

**World Summit on Sustainable Development
(RIO+10) Johannesburg, 2002**

**Federated States of Micronesia
National Assessment Report**

**Synopsis of Issues, Activities, Needs and Constraints:
Sustainable Development 1992 - 2002**



Map of the FSM will be inserted in this page.

Forward

Table of Contents

Forward	3
Table of Contents	4
Acronyms	5
Acknowledgements	5
1.0 Vision	6
2.0 Background	6
3.0 Introduction.....	7
4.0 The Way Forward.....	9
4.1 Guiding Principles for Sustainable Development of the FSM	10
5.0 Assessment of Implementation of Agenda 21	11
6.0 Socio-Economic Framework	11
6.1 Human Resources & Institutional Development	12
6.2 Vulnerability	13
6.3 Finance	14
6.3.1 Public Sector.....	15
6.3.2 Private Sector.....	16
6.4 Education.....	17
6.5 Health.....	17
6.6 Tourism.....	19
7.0 Ocean and Coastal Framework	20
7.1 Coastal	21
7.2 Oceans	22
8.0 Land Framework	23
9.0 Environment Framework	25
9.1 Climate Change, Variability & Sea level Rise.....	27
9.2 Biodiversity	30
9.3 Freshwater.....	32
10.0 Infrastructure Framework	33
10.1 Waste Management & Pollution	34
10.2 Energy	36
12.0 References.....	38

Acronyms

AOSIS	Alliance of Small Islands Developing States
CBO	Community Based Organizations
CBD	Convention on Biological Diversity
CTF	National Conservation Trust Fund
CRC	Convention on the Rights of the Child
EEZ	Exclusive Economic Zone
ENSO	El Nino/Southern Oscillation Phenomena
FSM	Federated States of Micronesia
GDP	Gross Domestic Product
IPCC	Inter-Government Panel on Climate Change
LPG	Liquid Petroleum Gas
NBSAP	National Biodiversity Strategy and Action Plan
NCD	Non-Communicable Diseases
NEMS	FSM Nationwide Environmental Management Strategies
NGO	Non Government Organizations
MCT	Micronesia Conservation Trust
MLHC	Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean
NORMA	National Oceanic Resource Management Authority
PICCAP	Pacific Island Climate Change Assistance Program,
SIDS	Programme of Action for the Sustainable Development of Small Island Developing States.
TTPI	Trust Territory of the Pacific Islands
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
WWF	World Wildlife Fund
WSSD	World Summit on Sustainable Development

Acknowledgements

[The Department of Economic Affairs will write the section on acknowledgement.](#)

1.0 Vision

“Attaining discernible sustainable development in the Federated States of Micronesia for the benefit of all citizens and for the needs of all future generations”.

2.0 Background

The Federated States of Micronesia (FSM) is a young independent nation. It was a United Nations Trust Territory of the Pacific Islands (TTPI) administered by the United States of America until the two nations signed a Compact of Free Association in 1986 leading to the trusteeship termination by the United Nations (UN) in 1991. The Compact treaty established a special relationship with America providing economic assistance. The funding provisions under the original compact are currently being renegotiated between the two countries.

The FSM is the largest and most diverse part of the greater Micronesian region and is comprised of four States, which are, in geographic sequence from west to east, Yap, Chuuk, Pohnpei and Kosrae (Figure 1). All but Kosrae State include more than one island and each State has considerable autonomy within the federation.

The total landmass of the FSM is 438 square miles (702 km²), with a declared Exclusive Economic Zone (EEZ) covering over 1 million square miles (1.6 million km²). The FSM is comprised of 607 islands between 1.0-9.9⁰ N and 138.2-162.6⁰ E (Figure 1) with land elevation ranging from sea level to 2,500 feet (791 m). The northeast trade wind belt heavily influences the tropical climate of the FSM with strong trade winds prevailing from December through April and periods of weaker winds and doldrums occurring from May to November. Rainfall is extremely high on the high volcanic islands of Kosrae, Pohnpei and Chuuk and can exceed 400 inches (1,016 cm) a year (SPREP, 1993, Lindsay & Edward, 2000). The region is affected by storms and typhoons that 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 with groundwater sources greatly reduced, agricultural systems damaged and coral bleaching events recorded (Falanruw, 2001).

The indigenous population is Micronesian with most of the people residing on the main islands of the State capitals. The 2000 census preliminary count of the population is 107,000 (July, 2000), half of which are younger than 20 years of age. Traditional, social and cultural institutions are still very strong and Micronesian society is based on the extended family, which is responsible for the family welfare, especially in relation to customary family land. Ownership of land and marine areas varies between States. In Kosrae and Pohnpei, land is both privately and State owned, while marine areas are managed by the State as public trusts. In Chuuk and Yap, the majority of land and marine areas are privately owned or managed by individual estates and are acquired through inheritance, gift or, recently, by purchase. In all States, land cannot be sold to non-citizens of the FSM (Falanruw, 2001, URS, 2001 AND FSM Government, 2002a). These land and marine ownership patterns greatly influence the strategies and actions required to sustainably develop the nation.

The National constitution of the FSM is the basis for all legal authority and decision making for the nation. The legislation and institutional framework of the FSM includes, both National and individual State constitutions with each of the four States functioning as semi-autonomous governments (Mace, 1999). 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 the concerns and issues of managing their own natural resources and sustainable development (Mace, 1999). Each State has 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 States, when needed and requested, on matters related to planning, economic development, natural resources, fisheries, and the environment (Mace, 1999).

The economy of FSM is small and is largely dependent on aid provided through the Compact of Free Association with America (SPREP, 1993). The US dollar is the currency used by the nation. Estimates (2000) of Gross Domestic Product (GDP) performance indicate that since FY87 the FSM economy has grown by an average annual rate of 2.5 percent (FSM Government, 2000b). Economic performance of each State within the nation varied over the period of FY87-99 with GDP growing at an annual rate of 0.3 percent for Chuuk State, 2.5 percent for Kosrae State and 3.6 percent for the States of Pohnpei and Yap. While real GDP grew by annual average of 2.5 percent during the FY87-FY99 period, this was nearly matched by the rate of population growth, resulting in only a very small increase in the level of real per capita incomes in the FSM (FSM Government, 2000b).

The majority of economic activities within the nation are subsistence farming and fishing, agricultural production, commercial offshore fishing, wholesale, retail and government services. The government services dominate the economy. Agriculture, fisheries, and tourism sectors are recognized as providing the long-term growth potential and comparative advantage of the FSM. Thus the major economic challenge facing the FSM is to assist in building and developing an environment conducive to private sector growth (FSM Government, 2000b and 2002a). Currently, the FSM public sector maintains wages almost double those of the private sector. The commercial tuna fishery (international and domestic) is the nation's second highest revenue earner with annual revenues between US\$10 –15 million dollars FSM, (FSM Government, 1999a). Fifty thousand tourists (FSM Immigration) entered the FSM in 2000, (Kosrae 12%, Pohnpei 37 %, Chuuk 36 %, Yap 15 %), contributing small revenue earnings to the economy of the country.

3.0 Introduction

The United Nations Conference on the Environment and Development (UNCED) held in Rio de Janeiro, Brazil in June 1992 provided a set of fundamental principles and a programme of action for achieving sustainable development (Agenda 21). This programme included the provisions for two Conventions, Climate Change and Biological Diversity.

The FSM signed on as a party to the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 with ratification completed in 1993. The FSM submitted in September 1997 its initial National Communication to the Secretariat of the UNFCCC. A comprehensive Addendum to this document was submitted to the secretariat of the Convention in October 1999. The Kyoto Protocol to the UNFCCC was signed in 1998 and ratified in 1999. The Convention on

Biological Diversity (CBD) was signed in 1992 and was ratified 1994. The completion of the FSM National Biodiversity Strategic Action Plan (NBSAP) was completed in 2002.

These documents are the nations initial step to meet the obligations of these conventions. The nation is a member of the Alliance of Small Islands Developing States (AOSIS) and an active participant to the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (SIDS).

Through this document the FSM reaffirms the nations commitment to the Rio principles, the two conventions and the full implementation of Agenda 21 to attain sustainable development of the nation. The FSM acknowledges that good governance, financial transparency, sound long term economic policies that are responsive to the needs of the communities and improved infrastructures, especially in remote locations are the basis for sustainable development, long term economic growth resulting in poverty alleviation and increase employment opportunities (Anon, 2001). The FSM also fully acknowledges that the maintenance and protection of healthy ecosystems is a prerequisite to attain sustainable development FSM Government, 1999b and 2002a).

The vulnerability of the FSM, like other Small Island Developing States (SIDS) to economic, social and environmental issues and the ability to address these issues are major constraints preventing the sustainable development of the nation. The nation fully acknowledges these issues and has made initial steps to better understand, reduce and manage these vulnerabilities.

The FSM is exceptionally vulnerable to natural disasters and its remoteness from major trading markets greatly impedes the nations potential to economically compete regionally and internationally. The FSM's economic development is directly linked to the environment, which is present in every facet of Micronesian's way of life providing the natural resources for food, shelter, and is utilised for medicinal and traditional purposes (FSM Government, 2002a). The majority of households within the nation are dependent on subsistence living. Traditional resource utilization practices and community management regimes are eroding which has a direct negative impact on the health of the nations environment. This deterioration has been greatly enhanced in more recent times due to the changes from subsistence to a commercial economy, high population growth rates, urbanization and the development of centralized governments (FSM Government, 1999b and 2002a).

The nation has embarked on a programme to conserve, preserve, manage and protect the ecosystems and the biodiversity of the country which have included the implementation of conservation areas, wise land use and marine management plans, and environmental community awareness and capacity building (FSM Government, 2002a). Sustainable development principles have been integrated into these programmes, however increased information exchange and programme implementation is required. The development and implementation of suitable traditional and scientific resource management programmes that can address these issues in both the near and long term are essential.

