FINAL REPORT

THEMATIC ASSESSMENT

Climate Change
United Nations Framework Convention On Climate Change (UNFCCC)

Prepared for

Department of Environment

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LIST OF ACRONYMS

ACIAR - Australian Center for International Agricultural Research
ADB - Asian Development Bank
ARGO - Array for Real-Time Geostrophic Oceanography
AIJ – Activities Implemented Jointly
ALTA- Agricultural Landlords and Tenants Act
APN – Asia Pacific Network
AusAID - Australian Agency for International Development
BLI - Birdlife International, Fiji Programme
CCC - Coral Cay Conservation
CC - Climate Change
CC: TRAIN - Training Programme to support the Implementation of the Convention
CDM - Clean Development Mechanism
CI - Conservation International
CIDA - Canada International Development Agency
GLOBEC – Global Ocean Ecosystem Dynamics
DoE - Department of Energy
DOE - Department of Environment
DoF - Department of Forests
DSAP- Development of Sustainable Agriculture in the Pacific
ECF - Environment Consultants Fiji
EU - European Union
FD - Fisheries Department
FIRCA- Fiji Islands Revenue and Customs Authority
FEA - Fiji Electricity Authority
FHCL - Fiji Hardwood Corporation Limited
FIBS – Fiji Islands Bureau of Statistics
FLMMA - Fiji Locally Managed Marine Areas network
FMS - Fiji Meteorological Service
FSC - Fiji Sugar Corporation
FSPI - Foundation of the South Pacific International
(GHG) - Greenhouse Gas Inventory
GEF - Global Environment Facility
IAS - Institute of Applied Science
ICM - Integrated Coastal Management Program
IGCI - International Global Change Institute, Waikato University, NZ
IOI – International Ocean Institute
JICA - Japan International Cooperation Agency
LMMA - Locally-Managed Marine Area Network
LDCs - Least Developed Countries
LDCF- Least Developed Countries Fund
LTA- Land Transport Authority
MAC - Marine Aquarium Council
MAFF - Ministry of Agriculture, Fisheries, Forests and ALTA
MAFFA - Ministry of Fisheries, Forests and ALTA

MASLR - Ministry of Agriculture, Sugar and Land Resettlement
MC - The Australian Bureau of Meteorology
MDGs – Millennium Development Goals
ME – Monitoring and Devaluation
MMAJ - Metal Mining Agency of Japan
MPAs- Marine Protected Areas
MPI - Ministry of Primary Industries
MRD - Mineral Resources Department
NAPA - National Adaptation Programme of Action
NASA-National Aeronautics and Space Administration
NIWA – National Institute of Water and Atmosphere
NOAA- National Oceanic and Atmospheric Administration
NLTB - Native Land Trust Board
NTC - National Tidal Centre
OFCCP -Oceanic Fisheries Climate Change Project
PACE-SD - Pacific Centre for Environment and Sustainable Development
PHL - Pacific Hydro Limited
PIC - Pacific Island Countries
PI-GCOS-Pacific Islands Global Climate Observation System
PIGGAREP - Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project
POGO – Partnership for Observations of the Global Oceans
QDPIF (Aus) - Queensland Department of Primary Industries and Fisheries, Australia
RED - Reduced Emissions from Deforestation
REDD - Reduction of Emission in Deforestation and Degradation
RETs – Renewable Energy Technologies
SBWG - Sovi Basin Working Group
SIDS - Small Island Developing States
SCCF - Special Climate Change Fund
SEREAD - Scientific Educational Resources and Experience Associated with the Deployment of Argo
SHADOZ- Southern Hemisphere Additional Ozonesonde
SOPAC - South Pacific Applied Geoscience Commission
SPC - Secretariat of the Pacific Community
SPC/ GTZ - SPC/GTZ Pacific-German Regional Forestry Project
SPREP - South Pacific Regional Environmental Program
SPRH - South Pacific Regional Herbarium
START - SysTem for Analysis, Research and Training
STE- Stratospheric/Troposphere Exchange
STOIC - Stratospheric Ozone Inter-Comparison
TGICA - Task Group on Data and Scenario Support for Impact and Climate Assessment
UNDP - United Nations Development Programme
UNFCCC- United Nations Framework Convention on Climate
UNCBD – United Nations Convention of Biological Diversity
UNCCD-United Nations Convention to Combat Desertification
UoW - University of Waikato
USP - University of the South Pacific

UNESCO – United Nations Educational, Scientific and Cultural Organization
UNITAR- United Nations Institute for Training and Research
WCS - Wildlife Conservation Society
WHO - World Health Organization
WI-O - Wetlands International – Oceania
WSSD – World Summit on Sustainable Development
WWF - World Wide Fund for Nature

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EXECUTIVE SUMMARY

Fiji enjoys a tropical South Sea maritime climate without great extremes of heat or cold. On the average some ten to twelve cyclones per decade affect some parts of Fiji, and two to three cyclones can be very severe. At all seasons the predominant winds over Fiji are the Trade Winds from the east to south - east. Temperatures average 22°Celsius (72 °F) for the cooler months (May to October) while (November to April) temperatures are higher with heavy downpours. Although rainfall is highly variable, the average rainfall increases steadily inland from coastal areas. The positioning of the SPCZ has a strong influence on rainfall over Fiji. During the dry season (May to October) the SPCZ tends to be positioned more to the northeast of Fiji. In the rainy season (November to April) the SPCZ tends to be located over Fiji. On the larger islands, Viti Levu and Vanua Levu, the south-eastern regions are the high-rainfall areas. The mountains of these high islands have a strong influence on the distribution of rainfall, with the regions on the leeward (western) side of the mountains being much drier on average. During an ENSO event, conditions drier and hotter than normal can be expected, from December to February and drier and cooler conditions are expected from June to August. The 1997/1998 ENSO event greatly influenced Fiji's rainfall pattern. In September of 1997, most parts of the country recorded 20% to 50% below average rainfall. The western parts of the country recorded less than 10 mm of total rainfall, that is, below 7% of the average. In December, all sites recorded 50% to 90% below average rainfall. All coastal sites in Viti Levu and parts of Vanua Levu recorded lowest-ever rainfall totals for the period of 8 consecutive months from September 1997 to April 1998.Fiji lies in an area normally traversed by tropical cyclones mostly during the November-April wet/cyclone season.

During the 1980s there were growing international concerns that changes in the atmospheric concentrations of a number of gases had potential to affect world climate. In 1988 the United Nations General Assembly recognized the need to manage human activities that were affecting, or had potential to affect, the world's climate patterns. Following international negotiations the United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature in 1992. Fiji signed the convention at its launch in 1992 and ratified it in 1993. The objective of the UNFCCC is to stabilize the concentrations of greenhouse gases in the atmosphere at levels that prevent dangerous interference with the world's climate. This should be done within a time frame that will allow ecosystems to adapt naturally to climate change, to ensure food production is not threatened and to enable economic development to proceed in a sustainable manner (Article 2 of the UNFCCC).

Fiji's obligations under Articles 4 and 12 of the UNFCCC require that all signatories to the UNFCCC communicate to the Conference of the Parties (COP) on their National Greenhouse Gas Inventories and develop national plans to mitigate climate-change impacts and promote measures to facilitate adequate adaptation to climate change within three years of the convention coming into force. *Because of limited national capacity and financial constraints Fiji has not been able to meet this requirement until now.* Despite this, it has enabled to meet some of its national obligations under the UNFCCC through support received through the Pacific Islands Climate Change Assistance Programme (PICCAP). PICCAP is a three-year programme funded by the Global Environment Facility (GEF), executed by the United Nations Development Program (UNDP) and implemented through the South Pacific Regional Environment Programme (SPREP), in close collaboration with the UNITAR-administered CC: TRAIN.

The impact of political uncertainties from the late 80's to the present has provided constant changing of national policies and strategies that basically affected the sustainability of projects under the Department of Environment in particular the climate change programme. Issues arising from these include changing of senior governmental management officers, realignment of DOE into different governmental ministries and

portfolios, downsizing of civil servants, amalgamation of departments and ministries, non-prioritizing of environmental issues compared to economic initiatives from the central government, constant relocation of office spaces and severing of international ties to major donor countries such as United States of America, Australia and New Zealand. It has taken more than a decade to facilitate and implement Fiji's obligations under this convention. In essence Fiji has not examined its capacity needs, gaps and constraints to facilitate and implement the UNFCCC.

A National Capacity Self Assessment (NCSA) Project was carried out by the DOE funded by UNDP/GEF to examine its national capacity in June 2008. This exercise is expected to address this gap. The project provides Fiji the opportunity to "conduct a thorough self-assessment and analysis of national capacity needs, priorities and constraints with respect to meeting global environmental management objectives". The stocktaking exercise provides a baseline situation for climate change and will form the basis of the thematic assessments to follow.

Findings

Findings of this study have been identified during the initial stocktaking exercise, but these are initial observations, this report basically identified an in depth assessment of these issues which are as follows;

- Greenhouse Gas Inventory (GHG) – *Too much emphasis was placed on carrying out this exercise since Fiji is basically an agriculture based economy still in transition into commercial tourism*

- Vulnerability and Adaptation – *This is more relevant to Fiji's situation, but the emphasis to carry this out on a national basis is difficult due to lack of historical quantitative and qualitative data. Another major issue is lack of financial commitment for the government to carry out VA of Fiji. Adaptation and mitigation put into place lacks baseline scientific data which often compound existing problems rather than solving it.*

    - National Policy and Actions on Climate Change – *There is lack of national policy to adequately address adaptation and mitigation options to address adverse impacts of climate change issues in Fiji. The existing climate change policy is still in its infancy stage and will need greater consultation from stakeholders to appropriate and comprehensively addresses national issues.*

- National Communication – *Inadequacy of DOE to facilitate and implement its obligation under the convention, have prolonged submission of Fiji's national communication to the UNFCCC secretariat in Bonn on time. It took almost 10 years after the initial implementation of the climate change programme in Fiji for compilation and reporting of this very important document. These are mainly due to lack of funding and technical expertise.*

- A Regional Pacific Climate Change Project (PICCAP) – *The PICCAP has been providing member countries by filling in the gaps and constraints in human resources for project implementation and completion, proposal write-up for sourcing of funding and technical support systems for weather and climatic variability in the Pacific. However at times SPREP has been inward looking by increasing of their capacity with huge administration, and operational cost and tendency to monopolize transfer of knowledge compared to improving member countries capacities they are serving.*

- National climate change committee – *lacks core strategic functions to monitor, assess and review project implementation. Most of the time steering committees are non-sustainable. Meetings tend to be on "ad hoc" basis and voluntary with no clear mandate to carry out it functions*

- Other related CC work- *these include ongoing projects facilitated by* crop *agencies such SPREP, SOPAC, SPC and USP. Most of these works are carried out at regional level in association with international organizations linking with climate change projects such IGCI, IOI, JICCA, CIDA, NOAA, START, UNDP/GEF, UNCBD UNCCD, UNESCO and UNITAR, WMO, those institutions with direct linkages to programmes in Fiji via regional institutions such as USP, SOPAC and SPC tend to be independent and are not aligned to Fiji's UNFCCC secretariat. Most of these works are related to adaptation and sea level rise.*

Capacity Constraints

Capacity constraints are almost relative across the stakeholders these are:
Systemic

- Lack appropriate integrated approach in resource management
- Lack policy coordination and institutional support to satisfy regular reporting requirements

Institutional

- lack of human resources,
- Lack of historical quantitative and qualitative scientific data
- Lack of public awareness of climate change issues
- Lack of financial resources to gather, store, and analyse existing data

Individual

- Bringing new concept to communities are always great challenges
- lack of technical knowledge

It is imperative that important conventions such as these should be prioritized by the central government and that economic benefits derived from being signatory members should be mainstreamed into the strategic planning of the ministry of planning and finance.

The Kyoto Protocol has developed a very import document the Marrakech Accord; this has enabled Fiji to take advantage of the carbon trading opportunities under the clean development mechanism (CDM). Fiji was one of the first island countries in the Pacific to sign and ratify the Kyoto Protocol in September 1998 and there are only two designated national authorities (DNA) in the Pacific to trade carbon credits under the CDM, the two countries are Fiji and Papua New Guinea (PNG).

Under the NCSA programme, the Fiji interim government was disclosed about the potential of trading under the CDM compulsory market. In July 2008, a Cabinet paper was approved by cabinet to develop a carbon trading unit (CTU) at the DOE. Another cabinet paper was passed on the 8th of October 2008 to look into the composition of this set up at DOE This set into motion the fundamental mechanism to take Fiji into the

compulsory market. The voluntary market was initially perceived as being rigid and static, however overnight this has become a lucrative trading marketing specifically with projects on Avoided Deforestation Reforestation/Afforestation and Biomass conversion.

Overall Fiji has full potential to facilitate and implement its obligation under the convention; this can only be realized if it develops necessary institutional, policy, financial and human resources capacities at the secretariat (DOE). One of the major potential catalysts for the above to be realized is taking advantage of the carbon trading opportunities at the compulsory and voluntary markets.

1.0 INTRODUCTION

In this report, the self assessment exercise will rest on of Fiji's capacity to facilitate and implement projects obligated under article 42 and article 12 of the UNFCCC. This is the benchmark to gauge the capacity of DOE and related stakeholders in meeting its defined obligations.

1.1 National Profile

Fiji lies in the heart of the Pacific Ocean midway between the Equator and the South Pole and between longitudes 174°East and 178° West of Greenwich and latitudes 12° S and 22° south. Fiji's Exclusive Economic Zone contains approximately 330 islands of which about a - third are inhabited. It covers about 1.3 million square kilometres of the South Pacific Ocean. Fiji's total land area is 18,333 square kilometres. There are two major islands - Viti Levu which is 10,429 square kilometres and Vanua Levu 5.556 square kilometres. Other main islands are Taveuni (470 sq km), Kadavu (411 sq km), Gau (140 sq km) and Koro (104 sq km).

1.1.2 Geography

The Fiji islands are composed of large mountainous islands, which are largely of volcanic origin, such as Viti Levu and Vanua Levu (which take up 87% of the total land area), and numerous small volcanic islands, low-lying atolls and elevated reefs. The largest islands have a diverse range of terrestrial ecosystems, including extensive areas of indigenous forest. The high islands have distinct wet and dry sides due to prevailing wind patterns. Coastal ecosystems include mangroves, algae and sea-grass beds in shallow reef and lagoon areas, and various reef types such as barrier, fringing platform and atoll or patch reefs.

1.1.3 Climate

Fiji enjoys a tropical South Sea maritime climate without great extremes of heat or cold. The islands lie in area which is occasionally traversed by tropical cyclones, and mostly confined between the months of November to April every year. On the average some ten to twelve cyclones per decade affect some parts of Fiji, and two to three cyclones can be very severe. At all seasons the predominant winds over Fiji are the Trade Winds from the east to south - east. On the western and eastern sides of Viti Levu and Vanua Levu however, day time breezes blow in across the coast. In general, the winds over Fiji are light or moderate, the most persistent being in the period July - December. Temperatures average 22°Celsius (72 °F) for the cooler months (May to October) while (November to April) temperatures are higher with heavy downpours. Although rainfall is highly variable, the average rainfall increases steadily inland from coastal areas. It usually increases between December - April, especially over the larger islands, but in May - October it is often deficient, particularly in the dry zone on the western and northern sides of the main islands.

1.1.4 Rainfall

The positioning of the SPCZ has a strong influence on rainfall over Fiji. During the dry season (May to October) the SPCZ tends to be positioned more to the northeast of Fiji. In the rainy season (November to April) the SPCZ tends to be located over Fiji. In addition to these seasonal variations, there is also a high degree of inter-annual variability in rainfall, which is strongly influenced by ENSO and SPCZ fluctuations. Another important influence on rainfall is the south-easterly trade wind, which carries moist air onto the islands. On the larger islands, Viti Levu and Vanua Levu, the south eastern regions are the high-rainfall areas. The mountains of these high islands have a strong influence on the distribution of rainfall, with the regions on the leeward (western) side of the mountains being much drier on average. The annual rainfall in the east of Viti Levu, where Suva is located, ranges from 3000 mm to 5000 mm, while in the west of Viti

Levu, where Ba, Lautoka, Nadi and Sigatoka are located, annual rainfall ranges from 2000 mm to 3000 mm. While the prevailing wind is from the southeast, tropical cyclones and depressions tend to track from the north and west. Thus, although the west of Viti Levu is drier on average it can experience very heavy rainfall events and associated flooding.

1.1.5 Temperature

The average daily temperature varies seasonally, from 23°C to 25°C in the dry season and from 26°C to 27°C in the rainy season. On average, temperatures during the colder months (July-August) and the warmest (January-February) vary by about 3 to 4°C. Inter-annual fluctuations in temperature are relatively low, ranging from ±0.5°C about the long-term mean.

1.1.6 El Niño

ENSO is an inter-annual cycle of disturbance to the Walker atmospheric circulation and an associated shift in the location of warm ocean water across the equatorial Pacific (Congbin Fu et al. 1986). El Niño events, which lead to a northeast positioning of the SPCZ, are the major cause of drought in Fiji. During an ENSO event, conditions drier and hotter than normal can be expected, from December to February and drier and cooler conditions are expected from June to August. While lower than normal rainfall can be expected over most of Fiji, the most severely affected areas tend to be in the west of the main islands. Fiji is located in a part of the Southwest Pacific region where anomalies in annual rainfall are strongly correlated with the **Southern Oscillation Index** (SOI) which is a measure of monthly atmospheric pressure differences between Tahiti in French Polynesia and Darwin in north Australia

Table 1: SOI Data for Fiji's El- Nino Years

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1965	-0.5	0.1	0.2	-1.3	-0.1	-1.6	-2.3	-1.3	-1.4	-1.3	-1.8	0
1966	-1.4	-0.5	-1.6	-0.7	-0.8	-0.1	-0.1	0.3	-0.3	-0.4	-0.1	-0.5
1967	1.5	1.2	0.8	-0.5	-0.3	0.5	0	0.5	0.5	-0.2	-0.6	-0.7
1972	0.3	0.6	0.1	-0.7	-2.4	-1.6	-1.9	-1.1	-1.5	-1.3	-0.5	-1.5
1982	1	-0.1	0	-0.3	-0.8	-2.5	-2	-2.7	-1.9	-2.2	-3.1	-2.5
1983	-3.4	-3.5	-3.2	-2	0.5	-0.6	-0.9	-0.3	0.9	0.2	-0.2	-0.1
1987	-0.7	-1.4	-1.6	-2.2	-2	-1.8	-1.8	-1.3	-1.1	-0.6	-0.1	-0.6
1992	-2.6	-1	-2.2	-1.8	0.1	-1.2	-0.7	0.2	0.1	-1.8	-0.8	-0.7
1994	-0.2	0	-1	-2	-1.1	-1	-1.7	-1.6	-1.6	-1.5	-0.7	-1.3
1997	0.4	1.3	-0.8	-1.6	-2.2	-2.4	-0.9	-2	-1.4	-1.7	-1.5	-0.9
1998	-2.4	-2.1	-2.9	-2.5	0	1	1.5	1				

Source: Fiji Meteorological Service

The 1997/1998 ENSO event greatly influenced Fiji's rainfall pattern. It intensified from April to June of 1997 where the SOI for June reached its lowest value since 1905. In September of 1997, most parts of the country recorded 20% to 50% below average rainfall. The western parts of the country recorded less than 10 mm of total rainfall, that is, below 7% of the average. In December, all sites recorded 50% to 90% below average rainfall. All coastal sites in Viti Levu and parts of Vanua Levu recorded lowest-ever rainfall totals for the period of 8 consecutive months from September 1997 to April 1998.

