	35,493	4,170	9,716

\* In Chuuk State, only the islands of Moen, Dublon, Fefan & Eten were included in the survey

\*\* Other = inland water, urban, nonforest and types totaling less than 100 hectares in area

\*\*\* includes coconut plantations

Additional work is needed to discern important types of native vegetation such as the cloud covered moss forests of the mountains of Pohnpei and Kosrae, and to identify forest types within the broad category of “upland forest”. The forests of the eastern states of the FSM are more characteristic of rainforests, having abundant rainfall throughout the year, while the forests of Yap are adapted to a monsoon climate with frequent periods of drought. There is a gradient in the species composition of native forests of the FSM with the forests of Kosrae and Pohnpei having a greater abundance of ferns and fewer species of native trees species than the forests of Yap. There is also an increase in the number of species of basic mangrove trees going from the eastern to western ends of the FSM.

The nature of the “agroforest” category differs from island to island. In Pohnpei it depicts areas from early to late stages of shifting agriculture, as well as settled homesteads. In Chuuk the type consists largely of coconut/ breadfruit ‘tree gardens’ on sloping land. In Yap the type represents long established tree garden/ taro patch systems

involving landscape architecture to manage water flow through the system. The nature of savannas also differs from east to west. In Pohnpei and Kosrae these open areas are generally indicative of disturbance and are filled largely with Ischaemum grass or Gleichenia ferns. The savannas of Yap are much older and some contain a more diverse and characteristic set of savanna species including some endemics.

#### **4. Threats leading to land degradation**

At one time Micronesians were almost completely dependent on the natural resources of islands for their lives. As human populations grew, so did their impact on natural resources. Species have been lost and ecosystems damaged by the dense populations of the FSM's past. At the same time, the people of the FSM have adapted to living with limited island ecosystems. Micronesian cultures incorporate practices having conservation value and thus served to buffer people's impact on the environment. The cultural and technological adaptations to living with island ecosystems are an important heritage of the past and asset for the future.

Today the population of the FSM is growing rapidly, and patterns of resource use are changing. New technologies enable people to have a much greater impact on the natural environment, and commercial markets encourage greater exploitation of natural resources. Infrastructure developments such as roads and unsustainable agricultural practices have led to deforestation. For example, on Pohnpei island the reduction in the area of native upland forest from 42% of the total vegetation cover in 1975 to but 15% in 1995 is attributed largely to clearing to plant sakau (kava or Piper methysticum). The availability of off-island markets has resulted in unsustainable exploitation of resources.

Another set of threats to land resources results from loosely controlled use of powerful technology in activities such as earth moving, dredging and sand mining. These activities result in changes in drainage patterns, destruction of natural habitat, filling of wetlands and erosion and siltation, that threaten ecological processes. There is a growing problem of pollutants including solid waste, sewage and nutrient discharges, oil spills, asphaltic oils, PCBs, chlorine, pesticides, herbicides, fertilizers. Greenhouse gases, ammonia and other cleaning chemicals.

Increased travel and transport has decreased island insularity and brought new pests and invasive species, diseases, spills or leakage of oil and hazardous substances from ships transiting through FSM waters, threats from toxic materials and nuclear accidents and new concerns such as impacts of genetically altered organisms. There are increasing issues of access such as bio-prospecting, intellectual property rights, and fair sharing of benefits from the use of island resources.

Global climate change and climate extremes are of special concern to the FSM. The severe ENSO events of 1982-1983 and 1997-1998 brought increased impacts from storms and severe periods of drought followed, in some islands by excessive rainfall. Groundwater sources were taxed, agricultural systems were damaged and problems of wildfires and invasive species were greatly aggravated. Periods of especially low tides and warm inshore water damaged inshore marine resources. Then the especially high

seas that followed, resulted in salinization of many taro patches and some fresh water sources. Coastal erosion is also becoming more evident. The islands' natural resources face natural disasters such as typhoons and storm surges which occur periodically in the islands.

## **5. Legislation and Institutional Framework**

Because of the government structure of the FSM federation with a National Government and four semi-autonomous State governments, each of the four States have their own constitutions along with the FSM constitution. This structure makes it a prerogative of each State to enact their own legislation in line with their powers as mentioned in the FSM Constitution to address land degradation issues. At the state level there are also municipal ordinances and traditional precedents.