Globalization and global environmental crises such as climate change, sea level rise and climate variability (frequent and severe typhoon, storm surges, droughts) are major concerns to the FSM and the protection and conservation of island biological resources that can assist the nation to protect itself from these natural forces is extremely important (FSM Government, 1999d). Equally, the mitigation of anthropogenic activities within the nation that are contributing to these issues need to be further addressed.

The FSM has made a serious commitment to improve environmental legislation, strengthen institutions, increase capacity building and public awareness for those agencies (National and State Governments, Non-Government Organizations (NGO) and Educational Institutions responsible for the environment and sustainable development, which has greatly increased actions and commitments for Agenda 21 implementation. However, it is acknowledged that as a nation we need to further assess our current implementation strategies and collaboratively develop and implement programmes that will address our problems and weaknesses (Anon, 2001). The importance of achieving sustainable development is not understated. The strengthening of community collective ownership and responsibility for the implementation of sustainable development is required and all citizens and residents of the nation need to be actively involved to achieve this goal.

4.0 The Way Forward

The people of the FSM support and endorse the Small Islands Developing States (SIDS) Inter-regional and Asian/Pacific goals for sustainable development in the 21st century (Anon, 2001). The government and people of the FSM are committed to developing a sustainable nation that is based on the following criteria (Anon, 2001 and Smith, 2001):

- Environment:** Providing adequate life giving services to all, including safe drinking water, clean air, fertile lands, bountiful forest and marine ecosystems and overall ecological stability.
- Economy:** Undoing the vicious cycle of poverty, building on the equitable sharing of resources and their benefits for better quality of life at community, State, National, regional and global levels; and transforming markets into instruments of environmental management.
- Empowerment:** Including all citizens and stakeholders in the decision making process; strengthening local government authorities, civil society and the private sector; and creating effective political will for community, State, National, regional and global action for sustainable development.

The FSM through a multi-stakeholder consultative workshop held in February 2002 developed a programme of future needs and initiatives that must be implemented for the sustainable development of the nation. This programme has been developed in line with the goals of Agenda 21 and the Barbados Programme of Action. The nation understands sustainable development as *“the development that meets the needs of the present population without compromising the ability of future generations to meet their own needs ensuring improved quality of life for all citizens now and in the future”* (UN Report, 1989).

The formulation of this document has been based on the information and directives provided during the World Summit on Sustainable Development (WSSD) workshop, including the five priority sectors highlighted, information provided in the FSM’s National Economic Summits, FSM Planning Framework for 1999-2002, information provided by National and State government sectors, NGO’s and private entities.

The FSM clearly acknowledges the progress to attain sustainable development within the nation has been slow which is a direct result of limited financial, institutional, regulative (National and State) and human resources. The shortage of trained and skilled labour and a small private sector are major concerns that need to be addressed at all political and social levels to augment

development. The economy of the nation is still based on the natural resources of both land and sea and these resources are vulnerable to natural and anthropogenic threats.

The FSM acknowledges the development of human resources is the key to sustainable development. In the past the nation placed greater emphasis on capital economic development projects than on human resource development issues. Recently this trend has changed and programmes to develop local resource capacity and institutional strengthening have been undertaken, including programmes for gender equality and improvements for the nations women and children. Further improvements in all formal educational services are required to provide the training and skills required to sustainably develop the nation. International and local NGO communities operating within the FSM have contributed considerably to this, especially in the areas of environmental management and community empowerment.

Continued technical expertise and assistance, including financial in all sectors has been highlighted, however the nation clearly desires that all future programmes must have a component for capacity building of local citizens and public awareness programme as appropriate.

Although considerable effort and advancements have been made, communication and coordination among National and State government agencies with the private sector, NGO community, local municipalities and citizens need to be further improved with special emphasis on awareness of environment and sustainable resource utilization and management. This is especially important for cumulative and long-term impacts. The further development of community-based services will greatly assist in this endeavor.

4.1 Guiding Principles for Sustainable Development of the FSM

The below list of guiding principles for the sustainable development of the FSM were formulated during the multi-sectoral National assessment workshop held in Pohnpei Sate, FSM (February 2002). These principles form the basis of the nations future commitments to achieving sustainable development. The recommended sustainable development initiatives outlined within this report have been derived from these principles and have been endorsed by the people of the nation. They include:

<i>Sovereign Rights:</i>	The people of the FSM hold the sovereign rights over their natural resources.
<i>Good Governance and Leadership:</i>	The National and State governments actively promote sustainable development through appropriate levels of transparency, accountability and strengthen legislation and policies that are proactive and responsive.
<i>Community-based Approach:</i>	The community is the basic management unit for the sustainable development within the FSM – they have the right and responsibility to manage and sustainably develop their resources for their benefit and that of future generations.
<i>Nation Partnerships:</i>	Improve and encourage partnerships at all levels of government with the private sector, non-government agencies and civil society to be actively responsible for sustainable development.
<i>Traditional Heritage:</i>	Build upon and utilize the rich traditional knowledge and experience

of our ancestors to devise and implement strategies for the sustainable development and stewardship of nations resources.

Ecological Integrity:

Maintain and improve the diversity and quality of our ecosystems, conserving and enhancing our ecosystems' capacity to adapt to change whilst allowing all citizens sustainably conserve and manage our resources.

5.0 Assessment of Implementation of Agenda 21

The following assessment of implementation of Agenda 21 are to be used to provide guidelines for and to identify the challenges faced by the FSM to implement these initiatives and to allow meaningful quantifiable evaluation of the nation's progress. The implementation of these initiatives are high priority concerns of the nation and through this document are highlighted for the attention of the international community to fully acknowledge the commitments and needs of the FSM to attain sustainable development.

The information presented below has been sourced from National and State multi-stakeholders meeting and workshops and from documents pertaining to the economic development of the nation. In particular, the 1st and 2^d National Economic Summits and the Nations Policy Framework. These documents are the FSM's foremost national policy statements for all future development programmes for the 21st century. The following sections were highlighted as priority areas during the national WSSD multi-stakeholder workshop and are summarized below.

6.0 Socio-Economic Framework

The cross-sectoral elements highlighted in this sector are intrinsically important to the sustainable development of the nation and are directly related to each sector included in this report. These elements have not been replicated, however their importance for each sector cannot be understated.

The development of a sustainable future for the FSM is intricately integrated with the nations population. Population growth and density is the nations key environmental and sustainable development driver.

The past decade has witnessed internal migration and emigration of the citizen of the FSM. There has been a steady movement of the population within all States from outer lying communities and islands towards the States capitals. Resulting in loss of traditional values and culture, increased urbanization and greatly increasing pressure on limited resources required for subsistence lifestyles. Resulting in infrastructures and associated essential services being unable to keep pace with urban development. This increase of people in the major centers has not stimulated an increase in work availability and therefore unemployment, especially in the unskilled sectors of the nation is high. The lack of secure employment has stimulated an ever-increasing outward emigration of citizen to Guam, Hawaii and the United States mainland in search of improved employment and education opportunities. Unfortunately, the majority of citizen who depart the nation do not return. The nation is currently developing programmes that can address these issues and provide sustainable mitigation actions that will provide long-term solutions to these concerns.

6.1 Human Resources & Institutional Development

The citizens and residents of the FSM are the critical elements for the sustainable development of the nation. The development and capacity of the nation's human resources is therefore the key to the FSM's sustainable development. The ability, skills and knowledge of the present population to develop appropriate legislation and sustainable management related development programmes is essential for the sustainable development of the nation for future generations.

Currently, the understanding of the principles and concepts of sustainable development in the general population is limited. Therefore, there is a need to develop a nation wide education and awareness programme for all age groups to provide the knowledge needed to understand the concepts and the value of sound economic sustainable development. These programmes need to empower communities and individuals to take ownership and responsibility and be supported by good governance (FSM Government, 2002a).

Furthermore, human capacity building, community empowerment and institutional strengthening programmes need to be developed to further provide educational avenues and programmes to stimulate information exchange to allow all agencies and individuals' additional skills and knowledge to attain the nations sustainable development goals. Assistance is required from outside donor organizations to provide technical skills to develop the human resource capacity of the nation. The establishment and support of NGO's working directly with communities and resource owners is a priority.

Improve institutional arrangements and communication to better define government roles in infrastructure development, the delivery of public services and the coordination among National and State government agencies with the private sector, NGO community, local municipalities and citizens need to be further improved (Anon, 2001). Increased political awareness and support at both the State and National political arenas need to be further development.

The three highest priority areas for human resource development within the FSM are (FSM Government, 2000b and 2002a):

- **Human Capacity Building:** To develop and strengthen the capacity of resources owners, traditional leaders, communities, women, technical staff and policy makers in the coordination and implementation of programmes to sustainably develop the nation.
- **Public Awareness and Education:** To promote, encourage and strengthen the awareness and understanding of all stakeholders (local resource owners, traditional leaders, communities, government agencies, academic institutions, NGO's and policy makers) of the importance that the nation's development is sustainable for the long term.
- **Institutional Strengthening:** To develop and strengthen the capacity of National, State and Municipal government agencies, NGO's and academic institutions in the coordination, education and implementation of activities that will promote long term sustainable management of resources and the sustainable development of the nation.

Furthermore, the FSM through the 1st and 2nd Economic Summits has highlighted the concerns for gender equality, children and youth welfare and equal opportunities for all citizens. The development of programmes addressing these issues is essential for the sustainable development

of the nation. Five key policy elements have been identified and documented for gender equality within the FSM, they are (FSM Government, 1999a):

- Address the under-representation of women in decision-making.
- Enhance the human resources of the nation by ensuring the full participation of women.
- Ensure women's access to capital.
- Protect women's property rights.
- Address discrepancies in compensation.