1.1.7 Cyclone

Fiji lies in an area normally traversed by tropical cyclones mostly during the November-April wet/cyclone season. Cyclones bring about flooding and multiple landslips, which have major impacts on the economy and infrastructure, and many adverse effects for the people of Fiji

1.1.8 Flora/Fauna

Fiji's flora and fauna are relatively few in number but are of exceptional scientific interest because of the higher proportion of endemic forms - i.e. those found nowhere else in the world. Ten per cent of the 476 indigenous Fijian plant species identified are endemic. Fiji also has a few rare reptiles and birds. Notable of this, is the Crested Iguana, found only in some parts of Fiji namely Yadua Taba in Bua and the Yasawas. Other rare species include the Fiji burrowing snake, Fiji petrel, the pink-billed parrot finch, the red throat lorikeet and the long legged warbler. Two researches in conjunction with the Fiji Museum found bones of crocodiles, giant tortoises and giant Fiji pigeons during one of their projects. The crocodiles were around two and a half meters long and the giant iguanas a metre and a half long. The amended bones of these long extinct animals were found in the Volivoli and Qarinivokai caves which is situated to the West of Sigatoka dunes.

1.1.9 Socio-Economics[1]

1.1.9.1 Demography

The current population according to the 2007 census stands at **837,271** of which **427,176** are males and **410,095** females the population growth rate in 2008 was **0.7%.** Population density stood at **45.7 per square kilometre** Life expectancy is around **66.5 to 66.6** years on an average and the average household size is **4.75.** Majority of the population and development are located along the coastal flood plain areas of the islands.

1.1.9.2 National Income

In 2007, GDP at constant price had a negative annual growth rate of **-6.6%** and the GDP per head followed suit with a rate of **-7.0%** this may have been due to the trickle down effects of the global financial crisis and the repercussions of the political instability which also saw inflation rise from 4.8% in 2007 to **7.7%** in 2008. Total fixed capital formation for 2008 was **$158,215,000** of which **$17,817,000** was from Environmental Protection. Government consumption expenditure was **$756,294,000** of which **$8,126,000** was spent on environmental protection. Preliminary figures indicate that government spent 8.1 Million on environmental protection.

1.1.9.3 Climate Change

All nations, including Fiji, that are signatories to the United Nations Framework Convention on Climate Change (UNFCCC) are obliged to provide National Communications to the Conference of Parties (COP) of the UNFCCC. The COP4 stressed the need for parties to the Convention to take into account the need for establishing implementation strategies for adaptation to climate and sea-level changes. As such, Fiji is required to submit a National Communication document that shall include information on climate change vulnerability and adaptation implementation policies and strategies.

[1] All figures based on statistics derived in December 2008 by FIBS

Fiji's commitment to fulfill the requirements of the National Communication has been supported by the Pacific Islands Climate Change Assistance Programme (PICCAP) – of the South Pacific Regional Environment Programme (SPREP) through funding from the Global Environmental Facility (GEF). As an island nation, it is essential to understand how climate change and sea level rise will affect and impact on our coastal ecosystems, marine resources, subsistence and commercial agricultural developments, domestic and industrial developments, human health, water resources, population, and our national economy at large. In order to develop and implement appropriate response strategies, it is essential to establish a comprehensive baseline of the current situation in Fiji and an understanding of the effects of climate change, the degree of vulnerability and the national capacity to adapt.

Fiji is largely an agriculture-based economy still in transition into more commercial based economy. Fiji's contribution to global GHG emissions is 21.06% (CCIP 2009). The last GHG inventory was carried out in 1994.

Emissions Summary for Fiji

	Emissions, in Gg CO_2 equivalent		
	1994		Latest available year (1994)
CO2 emissions without LUCF	821.0		821.0
CO2 net emissions/removals by LUCF	-7,840.0		-7,840.0
CO2 net emissions/removals with LUCF	-7,019.0		-7,019.0
GHG emissions without LUCF	1,391.3		1,391.3
GHG net emissions/removals by LUCF	-7,701.6		-7,701.6
GHG net emissions/removals with LUCF	-6,310.3		-6,310.3

Table 2: Green House Gas Emissions Profile for Fiji. (Source: www.unfccc.int)

However, since then there has been growth in number of industries and vehicles that emit GHG nevertheless, work is being planned to commence the preparation of the second National Communication and with it a new GHG Inventory will be prepared over the next three years.
While Fiji's GHG emissions may not be significant, the country is still vulnerable to the impacts of Climate Change whether it is the threat of rising sea levels or impacts of extreme weather conditions. The following are some of the potential sectors affected by climate change:

- Agricultural production decline by [30—40%][2] affecting food security due to salinisation of soils as intrusion of salt water into fresh water lens and/or due to excessive removal of ground water.

- Freshwater supplies would be affected as riverbeds and bore holes dry up due to extreme drought conditions and/or salt water intrusion into the freshwater lens.[3]

[2] Pacific Regional Department: Climate Change Implementation Plan, 2009 [DRAFT].
[3] Pacific Island developing Country Water Resources and Climate Change.

- Tourism industry, which is the backbone of the economy, would decline, as there will be a loss of tourist attractions due to coral bleaching and coastal erosion.

- Disaster risks would increase as frequency of extreme weather events (e.g. cyclones) would increase leading to flooding, inundation of low lying areas, sea level rise coupled with storm surges would lead to significant loss of coastal areas, leading to displacement of coastal villages.

- Human health and safety would be compromised as longer wet periods would increase prevalence of diseases such as dengue fever and water borne illness such as cholera, diarrhoea and leptospirosis, also Nutritional related illness due to poor food production are most likely.

Extensive studies and reports have been compiled in relation to climate and its impacts in Fiji. There has been research studies' dating as far back as 1989 by academics, like Professor Patrick.D. Nunn and many others[4] all have highlighted impacts of climate change on coastal areas, agriculture, water resources and extreme climatic events. These impacts will also affect the socio-economic status of the country, since majority of the population and development is along coastal plains with sea level rise and increased inundation of coastal areas, villages would be forced to relocate to higher ground this would bring about clearing of forests to accommodate them deforestation would eventually lead to loss of biodiversity. Coastal fisheries would be affected by increase in sea temperature, which would lead to coral bleaching resulting in loss of food supply and income for the coastal people. Essentially, the 25-year event at present sea level will be come the 5-year event if sea level rises by 0.5 m (Solomon & Krüger, 1996). On the other end increased frequency and intensity of extreme events such as cyclones and El Nino events would lead to flooding and/or drought affecting food crops and causing damages to infrastructure. The costs of responding to climate change depend on the options considered. They include

(i) Prevention: substantial commitments to prevent climate change;
(ii) Adaptation: highlighting strategies and measures for reducing expected damages
(iii) Policies: indirectly inducing reduced emissions of greenhouse gases.

Although accurate estimates of costs of protection against climate change have not been finalized in Pacific islands, IPCC estimates that adaptations to climate change could cost billions of dollars. Large numbers of people inhabit coastal areas and are dependent on subsistence agriculture and fishing. Climate change poses the most significant long term threat to food security and traditional livelihoods and adaptation costs will be disproportionately high, relative to national income. Ensuring that communities are equipped with the necessary skills and tools to adapt to these changes is essential to minimising the economic, social and cultural costs associated with climate change. When addressing issues on climate change it is important to note that everything is connected to everything else.

[4] Development and Climate Change in Fiji: Focus on Coastal Mangroves
Rates of floodplain accretion in a tropical island river system impacted by cyclones and large floods
Effects of Global Warming on South Pacific Islands, 1900-2100

1.2 BACKGROUND

At the first World Climate Conference (WCC), in 1979, Scientists began to express anthropogenic influence for increasing concern over the rising emission of greenhouse gases in the atmosphere affecting global climate. In light on this, the United Nations General Assembly in 1988 agreed to a resolution, to protect global climate for present and future generations of mankind. "Two years later, in 1990, the United Nations General Assembly passed a resolution, formally launching negotiations on a climate change convention. In May 1992, the United Nations Framework Convention on Climate Change (UNFCCC) text was adopted and the Convention opened for signature in June at the Earth Summit, held in Rio de Janeiro. The UNFCCC entered into force in March 1994 (Fisher E, 2004).

It has taken more than a decade to facilitate and implement Fiji's obligations under this convention. In essence Fiji has not examined its capacity needs, gaps and constraints to facilitate and implement the UNFCCC.

Some findings were:

- capacity development needs at the overall systems levels;
- the existence of synergies across Conventions in terms of capacity needs; and
- the need for programmatic approaches to capacity development that are nationally driven and reflect country priorities.

In August 2008, the Department of Environment through UNDP/GEF approved the provision of funding for Fiji to undertake self assessment capacity building needs, with emphasis on cross-convention synergies in capacity building activities.

The National Capacity Self Assessment Project is expected to address this gap. The project provides Fiji the opportunity to "conduct a thorough self-assessment and analysis of national capacity needs, priorities and constraints with respect to meeting global environmental management objectives". The stocktaking exercise provides a baseline situation for climate change and will form the basis of the thematic assessments to follow.

1.3 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Fiji signed the UNFCCC in 1992 at the Rio Convention and subsequently ratified the following year in 1993. The Framework Convention on Climate Change came into force in March 1994. The Convention divides countries into three main groups, with commitments varying according to their classification. Annex 1 Parties include the industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992 along with countries with economies transition (EIT). Annex 11 Parties consist of OECD members of Annex 1 excluding the EIT Parties. These Parties are required to provide funding to developing country Parties to undertake emissions reduction activities and to help them to adapt to the adverse effects of climate change (Fisher E, 2004). The third group is the Non-Annex 1 Parties and includes the developing country.

1.4 KYOTO PROTOCOL

At the first Conference of the Parties (COP) to the Convention, held in 1995, it was agreed by Parties that the Convention by itself was not sufficient to address the problems of climate change and a decision was taken to start negotiations for legally binding and more detailed commitments for industrialised countries. At the third COP held in 1997 in Kyoto, Japan, the Kyoto Protocol was adopted. The Protocol has legally binding emission targets for industrialised countries. The Protocol's rules were clarified in detail in the 2001 *Marrakesh Accords*. Fiji acceded to the Protocol in September 1998 and entered into force in 2002 (Appendix 8-3).

2. 0 METHODOLOGY

This work entails four main steps to finalize in-depth reports: The NCSA implement specific tools to derive information and data. The first step is to gather information by collating data from:

- Literature review
- Questionnaires/interviews
- Fieldtrips
- Stakeholders workshops
- Awareness workshops
- Capacity workshops; and
- Use of media-internets, telephones and internal communications within govt departments

The second step is prioritizing of information according to the term of reference provided by the secretariat's (DOE) national coordinator. This work involves aligning governmental stakeholders to their corporate goals in regard to the convention. The work also involves collating any type of data which directly and indirectly correlated to the implementation and/or facilitation of Fiji's obligations under the convention. This include collation of information from related stakeholders in the NGOs, statuary bodies, the corporate and private bodies and the community based organizations (CBOs)

The third step is data assessment and analysis. This step is critical and important because it identifies and analyse critical issues pertaining to capacity gaps and constraints with related stakeholders. This step also looks at the different issues that are cross-cuttings with related stakeholders and players in sectors of the political, social and economic sector.

The last step is identification of mitigation and adaptation options that are relevant and appropriate for Fiji's situation.

One of the tools for capacity assessment was using a SWOT and root cause analysis. Questionnaires asked during the interviews were also used to gauge their knowledge and awareness of Fiji's task under UNFCCC (See Appendix 8-2 for sample questionnaires used during interview).

3.0 IMPLEMENTATION FRAMEWORK

3.1 OVERVIEW

The modality for implementation is through governmental initiated programmes. It is a top-down management approach to facilitate and implement national obligations under the convention. Fiji ratified the convention in 1993 and enters into force in 1994, and the stakeholders are consisted of national, regional and global players.

The establishment of the Climate Change Programme was funded by the US Country studies Program from 1994-1997. Under this assistance Fiji was able to produce the baseline information for the following reports:

- Vulnerability and Adaptation Assessment of Suva Peninsular Area,
- A Review of the Types of Coastal Protection Structures Used in Fiji Today with a Comment on their Effectiveness,
- Oral Literature Survey of Ovalau Island,
- Land Capability and Classification Study of Ovalau Island and
- The Coral Reef Survey of Ovalau Island.

From 1998 to 2000, the Climate Change Unit under the SPREP's Pacific Island Climate Change Action Programme (PICCAP) received funding under the GEF executed by UNDP. Under PICCAP, Fiji has been enabled to finalize its national communications through CC: TRAIN Training programme. The engagement of the statuary bodies such as Native Land Trust Board (NLTB), National Trust of Fiji and environmental NGOs such as WWF and PCDF have allowed greater participation of related stakeholders to shoulder facilitation and implementation at grass root level. Apart from SPREP, regional institutions such as SOPAC, SPC and Forum Secretariat have played supporting roles to facilitate Fiji's obligation in the technical area of governance, environment and economics.

3.2 COMMITMENTS

The commitments for Fiji are set out in Box 1 and include:

- Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

- Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

- Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions.

- Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods.

Box 1. Commitments for Non-Annex 1 Parties as set out in Article 42

1. All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

(a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

(c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

(e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

(f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

(g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

(h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

(i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations; and

(j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12[5].

Box 2. Article 12. Communication of Information Related to Implementation

1. In accordance with Article 4, paragraph 1, each Party shall communicate to the Conference of the Parties, through the secretariat, the following elements of information:

(a) A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;

(b) A general description of steps taken or envisaged by the Party to implement the Convention; and

(c) Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

3.3 FIJI'S PROGRAMME OF IMPLEMENTATION

3.3.1 Existing National Capacity

Fiji has in place existing capacity to help implement provisions of the UNFCCC. However, it needs to improve and build on these capacities to achieve its goals in implementing UNFCCC. Capabilities identified are:

Systemic

- Climate Change Policy (2006)
- Formulation of a CDM Policy Guideline
- Technical assistance from Crop agencies/ financial institution
- Existing National climate change committee
- Formulation & Implementation of NAP

Institutional

- Existing Climate change unit
- Crop agencies implementing programmes relative to climate change (e.g PICCAP)
- Existing data & information on Sea Level & Climate
- Technical assistance from Crop agencies/ financial institutions

Individual

- Capacity building workshops by crop agencies & stakeholders
- Community based adaptation programmes

3.3.2 FOCAL POINT INSTITUTION

The **Department of the Environment** is the focal point for facilitation and implementation. Related stakeholders in government include the following:

- Ministry of Tourism
- Ministry of National Planning
- Ministry of Fisheries
- Ministry of Fisheries
- Forestry Department Lands Department
- Ministry of Agriculture
- Ministry of Agriculture, Koronivia Research
- Ministry of Works and Energy
- Ministry Of Education
- Ministry of Women

Related Stakeholder in NGOs includes the following:

- WWF Fiji Office Country Program
- FSPI
- Partners in Community Development (PCDF)

Related Stakeholders in Academic institutions include the following:

- University of South Pacific -IAS
- University of South Pacific –Herbarium

Related Stakeholders in Regional institutions include the following:

- SPREP
- SOPAC
- SPC
- FAO
- **PACIFIC ISLANDS FORUM SECRETARIAT**

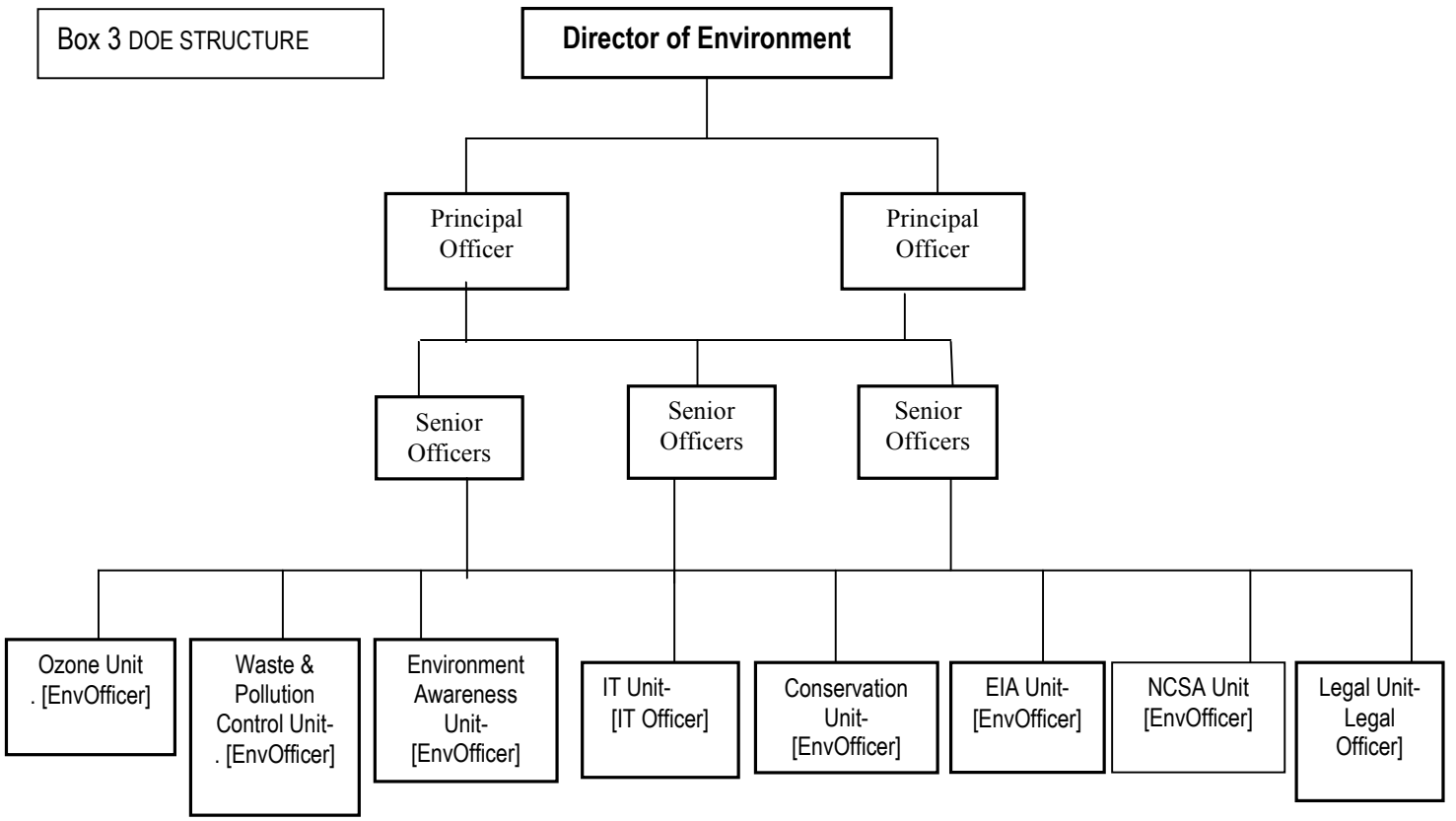
Related Stakeholders in International organizations include the following:

- United Nation Development Programme
- Global Environmental Facility
- UNFCCC
- UNCCD
- UNCBD

Appendix 8-4 defined details of the above stakeholders.
Box 3 shows the structure of the NCSA unit within the DOE. It has to be noted here that the convention is not restricted to the above agenda of meeting Fiji's obligation; it is also an avenue for greater participation

in the carbon trading aspect of the CDM compulsory and voluntary market. Institutions like Native Land Trust Board, Fijian Affairs Board, Fiji Hotel Association, Fiji Pine Limited, Fiji Hardwood, Fiji Electricity Authority (FEA) and community based organizations (CBO) etc., have potential projects under the carbon market which will beneficial for Fiji's economy and conservation of its environment.