The source of the National Government's authority to regulate is the FSM Constitution. The Constitution clarifies the National and State Governments' roles in implementing the FSM's obligations under the Convention to Combat Desertification. The FSM Constitution explains that a power that is expressly delegated to the national government, or a power that is of such an "indisputably national character as to be beyond the power of a state to control", is a national power." However, a power that is not expressly delegated to the national government or prohibited to the states, is a state power. The FSM Constitution also sets out powers that are expressly delegated to the FSM Congress. There are many powers listed, but the important ones for purposes of this report include the power to ratify treaties, the power to regulate foreign and interstate commerce, the power to regulate navigation and shipping, except within lagoons, lakes, and rivers, the authority to regulate the ownership, exploration, and exploitation of natural resources within the marine space of the FSM beyond 12 miles from island baselines, and the authority to promote health by setting minimum standards, coordinating state activities relating to foreign assistance and providing training and assistance to the states.

Responsibility for environmental issues is shared between the FSM National Government and the individual FSM States. This sharing of responsibility has at times resulted in legislation that appears duplicative at the State and National levels. It has also resulted in gaps in legislation and areas in which the location of responsibility between the State and National Governments has been less than clear. The State and National Attorneys General at one time formulated a tentative Joint Opinion regarding State and National jurisdiction over certain environmental issues. This Opinion, though not signed, concludes that the protection of ecosystems, such as reefs and mangrove swamps, is the responsibility of the States; land use, land management, agriculture, forestry and watershed protection in general are regulated by the States, although the National Government has regulatory authority if any aspect of these areas has a clear effect on foreign or interstate commerce or concerns the public health.

In essence, that opinion recognized that the primary responsibility for land management, natural resource management and development planning rests with the four individual States of the FSM. The States take the lead role in ensuring that development is avoided in vulnerable areas and ensuring that critical natural systems are protected. Most of the



States have made efforts to control development and manage natural resources through the creation of land use plans, coastal zone plans, legislation and regulations. The National Government provides guidance and technical assistance to the state, when needed and requested, on matters related to planning, economic development, natural resources, fisheries, and the environment.

## **6. Constraints to Natural Resource Management**

Although the people of the FSM are taking measures to address the numerous threats to the fragile and vulnerable islands, there are constraints and challenges to the small nation. As a developing nation struggling to be a part of the global community, the FSM is continually faced with the question of sustained financial resources to support resource management efforts. The lack of sufficient and sustainable funding leads to other constraints relating to information availability, human resources, institutional capacity and coordination. There is almost no monitoring of the condition of natural resources. Only in Pohnpei has there been a survey to note changes in vegetation since 1976. Urbanization removes people from day to day contact with natural resources so that there is no longer a feedback system between people and their environment that could alert people to problems. Research is very limited and if undertaken, is often not for the benefit of the islands. Without sufficient and useful information on the resources, decision-making often does not address the root causes of our problems and often addresses short term rather than long-term objectives. The public continues to require awareness-raising of the issues and especially of the impact of their activities.

The dispersed nature of the FSM population makes it difficult to have sufficient human resources in the environmental management sector with a few resource managers having to oversee a large geographical area. Some offices have barely enough manpower to fulfill their mandates. Not only is the number lacking but the existing personnel are usually in need of training to improve their skills to effectively carry out their tasks. This leads to the lack of or ineffective enforcement of regulations and implementation of plans. For example, there is a lack of management plans for sustainable development. The government structure also does not adequately provide for effective coordination between national and state governments, traditional leadership and communities; and between scientific researchers, resource management agencies and resource owners and stewards. Land tenure systems also complicate the establishment of protected areas and sanctuaries. Legislation and regulations though enacted or adopted to enable effective enforcement are difficult to enforce, are duplicative, or, in some places, non-existent. All these constraints need to be continually addressed to effectively tackle the threats of land degradation.

## **7. Financial Assistance for Land Degradation**

The government is considering to provide financial or technical cooperation and assistance under a budget allocation associated with the Convention. In the meantime, the government is supporting the Convention by providing logistical support for the operational focal point. The government has received from the Secretariat of the Convention, funding assistance to complete its first National Report. This funding is being utilized to develop the National Report.