The current population of the FSM includes over 50 percent under the age of 20 years and therefore the importance of Youth to the immediate and long-term sustainable development of the nation is paramount. Programmes have been developed targeting this age group to provide information and skills to lead productive lives in all government sectors within the nation. The FSM is a signatory to the Convention on the Rights of the Child (CRC) and recently became a signatory of two optional protocols:

1. The Involvement of Children in Armed Conflict.
2. The Sale of Children, Child Prostitution and Child Pornography.

6.2 Vulnerability

The vulnerability of the FSM, like other Small Island Developing States (SIDS) to economic, social and environmental issues and the ability to address these issues are major constraints preventing the sustainable development of the nation. The nation fully acknowledges and supports the SIDS vulnerability statement (UN 1999) "... *face particular constraints in their efforts to achieve sustainable development and their specific physical circumstances often make it difficult for them to benefit from global economic development and thus achieve sustainable development*".

The FSM has made initial steps to better understand and address these nation wide vulnerabilities. The major vulnerability issues that have been highlighted for the nation are:

- Fragile and vulnerable economies.
- Reliance on foreign aid assistance.
- Remoteness from international trade markets
- Subsistence dependence on natural resources.
- Susceptibility to natural disasters.
- Climate change.
- High transportation and communication costs.
- Limited human resources.

The FSM is in agreement that a region wide protocol is required to be developed to measure economic, social and environmental vulnerabilities that will be utilised to provide the foundation for understanding the special case for (SIDS) and provide a more effective mechanism that will support the FSM in pursuing its sustainable development goals. Currently, the FSM, like other SIDS, does not fit into the traditional criteria in terms of measuring vulnerability by using per capita income, GDP measures and GNP. Because of the FSM's unique situation as a SIDS, its needs are not properly communicated and understood by developed countries as well as other developing nations. Therefore, the critical issue for the FSM is that the extent of vulnerability

affecting the FSM are such that the sustainable development goals are barely taken into consideration by the international community (UWICED, 2002).

The FSM shall endeavor to place more emphasis on all aspects of vulnerability in the future in order for a better understand and to initiate programmes to further reduce and manage it's economic, social and environmental vulnerabilities. However, the nation's critical constraints of limited human resources and lack of financial resources hinder the successful implementation of these programmes.

The FSM defines the nations vulnerability as:

- **Economic Vulnerability:** A small, isolated and fragile island nation, geographically dispersed with four states with an Exclusive Economic Zone (EEZ) covering over one million square miles (1.6 million km²) of the Western Pacific Ocean; the FSM' small and isolated economy is very vulnerable to economic globalization, external economic forces and reliance on foreign financial assistance (UNDP. 2002).
- **Environmental Vulnerability:** The risk and damage to the FSM's natural ecosystems, including human-induced (climate change and other human-induced impacts) and other impacts on coral reefs, wetlands, freshwater, coastal areas and marine resources, forests and soils. Each of these resources is essential in providing services to the FSM economy and society. These resources are essential for the present and all future generations (UNDP. 2002).
- **Social Vulnerability:** The reflection of internal and external stresses and hazards that negatively impacts on the social and cultural fabric and cohesion of the FSM. For instance, the following activities have been increasing in the FSM: growth in criminal activities, growing rates of HIV/AIDS infection, increased illiteracy, declining public health and public infrastructure, and emigration of skilled citizens (UNDP. 2002).

The FSM is in agreement with its neighbour's nations that to build resilience and reduce its vulnerabilities in the pursuit of sustainable development it seeks the following initiatives (Anon, 2001).

- Promote mutually supportive social, cultural, trade, investment, economic and environmental policies and goals.
- Implement effective measures to address the vulnerability of island communities and their ability to adapt to the impacts of climate change, sea level rise and anthropogenic and natural hazards.
- Increase research and development programmes on environmental vulnerability index and its implications by the tenth anniversary of the Barbados Program of Action.

6.3 Finance

The economy of the FSM is largely dependent on the financial provisions provided by the Compact of Free Association with the America. The funding provisions under the original compact are currently being renegotiated to determine their future relationship (FSM Government, 2002a). The majority of National and State public services entities derived their finances from this treaty and these government services dominate the economy (FSM Government, 2000b). The commercial tuna fishery (international and domestic) is the nation's

second highest revenue earner with annual revenues between US\$10 –15 million dollars (FSM, Government, 1999a). Additional revenues, albeit considerably smaller, are generated from the nations tourist industry and agriculture.

Agriculture, fisheries, and tourism sectors are recognized as providing the long-term growth economic potential and comparative advantage of the FSM (FSM Government, 2000b). Thus the major economic challenge facing the nation is to assist in building and developing an environment conducive to private sector growth. Currently, the FSM public sector maintains wages almost double those of the private sector (FSM Government, 2000b).

Bilateral and multilateral funding assistance programmes have greatly assisted infrastructure and institutional development and capacity building of the human resources of the nation. These programmes have assisted all sectors of the National, State and Municipal governments, NGO's, private individuals. The importances of this financial assistance and the programmes that have been undertaken over the past decade have contributed considerably to the current development status of the nation. The continued assistance from these programmes is required for the future to assist the people of the FSM to attain sustainable development.

6.3.1 Public Sector

The National and State governments of the FSM have initiated several programmes over the past decade to improve delivery of services whilst reducing the financial costs. An extensive Public Sector reform programme was undertaken in the late 1990's, which effectively reduced the size of the government payroll by almost, 20% whilst maintain services (FSM Government, 2000b). More recently, both the National and State governments have evaluated their individual roles and services which has led to a series of reforms of public sector enterprises. Telecommunications and Utility services are examples. National and State government agencies are making steady progress towards improving services and more efficient use of resources, however obstacles such as 'reform fatigue', the need for strong and consistent leadership and political will need to be further addressed before sustainable development goals are attained (FSM Government, 2000b). New legislation has been developed at the National and State levels that encourages growth and development of the private sector within the nation. These initiatives will be further reviewed and developed in the future.

National sustainable development issues that need to be addressed by the public sector have been grouped into four definable policy elements. Each policy elements has specific strategies and program activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Public servants throughout the nation need to manage the operations of government responsibly and within clear-cut fiscal realities that increasingly encourages further growth and expansion of the private sector. This applies in the generation and the expenditure of revenue.
2. The public sector must make significant qualitative improvements in the delivery of services, and in the manner that is more efficient and effective; and openly manage and operate the departments, agencies, and enterprises.
3. Reduce the role of government in commercial activities and create more effective mechanisms to monitor public enterprise performance.
4. Ensure National and State capital investment budgets are spent wisely and responsibly.

6.3.2 Private Sector

The economy of the FSM over the past decade has grown at a modest rate, approximately 1% annually, due partially to the steady, although not spectacular performance of the private sector (FSM Government, 2000b). The development of an active profitable private sector is a prerequisite for the sustainable development of the nation. Presently, wholesale and retail outlets services providing commodities needs, most of which are imported, dominate the private sector. The nation has highlighted tourism and offshore commercial fishing as the most potential areas for private sector growth, however the potential for these areas are yet to realized. The development of the private sector has been constrained in the past by a less than fully enabling legal environment, and in recent years the uncertainty of future Compact revenues. Proactive legislation at both the National and State governments are being developed which will assist the development of sustainable private sector (FSM Government, 1999b and 2000b).

National sustainable development issues that need to be addressed by the private sector have been grouped into five definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Commitment to economic reforms.
 - Macroeconomic policy.
 - Maintain financial stability.
 - Limit size of government and develop public accountability.
 - Make tax regime consistent with private sector-led economic strategy.
2. Develop an outward looking approach to economic development.
 - Make tax regime consistent with outward-oriented economic strategy.
 - Encourage investment in priority and potentially competitive export growth industries.
3. Lower costs, improve performance and develop competitive markets for the means of production.
4. Reorient public agencies and administration to facilitate private sector development, decrease the cost and increase the ease of doing business, promote good governance, and minimize government involvement in commercial and service industries.

Regulatory Environment.

- Develop a corporate and business enabling and regulatory environment that promote a private sector capable of generating long-term economic value and respects the interests of stakeholders and society.

Commercialization and Business Development Support.

- Focus support on competitive tradable goods and services.
 - Focus on efficient, coordinated support services providing information, advice and training, not subsidized finance.
 - Support business development at all levels of experience and growth.
 - Allow the market to determine the value and commercial viability of State owned production type enterprises earmarked for privatization.
5. Provide an efficient and cost-effective infrastructure (to support competitive and efficient private sector development).

6.4 Education

The sustainable developments of FSM clearly lie in the ability of all citizens to actively and responsibly participate in the nation's development. Therefore, the education of all citizens is paramount to achieve this goal. The importance of education to the nation has been clearly identified in the FSM Economic Summits indicating that the goal for educational development within the nation is to support the “*sustainable economic, social, political and cultural growth*” (FSM Government, 1995 and 1999b).

The ongoing task for the education sector is to improve the quality of education and to make education relevant to the economic and social/traditional needs of the nation (FSM Government, 2000b). Significant efforts at addressing these issues have been undertaken over the past decade from the education sector at the National and State levels. In particular, the nation has developed a Strategic *Plan for Improvement of Education in the FSM* that has provided a mechanism for the organizing and coordination of effort and manpower. In addition a more specific policy document: *FSM Language Policy* that sets out a framework for language maintenance and diversity within the FSM context has been developed (FSM Government, 1999b and 2000b). The recommendations from these documents are currently being integrated into the education system.

The education sector has undertaken a series of proactive teaching systems, incorporating innovation in curriculum design, school management and community participation programmes to develop teaching and learning methods within each State (FSM Government, 2000b). These programmes have yielded positive results but all education agencies agree that more needs to be done for the FSM to have an education system that is capable of meeting the demands placed upon it to produce graduates with the knowledge and competencies needed either for productive participation in society or to pursue further studies (FSM Government, 2000b). The development of an education system more conducive to Micronesians' culture whilst maintaining international standards is required to attain these goals.

National sustainable development issues that need to be addressed by the education sector have been grouped into five definable policy elements. Each policy element has specific strategies and programme activities assigned to be developed and implemented (FSM Government, 1999b). These are:

1. Enhancing accountability and the quality of education.
2. Linkages between education and life long experiences.
3. Enhance the quality of staff.
4. Improved collaboration and cooperation.
5. Financing education.