Box 3 DOE STRUCTURE



DOE is consisted of an Environment Awareness Unit, in which they develop and implement the awareness programs. Another unit is the Waste Management and Pollution Control Unit. In this unit they identify waste problems and develop a Waste Management Strategy to outline various approaches in addressing wastes and the proper disposals of the waste. This includes liquid waste and solid waste. Another unit is the Environment Impact Assessment Unit. For every new development that is being proposed and submitted to DOE or other planned authorities, DOE ensure that proper studies and assessment are done or carried out to identify any potential impacts there might be of those new developments on the environment and also to ensure that those impacts that have been identified can be addressed such that those likely impacts can be minimized or reduced when the developments is undertaken. Another important unit is the Conservation Unit; It is involved with protecting and conserving plants and animals, various species we have, such that these are the basis for livelihoods in Fiji. Most of the work of these units is based on Fiji's commitments to various regional and international conventions to which Fiji is the party to and these conventions are on climate change, waste management, and biodiversity etc.

3.3.3 ESTABLISHMENT OF A NATIONAL CLIMATE CHANGE COMMITTEE

The establishment of the national climate change committee (NCCC) began since the programme came into force in 1994. These consisted of senior management officers in the government, academic, private, NGOs, statuary bodies and corporate institutions. Toward the end of 1997, the national committee became a non-functional with very little mandate from the central government. The same team was again reactivated in 1998 under the PICCAP and has been influential in the facilitation and monitoring of existing projects in particular the preparation of the national communication.

The NCCC was established to advise the government on matters relating to climate change during the UNFCCC process, and draws on expertise within key government departments. The committee facilitates the work of a technical team comprising a National PICCAP Project Coordinator and technical staff drawn from relevant sectors to participate in the CC: TRAIN training programme.

3.3.4 STAKEHOLDERS ANALYSIS

The stakeholder's analysis was carried out in institutions and organizations in government, non-governmental organizations, regional institutions, academic institutions and statuary bodies (Appendix 8-1a). The aim of this study is to find out their role and issues that might contribute to implementation of DOE's commitment under the convention.

Under article 42, the following obligations are expected to be fulfilled when Fiji enters into ratification of the UNFCCC in 1993.

Article 42(a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties

The Department of Environment (DOE) is mandated to carry out this with the support from line ministries such as the Department of energy, Department of Agriculture and Forestry, Ministry of Civil Aviation and Transportation etc.

This inventory describes in detail which assumptions were made, which should facilitate the development of any future inventories. Technical studies have been carried out by USP -NASA/NOAA Ozone Project
This is an on-going initiative since 1997, started as part of NASA's PEM-Tropics (Pacific Exploratory Mission to the Pacific) mission to provide ground based ozonesonde measurements of the vertical profile of ozone. The project is being funded by NASA, NOAA and USP. Another project carried out by USP-NIWA NZ for Greenhouse Gas Project. This is a joint effort between USP and the National Institute of Water and Atmospheric Research (NIWA), New Zealand. Started in a small way in 1994, with the Director, Professor Koshy as the Principal Investigator, this project has since grown into a successful international collaborative effort, which has also developed in-house capacity at the chemistry department for the measurement of ambient methane concentrations. Dr. M. Maata is the partner in this project and the postgraduate student, Francis Mani, joined the project in 2002 and graduated with his Masters degree in April 2004. The

postgraduate student also received some funding assistance from START. Another project includes El Nino and Sugar Project, this examines meteorological data from Fiji MET service and sugar production information from the Fiji Sugar Corporation, to help determine the relationship between climate and variability and assuming the worse scenario, a 10-year plan has been drawn. This study followed the political instability in 2000 and 2006. Ever since, the project has been discontinued.

CONSTRAINTS

- The inconsistency of the focal point in its facilitation role has been linked to the lack of funding and support from the central government since the ratification of the convention in 1993 in particular the ongoing PICCAP after the US Country Studies Programme
- The sustainability of project coordination for technical projects is limited to project timeline; this is due to the lack of human resources to provide technical expertise to the government. These are in the area of GHGs, weather and climatic variability studies, vulnerability assessment and mitigation. This capacity is lacking at the senior management level of DOE.
- The timeframe for implementation of initial obligations under the Convention was derailed due to reporting difficulties pertaining to article 12. For example the delay in producing the first initial communication which was submitted in 2005, almost 13years after ratification.
- Opportunities that Fiji have missed in the area of bi-lateral and multi-lateral agreements enjoyed by regional and international organizations through donor agencies funding of climate change projects.
- Opportunities existing in the CDM market under the compulsory carbon trade market since 1998 for renewable energy have not been realized since 2002.
- The lost opportunities in the carbon market that Fiji is losing out since 2002 after the establishment of the DNA.

Article 42(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

The Department of Environment (DOE) is mandated to carry out this with the support from line ministries such as the Department of Energy. Fiji Meteorology Services, Department of Agriculture, Forestry and Fisheries. Regional institutional support came from SPREP through the Pacific Islands Climate Change Assistance Project (PICCAP) under the Climate Change Enabling Activity, funded by GEF. It took more than a decade to complete a national communication document and this is due to the following issues:

CONSTRAINTS

- DOE lacks the continuity to sustain the Climate Change Project since ratification in 1993, this provides a very difficult backdrop to synthesize reports for drafting of the initial communication
- Most of the officers are on short term temporary working contracts lasting only for 2-3years, with very little support staff to monitor implementation and coordination work. This does not allow smooth facilitation of projects.
- Outgoing staff do not disseminate crucial information and their expertises are very crucial to draft reports. This provides a lot of gaps in report writing.

- There is little mechanism in the DOE to filter information and there is no consistent data compilation of the entire project undertaken and those pending. Most of the information are either lost or left with stakeholders to complete or store.

Article 42 (c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors

National programmes include renewable energy and creation of biodigesters and biofuels projects. These are the initiatives of Energy Department working in partnership with FEA. There are also programmes that link to local authorities for solid and liquid waste management. For example the Naboro Landfill Waste Management and the community climate change and energy reduction program in Fiji.

Promotion of renewable resources at Butoni is still operational, but has not reached its required maximum energy output of 9-10MW of electricity. Currently it is supplying less than 5-6MW of electricity and has high operational costs. Rural Electrification has been the mandate of the Department of Energy, this programme is still ongoing.

Overall under the Government of Fiji Rural Electrification 2008 Business Plan (Department of Environment) it has over forty activities. Of the 40 activities, 15 are renewable energy activities with a total budget of FJD2 million. These are the co-financing activities in Fiji and include major projects. This is part of the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)

CONSTRAINTS

- Political upheaval in 2006, have affected the implementation of the 2008 rural electrification business plan. Most of the donors from EU and World Bank have withdrawn their funds.
- Very little realignment between the DOE and Department of Energy
- Very little data and information exchange between the focal point and department of energy
- Knowledge on the implementation of the Carbon Trading under the Marrakech Accord in 2002 did little to support the rural electrification programme under PIGGAREP.

Article 42 (d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

Project that are related to these include Sovi Basin carbon Sequestration programme, one of the last remaining virgin forest in the interior of Viti-Levu Island. The Sovi Basin, located on the Fijian island of Viti Levu, covers over 50,000 acres and is the largest remaining lowland rainforest in Fiji. Fiji Water a leading Freshwater Company in Fiji has taken up an initiative partner with Conservation International (CI), a leading conservation organization, for the protection and preservation of the Sovi Basin rainforest in Fiji.

Another project include the Kabara Climate Witness Project, this is coordinated by WWF, Fiji programme (See Appendix 8-1a), the programme is a last ditch effort to save the remaining indigenous tree from being harvested for carving purposes for income generation to the people of Kabara in the Lau Groups of Island

(East of Fiji).

Another project to this is the adaptation to climate change in the tourism sector; this specifically looks at practices that allow sustainable use of the natural resources such as water, energy, nature and food for tourism development. One of the major concerns is the use of coastal zone for tourism development; this basically diminishes the mangrove vegetation around the major islands of Viti-Levu and Vanua Levu.

CONSTRAINTS

- No system approach to meeting this article, it is one of the most neglected obligation termed as Activities Implemented Jointly (AIJ).
- There is little or no interaction between the focal point and those involved in these projects.
- Resources in government are insufficient to address issue of concern and the involvement of NGOs is indicative of this.

Article 42 (e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

"Top down approach" has been the classical example of development in Fiji, where things are pushed from the top right down to the bottom with little or no integration of a "bottom up approach". This has been very problematic due to its inclusiveness, with little or no transparency and little ownership of the projects by the resource people at the grass root level who feel that they are always left out in all the projects that governments implemented at the top echelon of the decision making body. Thus in 1995, an integrated coastal zone management tool was prepared for DOE. This tool is used as a basis to look at coastal development from a multi-dimensional perspective. It purpose is also to allow for an integrated bottom up and top down approach at all levels of management in government.

Another mandate by the DOE is to carry out this obligation apart from the UNCCD commitments carried out by Landuse Department, Ministry of Agriculture. Project related to these include: afforestation, reforestation, biomass conversion and renewable energy which was initiated in 2002 after the Marrakech Accord.

Another project is Climate Change Adaptation in Rural Communities of Fiji which are mostly carried out by IAS-USP and PACE-USP. This project looks at the vulnerability of coastal systems to the impact of increase sea level. Another similar study is carried out by SOPAC, SPREP and IAS-USP called National vulnerability and adaptation assessment study – Phase II. Other similar studies include *Coastal Erosion and Inundation study in Navukailagi, Lomaiviti, River Bank Erosion and Flooding in Korotasere, Vanua Levu*, and *Water Problems in Druadrua Island, Vanua Levu* carried out by PACE-USP.
Finally Piloting Climate Change Adaptation to Protect Human Health (PCCAPHH) has been carried out by the Ministry of Health. It looks at the impact of climate change on human health.

CONSTRAINTS

- Most of these projects are ongoing but with limited lifeline when their funding are exhausted.

- For Fiji, IAS-USP and PACE-USP has been one of the leading institutions for carrying out adaptation programmes at rural level and there is very little exchange of information with the DOE
- Vulnerability assessment studies were carried out in island locations such as Kadavu and Yasawa in cooperation with SPREP. Immediate and long term adaptation options are some of the major responses being suggested for communities, but the issue of resilience and sustainability impinges on the communal set-up and cultural-social integration and mobility
- Fiji is an oceanic island nation and due to the coarseness of the spatial resolution, there is inadequacy of existing general circulation models (GCM) in forecasting possible climate change scenarios in Fiji since small-scale weather systems are non-existent in the models
- The need for additional finance resources to implement the appropriate adaptation options in coastal zones, water resources, agriculture and the health sector
- Most of these projects are outside of DOE's monitoring and evaluation
- It seems that institutions and organizations have directly accessed funding institution with or without prior consultation of the DOE as a focal point for UNFCCC
- Information exchange and integration has been very limited or none at all.

Article 42 (f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

Existing policies in government such as the Town and Country Act with specific conditions for EIA approvals prior to passing of survey and master plans of project developments are not inclusive and pro-investment driven project with little or no direct influence on conservation principles.

Existing policies such as Fiji Climate Change Policy (2006) has been drafted and has yet to be enacted, this has put a lot of constraint by Fiji in trying to meet the article's obligations. The Environmental management Act (EMA- 2005) along with a national solid waste management strategy and action plan for the year 2008-2010 was also implemented. The EMA has a very strong EIA component to assess developmental impact on the environment. Other polices such as the Landuse Management Policy also tries to incorporate the obligations of the article but needs to be legislated.

The Ozone Depleting Substances Act in 1998 is one of the strong elements of this article; it actually supports the OHS act under the Ministry of Labor. The Occupational Health and Safety Act are designed for the national management of hazardous substances/chemicals from the source and its impact on people or employee. Included in this are the productivity standards such as the GREEN PRODUCTIVITY and ISO140001 standard under the Employment Relations Legislation.

The Fisheries Tribunal and Land Conservation and Improvement Act are other pieces of existing legislation that looks at the compensation and conservation themes.

CONSTRAINTS

- Many of the policy lacked a lot of appropriate teeth to begin implementing necessary climate change adaptation and mitigation options. Thus there is very little work that has been carried out in

hard adaptation and mitigation options for example appropriate coastal engineering for protection of coastal zones.

- Town and Country Planning acts are old and outdated with very little reference to conservation and sustainable development except for its role in supporting the EIA provisions under the EMA
- Fisheries tribunal has specific task on the compensation of depleted marine resources or i-qoliqoli. The methodology is outdated and lacks critical components to include intangible valuation principles which are pertinent to Fiji indigenous societies.
- Most of these projects are outside of DOE's monitoring and evaluation work.
- Line ministries responsible for approval and vetting of EIA such as Lands and Town Country Planning have at times conflicting roles and duplicating roles. This prolonged clarification and delay of approvals for concept and masters plans.
- The existence of overlapping legislations and policies such as the OHS and ODS, the Land Conservation and Management policy and the NBSAP, the Quarry license and the EIA complicates decision making issues.

Article 42 (g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

Projects included in this article are somewhat vague and overarching. Specific projects include Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in the Pacific Countries (AIACC) which looks at case studies of Navua town and Natadola sites. Related projects also include;

- Water Quality Assessments and Water Wastage Study carried out by IAS-USP
- USP -NASA/NOAA Ozone Project (refer to Appendix 8-1a, box 27).
- The impact of tropical cyclones on river flows, morphology and sedimentation in Fiji –Geography Department USP (refer to Appendix 8-1a, box 29).
- Pacific Island Climate Data Rescue (PI CDR) Project and Pacific Hydrological Cycle Observing System Project (Pacific HYCOS). (Refer to Appendix 8-1a, box 38).

Other projects related to these include Projects that comes under this includes; Fiji's Seasonal Rainfall Prediction Model, Climate Change Variability - Community Relocation Project, Investigating rates of floodplain sediment accretion in tropical Pacific island river basins, the South Pacific Sea Level and Climate Monitoring Project (SPSLCMP), and South Pacific Sea Level & Climate Monitoring Project (SEAFRAME). Fiji is also blessed with three oceanic observation tidal monitoring stations since the early 1930s. These are still ongoing.

CONSTRAINTS

- Lack of historical quantitative and quantitative scientific data, provides restrictions for appropriate assessment and analysis, thus is a need for additional funding to conduct in depth vulnerability analysis "in most areas, in particular coastal zones, water resources, agriculture and the health sector" is imperative.

- It seems that knowledge has been the property of overseas consultants and institutions, with very little knowledge transfer. For example in the area of technical and scientific project implementation such as, Climate Scenarios, VA and Mitigation Options are usually the domain of regional and international academic and technical institutions such as USP, SPC, IOI, NOAA SOPAC and Pacific HYCOS etc. with very little dissemination to the focal point.
- Utilization of this information to related governmental departments for national purposes has been very little. Most of these institutions have utilized raw data from governmental institutions such as the Mineral Resources Department and Fiji Meteorology services to further promote their organizational agendas as lead agencies in these fields with little transfer of knowledge to those who owns the data.
- The DOE has never fully utilized these important programmes except in its write-up of its initial communications to the UNFCCC
- There is no alignment of related stakeholders in academic and technical institutions to provide human and financial resources to gather, store, and analyze existing data (e.g. Capacity building of Fiji Meteorology Department).
- These programmes are well outside of the DOE's capacity to assess and utilize, due to lack of technical personnel and funding

Article 42 (h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

The FMS is also serving the interest of Fiji and other Pacific Island Countries, with regional institutions such as SOPAC, SPREP, SPC, FAO and USP to support the facilitating of this article. These programmes have been to the advantage of regional crop agencies such as SOPAC, SPREP, SPC and USP. Most of what takes places in this article also occurs in Article 42(g**).**

Constraints
Most of the constraints are similar to Article 42(g) above and the problem has been compounded by very little exchange of information and ownership of data by Fiji.

Article 42 (i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations.

Climate change issues and public awareness programme has been largely the domain of technical and academic institutions in Fiji. Recent coverage by local newspapers the Fiji Times and Fiji Sun has provided enlightenment to local people. However the real issue is that this information is the ownership of these information are within the domain of those who actually are not part of the impact of climate change vulnerabilities which are the grass root people. This information does not filter right to the rural people and those communities who are the frontier of climate change vulnerabilities.

Access to information such as Pacific Island Climate Update (ICU) Bulletin and WWF Public Outreach on Climate Change is the domain of technical institutions and regional organizations and/or NGOs such as

WWF. There is very little filtration of the materials to the wider communities at large. The DOE definitely has had success in its yearly programme namely the Environment Week but the impact of this is very limited.

There are other media of mass communication such as FSPI's Stories from the Mat (Vol 1, Issue 1, 30 June 2008), SPREP's Climate Change Film Festival & Climate Change Portal and SOPAC-Vulnerability Index & SOPAC Media and Virtual Library but these are confined only to related stakeholders with very little filtration to the grass root people at large.

Overall the issues and problems are almost similar those echoed in Article 42(g) and Article 42(h).

Article 42 (j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12

Fiji has managed to achieve the following reporting since ratification of the convention the following communications under its national communication: A national inventory of anthropogenic emissions National Greenhouse Gas Inventories; Vulnerability and adaptation issues; and National policy and actions. Overall this has been a major problem for Fiji.

CONSTRAINTS

- Most of what is written in this report reflected the work of stakeholders in particular the NGOs.
- Opinions and suggestions outline in the report are necessarily not the DOE's viewpoint, but that of related stakeholders in particular SPREP
- The reports lacks essence of reporting pertaining to the obligation of Fiji under the convention
- In general the report summarizes reports that are carried out independently of DOE's assessment and review

3.4 ASSESSMENT OF NATIONAL INITIATIVE AND PROJECTS

3.4.1. Assessment Process

A major underlying issue which basically runs across the different stakeholders is lack of data sharing and integration between the focal agency (DOE) and their core task under their corporate plans and KPIs to facilitate and implement UNFCCC obligations at national level (Table 3.4.1).

TABLE 3.4.1 : History and structure and Fiji's Timeline of Events after Signatory and Ratification of UNFCCC

Date	Subject
09 October 1992	Date of signature of UNFCCC:
25 February 1993	Date of ratification UNFCCC:
21 March 1994	Date of entry into force UNFCCC:
17 September 1998	Date of signature of Kyoto Protocol:
17 September 1998	Date of ratification Kyoto Protocol:
16 February 2005	Date of entry into force Kyoto Protocol:
1994	Formation of Climate change Unit (CCU) at DOE
	Formation of the National Steering Committee
	Project identification with related stakeholders
	Engagement of related stakeholders for baseline data collection and study
1997	Completion of baseline studies on GHG, VA, Review of hard and soft coastal protection systems, coral reef survey, Landuse study, ICM, Policy on ADAPTATION & MITIGATION and AIJ,
1998	Signatory to the UNFCCC ratified the Kyoto Protocol
	SPREP began support for member countries to fulfill obligation under PICCAP
2001	Fiji enters into Marrakech Accord
2002	Fiji Signed Marrakech Accord under CDM Establishment of a National Designated Authority (DNA)
2005	Completion of First National Communication
2006	Continuation of the CC unit
2007	Phasing out of CC unit due to lack of fund
2008	Establishment of NCSA

3.4.2. Assessment of National Activities under Article 42

For the assessment of national activities, the study draws back on the Commitments for Non-Annex 1 Parties as set out in Article 42 to gauge their present progress. The stakeholder analysis in appendix 8-1a provides details which also highlights contribution or lack thereof, to meeting obligations to UNFCCC and the constraints and progress of the projects is highlighted in table 3.4.2 below.