6.5 Health

The health and the quality of life of the nation's citizens are central to the sustainable development of the nation. The FSM, through national documents such as the National Economic Summits have provided clear goals for the development of health care services to support the “*sustainable economic, social, political and cultural growth*” of the nation (FSM Government, 1995 and 1999b).

The priority tasks for the health sector is to improve the quality of medical services to the nation whilst reducing expenditure and to educate all citizens on improved lifestyle that are conducive to better health, with special reference to decreasing the high mortality rates derived from non-communicable diseases (NCD) (FSM Government, 2000b).

The people of FSM view free health care as entitlement. The constitution and its bylaws clearly state, “*no one in need of medical care shall be denied such care because of inability to pay all or any part of any fee established*” (FSM Government, 2000b). The free delivery of these services over the past decade, coupled with the nations high population growth rate has placed considerable financial constraints on the nations health care system that has caused a decrease in the successful delivery of essential health care series within the nation. These constraints have lead to streamlining the health services in recent years that have addressed these complex issues and resulted in programmes that have utilised personnel and funds more efficiently and effectively at both the National and State Governments (FSM Government, 1999b and 2000b).

These actions have precipitated the nations health care services to look at quality, efficiency and effectiveness of health care delivery, including identification and prioritizing of essential services, supplies and medicines, short and long-term workforce needs and facility requirements for the future (FSM Government, 2000b). These actives are ongoing.

National sustainable development issues that need to be addressed by the health sector have been grouped into four definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Prioritization of health care services.
2. Sustainable health care financing.
3. Development of human resources for health.
4. Infrastructure/Facilities/ Systems development.

The major causes of morbidity and mortality in FSM are the non-communicable diseases (NCD) of lifestyle and modernization (FSM Government, 2000b). The lifestyle diseases include those associated with over and improper nutrition and substance abuse (e.g. Hypertension, Diabetes).

Community education and awareness programmes have been upgraded over the past decade to delivery primary health care. These programmes have targeted the essential public health services such as immunization, child health, family planning, mental health and various Infectious Diseases (e.g. Hepatitis, Leprosies, and Tuberculosis), Sexual Transmitted Disease (STI) and HIV/AIDS. Insufficient funds and human resources however have reduced the effectiveness of these services (FSM Government, 2000b). These difficulties are further increased for the outer lying and remote communities of the nation.

Through stakeholder workshop and meetings the following issues have been identified that are currently hindering the effective implementation of high priority health services for all FSM citizens (FSM Government, 1999b and 2000b):

- Inadequate delivery of rural health services.
- Poor quality of health services.
- Use of inadequate, inappropriate and overly expensive drugs for basic and essential services.

- Inadequate and uncertain financing of health services.

Sustainable health care financing is crucial to the maintenance and delivery of health care services, including both essential health services and secondary and tertiary services. Given the level of disability and death caused by NCD's related to lifestyle choices, prevention of lifestyles and behaviors leading to these diseases have been given highest priority. Consequently, community based primary and preventive health care measures have been given highest priority, along with public-private multi-agency partnerships in control and treatment of these diseases. Continued human resource capacity building, intuitional maintenance and up grading programmes are essential to the development of a sustainable health system for the nation (FSM Government, 2000b).

6.6 Tourism

Tourism has been selected to be one of three areas of focus for the future sustainable economic development of the FSM and thus a national tourism development strategy has been recently developed. The development goal of the strategy is: *“To create a sustainable tourism industry as a significant contributor to the nation’s development, coordinated with other sectors of the economy, based on the FSM’s particular natural and cultural resources”*(FSM Government, 2000b). The importance of sustainable development that controls negative social and environmental effects has been highlighted in this document with traditions, culture and the nation’s diverse environment seen as a high tourist potential that must be sustainably managed.

The nation’s tourism objective for the next three to five years “ *is to attract 100,000 visitors per year with an average length of stay of 5 days. This equates to 500,000 visitor days per year with an average of 1,370 visitors per day*”. These figures have been developed using past visitor numbers, infrastructure condition and handling capacity, future planed developments, the ability to develop and maintain sustainable tourism and the generation of significant revenues (FSM Government, 2000b). On an annual basis, the objective above provides for an average growth rate of approximately 24 percent per year over a five-year period. This average growth rate is not unreasonable or uncommon, especially given that FSM is located in a potentially fast growing tourism destination (FSM Government, 2000b). However, the rate of expansion is dependent on the capacity of the nation to implement policies that are conducive to assist this sector to develop (FSM Government, 2000b).

Despite the potential of the sector, the FSM visitor industry has performed poorly. Numbers of tourist vary between States, however overall, the annual number of visitors has decreased during the 1990s and the goals set above are yet to be attained (FSM Government, 2000b). Consequently, low average (<40%) hotel occupancy rates in FSM over the last 5 years (1995-2000) have been recorded (FSM Government, 1999b and 2000b). The main stay of the tourist industry is based on diving, with Yap and Chuuk States dominating these activities with the non-diving tourist market well underdeveloped. The majority of visitors into the nation are either returning residents for vacation and/or business travelers associated with government agency programmes.

National sustainable development issues that need to be addressed by the tourism sector have been grouped into eleven definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Develop commercially sound private sector tourism businesses as the core of the visitor industry.
2. Strengthen FSM tourism through linkages with other Micronesian destinations and travel businesses.
3. Inform, educate and obtain the support of the public for an expanded tourist industry that maximizes economic, and social benefits while sustaining the FSM's culture and environment.
4. Provide an optimal level of public infrastructure to support private sector investment in tourism and improve basic services to hotels and visitors.
5. Develop tourism support services that are industry responsive, self-financing, and coordinated.
6. Promote the FSM's pristine island environment, culture and people as its greatest assets.
7. Provide the tourist industry with a labour force that meets the standards and productivity needed to be competitive.
8. Improve access to land suitable for tourism development.

7.0 Ocean and Coastal Framework

The ocean and coastal marine resource of the FSM are essential and vital components of the culture and existence of the citizens of the nation. Marine resources traditionally and presently are central to subsistence livelihoods of the nation providing food and resources. The majority of the nations protein requirements are derived from these resources and more recently, these resources have been utilised for commercial activities and have contributed to the nations economic development (FSM Government, 1999b, 2000b and 2002a).

The sustainable management, utilization and conservation of these valuable resources are therefore paramount to the long-term sustainable development of the nation.

The FSM has taken a precautionary approach as outlined in the Rio Declaration, Principal 15 and recognizes the importance of oceans and coastal ecosystems through the 1st and 2nd FSM National Summits and fisheries conferences to safeguard its communities and maintain the health of its ocean and coastal ecosystems for the future. The nation is in full support of the Pacific regions ocean initiatives and as a nation is committed to see these initiatives implemented (Anon, 2001). In summary these are:

- A renewed National commitment to improving the understanding of the ocean; sustainably managing ocean and coastal resources, maintaining the ecosystem integrity of our oceans and coastal systems; promoting peaceful utilization of ocean resources and creating regional partnership and cooperation.
- Promoting sustainable marine and coastal ecosystem resource management and development: improve and develop scientific marine and coastal resource survey and monitoring techniques: increasing human resources and capacity to manage ocean systems: regulate and enforce pollution control measures.
- Complete the maritime boundary delimitations of the nation, and implement the United Nations Convention on the Law of the Sea and related conventions in an integrated manner and further develop and implement National policies and legislation that allow the sustainable development and preservation of the oceans and coastal resources of the FSM.

7.1 Coastal

Coral reefs and their associated ecosystems and biomes are the dominant shallow marine feature of the nation. All major types of coral reefs are found within the FSM, including barriers reefs, fringing reefs, atolls and submerged reefs. In addition, mangrove forests and sea grass beds are well developed especially along the fringes of the high islands and some atolls, and they are essential habitats to a wide range of marine organisms (Lindsay & Edward 2000).

Coastal marine resource utilization consists of inshore fisheries, nearshore fisheries for large pelagic species and demersal fisheries. Subsistence fishers make the greatest use of inshore resources, while artisanal (small-scale commercial) fishers concentrate on nearshore and bottom resources (FSM Government, 2000b). In the main islands of each State small-scale fishers sell catch in excess of their own requirements and these fisheries are essentially extensions of the subsistence fishery and mostly rely on inshore species, which are susceptible to over-exploitation (FSM Government, 2000b & 2002). Coastal resources, especially close to urban centers, are becoming over exploited. The use of inappropriate and unsustainable fishing practices are being employed which has lead to competition between resource users and in most cases has accelerated resource depletion, habitat alteration, degradation and in some cases destruction (Lindsay & Edward 2000, FSM Government, 2000b and 2002a).

All waters located within twelve (12) nautical miles (22.2 kilometers) of land, falls under the jurisdiction of the respective State governments and therein all forms of foreign commercial fishing are excluded. These inshore resources are managed, conserved and developed by the respective State governments in association with resource owners. This includes all coral reefs and associated lagoonal and coastal ecosystems (territorial sea) (FSM Government, 1999a).

The development and implementation of conservation areas and management plans to preserve coastal resource ecosystems for the future is required. The formulations of marine management plans are currently being developed through community/government consultations in each State. These plans will have a direct positive impact on the implementation of ecosystems management programmes and assist in the preservation, conservation, and sustainable development of the nation's coastal resources (FSM Government, 2002a).

The issues to be addressed by the inshore/coastal fisheries sector have been grouped into six definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented. These are:

1. Ensure sustainable development of inshore marine resources and preservation of the inshore marine environments.
2. Reform of laws and regulations to enhance sustainable fisheries development and management.
3. Human resource development.
4. Promote value added investments.
5. Control fisheries access.
6. Promote public awareness of marine resource conservation.

Through multi-sectoral meetings the below list of constraints/deficiencies have been encountered in implementing sustainable development for this sector. They are:

- Over exploitation and use of destructive and unsustainable fishing methods for marine organisms (e.g. reef fish).
- Overexploitation, inappropriate development and degradation of coastal & marine ecosystems, including mangrove forests.
- Lack of reliable scientific biological data to develop suitable sustainable management plans.
- Lack of public understanding of resource user awareness of marine resource conservation and management practices.
- Limited skilled human resources.
- Increasing populations and urbanization.
- Terrestrial and marine pollution. e.g. oil spills, coastal waste dumpsites.
- Alien invasive species impacts.

7.2 Oceans

The FSM has an Exclusive Economic Zone (EEZ) covering over one million square miles (1.6 million km²) that falls under the jurisdiction of the FSM National Government. The conservation, management and sustainable development of all commercial fisheries within this area are mandated to the National Oceanic Resource Management Authority, NORMA (formally know as Micronesian Fisheries Authority, MFA). The tuna fishery within the FSM EEZ is the largest commercial exploitation of natural resources within the nation, with license fee collections from foreign fishing permits providing the second largest external source of revenue for the nation after the US Compact of Free Association. This fishery has provided the nation with annual revenues between US\$10 - US\$15 million dollars and average annual catch rates range between 80,000 - 250,000 metric tonnes. The tuna fishery is composed of three gear types; purse seine, long line and pole and line targeting three main species of tuna (skipjack *Katsuwonis pelamis*, yellowfin *Thunnus albacares* and bigeye *Thunnus obesus*). In addition, other pelagic fish (swordfish, marlin and shark species) are also caught as a by-product of this fishery (FSM Government, 1999a).

NORMA operates an intensive monitoring programme that collects fishing vessel data from compulsory log sheets, an on board observer programme and port sampling activities (FSM Government, 1999a). In addition, NORMA is an active collaborator with regional organization on tuna management issues throughout the Pacific.

The FSM became a signatory of the “Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (MHLCTC)” on September 4th, 2000. The nation is a signatory of the parties to the Niue Treaty improving regional fisheries surveillance including a Memorandum of Understanding with The Republic of Palau and the Republic of the Marshall Islands for information exchange on surveillance matters and is a signatory on the Nauru Agreement which aims to improve cooperation in the management of fisheries of common interest.

As a result of the FSM’s commitment to this convention, NORMA, the management agency, has developed through multi-stakeholder workshops and a review process a “Plan for the Management of Tuna in the FSM”. The overall objectives of this plan are (FSM Government 2000a):

- To ensure the nation’s tuna resources are protected, conserved and managed in a sustainable way;
- To obtain maximum, sustainable economic benefits from the nation’s tuna resources; and

- To promote economic security for the nation through conservation and management of tuna resources.

Furthermore, the plan has developed six specific goals based on the above objectives to which NORMA is legislated to manage. These are in decreasing order:

1. Ensure that the tuna catch does not exceed sustainable levels.
2. Obtain National revenue from foreign fishing access agreements.
3. Support development of FSM-owned and/or foreign FSM-based fishing enterprises.
4. Encourage investment in enterprises related to tuna fisheries.
5. Promote employment opportunities.
6. Enhance international relationships beneficial to the FSM.

National sustainable development issues that need to be addressed by the ocean fisheries sector have been grouped into seven definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Ensure sustainable development of offshore marine resources and preservation and conservation of the marine environments.
2. Reform of laws and regulations inhibiting sustainable fisheries development.
3. Promote private sector and Micronesian-incorporated enterprises to be responsible for all commercial fisheries investments and operations.
4. Manpower development.
5. Promotion of value added products.
6. Controlling fisheries access.
7. Promoting public awareness.

Through multi-sectoral meetings the below list of constraints/deficiencies have been encountered in implementing sustainable development for this sector. They are:

- Persisting government involvement and ownership in the industry.
- Lack of economic and enterprise management.
- Land tenure laws inhibit long-term investment and optimal land allocation for development of ports and industrial sites.
- Higher costs of production, especially transshipping in FSM, higher taxes, fees and other charges for foreign vessels doing business in FSM.
- Lack of favourable business environment to enable private sector ownership and management.
- Limited skilled manpower base.
- Limited and high cost air transport.
- Limited international and domestic markets which are potentially oversupplied.
- Produce pan-global product.

8.0 Land Framework

The agroforestry resources of the FSM are integral and vital components of the culture and existence of the citizens of the nation. Agroforestry, traditionally and presently are central to subsistence livelihoods of the nation providing food, shelter and resources. Traditional production techniques are still used today by the majority of farmers who produce primarily for subsistence

with surpluses sold domestically (FSM Government, 2000b). Commercial production of crops and livestock are undertaken in each State with a range of vegetables and citrus products produced and swine farming dominating livestock production. Exportation of these products is limited due to production levels and transportation services. The production of Copra remains the main cash crop for the outer islands (FSM Government, 2000b & 2002a). The sustainable management, utilization and conservation of these valuable resources are therefore paramount to the long-term sustainable development of the nation.

The vegetation types of terrestrial plants within the FSM vary from east to west due to differences in climate (particularly rainfall), geology, topography and geographical isolation (Falanruw, 2001). Native forests have been extensively modified by traditional agricultural practices in the past and are currently being heavily impacted throughout the FSM through inappropriate land use practices (FSM Government, 2002a). Conservation management of the remaining native forest systems has been given high priority throughout the nation.

The diverse agroforests and related traditional agricultural systems of the FSM are possible models for sustainable agricultural development. These extensive “man-made” forests are complex and environmentally sustainable agriculture systems that are the result of thousands of years of development. They mimic natural forest ecosystems and shelter extremely high species and cultivar diversity (e.g.: Pohnpei State agroforestry consists of over 130 species and studies have identified 179 types of yam, 130 breadfruit, and 50 banana cultivars) (Falanruw, 2001 and FSM, Government 2002a).

The promotion of sustainable agroforestry practices and development has been undertaken within the nation to ensure the long-term protection of traditional important agriculture practices, culture methods, the nations remaining forest systems and biodiversity. This has included the development and implementation of management plans, which have incorporated conservation areas. The formulations of land use plans are currently being developed through community/government consultations in each State. These plans will have a direct positive impact on the implementation of ecosystems management programmes and assist in the preservation, conservation, and sustainable development of the nation’s land resources (FSM, Government 2002a).

The nation has taken a precautionary approach as outlined in the Rio Declaration, principal 15 and recognizes the importance of terrestrial and agroforestry ecosystems through the 1st and 2nd FSM National Summits to safeguard its communities and maintain the health of its terrestrial ecosystems for the future. The FSM is in full support of the Pacific regions natural resource initiatives and as a nation is committed to see these initiatives implemented (Anon, 2001). In summary these are:

- To further develop and implement legislation and policies at National and State levels that promotes sustainable management of natural assets, including enforcement, data collection, ongoing assessment, evaluation and economic evaluation.
- A renewed national commitment to improving the understanding of the terrestrial ecosystems; sustainably managing resources, maintaining the ecosystem integrity and initiate appropriate research programmes to allow sustainable development.

- Promoting sustainable agroforestry ecosystem resource management and development: implement appropriate conservation measures; increasing human resources and capacity to manage terrestrial systems: regulate and enforce pollution control measures.
- Recognition of traditional ownership of resources, the protection of traditional practices and knowledge.
- Enhance and strengthen food and health security through sustainable agroforestry practices.

National sustainable development issues that need to be addressed by the land and agricultural sector have been grouped into six definable policy elements. Each policy elements has specific strategies and programme activities assigned to be development and implemented (FSM Government, 1999b). These are:

1. Promote environmentally sustainable production.
2. Increased production of local produce for home use to reduce food imports.
3. Increase commercial production through a competitive private sector.
4. Increase access to finance for viable agricultural production through a sustainable commercial credit system.
5. Increase agricultural production know-how and deliver agricultural support services needed by farmers.
6. Promote sustainable foreign investment in agri-business.

Through multi-sectoral meetings the below list of constraints/deficiencies have been encountered in implementing sustainable development for this sector. They are:

- Inappropriate farming practices.
- Agricultural degradation, soil degradation, deforestation of coastal & mangrove forests.
- Degradation of freshwater resources, watersheds.
- Increasing populations and urbanization.
- Increased and poorly planned infrastructure development.
- Terrestrial pollution.
- Impacts on native species due to alien invasive species.
- Global climate changes (El Nino) and sea level rise.

9.0 Environment Framework

The FSM fully acknowledges that the maintenance, utilization and protection of healthy ecosystems are a prerequisite to attain sustainable development. Therefore, the economic development of the FSM is directly linked to the current and future health of the nations environment. The natural resources of the FSM are present in every facet of Micronesians way of life providing the natural resources for food, shelter, and are utilised for medicinal and traditional purposes (FSM Government, 1999b and 2002a).

Traditional resource utilization, practices and community management regimes are eroding which have a direct negative impact on the health of the environment. This deterioration has been greatly enhanced in more recent times due to the changes from subsistence to commercial economies, increased population growth, urbanization and the development of centralized governments (SPREP, 1993 & FSM Government, 2002a). Furthermore, the regulative

responsibility for the management of the environment within the nation is unclear and in the past has been a source of confusion between the National and State government. This confusion has led to jurisdiction disputes, lack of cooperation and poor environmental management in some circumstances. Recently, both regulative and departmental confusions have been discussed and the nation has made clear progress to coordinate programmes to encourage sustainable development and management of the environment. The involvement of NGO's and community groups has greatly assisted this endeavor.

The past decade has produced a series of National reports that have documented the nation's environmental status and strategies. The foremost report, the FSM National Environmental Management Strategies (NEMS) was produced in 1993 and was the initial statement by the FSM on the environment. This report's findings and recommendations are still valid. The major strategies that emerged from this document were:

- Integrate environmental considerations in economic development.
- Improving environmental awareness and education.
- Manage and protect natural resources.
- Improve waste management and pollution control.

Since this report the nation has updated the status of the environment through the following documents that have been produced from multi-sectoral meetings and workshops. These are:

- 1st National Economic Summit, 1995.
- FSM Initial National Communication to the United Nations Framework on the Convention on Climate Change (UNCCC), 1997.
- Climate Change Action Plan, 1997.
- Preliminary National Communication to the UNCCP, 1997.
- The Addendum to the Initial National Communication to the UNCCP, 1999
- 2nd National Economic Summit, 1999.
- FSM National Biodiversity Strategy and Action Plan, 2002.