TABLE 3.4.2- FIJI'S COMMITMENTS TO ARTICLE 42 (a)-(j)

Article 42	Projects	Progress	Issues
a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties	National Greenhouse Gas This inventory describes in detail which assumptions were made, which should facilitate the development of any future inventories. These are primarily based on the six major greenhouse gases covered in the Kyoto Protocol, namely: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride USP-NIWA NZ Greenhouse Gas project Ozone and Methane Project El Nino and Sugar Project ODS-Ozone Depleting Substance	Fiji's first Greenhouse Gas Inventory for 1991 was developed from 1995 to 1997. Several factors caused delays in the process of developing this inventory. One of the major causes was the difficulty of obtaining information from other government organisations and the private sector due to lack of quantitative and qualitative data gathering. The main sources of major greenhouse gases in Fiji were found to be: Carbon dioxide from burning of fossil fuel and biomass Methane – emission from animal and human wastes and flooded rice fields Nitrous oxide from burning of biomass and incomplete combustion of fossil fuels	• A lot of information on emission of moisture content of wet and dry areas is based on assumptions, this need to be verified in a more detailed analysis. Gaps identified are the following areas; • Moisture content in dry and wet seasons is yet to be specified areas, but the caloric values in the area of fuelwood, copra and baggage are based on wet seasons. The energy sector is the major source of GHG emissions in Fiji, with emissions dominated by the transport and energy industries. Therefore, to have a significant reduction in the national emissions of GHG gases, mitigation measures will need to target the release of carbon dioxide from this sector. Compared to global net emission, • Fiji is insignificant and therefore has capacity to solve its own domestic problem whilst on the other hand, specific focus and emphasis should be realigned to the area of vulnerability assessment and adaptation (mitigation options).
b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;	Pacific Islands Climate Change Assistance Project (PICCAP): Climate Change Enabling Activity, Fiji Establishment of a Climate Change Unit within the Department of Environment Promotion of Renewable Energy, Fiji: Butoni Windmill Farm (Sigatoka) Wailoa Basin Hydropower Nadarivatu Renewable Energy EPC Project Rural Electrification Scheme Biofuel Projects in Taveuni and Vanua Balavu, Rainwater Harvesting Pilot	PICCAP completes its timeline in 2005 after completion of Fiji first national communication. Establishment of CC unit in Fiji has been part of the DOE's unit since 1994. It phases out in 2007-2008 due to lack of funds Promotion of renewable resources at Butoni is still operational, but has not reached its required maximum energy output of 9-10MW of electricity. Currently it is supplying less than 5-6MW of electricity and has high operational costs Rural Electrification has been the mandate of Energy Department., this programme is still ongoing. This has been a private sector	• This is one of the least obligations which Fiji has really not taken the lead role in implementing\ or facilitating. • Mitigation options in the energy sector have been largely the core objectives and work of Department of Energy, FEA and LTA. Independent Power Producers (IPP) are also part of this work, such as Tropik Woods, and Fiji Sugar Corporation • The reason for this is the non existence of the CDM unit at the DOE. • There is also the non establishment of the Carbon Trading Unit with DOE and its related NSC. • Mitigations options employed lack a lot of baseline scientific information. Problems associated

	Project: Sustainable Growth Initiative: Fiji Water Project Water Shortages in Bavu, Western Viti Levu Coastal Erosion and Water Problems in Votua, South West Viti Levu River Bank Erosion and Innundation in Buretu, Southeastern Viti Levu	project with Fiji Water Ltd PACE USP has been working on this site, in trying to mitigate water shortages through introduction of water tank containment of rainwater. The two projects are part of IAS initiatives under their climate change projects of vulnerability assessment	with failure of seawalls, coastal reafforestration and definitions of boundaries are still lacking. • Social and traditions adaptation and mitigations measures are least researched and this leads to lost of intellectual property rights as most of the rural communities tend to depend on govt for everything
c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;	National programmes include RE and creation of biodigesters and biofuels projects. These are the initiatives of Energy Department working in partnership with FEA Programmes links to local authorities for solid and liquid waste management e.g Naboro Landfill Waste Management Pacific Islands Renewable Energy Programme (PIREP) Community climate change and energy reduction program, Fiji	**Govt of Fiji Rural Electrification:** Dept of Energy's 2008 Business Plan has over forty activities. Of the 40 activities, 15 are renewable energy activities with a total budget of FJD2 million. These are the co-financing activities in Fiji and include major projects outlined in Box 30 This is part of the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) -GEF-funded five-year	• The Energy Department has been main focal point of facilitation and implementation of RE without any kind of alignment to the Department of Environment. • These programmes have never been an initiative of the Department of environment, except for the waste management strategy and action plan, which is not aligned to the CC unit at the DOE.
(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;	Sovi Basin carbon Sequestration programme – One of the last remaining virgin forest in the interior of Viti-Levu Island The Sovi Basin, located on the Fijian island of Viti Levu, covers over 50,000 acres and is the largest remaining lowland rainforest in Fiji Kabara Climate Witness Project Adaptation to Climate Change in the Tourism sector in Fiji Islands	Fiji Water a leading Freshwater Company in Fiji has taken up an initiative partner with Conservation International (CI), a leading conservation organization, for the protection and preservation of the Sovi Basin rainforest in Fiji. The FIJI Water Foundation, launched through a grant from FIJI Water supported by contributions from 700 FIJI Water employees around the world, will provide funding to endow the Sovi Basin Trust Fund (SBTF). CI's Global Conservation Fund will also donate funding towards the SBTF. The SBTF will make annual disbursements that not only offset the cash value of the otherwise available logging payments to local land owners in the Sovi Basin, but also pay for land leases and create jobs.	• This is a very novel conservation initiative, but the problem of land tenure issue will be a big problem. • Leasing arrangement may sound good, but the idea of leasing the entire area would be difficult as the land is owned communally. • Another important issue is the lease agreement, if indeed the area is leased, then there should be a legal binding document to involve resource and landowners to be partnership of a joint venture for the opportunities carried out under the Afforestration projects in the carbon trading • Report and updating of this project has never been carried out. These are being carried out by NGOs and Govt Departments.

(e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;	Piloting Climate Change Adaptation to Protect Human Health (PCCAPHH) Climate Change Adaptation in Rural Communities of Fiji National vulnerability and adaptation assessment study – Phase II Coastal Erosion & Inundation study in Navukailagi, Lomaiviti River Bank Erosion & Flooding in Korotasere, Vanua Levu Water Problems in Druadrua Island, Vanua Levu Fiji Watershed management project for the sugarcane drought-prone areas	Most of these projects are ongoing with lifeline when their funding is exhausted. For Fiji, IAS-USP and PACE-USP has been one of the leading institutions for carrying out adaptation programmes at rural level Vulnerability assessment studies were carried out in island locations such as Kadavu and Yasawa in cooperation with SPREP Immediate and long term adaptation options are some of the major responses being suggested for communities, but the issue of resilience and sustainability impinges on the communal set-up and cultural-social integration and mobility	• Fiji is an oceanic island nation and due to the coarseness of the spatial resolution, there is inadequacy of existing general circulation models (GCM) in forecasting possible climate change scenarios in Fiji since small-scale weather systems are non-existent in the models • The need for additional finance resources to implement the appropriate adaptation options in coastal zones, water resources, agriculture and the health sector • Most of these projects are outside of DOE's monitoring and evaluation • It seems that institutions and organizations have directly accessed funding institution with or without prior consultation of the DOE as a focal point for UNFCCC • Information exchange and integration has been very limited or none at all.
(f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;	Integrated Coastal Zone Management Programme for Fiji Town and Country Act with specific conditions for EIA approvals prior to passing of survey and master plans of project developments Fiji Climate Change Policy (2006) Environmental management Act (EMA- 2005) A national solid waste management strategy and action plan 2008-2010 Landuse Management Policy Ozone Depleting Substances Act 1998 Fisheries Tribunal Land Conservation and Improvement Act OHS regulation The Occupational Health and Safety Service for the national management of hazardous	Existing policies and regulations are indicative of Fiji's responses to the impact of climate change. This policy however lacked a lot of appropriate teeth to begin implementing necessary climate change adaptation and mitigation options for example in the area of coastal engineering for protection of coastal zones. Town and Country planning acts are old and outdated with very little reference to conservation and sustainable development now utilizes provisions of the EMA on EIAs. Fisheries tribunal has specific task on the compensation of depleted marine resources or i-qoliqoli. ODS NSC mandate to coordinate the reporting on annual use, import and storage of controlled substances. The Committee includes representatives from the Government, the Fire Control Sector, the Motor Industry, Tertiary Institutions, the Hotel Industry, the Shipbuilding Industry, and the Builders Industry.	•These are the initiatives of the OHS and Public Health Sector. This work was not included in the national communications as one of Fiji's obligation under the UNFCCC. •The need for implementing appropriate integrated approach in resource management and governance (especially issues dealing with complex land tenureship) • Most of these policies are drafted independently without any type of any coordinated management approach for example the OHS and the ODS, they are speaking of the same thing with duplication of the impact assessment section.

	substances/chemicals, an impact assessment for spillage is available GREEN PRODUCTIVITY is one of the measures of productivity under the Employment Relations Promulgation 2007 and subsidiary Legislation 2007	OHS and Employment Relations Promulgation with the labor ministry sets the underlying principle of ODS act	
(g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;	Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in the Pacific Countries (AIACC) -Navua town & Natadola area Water quality assessments Water Wastage Study USP -NASA/NOAA Ozone Project Pacific Island Climate Data Rescue (PI CDR) Project Pacific Hydrological Cycle Observing System Project (Pacific HYCOS) Integrated Methods and The impact of tropical cyclones on river flows, morphology and sedimentation in Fiji – Geography Department USP	The ongoing scientific studies have been the domain of regional and international academic and technical institutions such as USP, SPC, IOI, NOAA SOPAC and Pacific HYCOS etc. Most of these institutions have utilized raw data from governmental institutions such as the Mineral Resources Department and Fiji Meteorology Department to further carry out in depth assessment of Fiji's climate Utilization of this information to related governmental departments for national purposes has been very little.	• Lack of historical quantitative and quantitative scientific data, provides restrictions for appropriate assessment and analysis, thus is a need for additional funding to conduct in depth vulnerability analysis "in most areas, in particular coastal zones, water resources, agriculture and the health sector" is imperative. • It seems that knowledge has been the property of overseas consultants and institutions, with very little knowledge transfer. For example in the area of technical and scientific project implementation such as, Climate Scenarios, VA and Mitigation Options. • At times these institutions have used these data for their own objectives and instead have commercial it by engagement consultancy works out of this information.
(h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;	Fiji's Seasonal Rainfall Prediction Model Climate Change Variability - Community Relocation Project Investigating rates of floodplain sediment accretion in tropical Pacific island river basins The South Pacific Sea Level and Climate Monitoring Project (SPSLCMP) South Pacific Sea Level & Climate Monitoring Project (SEAFRAME)	Fiji is blessed with three oceanic observation tidal monitoring stations since the early 1930s. These are still ongoing. These programmes have been to the advantage of regional crop agencies such as SOPAC, SPREP, SPC and USP. The DOE has never fully utilized these important programmes except in its write-up of its initial communications to the UNFCCC.	• There is no alignment of related stakeholders in academic and technical institutions to provide human and financial resources to gather, store, and analyse existing data (e.g. Capacity building of Fiji Meteorology Department). • These programmes are well outside of the DOE's capacity to assess and utilize due to lack of technical personnel and funding • Exchange of information between technical and academic institutions has been lacking.
(i) Promote and cooperate in education, training and public awareness related to	Pacific Island Climate Update (ICU) Bulletin WWF Public Outreach on CC.	This NZAID, funded bulletin provides the present climate in tropical South Pacific Islands and its impact on the people	• Most of the Public Awareness programmes have been the domain of NGOs. • DOE's effort is limited on its limited

climate change and encourage the widest participation in this process, including that of non-governmental organizations.	DOE's Environment Week FSPI's Stories from the Mat (Vol 1, Issue 1, 30 June 2008) SPREP's Climate Change Film Festival & Climate Change Portal SOPAC-Vulnerability Index & SOPAC Media and Virtual Library. SPC's Land Resources Divisional Newsletter Local newspaper such as the Fiji-Sun, Fiji Times, Shanti-dut, and Nailalakai also plays major role in reporting CC events in the region and around the globe.	As part of our ongoing efforts to raise awareness on climate change, WWF has staged a number of public outreach events, ranging from school visits (in Cook Islands and Fiji), community presentations, to public events. Annual environmental weeks has been the mainstay of DOE's awareness programmes on CC DOE also produces CC bulletin with the local Fiji Times newspaper in 1994-1998, but this was discontinued due to lack of funds Regional Institutions such as SPREP, SOPAC and SPC are also major players in the region in regard to CC public awareness	national budget. • Supplements of other project initiatives to carry out its public awareness functions do exists but limited, for example funds derived from EIA consultant's registration fees, NCSA funds, Ozone funds, &CIDA projects etc.
(j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12	▪ . National Communication entails the following reports: ▪ A national inventory of anthropogenic emissions National Greenhouse Gas Inventories; ▪ Vulnerability and adaptation issues; and ▪ National policy and actions	Assumptions are used for most of the inventory data on moisture content in Fiji Utilization of the national inventory report was not prioritized for the CDM projects under the Kyoto Protocol. Most of the VA projects are snapshots of the real situation in Fiji. National policy lacked CC implementation and facilitation in particular issues in regard to the post Kyoto protocol for CDM.	• Most of what is written in this report reflected the work of stakeholders in particular the NGOs. • Opinions and suggestions outline in the report are necessarily not the DOE's viewpoint, but that of related stakeholders in particular SPREP • The reports lacks essence of reporting pertaining to the obligation of Fiji under the convention • In general the report summarizes reports that are carried out independently of DOE's assessment and review.

3.4.3 Summary assessment of national activities

In summary existing environmental legislation such as the Fiji Environmental Management Act has managed to include specific acts and legislations critical in fulfilling Fiji's obligation outline in Article 42 (f) in the area of impact assessment, but overall lacks appropriate tools to mandate compulsory facilitation and implementation of Article 42 (a) –(j)

There is very little utilization of academic, research or regional environmental institutions to provide substantive support in the process; (lack of coordination, lack of manpower due to lack of finance for continual project implementation at the focal point) – Article 42 (g), (h) & (i)

Lack of policy coordination and institutional support to satisfy regular reporting requirements implicit in the National Communication process (this is relevant in the drafting of the Fiji Climate Change Policy) – Article 42 (j)

Lack of expertise/knowledge in implementing test methodologies and establishing baseline conditions at the national level with focal point of implementation (e.g., Department of Environment DOE). – Article 42 (g) & (h)

Lack of country-specific data and inadequate/inappropriate statistics for simulation models despite existence of technical support governmental, academic institutions and regional crop agencies; – Article 42 (g) & (h)

Lack of public awareness of climate change issues and inadequate sensitization to anthropogenic factors that exacerbate vulnerability with critical stakeholders such as agriculture, tourism, health, forestry and fishery in government and private sectors – Article 42 (i)

Inadequate private sector support, demonstrated lack of commitment to climate change issues in the area of renewable energy sources, and Landuse management for carbon trade market – Article 42 (c)

3.5 ASSESSMENT OF REGIONAL INITIATIVES AND PROJECTS

Regional initiatives are mostly carried out by crop agencies such as SOPAC, USP, SPREP, SPC and FORUM SECRETARIAT. Most of their works are contained in the boxes in the Appendix 8-1a. The following institutions have been directly and indirectly involved with establishing Fiji's climate change responses to satisfy their national obligation in the area of information sharing although capacity building needs to be given more focus. Most of these come in the form of invitations for workshops, conferences, seminars and training which are temporary and comprehensive. In areas where Fiji lacks technical expertise, such as climate research, vulnerability assessment of coastal areas such as coastal processes, coastal profiling and oceanic processes, these institutions plays a major role.

- **SOPAC (see box 37)**

SOPAC provided funding for projects ranging from Community Risk Community Lifelines such as Reducing Vulnerability of Pacific States since 2001, to renewable energies, disaster awareness and preparedness, landuse management, studies of natural mineral resources and wastewater management. SOPAC from time to time liases with DOE in regard to facilitating Fiji's obligation under the convention.

In the area of exploration, most of the fund is geared toward exploration of seabed mineral deposits, oil deposits and natural gas deposits. However, data extracted from these remain confidential and are disclosed only to donor institutions and countries that fund these researches. For example, the information on oil deposits in Fiji was funded by the Australian government since 1900s; most of these data are not available for small island countries but the property of the federal government of Australia. Data are also extracted by SOPAC for assessment from the Mineral Resources Department but there is a need for greater exchange and sharing of information and data with DOE, and in particular with regard to the convention's obligations.

Overall SOPAC have a major role to play in reducing the constraints and gaps of technical human resources and capacity building. For example SOPAC has carried out important work on projects for Tuvalu and Kiribati on coastal profiling to assess the impact of sea level rise on these vulnerable low lying

atolls. It has also greatly assisted member countries in the area of geology, geophysics and mineralogy. In the areas of coastal vulnerability, climate simulation, remote sensing, GIS and mineral exploration (both land and sea) excellent technical work has been carried out but in general there is a requirement for greater dissemination of information to the DOE.

- **USP/PACE (see box 27)**

Pacific Center for Environment and Sustainable Development (PACE) is under the Faculty of Science, Technology and Environment, the University of the South Pacific was established in 2001 foccussing on three areas;

i) training and education,
ii) research consultancy and;
iii) publication, outreach and networking.

In 1997 and 1999 PACE was responsible for the study of Greenhouse gases and aerosols in the Pacific. It also has carried out studies to measure concentrations of methane, carbon monoxide and non-methane hydrocarbons, as well as aerosol properties in the atmosphere. This is a joint study with NASA. The study includes measurements of the complete chemistry of the atmosphere over Fiji (National Communications, 2005).

Reports of the above studies have been published at the IPCC TWENTY-NINTH SESSION Agenda item: 3 in Geneva, on 31st August – 4th September 2008. The summary was the task group's (TGICA) activities as reported from the Expert Meeting on "Integrating Analysis of Regional Climate Change and Response Options" held in Nadi, Fiji, 20-22 June 2007. PACE contributed to the report write-up of Fiji's first national communication in 2005, however there is a need for more exchange of information between PACE and DOE.

- **Stratospheric ozone monitoring (see BOX 33 and BOX 27)**

Measurements of ozone are conducted at the Laucala Bay campus of USP for academic purposes. This is a joint project between NASA and the USP Division of Chemistry and PACE. The activity includes the monitoring and archiving measurements of stratospheric and tropospheric ozone, including vertical profiles and other trace species, aerosols and UV-B monitoring (National Communications, 2005).

The future of this study is the continuation of the monitoring of vertical ozone profiles under the SHADOZ programme. Future studies on the STE processes more accurately by coupling a frost-point hygrometer with the ozonesonde launches, needs monitoring vertical water vapor profile regularly. It also anticipates the start of a continuous UV-B monitoring programme and study the changes in the influx of surface UV-B radiation as a result of stratospheric ozone variations. The plan is to acquire a good narrow band UV-B pyranometer for the Department of Chemistry and also have a regular standardization and validation programme.

For effective study of surface influx of UV-B, the atmospheric aerosol loading and cloud cover also needs to be determined. Hence plans to introduce a light detection and ranging (lidar) instrument and develop cloud characterization capacity at the university in conjunction with the Fiji Meteorological services is envisaged. Accurate measurements of surface UV-B levels will also pave the way for the currently incomplete

biological studies such as UV-B induced damage to plants, marine organisms, cases of skin cancer and cataracts. The introduction of a Dobson or a Brewer spectrophotometer to enhance the capacity of ozone monitoring and research at USP is one of the major aims of this programme.

Completion of the above activities will largely depend on funding from donor organizations. The data are currently restricted to the USP Division of Chemistry but other relevant stakeholders in Fiji would benefit if this was also made available to them.

- **Sea-Level Monitoring (see BOX 4)**

The National Tidal Facility (NTF) of the Flinders University of South Australia, with assistance from the Fiji Meteorological Service and Marine Department, is responsible for sea-level monitoring; using the equipment based at the Suva and Lautoka wharves. This monitoring of sea level is funded and managed by the South Pacific Sea Level and Climate Monitoring Project developed as a response to concerns raised by members of the South Pacific Forum countries about the potential effects of the Greenhouse Effect on climate and sea level in the region (National Communications, 2005). Fiji has 3 tidal gauges, producing very good tidal data periodically on a more comprehensive level. About 50% of the data has been assessed and utilized for critical forecasting and simulation purposes. The remainder of the data has the potential for further important assessment.

- .**Hydrology**

The Public Works Department (PWD) Hydrology Section operates 56 Water Level Recording Stations and well over 100 rain gauges throughout Fiji. These are in addition to and complementary to the Fiji Meteorological Service rainfall stations. USP conducts rain and surface-water chemistry analyses on a periodic basis mainly for teaching and learning, and conducts collaborative research with the PWD in areas such as floods, droughts and natural disasters (National Communications, 2005). Most of the data are used for simple simulation and forecasting scenarios although there is a large potential for more in-depth analysis and utilization at the national and regional level.

- **Oceans (see boxes 32 and 33)**

At present sea surface temperatures are not monitored in Fiji, but satellite data from National Oceanic and Atmospheric Administration (NOAA) and (ORSTOM) are available on the World Wide Web. Periodic in-situ measurements of sea surface temperature and water chemistry are conducted by USP for academic research. A brief oceanographic survey was conducted in the 1990s for marine disposal of mining waste in the Beqa Passage, south of Viti Levu (National Communications, 2005). SOPAC has technical assistance in monitoring specific sites such as Tuvalu and Kiribati for sea surface temperatures relating to sea level changes.

Regional activities have played a major role in capacity building of its member countries; these are in the area of:

- Information dissemination has been a critical factor of implementation. For example, Fiji Meteorology Services has been providing WMT and SPREP raw data to serve the interest of other countries in the Pacific. However, the exchange of information from crop agencies to their respective members in the Pacific has been one of the major hurdles in recent years.. In order to

build capacity in Fiji there is a need for greater exchange of this information between FMS and DOE.

- Technical knowledge in order to disseminate information between technical institutions and focal points. At DOE, however, a lack of technical human resource has reduced its capacity to achieve this. The project officers require more technical training in order to take up posts (Climate change projects) in order to then be able to explain things in laypersons terms.
- UNFCCC negotiations and decision makings at global level. However, there is a lack of dissemination of these decisions down through the information chains of regional and local national level. In particular the pace of COP meetings that deliberate many of the obligations signed under the Rio convention in 1992 has been a major obstacle for Fiji to cope with, in particular the DOE.
- In light of the above, the DOE has been relying a lot on the work of related stakeholders. Whilst this work is of high quality and importance, due to the reasons mentioned above, there is a need for more capacity building in the DOE. Regional and international workshops, conferences, and trainings relating to CC issues attended by related stakeholders including DOE were perhaps not fully utilised and taken forward. Feedback should have been included in the DOE's corporate plans, so as to provide information and data upgrading for its staff and human capacity building.
- Human resource capacity building through workshops, seminars, conferences, training programmes and symposiums. For example: SPREP has provided a considerable amount of training over the years in areas such as Environmental Impact Assessment (EIA). However, studies (*SPREP Environmental Training Needs,2000*) have identified areas that need strengthening:

❖ ***Lack of feedback on effectiveness of training***

It was noted the same training requests were being received year after year from the same countries. This raised questions of the effectiveness of the training provided, and whether those trained had implemented or transferred to others anything that they had learned – the challenge of any training activity.

❖ ***Lack of follow-up action after training***

One of the reasons for the lack of feedback on the impact of training is the lack of follow-up after training. Some participants have not been able to implement the knowledge/skills they acquired due to lack of equipment and further support assured to them by SPREP e.g. The cost of a one-week regional workshop for over 20 participants in Nadi, Fiji was approximately US50,000. Of that amount, about 80-90% went to paying travel, perdiems and accommodations, with around 10% going to the consultants/resource persons, for the design and delivery of the programme - this is a substantial investment. Greater implementation of knowledge needs to occur when the participants return to their home countries with funding in place to support this.

❖ ***Inappropriate participants attending training***

Another concern is participants who do not fulfill the selection requirements of training provided by SPREP, usually discovered too late during the training. The selection criteria is set by SPREP Programme Staff, but the selection process, in most cases, is left in the hands of Members, and does not always ensure the attendance of suitable candidates. This is not unusual in training in general, but

because of the considerable resources spent on training (regional and national); it is an issue that both SPREP and Members need to address together.

- ***In addition to the selection process in-country, there is also the selection process within SPREP which varies across Programmes***.

  E.g. the Environmental Education Officer leaves it to National Focal Points to screen and select candidates, with SPREP's concurrence. Others, such as the South Pacific Biodiversity Conservation Programme (SPBCP) stipulate that National Focal Points forward all nominations received, to SPREP, for it to make the final selection. A few projects such as SPSLCMP have developed close relationships with relevant organisations in-country and are sometimes able to confirm suitability of the candidates through direct contact with their organizational heads. Despite these measures though, there are still many instances where participants attending training are involved in jobs that have nothing or very little to do with the training provided.

Overall, regional programmes are conducting important work with excellent technical expertise in key areas. However, by nature, these programs tend to be scattered geographically and control of information is variable. There are gaps in technical areas that DOE could take advantage of but unfortunately do not have the human and technical resources to actively participate in performing their national obligation under the convention.

3.5.1 NATIONAL AND REGIONAL ACTIVITIES RELEVANT TO THE CDM

Annex 1 Countries have carried out actions within (domestic) to reduce emission, but if they cannot meet their designated Emission Reduction Allocation, the Kyoto Protocol provides a way out for them- which are stipulated as Kyoto Flexible Mechanisms (e.g. Clean Development Mechanism).

Very little work has been carried out to facilitate this very important element of the Kyoto protocol except that most of the initiatives are being undertaken by the private sector**.**

i) Regional Level:

The Pacific Islands Energy Policy and Plan (PIEPP) drafted in October 2002 are to be used as a guide for gender mainstreaming at the national level. This came out from agreement under the Pacific Islands Forum Secretariat draft discussion paper on 'Gender Mainstreaming the Pacific Islands Energy Policy and Plan (Aug 2003) be referred for consideration by the Pacific Energy and Gender Network (PEG) to facilitate gender mainstreaming of the PIEPP. The progress of this work is still ongoing with little exchange of information with the DOE, Fiji, it is interesting however that the Department of Energy has been part of this initial developments, but realigning this under Fiji's obligation under the convention has been lacking.

Another programme came under the PIGGAREP (Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project). This programme basically outlines the DOE's 2008 Business Plan has over forty activities. Of the 40 activities, 15 are renewable energy activities with a total budget of FJD2 million. These are the co-financing activities in Fiji and include most of the project mentioned in box 31 under SPREP. It has to be noted here that ITALY (under EU banner) has pulled back on most of these funding due to the current political crisis in Fiji. The Government of China has stepped in to finance some of these include the Nadarivatu Hydro Scheme by FEA whilst Somosomo Hydro Project is dropped from this

funding. In this study, it was seen that Pacific Island Countries (PICs) contribution to greenhouse gas concentrations in the atmosphere are minute, measured at less than 1% of projected global CO2 emissions to 2020 (*PIGGAREP 2005)* This is also another classical example of how the Department of Energy has been fully engaged whilst aligning this to the DOE's commitment under the convention has also been lacking.

SPC in 2008 has facilitated with regional countries the establishment of the Regional Land Resource Working group. This working group is mandated to coordinate and cooperate regional organisations at national level to approach CC from various sides including food security (adaptive agriculture), genetic resources (e.g. development of drought resistant local crop varieties, propagation through tissue culture of resistant native varieties etc.), biosecurity (incurrence of invasive plants and pests, quarantine etc.), awareness and training on CDM mechanisms and SLM etc. The aim is to find appropriate adaptation options to the impact of climate change in the Pacific.

- **Papua New Guinea**

The total forest cover among the larger Pacific Island nations totals around 42.5 million hectares (106.25 million acres) 39.3 million ha, (98.25 million acres) or 92 per cent are located in Papua New Guinea (SPREP, 2005). This project is unfortunately is not well positioned under CDM as most of the preference has been toward renewable energy.

ii) National Level

- **Fiji Vaturu and Wainikasou small-scale hydro project**

The Vaturu and Wainikasou projects are small-scale run-of-river hydro projects in Fiji implemented by Sustainable Energy Limited (SEL), a joint venture between the Fijian Electricity Authority (FEA) and a hydro project developer, Pacific Hydro Limited (PHL). Total installed capacity of the Vaturu and Wainikasou projects are 3MW and 6.5MW, respectively. There are two separate (not connected) grids servicing the two main islands in Fiji, Viti Levu and Vanua Levu. Both projects are grid-connected and located in the largest of the main islands, Viti Levu. The Vaturu project is located in Sabeto city in Nandi Province. The Wainikasou project is located at the Central highlands of Viti Levu in an area called Waimala-Naitasiri. The Wainikasou project commenced operations in May 2004, and the Vaturu project commences construction in June 2004 and will start operation in January 2005. The CDM component has been an integral part of the financial package from the early stages of both projects. Annual emission reductions for the entire project (i.e., Vaturu + Wainikasou) are expected to be 24,928 tCO2e and are achieved by displacing diesel generation from the national grid. The project was registered in October 2005 with CERs being sold under a 7-year forward sale agreement. Annual emission reductions from this project are estimated at 25,000 tCO2-e pa, with a total of 523,588 tCO2-e over the 21 year crediting period (*EcoSecurities* 2005). At the current carbon market price of USD30 for a tCO2-e, it is fetching an estimated price of USD750k with the current carbon unit cost for CERs. This has been what Fiji has been missing.

For Fiji, project activities identified with the greatest potential were in the renewable energy, waste, energy efficiency and forestry sectors (Johnston 2004, Porter 2007, and SOPAC 2007). Private sector sources took a more conservative view, considering projects confined to the sectors of waste and forestry as the only feasible opportunities available for Fiji. Given the evolving nature of energy demand in Fiji; whereby a large tourism development or new gold mine could have a large and rapid impact (Johnston 2004), CDM

opportunities under all potential sectors will be discussed. The renewable energy sector will not be examined, having served as the basis for the current projects discussion"
(*PEB Submission, 2008*).

Overall the Pacific needs assistance in most areas such as regional and institutional development, information exchange training, targeted research development and demonstration, public awareness creation at all levels and capacities for certification, monitoring and verification of CDM projects

- **National Steering committee for CDM**

Fiji is the only country beside PNG who can trade in the carbon market under CDM. This is specifically in the compulsory market. Since 2002, there was no establishment of a national steering committee to look into the opportunities offered under the carbon trading for CDM. It was under the stocktaking exercise that Fiji finally realised that they have been missing out on this opportunity. Specific calculations in the area of renewable energy alone, Fiji is estimated to be losing out on USD30m a year.

Observations into some of the new potentials that Fiji can delve into are as follows:

- REDD,
- Afforestation,
- Reafforestation,
- Biomass,
- Renewable energy

Some of the projects under the CDM for technology and engineering partners to provide carbon based projects in:

- Geothermal projects
- Natural gas projects
- Gas flaring projects
- Hydro and mini-hydro projects
- Transport sector reduced emissions projects.
- Sewerage treatment – methane capture

The projects that can be pursued under the proposed Carbon Trade Unit (CTU) if the government expedite its data collection will be as follows:

- REDD -Reduction of Emission in Deforestation and Degradation - E.G. Bundling of all native and public forests potentials Removable Units (RMUs) and trade them under the carbon market PES – Payment of Ecosystem Services - E.G. Valuation of Ecosystem services
- Biomass - e.g. conversion of fallow land into fuel wood
- Bio-fuel - e.g. production of Ethanol from Cassava and Molasses
- Bio-diesel- e.g. Production of coco diesel from coconut oil and jatropha
- Reforestation - e.g. replanting of logged areas
- Afforest ration - e.g. planting of forest on degraded land
- Geothermal - e.g. generation of electricity from geothermal hot springs

3.6 NEW PROJECTS UNDER UNFCCC AND KYOTO PROTOCOL (CDM)

Under UNFCCC, most of the new projects are those that precede the Kyoto Protocol initiatives. These have been rarely accomplished by the DOE. Most of the new projects are outlined in Boxes 3-40.

Under the Kyoto Protocol there are provisions for three innovative mechanisms which allow developed countries to meet their commitments as cost-effectively as possible by "buying" or generating emission reduction credits in other countries. However Annex 1 Parties are still required to take domestic actions to reduce emissions. The three mechanisms are:

- Joint implementation (under Article 6) provides for Annex I Parties to implement projects that reduce emissions, or remove carbon from the air, in other Annex I Parties, in return for emission reduction units (ERUs). This is not applicable to non-annex 1 countries which Fiji is a party to.
- The Clean Development Mechanism (CDM) defined in Article 12 provides for Annex I Parties to implement projects that reduce emissions in non-Annex I Parties, in return for certified emission reductions (CERs), and assist the host Parties in achieving sustainable development and contributing to the ultimate objective of the Convention. This is the only applicable legally binding document which Fiji can enter into after signing of the Marrakech Accord in 2002.
- Emissions trading, as set out in Article 17, provides for Annex I Parties to acquire units from other Annex I Parties. These units may be in the form of assigned amount units (AAUs), removal units (RMUs), ERUs and CERs

The CDM is the only mechanism which involves non Annex 1 Parties and takes place between an Annex 1 Party and a non Annex 1 Party. The CDM is expected to facilitate implementation of sustainable development projects in developing countries, and transfer of environmentally friendly technology from the developed countries to developing countries.

Obligations under the Protocol and as elaborated in the *Marrakech Accords* include the designation of national authorities by Parties seeking to be involved in CDM projects. The Department of Environment operates as Fiji's national authority for the CDM. The Designated National Authority (DNA) is the Director for Environment. The role of the DNA is the endorsement of completed projects for the Executive Board of the Clean Development Mechanism (CDM) to consider for approval for funding by available donors or interested parties.

Marrakech Accord has enabled Fiji to take advantage of the carbon trading opportunities under the CDM. Fiji was one of the first island countries in the Pacific to sign and ratify the Kyoto Protocol in September 1998 and there are only two designated national authorities (DNA) in the Pacific to trade carbon credits under the CDM, the two countries are Fiji (Department of Environment as DNA) and Papua New Guinea (PNG). Under the NCSA programme, the Fiji interim government was disclosed about the potential of trading under the CDM compulsory market.

In 2007, Cabinet approved the establishment of a Carbon Trading Technical Team. The team consisted of officials from the Department of Indigenous Affairs, Energy, Forestry, Fisheries, Meteorological Office, Environment, and the private sector (FEA). The current focus of the Technical Team is the identification and formulation of potential projects relevant for the trading of any carbon saved.

In July 2008, a Cabinet paper was approved by cabinet to develop a carbon trading unit (CTU) at the DOE. This set into motion the fundamental mechanism to take Fiji into the compulsory market. The voluntary market was initially perceived as being rigid and static, however overnight this has become a lucrative trading marketing specifically with projects on Avoided Deforestation Reforestation/Afforestation and Biomass conversion.

Overall Fiji has full potential to facilitate and implement its obligation under the convention; this can only be realized if it develops necessary institutional, policy, financial and human resources capacities at the secretariat (DOE). One of the major potential catalysts for the above to be realized is taking advantage of the carbon trading opportunities at the compulsory and voluntary markets.
Current CDM Projects

- Reforestation of degraded forested land for carbon sequestration (Pacific Reforestation Company).
- Low income community mangrove reforestation (Taishi Design Company- Japan)
- 40 MW Mini-Hydro Plant in Nadarivatu (Fiji Electricity Authority).
- Co-generation with baggasse (Fiji Sugar Corporation).

The DNA is currently awaiting the Project Idea Note to be submitted by the project proponents for further processing. With the Nadarivatu Hydro Project FEA is expected to save $25 million per year on diesel costs and is expected to displace 22,000 tonnes of diesel thereby contributing to reduction in GHG emissions.

3.6.1 EXPEDITED FINANCING FOR CAPACITY BUILDING IN PRIORITY AREAS

Fiji has ratified the Kyoto Protocol and signed the Marrakech Accord in 2002. Opportunities that can be realized is to immediately begin pursuing financial arrangement from Annex 1 countries who have the following credits under CDM to buy from Non-Annex 1 countries:

- Japan shortfall is 1 Billion credits
- U.K Current Requirement has109 million credits and increase to 500 million credits in 2008.
- N.Z shortfall of 127 million credits.

(*PEB Submission, 2008*).

It has been estimated that international carbon trading and carbon finance has the potential to generate up to 100 billion dollars in annual green investment flows. To achieve this scale of investment and reap the benefits, it will require certainty about the nature of the international climate change regime going forward. The global community now needs to look beyond the arrangement under the Kyoto Protocol (i.e. beyond 2012) and send a long-term price signal that gives confidence to both governments and project developers.

(*ADB, 2007*)

Major international investment bankers have vested interest in this area, expedite funding for capacity building in priority areas should be aimed at Carbon trading under CDM and voluntary market. These are:

- JPMorgan through its investment bank, and ClimateCare, a pioneer in carbon emission reductions, announced in March, 2006 that they will join forces in an acquisition to invest in quality, large-scale carbon emission reduction projects and to advance the development of a liquid financial market that trades in carbon emission reduction credits (*JPMorgan Chase & Co. Media: 2008*)
- Macquarie investment bankers, trading and buying CDM CERs in PNG
- Asian Development Bank has specific funding for creation of Fiji's set up of a CDM unit.

Fiji has got a DNA, the government has in place policies for this trading to begin, what it needs to take into consideration is to get into the carbon trading opportunities before 2012. The lost opportunity for Fiji began in 2002 to 2007, the period 2008 to 2012, is another period for Fiji to enter into this lucrative market. Fiji is in a strategic position because it has no transport logistics direct to market. e.g., compete on same terms as all other nations. It has a vast natural resource wealth such as forest, land, renewable, sustainable and low emission energy sources and finally biodiversity it has a high endemism.

3.7 STATUS OF IMPLEMENTATION OF THE KYOTO PROTOCOL

The Kyoto Protocol commitments are for Annex I Parties. However, all Parties participate in the negotiations. Article 12 of the Protocol outlines the obligations of Non-Annex I (developing country) Parties in the Clean Development Mechanism and outlines some of the main issues of concern for Fiji that are being negotiated.

TABLE 3.7: KEY ISSUES UNDER THE KYOTO PROTOCOL

ACTIVITIES	PROPOSED LEAD AGENCY
Land-use, land-use change and forestry (LULUCF)	LANDUSE AGRICULTURE
Compliance to the Protocol	Department of Energy and Department of Environment.
Matters relating to Article 3.14 of the Kyoto Protocol: minimization of adverse social, environmental and economic impacts on developing country Parties in the implementation of Annex I commitments and matters relating to 2.3 "minimization of impacts of policies and measures of Annex I Parties"	Department of Environment
Guidelines under Articles 5, 7 and 8: Methodological issues, reporting and review	Department of Environment
"Good practices" in policies and measures among non Annex I Parties	Department of Environment
Impact of single projects on emissions in the commitment period	Department of Energy
Arrangements for the first session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol	Ministry of Foreign Affairs

3.8 SUMMARY

Table 3.8 below shows the status of implementation of obligation under UNFCCC for Fiji.