In addition, the State governments have undertaken internal environmental reviews and status reports and are working in conjunction with all stakeholders to develop programmes that manage the environment based on sustainable protocols.

The FSM has embarked on a programme to conserve, preserve, manage and protect the ecosystems within the nation to maintain the diverse biodiversity as well as to allow sustainable development. The implementation of conservation areas, wise land use and marine management plans, environmental community awareness and capacity building programmes have been initiated (FSM Government, 1999b and 2000a). The nation has initiated the development of a National Conservation Trust Fund (CTF), the Micronesia Conservation Trust (MCT). It is envisaged that the MCT will act as a permanent endowment that can generate investment income providing a long-term source of stable annual funding for activities that support conservation and effective management of natural resources, build consensus on conservation priorities, complement and support government funded programmes and national sustainable development and conservation strategies (FSM Government, 2002a).

Global environmental crises such as global warming (frequent and severe typhoon, droughts and fires) and sea level rise are a major concern to the FSM and the protection and conservation of island biological resources that can assist the nation to protect itself from these natural forces is

extremely important. The development and implementation of suitable traditional and scientific resource management programmes that can address these problems for the long term are essential (FSM Government, 2002a).

The Nation as a whole has made a commitment to improve environmental legislation, strengthen institutions and increase capacity building for those agencies (National and State Governments, Non Government Organizations NGO's and Educational Institutions) responsible for the environment and sustainable development, increased community awareness and overall increased actions and commitments for Agenda 21 implementation.

Seven definable environmental sector policies and related strategies, programmes and activities have been identified by the nation are required to be implemented to guide the sustainable development and management of the environment for the future (FSM Government, 1999b). These are:

1. Encourage States to establish and support a system of conservation areas where special measures are taken to conserve biological integrity and biodiversity.
2. Create sustainable financing mechanisms for environmental and sustainable resource initiatives.
3. Expand and promote environmental ethics.
4. Support the development of environmental NGOs and Community Based Organizations (CBOs).
5. Create strong regulatory climate when and where appropriate.
6. Improve cooperation and coordination between different levels of government.
7. Develop technical support for existing and future environmental programmes.

The environmental sector has been broken up into three major sections based on the importance of these issues as highlighted in the nation's 1st and 2nd Economic Summits, associated National policy statements and the National WSSD workshop.

9.1 Climate Change, Variability & Sea level Rise

The FSM is one of the most vulnerable nations to the effects of climate change, climate variability and sea level rise; however, it is addressing climate change in the context of a three broad challenges (FSM National Government, 1999d):

1. **Promoting Sustainable Economic Growth** by addressing issues that will reduce nation's environmental, social and economic vulnerabilities.
2. **Balancing Resource Conservation and Management** (e.g., limited land and fresh water; competing demands for critical resources, etc.).
3. **Ensuring and Improving the Quality of Life** for all citizens and that of future generations.

The FSM has developed and is implementing a national climate change policy that address the sources and impacts of climate change for the present and long term future on the nation. The FSM fully acknowledges that climate change, due to global warming and sea level rise will have numerous direct and indirect social and environmental effects on the nation in the future. The nation is committed to its climate change policy, which addresses today's problems today while

taking early steps to minimize or adapt to the negative impacts of long-term climate change (FSM National Government, 1999d).

The nation acknowledges that current environmental practices are increasing the effects of climate change and mitigation programmes need to be implemented. In particular, the nation has greatly increased public awareness and participatory community development programmes in the design and implementation of adaptation and mitigation measures of climate change (FSM National Government, 1999d). These programmes are to be further developed, refined and implemented in the future.

This nations climate change response strategy recognizes and emphasizes (FSM National Government, 1999d):

- The value-added benefit of flexible approaches that provide for both adaptation and mitigation at the same time.
- The importance of understanding and responding to the impact of mean oceanic and atmospheric conditions (climate variability such as ENSO).
- The important role that emerging scientific insights and new technology transfer.
- The equally important role of integrating traditional knowledge and practices into national development plans.
- The importance of building capacity in country at all levels.

The FSM signed on as a party to the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 with ratification completed in 1993. The FSM submitted in September 1997 it's initial National Communication to the Secretariat of the UNFCCC. A comprehensive Addendum to this document was submitted to the secretariat of the Convention in October 1999. The Kyoto Protocol to the UNFCCC was signed in 1998 and ratified in 1999.

The FSM is not a significant contributor to the global emissions of greenhouse gases, however the nation fully acknowledges its international obligations and values the opportunity to act in “good faith” by joining with other responsible nations in a concerted effort to undertake reasonable, source-oriented mitigation measures and develop effective strategies to respond and/or adapt to the impacts of climate change (FSM Government, 1999d).

In 1991, the Seventh Congress of the Federated States of Micronesia passed Resolution (No. 7-24), which outlined the numerous threats facing FSM citizens from the effects of global warming. The resolution encouraged the Executive Branch of Government to work with and support the Alliance of Small Island States (AOSIS) in order to gain a stronger voice in international negotiations related to the UNFCCC. The Resolution stressed that FSM citizens would be among the first to realize the impacts of sea level rise, increased frequency and intensity of storm events, salt water intrusion, and destruction of marine life, all as a consequence of human-induced activities in other nations, developed countries in particular (National Government, 1999d).

Responding to the recognition of the importance of climate change considerations in relation to sustainable development of the nation, the FSM Climate Change Programme was established. Initially, the programme mandate was to fulfill the nations commitments and obligations under the UNFCCC, namely to produce the FSM Initial National Communication and to build national capacity in order to better identify possible action that could be undertaken by the nation to address climate change impacts.

During the past decade the FSM has fulfilled its requirements and commitments as a nation to Climate Change and has been an active nation at regional and global forums. The FSM has benefited from several regional donor programmes that have provided the mechanism to meet these requirements (e.g. Pacific Island Climate Change Assistance Program, PICCAP). National documents that have been produced are (FSM Government, 1999d):

- FSM Initial National Communication to the UNFCCC, 1997.
- Creation of the National Climate Change Country Team (Country Team), 1997.
- Addendum to the FSM Initial National Communication to the UNFCCC, 1999.
- A Policy Makers Summary of the Addendum to the National Communication, 1999.
- FSM Greenhouse Gas Inventory, 1998.
- Vulnerability and Adaptation Assessments:
 - Yap, 1992.
 - Kosrae, 1997.
 - Chuuk, 1999.

The plan of work for the Climate Change programme included the improvement of vulnerability and adaptation assessments and planning appropriate response strategies. These preliminary objectives have been completed. In addition, sub-areas of responsibility include technological needs assessment, coastal zone management, forest conservation and alternative energy planning as possible approaches to contend with climate changes and accelerated sea level rise. Currently, the programme continues to focus on national capacity building while improving vulnerability assessments and planning appropriate response strategies (FSM National Communication, 1999).

The nation is committed to seek to decrease and limit its vulnerability by finding way's to either reduce sensitivity to change or by increasing resilience to change or both (FSM Government, 1999d). Presently, three State of the nation have undertaken vulnerability assessments that have collectively provided an initial assessment of the effects of climate change of the types of islands found in the nation with a particular emphasis on sea level rise. The four States is currently undertaking their assessment. These assessments projected the following climate change activities for the nation (FSM Government, 1999d):

- Temperature and rainfall would increase.
- There would be a resultant increase in severe droughts.
- Sea level would rise according to Inter-Government Panel on Climate Change (IPCC) projections.
- Intensity and frequency of extreme events (e.g., tropical storms and storm surge, etc.) would increase.
- Increase in flooding due to the projected increase in extreme events.
- Increase in shoreline erosion due to sea level rise.

These assessments included a wide range of critical information gaps and research needs that are required to be developed and implemented to allow the collection of information to predict climate change events and provide the information to the citizens of the nation (FSM Government, 1999d).

The impacts of sea level rise and its direct impact on the nations coral atolls and low-lying areas on high islands is a real concern to the nation. The nation has acknowledge it vulnerability to fluctuations to sea level rise and has highlighted the following, as major issues that need to be address and mitigation actions developed and implemented (National Government, 1999d):

- Changes to the structure and biodiversity of reef systems with minimal effects on the morphology of coral reefs.
- Loss of sea grass habitats from lagoon and sheltered reef flats.
- Considerable increase in coastal erosion with resultant shoreline retreat.
- Loss of coastal agricultural land.
- A slight increase in freshwater wetland systems.
- An increase in mangrove forest areas at the expense of sandy beach systems.
- Increased risk from severe storms and other extreme events for human settlements in coastal margins.
- Increased risk to housing and infrastructure, especially coastal roads and filled areas.

Through multi-sectoral workshops and communications the critical limitations and constraints encountered to date for the implementation of climate change related activities included (FSM Government, 1999d):

- The significant costs associated with fieldwork in geographically -dispersed area of the FSM.
- The limited number of scientific technical and professional staff available.
- There is no significant enhanced program of community-based education and outreach.
- Limited financing and human capital

9.2 Biodiversity

The FSM National Biodiversity Strategy and Action Plan (NBSAP) was developed through a series of multi-sectoral meetings and discussion throughout the nation and submitted to the international community in February 2002. Information on priorities, threats and actions relating to biodiversity gathered during these consultations were synthesized and used to formulate the NBSAP. The FSM NBSAP Vision is *“The FSM will have more extensive, diverse, and higher quality of marine, aquatic, and terrestrial ecosystems, which meet human needs and aspirations fairly, preserve and utilize traditional knowledge and practices, and fulfill the ecosystem functions necessary for all life on Earth”* (FSM Government, 2002a).