TABLE 3.8. STATUS OF IMPLEMENTATION OF OBLIGATIONS UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE IN FIJI

ACTIVITIES	STATUS
National climate change mitigation programmes	Very little work has been carried out in this area due to the lack of technical expertise and policy guidelines. For example coastal protection systems against impacts of the sea level rise (SLR) in the area of hard options for coastal engineering. Lack of scientific quantitative and qualitative historical data.
National climate change adaptation programmes	Most of the implementation has been carried out in this area. Adaptation work has been part of the stakeholders programmes most of the time because it is convenient and easy to implement
Taking climate change considerations into account in other relevant social, economic and environmental policies	This has been mainly the work of NGOS which has become the facilitators and implementers of the UNFCCC where DOE capacity in human and financial resource has been lacking.
Guidance to the financial mechanism of the Convention (GEF)	This has never been fully exhausted due to ad hoc basis of implementation by DOE
Promotion of the development, application and transfer of climate-friendly technologies and practices	This has never been implemented at national level due to the non existence of a national steering committee for CDM under the Carbon trading mechanism; implementation has been on an "ad hoc" basis. Related stakeholder such as Department of energy and FEA has carried out their work independently for RE initiatives, fossil fuel switch and bio-digesters, including ethanol production in the agriculture sector.
Preparations to adapt to climate change	At policy level this is very much lacking but ongoing projects under CC programs with related stakeholders preparation has been very much part of their corporate plans, but implementation to these lacks substance
Participation in climate research	This is a very strong area with local regional and international institution taking lead roles in climate research. The problem with this is the under utilization of local knowledge and data by Pacific Island Countries to fully assess the impacts of climate change. The utilization of these data has been a contentious issue. These needs to be monitored,
Participation in systematic observation	This is a very strong area with local regional and international institution taking lead roles in climate research in particular academic institutions
Participation in information exchange	This is a very weak link in most of the stakeholders, the weak links are with government departments
Education, training and public awareness, public participation and public access to information and international cooperation.	This is a very strong area with related stakeholders in particular with the NGOs and regional organization who have greater access to funding
Compilation of an inventory of their greenhouse gas emissions	This has been completed but needs verification with data quality due to lack of historically quantitative and qualitative scientific data
Submission of First National Communication	This was done in 2005
Capacity building Initiatives	These are on ad hoc basis and are almost non existent
Implementation of Article 4.8 and 4.9 of the Convention (decision 3/CP.3 Articles 2.3 and 3.14 of the Kyoto Protocol): Adverse effects of climate change and impact of the implementation of response measures	This has never been fully coordinated with related stakeholders in the area of ME. Most of the implementation lacks baseline data to adequately propose appropriate adaption and mitigation options
Activities implemented jointly under the pilot phase (AIJ)	AIJ has been one area that is lacking with the DOE, most of what has been ongoing are private sector involving in this project, for example the Fiji Water Program with Conservation International in regard to the Sovi Basin Conservation scheme.

Emissions resulting from fuel used for international transportation: Shipping and aviation "bunker fuels"	This has never been assessed after the completion of the initial GHG report in 1998.
Co-operation with relevant international organizations	Cooperation has been on ad hoc basis, based on proposal completion for funding and human capacity building.
Proposal to amend the lists in Annex I and II of the Convention	Proposals are left to the discretion of SPREP who is a crop agency of the UNFCCC at a regional level. Most of these technical matters are left to SPREP, since there is a lack of Fiji's technical knowledge to deal with these.
Second review of adequacy of Article 4.2 (a) and (b) of the Convention	Same as above
Scientific and methodological assessment of contributions to climate change: the Brazilian proposal	Same as above
Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system: issues relating to hydro fluorocarbons and per fluorocarbons	The DOE capacity to respond technically to this is lacking. On the policy level, the DOE has prepared a legislation on this which is a near duplicate of the OHS act on impact assessment by the Ministry of Labour.
Methods and tools to assess climate change impacts and adaptation options	Methods appropriate for Fiji such as ICM has been devised with the support of technical and academic institutions.

3.8.1 Capacity Limitations for UNFCCC implementation in Fiji

The UN Framework Convention on Climate Change recognizes the uniqueness of the climate change challenges faced by small islands developing states, such as the Fiji Islands. While Fiji is fully aware of the climatic challenges faced by their islands, these challenges do not seem to adjust in the development policy adopted by the country and strategic priorities have been left unattended. Although Fiji created a national sustainable development strategy following the guidance of the World Summit on Sustainable Development, the implementation of the strategy has lacked uniformity. In a country where resources are limited, the need to consider environment in decision-making has been left as an isolated task for Department of Environment only in relation to the management of resources of interest for tourism. Land use planning and forestry has been left outside of the sustainable development framework.

Adaptation to climate change and vulnerability reduction does not escape this trend. The Ministry of Planning has not mainstreamed environment planning in villages or cities, and industrial development –also highly susceptible to climate variation— places no value on environment at the time of making decisions. There are many reasons for this weakness, particularly a diminished role of the Department of Environment over the years; more responsibilities, such international conventions to report to and environmental impacts assessment to monitor, and less human resources to complete their work. Other limitations include:

Systemic

- Political Will
- Policy formation capacity
- Review & amendment of existing legislations
- Lack of National GHG scientific data on GHG emissions and sea level changes

Institutional

- Lack of staff in Climate Change Unit within DOE
- Lack of technical expertise

- Lack of information sharing and co-ordination among private institutions and government institutions
- Duplication of programmes

Individual

- Lack relative local experts on Climate Change
- Lack of relative courses in tertiary institutions
- Lack awareness on UNFCCC
- Lack of empowerment of local community
- Lack of technical knowledge

4.0 CAPACITY BUILDING ISSUES FOR CLIMATE CHANGE

Most of the assessment of related stakeholders has been carried from Boxes 1-35 above. This section however puts into perspective the capacity issues that have been the main obstacle for facilitation and implementation of UNFCCC (Table 4.0).

TABLE 4.0 MAJOR STAKEHOLDERS THAT ARE ASSESSED UNDER FIJI'S OBLIGATION FOR UNFCCC

GOVT	NGOS	ACADEMIC	STATUTORY	REGIONAL	INTERNATIONAL
FMS & MRD	WWF	PACE-USP	FAB	SPREP	WMO
Dept of water and sewerage / landuse	PCDF	The school of Geography-USP	NLTB	SPC	
DENV/FAB	IAS	School of Pure and applied sciences, Department of Physics USP		SOPAC	
Min foreign affairs	CI	School of marine studies (SMS), USP		Pacific Islands Forum Secretariat	
Min of finance and National Planning	LIVE & LEARN	Faculty of science and technology			
Forestry & fisheries	OISCA	School of biological, chemical and environmental sciences (SBCES)			
forestry & fisheries					
in of finance and National Planning					
Forestry & Fisheries					
Min of health					
Regional Development and DISMAC		*NGOS = 6*			
Labor /PSC		*REGIONAL = 4*			
Public works, Tourism		*ACADEMIC = 6* *STATUARY = 2*			
Social Welfare		*INTERNATIONAL - 1*			
Transport, works and Energy					

The rule of thumb for productivity is measured by 80% administrative and 20% human initiatives (Mohapatara, 2008). The contentious issues that have been observed during stocktaking exercise reveal the following:

- Lack of human resources,
- Lack of technical knowledge and skills
- Lack of historical quantitative and qualitative scientific data
- Lack of public awareness of climate change issues
- Lack of financial resources to gather, store, and analyse existing data
- Lack appropriate integrated approach in resource management
- Lack policy coordination and institutional support to satisfy regular reporting requirements

During stocktaking, one of the major issues that seems to be generated from most of the stakeholders meeting and discussion is the very little information disseminating from the Ministry of Environment in regard to the Fiji's obligations under the convention. Many are doing their own work and there is very little coordination amongst the stakeholders to align themselves together in a system manner to implement these obligations. This in my opinion is the major hurdle in light of other pending issues such as lack of human and financial resources.

Management models to allow proper facilitation and implementation of Fiji's obligation to the convention such as the:

- Integrated resource and management based on a "Bottom-up, top –down approach" and:
- Integrated coastal zone management

Are in theory only with very little implementation.

Another related issue to this, is the lack of institutional realignment of policies, procedures and processes to allow greater participation from the stakeholders and also dissemination of important information for public awareness. This is compounded with the lack of legislative tools as a basis for compliance by the private sector, in particular the transportation, forestry, oil, agriculture, energy and fisheries sectors.

Lack of quantitative and qualitative technical and scientific data to fully assess the impact of climate change in Fiji and the region, in particular sea level changes and its impact on low lying coastal areas of both the atoll and volcanic islands makes policy and decision making difficult for appropriate mitigation and adaptation options. More research into the oral literature of the local residents in regard to their traditional and historical knowledge of their surrounding would be the best option for further scientific exercises. Collation of academic papers that aligns disciplines such as geology, oceanography, geography, geophysics and meteorology etc to explain coastal process and climate variability would be an option for a more comprehensive approach for the explanation of climate change; this is a contemporary issue in the academic area.

Under UNFCCC, very little work has been carried out to take advantage of the Kyoto Protocol CDM projects in the carbon trading market. This is very crucial and important to Fiji, as the year 2008-2012 are the most crucial periods for non annex 1 countries to take advantage of in the economic sector. Recent

studies have shown that the carbon trade market is currently worth globally US$30billions a year, and this trend will likely to continue in the future to the tune of US$100billion by 2012 (Carbon Strategic Global, 2008).

4.1 CAPACITY ASSESSMENT OF THE IMPLEMENTING AGENCY AND PARTNER INSTITUTIONS

4.1.1 DEPARTMENT OF ENVIRONMENT

The Department of Environment has been the focal point to facilitate the obligation of Fiji under the UNFCCC. Throughout the fifteen (15) years (1993 – 2008) that it has been facilitating the commitments of Fiji, the institution has been very weak in its internal structures to commit to this obligation. Most of the project officers had been on a temporary working arrangement for the DOE.

During the initial three years (1993-1997), Fiji was amongst the first to sign and ratify the convention. A national steering climate change committee was set up in 1994 to basically carry out the policy and governance issue of implementation. It was also the first government to carry out the following projects in the Pacific:

- National GHG inventory
- Vulnerability assessment studies
- Integrated Coastal Zone Management
- Activities implemented jointly (AIJ)
- National Climate Change Steering Committee
- Drafted under the proposed "Sustainable Environmental Management Bill", a climate change bill
- Drafting of the First National Communications

Most of the above projects have been completed by the end of initial three year project implementation, except for the Activities Implemented Jointly, Climate Change Bill and the Draft National Communication.

This was a successful project implementation, however the continuation of the initial project success became the extinguisher of the momentum, and this was evident, in 1998, and a new project officer was recruited to carry out the work, basically lack the background information and experience that had been the hallmark of the initial success of the project. In 1998, a new national steering committee was again set up, PICCAP came into existence and most of the work that Fiji should have continued with its own resources was at that moment being handed over to PICCAP. It was here that perhaps the Fiji CC unit became subservient to the whims of PICCAP, and it looks like PICCAP literally took over most of the pending work that was left to be carried out by DOE and therefore Fiji. These are the projects that it facilitates for Fiji and member countries:

- Completion of Fiji's First National communication (Appendix8-5)
- Provide gaps in human resources for project implementation and completion, proposal write-up for sourcing of funding and technical support systems for weather and climatic variability in the Pacific
- National Policy and Actions on Climate Change
- Vulnerability and Adaptation

After 2000, a new project officer was recruited, the tenureship continued only for a period of two (2) years, in which another project officer was recruited. This was the last of the project officers which last from 2002 to 2005. It could be seen here that there is a very high staff turnover and the capacity for the DOE to hold on to its experienced staff and project officers for the CC unit, was limited. From 2006 until today, the CC unit became defunct and it was handed to the chair of the Director of Environment, this is where the whole project projections and continuation was shifted. Project such as AIJ and CDM were very much lacking and the post Kyoto and Marrakech Accord facilitation were actually nonexistent, except for SPREP's initiative on the renewable energy resource plan for the Pacific.

As an institution the DOE lacks capacity in the following area:

- Revision of legislations
- Visionary Management and Leadership
- No centralized information system where information from sections could be accessed
- Lack of monitoring of MOUs of NGOs
- Lack of continuity and retention of experienced staff
- Core expertise was restricted at senior management level with little dissemination and transfer of knowledge and skills to the lower management bracket.

4.1.2 CAPACITY ASSESSMENT OF THE STAFF

- Lack qualified staffs relating to UN conventions
- High turnover of qualified staffs especially those technically qualified
- Less incentives and little motivational factors
- No assured career progression as staff are shifted from one project to another
- No incentives for volunteers though they work on full time basis
- No induction/orientation training given on joining the Department
- Out of 32 staffs only 10 are established staffs, 12 unestablished staffs and balance 11 are volunteers
- Staffs functioning in isolation rather than as a team

4.1.3 CAPACITY ASSESSMENT OF MANAGEMENT STYLES

- Donor dependency for projects reflects disorientation of project management and leadership in creation of livelihood alternatives and integration of these into the economic paradigm. Lack of utilization of user pay systems for enhancement of salary for staff retention shows lack of policies to reform the institution from within, specifically policies that allows consultancy work after working hours with the private sectors.
- Management styles and leadership should integrate with related stakeholders that attractive positions available outside for qualified staffs are to be conducted on consultancy basis, for example they utilize internal flexible systems such as "leave without pay principles".
- Data/information used by NGOs to pursue their own interest should be monitored and controlled through proper MOUS and TORs. Prosecution shall be executed if stakeholders breach these conditions.
- Volunteers leave after experience with DOE for better job prospects outside, reflects very little capacity building in the area of information, skill and knowledge transfer to permanent staff within the focal point.

- Change of Funding pattern by donors due to political environment and economic situations should be handled by a strategic management group existing with the focal point. For examples, funding proposals and vigorous donor research studies should be used as a risk adaptation tool. These are the mainstay of NGOs viability. In fact national steering committees should be enhanced to deal with these, due to the comprehensive advantage

4.1.4 CAPACITY ASSESSMENT OF RELATED STAKEHOLDERS

Most of these are carried out in section 3.3.3 Stakeholders Analysis. An in depth assessment of was however carried out to specific critical stakeholders. Most of the capacity constraints and gaps that are found across these institutions and projects are almost the same or relative but specifically unique to each location and environment. These are as follows:

Systemic

- Out dated laws
- Awareness of UN conventions lacking
- Monitoring by government departments and ministries are lacking existing practices is slow surveillance and monitoring for example, lack of monitoring and control on commercial fishing and poaching of marine resources
- No incentive from Government
- Donor reliant (heavy dependency on donors like JICCA, NZAID and Aus AID etc)
- Forest regulations not strictly followed
- Violation of rules in favour of contractors in some cases for example private logging companies
- ❖ Government want quick results where as development of technology is a very long process (7-8 years)
- Contract staffs are not made permanent even after more than a decade of service
- Urgent requirement of infrastructures for rural communities for example, ice factory to preserve fish so that there is equitable distribution of profit
- Weak penalties for violations
- No watershed management master plan yet developed
- Proposals are adequately financed and amounts reduced at Finance Ministry
- Changes in Government policies
- Political instability
- Lack of enforceability of multi-lateral Agreements
- Forced reduction of staffs at 10 percent for government workers
- Legislations need updating since there's a lot of overlapping legislations
- Mission and vision statements too broad /generic
- Non alignment of convention provisions in national acts

Institutional

- Specialist skills empowerment are avenues for moving to greener pastures, for example studying on scholarships overseas for technical staff
- Demand driven approach rather than more innovation
- Insufficient and inadequate career path for scientists
- Lack of basic infrastructure – electricity, phone, internet, vehicles etc
- Lack of training on best practices followed in their countries
- Working environment not conducive, e.g., lots of noise pollution and a result they tend to talk at a much louder voice
- Lots of expatriate staffs
- Lack of value added training
- Lack of technical manpower
- Duplication of Programmes e.g Greenpeace campaign on Climate Change and 1o Change Campaign by the Fiji Times
- Insufficient time and qualified staffs
- Lack of finance and at times when there's availability of funds, funding priorities might change
- Gap in sharing information with key stakeholders
- Unrealistic job descriptions/profiles
- More coordination required with focal point and other stakeholders
- Team bonding" fragile"
- Lengthy grievance procedures
- Minimum downward communication
- Commercial/economic activities takes precedence over conservation issues
- More coordination required with focal point and other stakeholders Involving community by increasing their participation

Individual

- Lack of adequate knowledge and interest by local communities
- Local communities refuse to plant free though they are the ultimate users
- Difficulty in bringing the concept to the community so that they understand the concept well and whole heartedly participate
- Bringing new concept to communities are always great challenges
- To respect all groups and different communities is a challenge
- Lack of adequate infrastructure at communal level for implementation
- More training facilities required at extension centres for government and resource owners
- Though some awareness of conservation of nature exists, it needs to be increased
- Concept of conservation sometimes conflicts with commercial and subsistence livelihood, for example no fishing in MPA (marine protected areas) are seen as hindrance by other users who have the same *i-qoliqoli* boundaries

- Use of outdated equipments with no relations to OHS in communal settings for example, use of gas cylinders/compressors etc are lacking during beach-de-mer harvesting and deep waters diving, resulting in many deaths.
- Lack of adequate awareness
- Insufficient local capacity

4.1.5 FINDINGS

Major components of facilitation and implementation that affect the capacity of the DOE and related stakeholders are as follows:

- ❖ Is the funding aspect, funding basically allows for constraints and gaps to exist in any institutions such as government non government and/ or private sector.
- ❖ It has been observed that the focal point lack sustained focus on climate change activities due to many reasons; one of these is the lack of the Climate Change Steering Committee to guide and focus the country's programmes.
- ❖ Fiji has not fully articulated its climate change programme at regional and international level and there is not significant budgetary support for climate change programmes by the central government, priority is lacking due to missed opportunities by the focal point in strategic positioning of its stakeholders for information gathering and updating and this resulted in missed opportunities to access funds to assist the country in its programmes.
- ❖ There is significant competition for climate change funding however the funds that the country has received to date suggest that Fiji have not fully exploited these funding mechanisms.

The issues presented for priority attention are the outcomes of several consultations with some of the relevant stakeholders. Constraints at the individual level pertain to inadequate training and insufficient staff. These are also recorded in *section 3.3.3 stakeholder's analysis.*

- ❖ At the institutional level the issues are related more:
  - ➢ with organizational culture in accepting new initiatives,
  - ➢ lack of equipment, inadequate office space in some cases and;
  - ➢ Insufficient provision of funds from the national budget.
- ❖ At the systemic level the constraints are;
  - ➢ there is lack of political will to prioritize this convention and as such:
  - ➢ there is the non-support from the decision makers who in some cases are not adequately informed or themselves constrained by lack of funds.

5.0 REVIEW OF POLICIES LEGAL INSTRUMENTS, AND/OR NON- REGULATORY MECHANISMS

There is no legislation governing the major thematic area of Climate change except Fiji's Climate Change Policy that in generic explains the governing policy for implementation through institutional legislation and framework. Existing environmental legislation such as the Fiji Environmental Management Act is yet to include specific acts and legislations critical to climate change issues in the area of adaption and mitigation except the environmental impact assessment section.