The FSM has a rich biodiversity inheritance, including ethnobiological traditions. Nevertheless, this fragile biological inheritance is seriously threatened due to both natural and anthropogenic events. The rate of biodiversity decline has considerably increased since the arrival of the first European explorers, culminating in the highest increases in biodiversity decline during the last century. The decline of the FSM’s biodiversity is clearly linked to increased centralisation and urbanisation of the population, high population growth rates, more effective and efficient technology, commercialisation including increased exportation of natural resources, reliance on imported commodities and the general westernisation of the nation (FSM Government, 2002a).

The NBSAP report outlines the state of the nations biological resources and the current biological and anthropogenic threats that are affecting their continued existence. All stakeholders identified eleven biodiversity strategic themes as the most important issues currently facing the FSM. The strategic themes, their objectives and specific actions are based on four guiding principles developed for the successful long-term preservation, conservation, and sustainable development of the nation’s biodiversity (FSM Government, 2002a). The eleven strategic themes are:

1. Ecosystem Management.
2. Species Management.
3. Genetic Resources Use.
4. Agrobiodiversity.
5. Ecological Sustainable Industry Development.
6. Biosecurity.
7. Waste Management.
8. Human Resources & Institutional Development.
9. Resource Owners.
10. Mainstreaming Biodiversity.
11. Financial Resources.

Each theme was assigned a specific goal that the nation believes to be those goals, which, if achieved, would lead the nation towards the stated Vision. Each strategy goal is to be achieved through the fulfillment of objectives that have been identified as priority areas that need to be addressed to allow the effective conservation, preservation and sustainable development of the nation's biodiversity (FSM Government, 2002a). In total, 33 objectives were highlighted. Each objective was further developed to include a specific list of required actions necessary for fulfillment of the objective and thereby further contributing towards the achievement of the strategy goal. In total, 175 specific actions were highlighted.

The actions were developed to be realistically achievable within a relatively short time frame and within the current human resource capacities and financial constraints of the nation. It is, however, clearly acknowledged that considerable time and effort from all sectors of the nation will be required to achieve the outcome of these actions. Financial and technical assistance from outside the FSM was also acknowledged and is required to achieve the goals of the NBSAP (FSM, Government, 2002).

The responsibility for the implementation of the actions identified in the NBSAP has been sanctioned to the four individual States of the FSM. Currently (June 2002), each State is undertaking additional stakeholder meetings to identify those themes that are most relevant to their individual circumstances and thus develop an implementation and monitoring programme.

The nation faces mounting constraints that are inhibiting efforts to conserve and manage the nation's biodiversity. In total, five categories (refer below) were identified which were further divided into 29 specific threats (FSM Government, 2002a). These five categories are:

1. Conversion and degradation of habitat and ecosystems biomes.
2. Over exploitation and unsustainable harvesting methods and practices.
3. Waste management.
4. Invasive organisms and pests.
5. Climate.

The FSM clearly acknowledges that considerable time and effort will be required to develop the human resources needed within the nation to implement the actions identified. Furthermore, sharing of information and resources at all levels of the government, non-government agencies, community groups and resource owners will be required to assist in this endeavor. The commitment to preserve, conserve and sustainably manage the biodiversity of the FSM is real and is of utmost importance for the sustainable development of the nation.

9.3 Freshwater

Freshwater resources are precious and limited within the FSM. The conservation and management of groundwater, the collection and safe storage of rainwater and non-contaminated water catchments and streams are essential for sustaining communities within the nation. The sustainable development of the FSM therefore will not be attained without an adequate safe freshwater supply that meets the needs of the present and future generations.

The high volcanic islands of the FSM receive high annual rainfall and freshwater supplies are collected from surface water runoff. These islands are blessed with abundant rainfall however; water supply is inadequate in both quality and quantity. The topography, geology and hydrology of these islands are not conducive to large scale formations of exploitable aquifers thus limit the sub-surface water storage capacity as well as inhibiting the construction of large water reservoirs (FSM Government, 2002b). Water catchments and storage areas are prone to contamination and pollution from human encroachment and activities and antiquated water delivery systems are currently being upgraded to cope with increasing demand and provide clean safe drinking water. Filtration and chlorination programmes have been initiated in urban areas, which have greatly improved water quality in recent times. Watershed integrated management programmes designed to protect the environment and reduce anthropogenic activities have been implemented, however these projects have been hampered by unclear demarcations of boundaries, land ownership, unsustainable agricultural practices and poor human and animal waste management practices.

The coral atolls of the nation, which represents the outer island communities, have very limited water storage capacity and are reliant on rainwater to meet their freshwater demands. Wells designed to access water from groundwater lenses have been used in the past and are still the major source of water for these communities. The development of roof catchment storage programmes has been initiated and is supplying more households with safe drinking water. Ground water contamination is a concern and programmes have been developed to improve water quality (FSM Government, 2002b). Salt water intrusion is not uncommon and in periods of drought (El Nino) water quality and availability is a major concern.

The nation has undertaken a series of programmes to improve the quantity and quality of freshwater supplies to all communities through improved water resource catchments and water shed management plans, however much work is still required to attain a nation wide safe freshwater supply. Improvements in the ability of individuals and communities to collect and store safe drinking water from precipitation have occurred. These programmes have included community awareness and educational directives designed to provide the knowledge, skills and materials required to increase rainfall catchments and storage (FSM Government, 2002b).

The nation is currently reviewing the potential of incorporating the use of desalination for water supplies for human consumption, especially for the outer atoll communities (FSM Government, 2002b).

Contamination of water delivery systems is a major issue currently being addressed by the nation. Water borne infectious diseases have been reported from antiquated water systems in the past, however improvements, physical, financial and management, have been implemented that have greatly reduced these problems (FSM Government, 1999b). Continued improvements and community awareness programmes will provide the infrastructure and awareness required to deliver safe drinking water to the nation.

Contamination of freshwater streams and rivers on the high volcanic islands (major population centers) are major environmental issue currently facing the FSM. Pollution from solid and liquid human wastes, improper garbage disposal and the effluent discharge of animal wastes (pigs) have greatly degraded these freshwater resources, some of which are threats to human life (FSM Government, 2002b). Outbreaks of water borne infection diseases such as anemic dysentery, hepatitis, cholera, meningitis and leptospirosis have been reported. Increased community awareness and education programmes have been undertaken by the government to assist the communities to prevent further degradation and to provide the information needed to initiate the clean up of these water sources. Legislation has been implemented but enforcement issues need to be improved. There is considerably more work required to have all water resources of the nation safe for human activities.

Nation wide knowledge of water resources (surface and groundwater), especially on the less inhabited islands and atolls, is limited and additional information is required before a nation wide water resource management plan can be developed and implemented.

Four definable freshwater resource sector policies and related strategies, programmes and activities have been developed through stakeholder meetings that are required to be implemented to guide the sustainable development and management of freshwater resources for the future (FSM Government, 1999b). These are:

1. Watershed protection and management.
2. Atoll rainwater collection, storage and groundwater protection and management.
3. Freshwater survey for sustainable usage.
4. Water conservation and education awareness.

10.0 Infrastructure Framework

The importance of the development of a solid nationwide infrastructure is a crucial role in the sustainable development of the nation. The roles of the public and private sector are clearly acknowledged and the nation in its endeavor to achieve sustainable development will further improve the coordination activities between these sectors and the communities to which they serve.

Eight definable sector policies and related strategies, programmes and activities have been identified by the nation are required to be implemented to guide the sustainable development and management of the nations infrastructure for the future (FSM Government, 1999b). These are:

1. Improve institutional arrangements and coordination to better define government roles in infrastructure development and delivery of services.
2. Manage government infrastructure and services within fiscal realities and encourage private sector take over where feasible and appropriate.
3. Provide appropriate, economically and needed infrastructure facilities and services.
4. Establish and prioritise investments in infrastructure development in order to ensure viability and sustainability.
5. Promote development of infrastructure that minimizes the destruction to the natural environment and resources.
6. An effective, coordinated, resilient and dynamic joint States and National waste management and energy sectors that is efficient and responsive to the energy sector requirements.
7. A diversified energy resource base.

8. Environmentally sound, efficient, safe and reliable sustainable energy supply.

The infrastructure sector has been broken up into two major sections based on the importance of these issues as highlighted in the nation's 1st and 2nd Economic Summits, associated National policy statements and the National WSSD workshop.

10.1 Waste Management & Pollution

The impact of pollution and the need for waste management programmes in the past in the FSM were small as most waste products were biodegradable and populations were dispersed. However, recent increases over the past decade in urbanization and the importation of non-biodegradable materials and chemicals have brought with them ever-increasing pollution problems and the urgent need for correct collection, disposals and management of wastes (FSM Government, 1999b and 2002a).

The current level of pollution from solid and liquid waste, primarily derived from domestic sources in the FSM, is increasing particularly in the vicinity of main population centers. Increased ship traffic, both domestic and international, has greatly increased pollution resulting in the degradation of the marine environment associated with the nations major ports. With the strong emphasis by the FSM's governments on economic development and the current population growth rate it is anticipated that the generation of waste, both solid and liquid, will considerably increase both in quantity and type in the future. The underlying problem of pollution of the urban centers currently within the nation is the inability of waste services to keep pace with population growth (FSM Government, 2002c).

The effect of pollution on the terrestrial, marine and freshwater environment is a major concern for the sustainable development of the FSM. The nations small land size, isolation and subsistence dependence on the environment greatly increases the nations vulnerability to contamination by solid, liquid and toxic wastes and chemicals (FSM Government, 1999b).

Sewage disposal is a major concern for the nation, particularly in urbanized areas and in atolls where high water tables prevent the effective use of septic systems. During the past decade marine pollution resulting from inadequate sewage disposal has contaminated water resources with high coliform contamination occurs in surface and ground water. Inadequate disposal of solid wastes and the lack of landfill sites for dumps are also major pollution issues. Public solid waste collection system is still limited and consequently the disposal of household waste is poor, with roadside litter and other garbage common (FSM Government, 2002c).

Management of toxic or hazardous chemicals and wastes is also recognized as an environmental health issue of major concern of the nation. These substances currently make up a small portion of the waste generated by the nation, but they represent a serious threat to human health through contamination of soil, food and water resources, and also to major ecosystems, such as mangroves and coastal lagoons, due to poor handling and disposal.

Recent privatization of State government waste management services have lead to the establishment of semi-private waste management services, which have resulted in improved waste collection and disposal services and management of landfills (FSM Government, 2002c).

The combined efforts of government and non-government environmental agencies and the community have initiated activities that promote public awareness on environmental issues as

waste management and pollution prevention. Promotion of Earth Day, Clean Up the World Day, and World Environment Day, and other public education programmes on waste management resulted in increased awareness of waste management and pollution prevention, general cleanliness, and sense of voluntarism among the general public (FSM Government, 2002c).

The nation has highlighted five major waste management issues that require considerable attention and the development and implementation of a sustainable waste management plan to prevent further degradation of the environment within the nation is a prerequisite to attain sustainable development (FSM Government, 2002). They are:

- **Solid Wastes and Sewage:** Provide an environmentally safe mechanism for the collection, storage and disposal of solid wastes and sewage within the nation to prevent further degradation of the environment.
- **Petrochemicals:** Provide an environmentally safe mechanism for the collection, storage and disposal of petrochemical wastes to prevent degradation of the environment.
- **Hazardous Chemicals:** Provide an environmentally safe mechanism to prevent or eliminate the use and abuse of hazardous chemicals and to develop and implement correct storage and disposal programs to prevent the degradation of the environment.
- **Pollution Emergencies:** Enhance the nation's capability to effectively respond to pollution emergencies to reduce negative impacts on the environment.
- **Air and Noise Pollution:** Provide an environmentally safe mechanism for the reduction of all activities that degrade the atmosphere and associated biodiversity.

The FSM in 1992 signed onto the International Basel Convention on the Transboundary Movement of Hazardous Waste and Their Disposal and the regional Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region. The nation also signed onto the Stockholm Convention on Persistent Organic Pollutants in July 2001.

The nation has undertaken programmes to develop all levels of waste management within the nations communities these have included:

- Establishment of the President's Council on Environmental Management and Sustainable Development.
- Establishment of State Environmental Protection Agencies to protect the air, land and water resources, and to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic and other requirements of the present and future generations.
- Increased public education/awareness/campaign on waste management and pollution prevention through promotion such as Earth Day, World Environment Day and Clean up the World.

The constraints and deficiencies encountered in implementing a sustainable waste management program through out the nation have been:

- Limited financial, technical and trained human resources.
- Lack of available land.
- Limited public awareness and education on waste management, pollution control and sanitation.

- Lack of effective data collection, analyses, and monitoring systems.
- Lack of strategic planning for waste management.
- Environmental health not a priority among the policy makers.
- Geographical characteristics.
- Lack of feasibility and engineering studies for sustainable waste management services.
- Waste collection, treatment and disposal.

10.2 Energy

The sustainable development of the FSM cannot be achieved without a highly efficient and effective energy sector that will provide the energy services required by the nation whilst reducing economic and environmental concerns. The FSM does not have any source of petroleum within the nation and all fossil fuels utilised for energy are imported. Energy usage over the past decade has change dramatically, which directly reflects the rapid development of energy intensive economic activities and the reliance on imported petroleum products within the nation (FSM Government, 1999c).

The energy sector of the nation is the fastest growing sector of the economy and the utility services are currently addressing the present and futures energy needs, however the current limitations to energy services is directly impeding the social and economic development of the nation. The widely distributed and isolated islands and communities of the FSM has made the challenge of providing safe, reliable and cheap energy to all communities a very difficult and expensive task (FSM Government, 1999b and 2000b).

Traditionally, energy requirements of the nation were limited and restricted to wood; wood products and other vegetable matter to fire household cooking needs. The utilization of wood from forests is a nation wide concern and management plans are being developed that limit the area and amount of wood that can be cleared for such purposes (FSM Government, 1999c). Special restrictions are being developed on the use of mangrove wood.

More recently, imported fossils fuels that are used to power the nations power stations have provided the energy requirements of the nation. All the major islands have large diesel powered power stations, whilst the majority of the smaller island and outer communities utilize small portable petrol/diesel generators to meet their requirements. Liquid Petroleum Gas (LPG) and kerosene are used widely throughout the nation as fuel for domestic cooking requirements (FSM Government, 2002a).

The islands of the FSM have abundant and consistently high levels of solar radiation, wind and water (high Islands), which can be utilized to provide sustainable energy. Several outer atoll communities have developed small alternative power generation schemes utilizing solar energy and wind, whilst hydroelectricity has been tried in the high islands. The development of alternative power systems and the careful use and management of the current fossil fuel power systems are priority areas for implementation to address the energy needs of the nation in the future. The use of alternative sustainable energy systems is paramount for the development of the rural and remote communities (FSM Government, 1999b).

The responsibility of the generation and distribution of power within the nation is entrusted to State's utility corporations. During the past decade each State has change the ownership of these utilities from State owned government line agencies to government owned corporations with control directed by their individual boards. These corporations are also responsible for the

delivery of water and sewage services. Each utility corporation has independent fuel arrangements with either Mobil Oil Micronesia or with Micronesia Petroleum Corporation (FSM Government, 1999c).

A draft National Energy Policy statement for the nation has been developed through multi-sectoral workshops and meeting. The objective of the plan is to promote the sustainable social and economic development of the FSM through the provision of cost effective, safe, reliable and sustainable energy services (FSM Government, 1999c).

Five definable sector policies and related strategies, programmes and activities have been identified by the nation are required to be implemented to guide the sustainable development and management of the nations energy sector for the future (FSM Government, 1999b and 1999c). These are:

1. An effective and coordinated energy sector.
2. Safe, reliable, cost effective and sustainable energy supply.
3. Restructure the power utilities and the petroleum industry and promote energy service companies.
4. Diversify FSM's energy resource base.
5. Environmental and efficient use of energy.

The constraints and deficiencies encountered in implementation and delivery of a sustainable energy programme throughout the nation have been summarized into four broad areas of the sector (FSM Government 1999c). These are:

1. Institutional
 - A relatively small but fragmented energy sector
 - An energy sector environment which is not conducive to competition and private sector participation
 - Absence of an effective oversight and coordinating mechanism between the governments and between energy sector partners.
 - Insufficient capacity at both the all government levels to coordinate, plan and manage the energy sector activities.
2. Power
 - A highly subsidized power sector operation.
 - Absence of any standardized technical and operation procedures.
3. Petroleum
 - Limited competition for the supply of petroleum products.
 - Fuel and lubricant supply companies to take responsibility for collection, removal and disposal of used and waste petroleum products.
 - Oil companies need to ensure that adequate fire fighting capability is available in terminals and the general community to cope with worst-case disaster scenario.
4. Renewable Energy
 - Existing solar electrification programmes are not sustainable.
 - Absence of any long-term experience with renewable energy.
 - Lack of monitoring of the nations renewable energy potential.

12.0 References

Anon, 2001. Regional round table for East Asia and the Pacific Region. Report for the 2002 world summit on sustainable development. pp19.

FSM Government. 2001. The FSM preliminary report to the convention of the parties of the convention on biological diversity. FSM report, 23pp

FSM Government Report. 1995. Proceedings of the 1st Economic Summit. FSM National Government. 247pp.

FSM Government Report. Micronesian Fisheries Authority: 1999 Annual Report. FSM National Government. 38pp.

FSM Government Report. 1999b. Proceedings of the 2nd Economic Summit. FSM National Government. 247pp.

FSM Government Report. 1999c. Draft National Energy policy for the FSM. FSM National Government. 19pp.

FSM Government Report. 1999d. The FSM National Government National Communication for the United Nations Framework Convention on Climate Change. 90pp.

FSM Government Report. 2000a. Plan for the Management of Tuna in the Federated States of Micronesia. Micronesian Fisheries Authority, 53pp

FSM Government Report. 2000b. The FSM Planning Framework 1999- 2002. FSM National Government. 239pp.

FSM, Government Report . 2002a. The FSM National Biodiversity Strategic Action Plan. FSM National Government. 59pp

FSM, Government Report. 2002b. The FSM National Assessment Report to the WSSD: Freshwater resource Sector Statement. FSM National Government. 17pp.

FSM, Government Report. 2002c. The FSM National Assessment Report to the WSSD: Waste Management Sector Statement. FSM National Government. 11pp

Falanruw, M. 2001. Terrestrial Biodiversity of the FSM. A report prepared for the FSM National Biodiversity Strategy and Action Plan. FSM National Government. 35pp.

Lindsay, S, R. and Edward, A. 2000. Coral Reef Status Report for the Federated States of Micronesia. College of Micronesian publication, 29pp.

Mace, M. J. 1999. National Legislation Relevant to Biodiversity within the Federated States of Micronesia. Office of the FSM Attorney General. 10pp.

SPREP, 1993. Nationwide Environmental Management Strategies (NEMS) – The Federated States of Micronesia. SPREP Publication. 154pp.

Smith, S. 2001. The Micronesian Conservation Trust – A sustainable Finance Mechanism for natural Resource Management in the Federated States of Micronesia. Concept Paper. The Nature Conservancy. 8pp

UN Report 1989. United Nations World Commission on Environment and Development. Web Site <http://www.un.org>. 12pp.

UN Report 1999. The 22nd Special Session of the UN General Assembly. Special Circumstances Faced by Small Island Developing States. Web Site <http://www.un.org>.

UN Report 2002. A Partnership Initiative to Overcome Vulnerabilities of Small Island Developing States. Web Site <http://www.un.org>.

UWICED, 2002. Vulnerability and Small Island Developing States. Discussion Paper. University of the West Indies Center for Environment and Development (UWICED). 9pp

URS. 2001, 'PACPOL Project SW1: Improving Ships' Waste Management in Pacific Islands Ports'. Report prepared for the South Pacific Regional Environment Programme. 62pp

WWF, 2001. Terrestrial ecoregions of the world: A new map of life on earth. Bioscience. Vol. 51, No. 11.