5.1 NATIONAL POLICY AND LEGAL FRAME WORK ADDRESSING UNFCCC

Specific policies are outline in section 3.3.3 in boxes 11, 12, 17 & 18. Section 3.4.2 also specifies policies, acts and legislations for implementation of Fiji's obligation under the convention in particular Table 3.4.2- Fiji's Commitments to Article 42 (a) – (j)

5.2 ASSESSMENT OF EXISTING POLICIES THAT CAN BE REALIGNED TO UNFCCC

TABLE 5.2: RELEVANT LEGISLATIONS IN FIJITHAT SHOULD INCLUDE CLIMATE CHANGE CONCERNS

AGENCIES	RELEVANT POLICIES, ACTS, STRATEGIES & LEGISLATION	ASSESSMENT OF COMPONENT
Dept of Environment	-Fiji's National Environment Strategy -Climate Change Policy -Ozone Depleting Substances Act -Environment Management Act -National Solid Waste Management Strategy and action plan	DOE has been mandated by the Fiji government to carry out fulfilling its obligations under the UNFCCC. Most of the policies and act in place have yet to fully capture the entire governance and processes of CC implementation in Fiji
Fisheries Dept	-Fisheries Tribunal -*Fisheries Act include the following :* Marine act (amendment decree) 1991 Marine insurance act (chapter. 218) Marine spaces act (chapter. 158a) Marine spaces (foreign fishing vessels) regulations Marine spaces (territorial seas) (Rotuma and its dependencies) order Maritime and ports authority of the Fiji islands act	One of the major impact of global warming in Fiji is sea level rise, the Fisheries Act have yet to include issues pertaining to climate change especially in the area of maritime protection of breeding grounds, overfishing, poaching and coral reef degradation. It has relied upon NGOs and Academic institutions along with CROP agencies such as SPC, SPREP and SOPAC to gill in the adaptation policies all these time.
Forestry Department	-Forestry Act -Fiji Forest Sector Review and its incorporation into the National Forestry Action Plan; -Re-inventory of the indigenous forest, installation of the Geographic Information System; -Fiji Logging Code of Practice.	- Most of these acts are outdated and strictly adheres to restrictions and prohibitions. However Fiji has continued to promote sustainable forest management both through domestic policy development and at international fora. Fiji is committed to the effective implementation of the outcome of CBD & UNCCD. - Forestry contribution to DOE's obligation under the CC convention is Afforestration, Reafforestration, REDD & Biomass -CDM AIJ projects include Sovi-Basin Sequestration project with Conservation International (CI) -Renewable energy projects with Department of Energy /Tropik woods and FEA on Biomass replanting.

Agriculture	-Landuse Management Policy -Agricultural Landlords and Tenants Act - Quarantine act (chapter. 112)	It is important to note that the Landuse policy has yet to be passed as legislation since inception in 2002. The issues of CC has been prioritized in this policy whilst little has been done to the ALTA which is a mechanism in place to utilize land development through agricultural practices
Department of Energy	-Fiji's Rural Electrification Policy	Rural electrification projects based on renewable energies such as hydro and solar have been very successful, these are important for the reduction of GHGs in the atmosphere apart from CDM opportunities
Ministry of Labour	-OHS regulation -Employment Relations Promulgation 2007 and subsidiary Legislation 2007	Chemical spillage impact Assessment. Section 3 on Employment relations (Labor-Management consultation and Cooperation Committee-Legal notice No.54) all industrial, commercial and private companies and/or employers of any business in nature, are to comply with productivity and GREEN PRODUCTIVITY & ISO14001 are the measures of productivity
Town & Country planning	-Town and Country Act	Most of the survey, concept and master plans of project sites relating to residential, tourism, commercial and industrial goes through the vetting of this act. Conditions have now been included that EIAs should be carried first prior to any development on the ground.
Ministry of tourism	- Fiji Tourism Development Act -Tourism Master Plan 2008-2016	Climate change issues has been well documented and reviewed for incorporation into the Tourism Master Plan (TMP) beginning with the Strategic Environmental Assessment (SEA) of the earlier TMP in 2004. The current review of the Fiji Tourism Development Act will integrate climate change policies for its coastal development, utilization of environmental resources, strengthening of its user pay principles and resource owners development and integration into the industry but with eco-friendly tourism entrepreneurial skills.
DISMAC	- Natural Disaster Management Act	This act basically provides provision for immediate adaptation and mitigation responses before, during and aftermath of natural disasters such as flooding of plains,

		hurricanes and coastal inundation. Specific relation to the Climate change policy is very minimal
FAB	- Fijian Affairs Act	The act basically looks at the governance of resource owners. This is a very important legislation for human resource capacity building at grass root level, very little has been aligned to impact of CC on the socio-cultural aspect of adaptation and mitigation. This needs strengthening.
NLTB	- Native Land Trust Act	NLTA deals with ownership of native land. Most of developments of tourism and commercial businesses on native reserve land have to go through NLTB. Leasing arrangements plays a pivot role in sustainable development, this is one area that could be strengthen for EIA purpose.
Ministry of Primary Industries	- Birds and Game Protection Act - Irrigation Act -Land Conservation and Improvement Act	Provides protection to the endemic fauna - Irrigation act provides the following: *Removal of trees or refuse, Power to withhold water, Damage to irrigation works by fire, Obstruction or damage, Waste or wrongful use of water by any person, Waste or wrongful use of water by owner or occupier, Refusal to allow passage of water, Construction of unauthorised waterways, Allowing animals to stray, Unauthorised use of vehicles and boats, Pollution of water and Tampering with irrigation areas*
Ministry of Transports, Works & Infrastructure	- Civil aviation act (chapter. 174) -Civil aviation authority of Fiji act (chapter. 174a) -Civil aviation (security) act 1994 -Civil aviation reform act 1999	Fossil fuel data are very important factors for CC issues in the area of transportation. These acts have yet to incorporate important policies to mitigate or adapt to thinning of the ozone layer as these require innovative technology. Fossil fuels consumption data are critical to GHG inventory; therefore more alignment should be focused to the focal point in the monitoring and evaluation of energy consumption in the civil aviation industry. Another factor is the utilization of these acts to incorporate policies gaps within FMS.
Local Authorities, Housing and Urban Developments	- drainage act (chapter. 143) - Litter decree, 1991 - Public Health Act	Drainage act specifically looks at the impact of urban development on the public health section; it has special regulatory mechanism responsible for the upkeep and maintenance of

		millions of dollars worth of drainage infrastructures around the country. Litter decree is specifically designed for adaptation tools to OHS, under the Public Heath Act; this has never been properly utilized as a tool for waste minimization under the EMA. The problems relating to this is the processes and procedure in regard to control and monitoring especially lacking of human resource. This is a social-cultural element that needs a change of mindset from home.
FEA	- Electricity act (chapter. 180)	This act specifically looks at the commercial viability of FEA with very little consideration for sustainability of renewable energy sources for conservation purposes
Fiji Visitors Bureau	- Fiji tourist commission and visitors bureau act (chapter. 104)	This act specifically looks at the mechanism between FVB and the Ministry of Tourism in the area of governance. Specific considerations to the climate change issues are lacking.
Ministry of Lands	- Quarries act (chapter. 147) - Rivers and streams Act	There are conservation elements existing in these acts, the design however is to regulate the private sector, with very little sustainable management of these resources.
Public Works Department (PWD)	- Water supply Act	Again this act is specifically made to regulate monitor and management usage of water for human consumption. Recent developments to gazette public water supply for economic gains, have given little to the issue of environmental sustainability and management. The impact of increasing water bottling companies in Fiji needs more assessment of the carrying capacity of water lens and aquifer in light of climate change issues such as the El-Niño impacts, sea level rise, coastal inundation salinity intrusion etc.

5.3 SUMMARY OF POLICY AND LEGISLATIVE REVIEW

In general, the findings shows the following

- The only legal instrument which has been passed as a policy in government that include climate change considerations is the Climate Change Policy
- Apart from this, the only legal instrument which has considered one of the obligation is the EMA on provisions of the environmental impact assessment

- Climate change has been seen as important issues for society in general, but lack political will to integrate these important issues into the national policies in particular the Environmental Management Act (EMA)

6.0 FINDINGS AND RECOMMENDATIONS

6.1 FINDINGS

Fiji has benefitted from this programme for the last fifteen years (15yrs), despite constraints identified in section 4.1 above. The existence of projects and reports that the DOE has completed and submitted under this convention has merely allowed Fiji to stay in par with rest of the Pacific countries. This perhaps provide a false sense of security to fully maximise opportunities of the convention in particular the post Kyoto commitments such as the CDM. For example a matrix of projects produced by SPREP in 2005, show the following quantum of financial assistance to the Pacific that has never been fully utilized by Fiji (Table 6.1).

Table 6.1 SUMMARY OF MATRIX OF PROJECTS FOR CLIMATE CHANGE PROJECTS IN THE PACIFIC* (Source: SPREP: 2005)**

DONOR	(Year)	PURPOSE	ACTION	TOTAL AMOUNT
World Bank	2002-2005	To finance On-going Projects 5 projects were funded - Adaption, Mitigation, Capacity Building, Information & data gathering etc	- Fiji shared between Kiribati about US$0.350M - Samoa receives US$2.3M - Tonga receives US$1.8M - Regional gets US$260,000 - Kiribati receives US$640.00 .- Kiribati sought Phase II: US$3.25 - Samoa receives US$2.6M	USD8.75m
UNDP/GEF-SIDSnet	2002-2005	Ongoing Projects 1 project -Information Technology and Training	- Regional Receives US$150,000+	US$150,000+
University of South Pacific - Ongoing Projects Joint funding with: (GEF/UNEP) (NASA) (START/NOAA)	2002-004	17 climate change projects on: Climatic conditions of the Pacific, Meteorology conditions, Atmospheric conditions, oceanic conditions, Renewable Energy Projects, Climate VA, Community based conservation, ICM	USP receives US$25,000 -US$220,000 (GEF/UNEP) -US$35,000 (NASA) -US$36,000 (START/NOAA) -3 Projects fund data are not available. -The project is shared between Fiji, Tuvalu, Kiribati, Marshall Is., Niue, Nauru, Vanuatu, Solomon Is.	US$316.000+
AusAID - Ongoing Projects	1991-2006	2 projects Sea Level and Climate Monitoring	Total of 3 phases US$12 M US$750.000 (AusAID contribution only). These are regional projects	US$12.8M
AusAID - Proposed Projects	2002-2008	2 Projects -Vulnerability and Adaptation Initiative - Meteorology Enhanced Climate Reduction (pipeline)	US$2 M US$0.75 M These are regional projects	US$2.75M
UNDP-GEF & PIC Govts- Ongoing Projects	2002-2004	Renewable Barrier Removals Renewable Energy projects –PIREP II	US$811. These are regional projects shared amongst the 14 PICs.	US$811
UNDP - GEF Proposed Projects	2002-2004	- Pacific Adaptation to Climate Change Project - National Adaptation Programme of Action - National Capacity Self Assessment	$5 million (14 countries) $200K per country $200K per country	$5 million (14 countries)
Total				US$840.766M

***The sum are not exact figure due to TBD reasons, ongoing projects from SPREP, SOPAC, SPC and FORUM SECRETARIATS are not shown as these runs parallel to the above projects.**
****http://www.ap-net.org/docs/14th_seminar/volentrasappendix.pdf**

Table 6.1 provides snapshot of the many opportunities that Fiji through DOE missed due to lack of information. Countries such Tonga, Kiribati, Tuvalu, and Samoa are more vigilant and are fully aware of the funding opportunities that exist under the convention. The figures are still in generic form, since detailed information on budgets from the Fiji government is irregular due to the inefficiency of the accounting systems which are complex and time consuming. It is difficult therefore to be exact, however also it is adequate enough to present the holistic picture of what other countries have received all these 14-15years as member of the convention(or even as not members for example Tonga).

One of the most pressing issues is the uncoordinated approach that perhaps has undermined implementation and facilitation from the onset of the programme. This may be due to the lack of leadership by stakeholders in particular the focal point to have a common vision fully utilising its national steering committee to exhaust information that are imperative to Fiji's commitments. Simply Fiji lacks an integrated management approach to all these. Fiji is in need of integrated coordinated, directed and sustained programmes to appropriately address climate change issues.

The following are the findings of this assessment:

- The Department of Environment has never operated as the institution with sufficient authority with respect to the implementation of the convention. This function has been shared at various times between the parent body of the Department, which changes from time to time with changes in political governance, such as the Labour Ministry, Land Departments, Ministry of Forestry, Town and Country Planning, Local governments, Tourism, NGOs and USP with institutions who were also focal points of UNDP-GEF related projects.

In light of the above, nominations of individuals to attend meetings of the convention bodies are confusing and complex, since there are no written procedures for selection criteria.

- For example is the decision making involve in attending important meetings that are relevant to pending issues. Many of these are left to the whims of senior management decision making. At times, officers who are indirectly involved with CC projects from other institutions mentioned above basically attend these meetings, when in reality those not invited are project officers who are well versed with the programmes. For instance the late submission of the national communication was the result of lack of communication breakdown from attending PICCAP meetings and hearing feedback from other PICs for their reporting progress. At times, important meetings are not attended either and these translate to lack of communications between parties and therefore information gap. At the moment, another issue that is still pending is the lack of the preparation of the project proposal for the second national communication.

- The control of information and raw data in government departments in regard to climate change issues should be prioritized. For example the Fiji Meteorological Services, has been utilizing its data for public use and in particular its utilization by crop agencies such as SOPAC and WMO/SPREP for regional purposes. It is good to share information for the betterment of education and public awareness, but these still are blurry issues. It seems that data such as these are used for the purpose of enhancing capacity building of these crop agencies. Simply means that regionalism takes precedent over national issues. Information in regard to technical and scientific inferences are centered around these regional institutions, with very little dissemination to PICs members, for the very reason that they have more access to funding mechanism and support from global and international agencies.

❖ For example as can been seen in table 6.1, that more than 70% of the funds are via crop agencies modalities of implementation, utilizing project proposal based on national information and data as their grounds of contention in securing funds. On the other hand, they have good track records of producing credible information on time compared to national focal points.

❖ Another example is the utilization of raw data from the Department of Lands and Mineral Resources in regard to GIS, geological and mineral resources. Perhaps more control by government through enhanced user pay principles may solve some funding constraints in government institutions.

- Enhancement and empowerment of the national steering committees to be fully responsible to provide answers to the following issues:

  - Create an integrated management approach modality and that activities undertaken in several agencies without any synergy or coordination are identified and aligned to DOE's commitment to the convention.
  - Public awareness at national level of the convention is crucial and institutions that are unaware of climate change concerns are to be updated of the fact that there is a role for them in the implementation of the Convention.

- Another overwhelming issues is lack of appropriate human resources to facilitate and implement DOE's commitment to the convention. These are compounded by lack of technical resource personnel in parent ministries and the public sector. Perhaps retention of qualified officers who have "hands on" experience maybe the answer to this, but overall some skills are lacking. The problem is that human resources are not tailored to fit the needs for implementation of obligations.

As Mahlung inferred that:

> "A quantum leap is required to transform these institutions to achieve the dual purposes of meeting their original requirements and the new ones that the UNFCCC brings, this will require both training and financial incentives as job descriptions are transformed"
>
> (Jamaica Report, 2005).

- The public awareness of DOE's commitment to the convention is lacking, at national level. This is a major hurdle of implementation and perhaps one of the causes for lack of participation of related stakeholders to align their corporate goals to reflect the DOE's commitment. Coupled with the non performance of the current steering committee makes "integration management approach concept" an arbitrary issue. The current public awareness being facilitated by the DOE through other programmes such as environmental week, solid waste management plans and EIAs etc., lacks the impetus for greater public awareness at national level.

6.1.2 CAPACITY CONSTRAINTS

Table 6.1.2 briefly identifies the capacity assessment carried out by the NCSA team for related stakeholders in governments (Appendix 8-1b).

TABLE 6.1.2: CAPACITY CONSTRAINTS MATRIX
(As identified during in-house session and multistakeholders consultation).

PRIORITY ISSUES	CAPACITY CONSTRAINTS		
•	INDIVIDUAL	INSTITUTION	SYSTEMIC
Public Awareness & Public Education	Staffing level of DOE need to be expanded to adequately address issue	No climate change unit exists	• **due to budgetary constraints no adequate funding for comprehensive campaign**
Develop National Action Plan	New law graduates are in capable to produce immediate results, as there is lack of experience to assimilate quickly into the reality of work environment. High turnover of experienced staff compounds the problem.	The effort of bridging gaps and constraints within the department is too overwhelming to "think outside of the box".	Lack of utilization of existing policies that can be used for cross cutting issues. Detailed assessment of policies and strategic corporate plans within public sector is crucial to find corresponding policies
Assessment of Vulnerability of Coastal Zone	The high turnover of project staff in the most of the technical institutions provides a major weak link for sustained training and workshops provided by crop agencies and regional academic institutions such as SPREP through PICCAP, IAS –USP and SOPAC.	Utilization of major regional academic and crop agencies is lacking by most of the stakeholders. Staff retention is a strategic decision.	Assessment of Vulnerability studies are confined to higher education in academic institutions. Integration of these into the mainstream of education curriculum is lacking.
Assessment of Vulnerability of Water Resources	Staff needs to utilize existing institutions that are familiar with thematic issues of the convention. Individual initiatives and creativity goes a long way.	Lack of initiatives may be the symptoms of leadership management styles	Lack of initiatives may also be the symptoms of funding constraints
Integration of Climate Change Concerns into National Policy	The work demands experience, visionary leadership and analytical skills that are not available at officer level, in government	Corporate goals of related stakeholders do not prioritize these, due to lack of information and awareness.	More work should be given to the private sector on AIJ, this will alleviate funding and technical constraints and gaps.
Vulnerability of Health Sector	Staff training of VA is crucial to integrate into the health sector	This has been the domain of Fiji School of Medicine, OHS and Local authorities	Greater Co-operation and Funding has to be sourced from both parties
Vulnerability of Agricultural Sector	Training required in vulnerability assessments and adaptation measures	Adequate funding will be required for assessments Vulnerability	Assessments not part of education curriculum
The Clean Development Mechanism	Activate stakeholders in project identification under the CDM. Training in project identification, design, verification and assessment	Lack of national steering body for CDM, and greater strengthening of the DNA.	Funding from central government is needed for sustained period to take advantage of the post Kyoto commitments.

6.2 PRIORITY AREAS OF ACTION

The priority areas of action should be focussed at the following issues in Table 6.2:

TABLE 6.2: ISSUES PRIORITIZATION MATRIX				
ISSUES	**SCALE OF PROBLEM**	**LEVEL OF CONCERN**	**ABILITY TO ADEQUATELY ADDRESS ISSUES**	**PRIORITY RANKING***
Public Awareness & Public Education	National	High	Low	1
Integration of Climate Change Concerns into National Policy	National	High	Low	1
National Action Plans	National	High	Low	3
National communications	National	High	Low	3
Assessment of vulnerability of coastal zones	National	High	Low	1
Assessment of vulnerability of water resources	National	High	Low	1
Integration of climate change into national policies	National	High	Low	1
Vulnerability of health sector	National	High	Low	2
Vulnerability of agricultural sector	National	High	Low	2
Vulnerability of fisheries sector	National	High	Low	1
Vulnerability of forest sector	National	High	Low	2
Vulnerability of tourism sector	National	High	Low	3
Assessment of Adaption measures	National	High	Low	3
Assessment of mitigation options	National	High	Low	1
Assessment of AIJ	National	High	Low	1
Assessment of national steering committee	National	High	Low	1
Clean Development Mechanism	National	High	Low	1
*1 = most severe problems, *2 = next most severe, *3= Severe				

6.2.1 ASSESSMENT AT THE INDIVIDUAL LEVEL (SKILLS REQUIRED FOR IMPLEMENTATION)

Table 6.2.1 provides the skills that should a prerequisite for implementation of the UNFCCC at the DOE and with its related stakeholders. It is recommended that the issues will form a basis for practical implementation and facilitation process for future applications (Appendix 8-7).

TABLE 6.2.1: MATRIX OF REQUIRED SKILLS		
Skills Required for Responding to Economic Impacts		
Area of Expertise	**Relevant Sector**	**Requirement**
Human/Economic Geographers,	Ministry of Tourism and Ministry of Education, Ministry of Finance and National Planning	Assessment of the economic impact due to vulnerabilities caused by sea level rise and other climatic disasters such as flooding, cyclones and hurricanes
Resource/Environmental Economists,	Ministry of Finance and National Planning.	Assessment of economic pressures on environmental resources such as marine and terrestrial fauna and flora. Also from increased pressures from political and social development
Environmental Scientist,	Mineral Resource Department and Fiji Meteorology Services	Assessment of climatic conditions in marine and terrestrial ecosystems
Resource Managers,	Environmental NGOs and Ministry of Lands, FAB and NLTB	Assessment of resource management in marine, water and terrestrial environment
Skills Required for Responding to Physical Impact		

Area of Expertise	Relevant Sector	Requirement
Coastal zone management specialists,	Academic Institutions such PACE and IAS. This is important sector for DOE in the area of vulnerability assessment	Assessment of coastal zone due to the impact of environment, economic, social and political pressures on low-lying coastal plains.
Coastal managers	Mineral Resource Department and Regional Institutions such as SOPAC and SPREP	Assessment of coastal protection systems (hard and soft adaptation and mitigation options) from impact of sea level rise
Physical oceanographers	Fiji Meteorological Services and SOPAC, MRD, GEOGRAPHY-USP, Marine Department	Assessment of environmental impact of oceanic surface temperature that regulates depression levels in the Pacific.
Marine/fisheries scientists	Ministry of Fisheries and SPC, Marine Studies-USP, IAS-USP	Assessment of impact of climate change on fishery breeding grounds, impact of coastal development on coastal and marine ecosystem
Hydrologists,	Ministry of Agriculture, Department of Hydrology and Irrigation, Marine Department and Marine Studies (USP)	Assessment of flooding due to climate change, inundation of coastal zone areas and low lying plains in river deltas
Water resource specialists	Ministry of Agriculture: Landuse and Water Management Section, NGOs –WWF and PACE-USP.	Assessment of the impact of climate change on the carrying capacity of water for economic and domestic consumption. Strategic plans for short and long term water management and sustainable use. These are based on climatic predictions in the region.
Hydro-geologists,	SOPAC and IAS-USP. Mineral Resource Department and Ministry of Lands. Marine Studies-USP and Marine Department.	Assessment of impact of sea level on low lying areas, such as salinity intrusion into the fresh water aquifers and fertile coastal lands.
Agro-climatologist,	Agriculture-Landuse and Water Management Section	Assessment of impact of climate change on drought. Ability to forecast weather patterns due to its importance for farmers in particular for drought prone areas such as the Western Division
Agro-meteorologists	Agriculture-Landuse and Water Management Section	Same as above, but specifically aimed for preparation of disaster prone areas against adverse effect of climate change in the short term.
Skills Required for Responding to Social Impacts		
Area of Expertise	**Relevant Sector**	**Requirement**
Social scientists,	Bureau of Statistics, NGOs such FSPI, WWF, IAS-USP, PCDF, WCS, LIVE & LEARN. FAB, NLTB	Data collection on oral literature should be recorded for coastal profiling assessment due to absence of historical science quantitative and qualititative data. Comprehensive study of Vulnerabilities Assessment in coastal areas due to the threat of sea level rise. Assessment of the resilience of human to extreme climatic conditions in the past until today.
Population and cultural geographers	Department of population studies, Bureau of statistics, NLTB, FAB	Assessment of population distribution, demarcation of vulnerable areas with different worse case scenarios and the impact of environmental degradation due to severe climatic conditions.
Social anthropologists,	FAB, NLTB, FAB, NGOS-WWF, IAS-USP, FSPI, PCDF, LIVE & LEARN.	Assessment of intellectual property rights of the indigenous people for specific survival skills as hunter and gatherers. Study the impact of traditional conservation techniques in the area of food storage, mobility under severe climate conditions and adaptation skills
Human security,	Ministry of Agriculture-Quarantine	Assessment of climate change on human

	Department, DISMAC, SOPAC, FMS, Ministry of Finance and Planning, Department of Irrigation and Hydrology	resilience to climate change impact. Planning to withstand the extreme events of global warming and its impact on the human well being
Livelihood specialist,	Agriculture-Landuse and Water Management Section	Assessment of livelihood alternatives apart from the status quo of cash and subsistence livelihood. Responses (adaptation & Mitigation) should be planned and appropriately strategized
Sustainable development specialists	Ministry of Finance and National Planning, Ministry of Commerce, Ministry of Tourism	Assessment of different responses to the negative impact of climate change should be prioritized. Sustainable development is crucial to discern carrying capacity of natural resources in the face of economic, political and social developments

6.3 RECOMMENDATIONS

The following recommendations are made to be considered for the future.

A. INSTITUTIONAL

- Re-Establish a climate change unit within the Department of Environment Strengthen Focal Point Institution with a Principal Officer-Climate Change. Specific focus on establishment of a climate national change steering committee for posts Kyoto commitments on CDM. This is very important since it needs specific focus, it cannot be realigned to existing management structure due to its importance and capacity, it can be only an additional section of the DOE structure (See Appendix 8-6).
- Establish National Climate Change Committee (Chaired by high level person preferably Minister and PS level) and a National Carbon Trade Unit (See Appendix 8-6).
- A unit to be established looking specifically into the treaty and convention, securing of funds and assist the Director in the implementation and reporting of the conventions. This can be realigned under the policy formulation section of the DOE, which currently is under the Legal Officer's work description. This is one area that can be enhanced to fully integrate the above into the existing structure of DOE.
- Integrate climate change consideration in national development policy in particular to integrate into the MDGs on environment and sustainable development, poverty eradication and alleviation, social justice and health betterment.
- Private sectors, non- government and community-based organizations must be brought into the process and given meaningful roles to fulfill. This can only be archived through the post Kyoto commitments on CDM and strategic user pay principles
- Institutions will require additional equipment including high-speed computers and other specialized technical equipment. An initial needs assessment will be required of all relevant institutions.
- Make use of local resources and enhance local capacity at the individual and institutional level for example by engagement of expertise in three thematic areas for academic institutions, regional organizations and focal points or be part of the national steering committees.

B. TRAINING

The UNFCCC has established a fellowship programme which offers some interesting opportunities. The web address*: http://unfccc.int/secretariat/ fellowship_ programme/ items/4429. php*, would an ideal training opportunity:

- For persons to use and further improve these vulnerability and adaptation tools. (UNFCCC Secretariat to advice on training areas)
- The provision of training in the areas of vulnerability and adaptation technologies.

- The training and development of storm surge models and maps. (Fiji Meteorological Service, SOPAC, USP-Marine Studies-Flinders University, and SPREP are existing agencies)
- The scientific training and technical institutions offering courses on CC (such as, Fiji institute of Technology-Environmental Science Department, IAS-USP, SOPAC-Oceans and Island Programme, and Mineral Department, Coastal engineering Section etc) will require additional technical expertise in climate change and its related fields. This will enable them to provide training as well as research capabilities for Fiji to tackle a changing climate (See Appendix 8-7 for proposed training programmes).
- Accommodate information sharing and build database source at focal point

C. PUBLIC EDUCATION

Design and implement a public awareness program targeting audiences at several levels of the society. Target groups should be:

- Policy makers, government officials at all levels of management
- Different age groups in society
- Lecturers in regional and national tertiary institutions
- Teachers in primary, secondary, college and special schools
- Teacher Trainers in training institutions
- General public in formal and informal sectors
- Groups in vulnerable areas (most vulnerable cases)
- NGOs/CBOs

D. TECHNICAL CAPABILITY

- Develop technical skills in the area of CDM and Carbon Trading, A Carbon Trade Unit has to be set-up to identify and assess project identification. Opportunities should be developed in the area of consultancy in the verification procedures.
- Focus of technical capacity should be concentrated on the post Kyoto commitments. Preparations for the COP 14 and COP 15 in Copenhagen should be strategize as soon as possible, given the timeframe of the trading mechanism until the 2012.
- Develop national action plans for mitigation and adaptation (Technical group selected by Fiji National Climate Change Steering Committee) These are consisted of Fiji institute of Technology-Environmental Science Department, IAS-USP, SOPAC-Oceans and Island Programme, and Mineral Department, Coastal engineering Section etc.
- Strengthening of formal climate change research programme for institutions in Fiji and abroad (Fiji Meteorological Service-WMO, SOPAC, USP-Marine Studies-Flinders University, and SPREP). Specific consideration should be given to the assessment so the 50% of raw data available, this will provide Fiji a solid baseline historical quantitative and qualitative scientific data.
- The establishment of a GHG database should be encouraged and strengthen, for example reactivation of the carbon emission inventory unit of the Department of Energy.
- The development of regional climate models at a small scale of small islands to allow for better analysis and understanding of the climatic processes should be established. Waikato University and SPREP have worked on compilation of these data, but exchange of information and for capacity building in PICs is lacking, therefore PICs are to develop their own technical institutions or capacity building of existing institutions in particular the School of Mathematics and Computer Science- USP and FMS. This will facilitate impact assessment models to examine the issues that the major sectors of

agriculture, water resources and the coastal zone will be required to minimize or adapt to. Specific study research should be focused on the following:

- food security
- social and economic impacts
- the effects of saline intrusion and:
- activities in the coastal zone that will undergo in the different climate change scenarios
- development and updating of hazard maps for floods
- land-slippages and other hazards
- Review the design criteria and building codes to include climate change concerns

❖ There is a need for the formal collection and archiving of baseline data to inform the specific studies and analysis that will be required for the vulnerability assessments. For example the DOE should have all the specific data that covers every projects and studies carried out on climate change issues in Fiji, the Region and International to store in their existing database and library.

E. POLICIES

❖ Capacity for Policy formulation to be strengthened
❖ The legal and policy instruments will require review and amendment by legal persons with some exposure to environmental issues in particular climate change (Attorney General Department)

F. REGIONALISM VERSUS NATIONALISM

Table 6.1 above provides the gaps and constraints that Fiji has missed all these years. Access to these donors is enjoyed mainly by crop agencies and regional academic and technical institutions for implementation of Fiji's role under the convention. Fiji needs to be independent of these crop agencies and to have a ministry of CLIMATE CHANGE with units to look at post Kyoto commitments (Appendix 8-3).

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DEPARTMENT OF IMMIGRATION - www.immigration.gov.fj
DEPARTMENT OF ENERGY & RURAL ELECTRIFICATION - www.fdoe.gov.fj
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FIJI ISLANDS MARITIME SAFETY - www.fimsa.gov.fj
FIJI PRISONS DEPARTMENT - www.corrections.org.fj
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8.0 APPENDICES

APPENDIX 8-1a: STAKEHOLDERS ANALYSIS

APPENDIX 8-1b: CAPACITY LEVEL ASSESSMENT REPORT (ASHIS MOHAPATARA)

APPENDIX 8-2: QUESTIONNAIRE SURVEY OF IMPLEMENTATION EFFORTS

APPENDIX 8-3: PROCEEDINGS OF THE UNFCCC CONVENTION COP 13 (BALI PLANS OF ACTION)

APPENDIX 8-4: INSTITUTIONS, PROJECTS AND CONTACTS OF STAKEHOLDERS

APPENDIX8-5: INITIAL NATIONAL COMMUNICATION

APPENDIX 8-6: PROPOSED INSTITUTIONAL RESTRUCTURE

APPENDIX 8-7: PROPOSED NATIONAL TRAINING INSTITUTIONS IN FIJI

APPENDIX 8-1a: STAKEHOLDERS ANALYSIS

The following GOVERNMENT STAKEHOLDERS were analyzed on two criteria which are for 1. Reason for inclusion and 2, assessment of role.

BOX 4. FIJI METEOROLOGICAL SERVICES (FMS)

Reason For Inclusion

- Collecting, quality controlling, and archiving meteorological data observed in the Fiji Islands. Data includes: precipitation, air, soil, grass & local sea surface temperatures, relative humidity, wind force & direction, sunshine, solar radiation, evaporation, lightning & thunder, and fog
- Archiving tropical cyclone reports and best track data for tropical cyclones occurring within RSMC-Nadi's region of responsibility
- Monitoring and predicting Fiji's climate e.g. precipitation and maximum and minimum air temperature
- Monitoring El Niño Southern Oscillation and regional climate circulation systems that affect Fiji's climate
- Monitoring and projecting climate change in the Fiji region
- Producing Monthly and Quarterly Reports, Information Sheets, Technical Notes, Research Reports on various aspects of Fiji's climate
- Providing the above reports and data to interested parties both within Fiji and abroad
- The Fiji Meteorological Service (FMS) has been carrying out climate-observing network since 2005, known as the National Climate Monitoring Network (NCMN).
- The main purpose of NCMN is to improve and enhance the climate observing network
- The Department provides daily weather forecasting and cyclone and other severe weather warning/advisory services for Cooks Islands, Kiribati, Nauru, Niue, Samoa, Tokelau, Tonga, Tuvalu, Vanuatu and the French Territories of Wallis and Futuna.

- **Opportunities in human resource management available for staff, these are:**

❖ Regional SPREP, National Institute of Water and Atmospheric Research (NIWA). SPREP/WMO
❖ Training in climate observations WMO & the Government of Fiji
❖ Training in climate observations WMO & Government of Fiji
❖ Training in support of forecasters JICA and the Government of Fiji
❖ Training in support of forecasters The Government of Fiji through the Meteorological Service

Assessment of Role

- Their role is very critical in providing scientific data and information to the public for early warnings on weather systems.
- Data storage, monitoring and dissemination of information and consultation services prove to be a very tedious and hard work to manage at the same time.
- Raw Scientific historical quantitative and qualitative data are available but only 50% of these are in digital form. Conversion of the other 50% is costly and lack of financial resources compound problems such as data storage, monitoring dissemination and utilization

- **Legal Framework for FMS**

❖ At present there is no legal framework for FMS to operate within. During the time of FMS establishment it was probably assumed that the Department would join CAAF and operate under the latter's framework. This has not happened and efforts since then to establish a legal framework for meteorological services in Fiji have not gained much success.

❖ With the reforms taking place both in the public and private sectors, in particular the trend towards commercialisation of services including aviation meteorological services, there needs to be a legal framework to justify the existence and protect the operations and services provided by FMS.
❖ The Department has been pursuing this matter with the previous Ministry and other relevant authorities with the hope of establishing such legal framework within 2002.
❖

- **Cost Recovery for Aviation Meteorological Services**

❖ FMS provides aviation meteorological services for the Nadi FIR now managed by Airports Fiji Limited (AFL). As per current Cabinet decision, AFL is required to reimburse 63% of FMS operating costs, but it is paying only 44%, which excludes costs for meteorological services to Nausori Airport and domestic airports (Labasa, Savusavu, Matei, and Rotuma). Arrears of revenue currently stand as follows: CAAFI $2.4 million (1/7/97 to 31/3/99), AFL $3.9 million (1/4/99 to 31/7/03) (FMS, 2005)

❖ A Draft Cabinet Paper has been with the previous Ministry since 2001 but is yet to be finalised.

- **Charging Policy for Cost recovery of Specialised Weather and Climate Services**

❖ FMS provides specialised weather and climate services, beyond that of pure public goods services, to many organisations in Fiji and abroad, the costs of which need to be recovered through implementation of a charging policy. A submission was drafted for Ministry of Finance consideration about 2 years ago (2006) but has not received much attention.

❖ The fact that FMS has no legal instruments in place can cause some handicap in pursuing the matter. However, the request for FMS specialised service has been growing tremendously and at least some cost recovery mechanism needs to be pursued urgently.

- **Shortage of Meteorologists - Retention of Professional Staff**

❖ Retention of professional staff due to lack of incentives and competitive pay structure is a continuing problem. Shortage of skilled personnel in areas such as weather/cyclone forecasting, computer programming, maintenance of specialised equipment like radars are difficulties currently faced by the Department. In the past 20 years, the Department has lost many local meteorologists most of who have secured similar jobs overseas. It has in turn acquired the services of well over 30 expatriates, mostly from New Zealand but also a few from Australia. The first localisation programme commenced in mid-1970s but took about 12 years to be completed. The second one was started following the events of 1987 and again took over 10 years to complete. Lately several local meteorologists have resigned raising doubts on the success of the recent New Zealand Government funded localisation project.

❖ There are very limited opportunities available to train a meteorologist abroad, as the appropriate courses are only conducted by the National Meteorological Services of Australia and New Zealand for this region. The courses are not regular either and there is a great demand for them in the Asia and Pacific regions. Since weather has no boundaries and the training is internationally recognised, a meteorologist is easily marketable. Also to be noted is the impracticality of absorbing and providing on-the-job training to more than a few meteorologists at a time upon their return to Fiji.

❖ The staffing has recently fallen to critical level thereby demanding the deployment of expatriate meteorologists while new graduates are recruited and specifically trained abroad with award of necessary scholarships. Otherwise the Department will not be able to provide essential services to Fiji and the region with any further deterioration in the staffing situation.

- **Regional Weather Forecasting and Cyclone Warning Service**

❖ Early in 2000, Cabinet endorsed the regional service provided by the Department as a contribution of the Fiji Government towards disaster mitigation in the South Pacific.

❖ Agreed that formal arrangements be put in place for the provision of weather forecasting and cyclone warning services to the countries listed above.

❖ Due to the recent budget cuts, the Department now faces extreme difficulty in providing an efficient and effective service to the region. The financial constraints need to be addressed. The option of channelling funds to the Department through the Ministry of Foreign Affairs needs to be looked at. This will hopefully place the funds under a special category where it is not subjected to cuts as the rest of the budget.

❖ Also, formal arrangements need to be established with the above-mentioned countries for service delivery and accountability.

❖ FMS Reform: A review of FMS was performed by Meteorological Service of New Zealand Limited (MSNZL) in April 1997 followed by a follow up review on organisational structure and operations in May 1998, both funded under NZODA. The 1997 review report made 11 recommendations, the first of which was "to form a government commercial company" and the second "to provide public good services through a purchase contract with the Fiji Government".

❖ As a result of these recommendations, there has been some uncertainty in the past as to which direction FMS should be heading. In 2000, Cabinet decided that FMS should continue as a Government Department and that any restructuring be undertaken from within. However, Government reform action has been rather slow and many of the problems highlighted in the NZ Review continue to affect the Department.

BOX 5 DEPARTMENT OF WATER AND SEWERAGE

Reason For Inclusion

- Impact of sea level rise will induce high inflows and infiltration (I&I) at high tide increase salinity levels and reduce treatment efficiency. E.g., in the central Suva area I&I are possibly as high as 90% in wet weather. If water can infiltrate the sewerage system then it can also leak out and pollute the local environment (ADB, 2007).
- Use of water for human need is crucial, despite Fiji being blessed with an abundance of water resources, there are continued problems with the supply of water as provided by ADB report 2007, that there are approximately 70% of Fiji's population has access to piped water. For those who have access to sewerage facilities it is about 15%

Assessment of Role

- Most of the work that is being carried out by this department is focused in trying to meet demand and capacity of a growing population.
- The tendency to align UNFCCC to its core objective is lacking, this is due to the lack of human resources to be responsible in facilitating this task
- The study to assess coastal vulnerability in regard to inundation and flooding on a national level is lacking, due to limited funding, lack of technical expertise and political will to adequately address the impact of increase sea level rise in coastal zones.

BOX 6 MINISTRY OF LAND & MINERAL RESOURCES

Reason for inclusion

- The Department of Lands and Surveys provide products, services and the administration structures to secure land rights, maximize the benefits from the utilization of State Lands and its resources, and to ensure its rational use and conservation.
- The development and conservation of Fiji's natural resources such as mineral deposits, water, mangroves, coral reefs and terrestrial waterways and marine life are under their jurisdiction.
- Policy objective include communities benefit from sustainable development and management of mineral groundwater resources to increase long term economic returns for the broader community in particular to indigenous Fijian resource owners

Assessment of Role

- The department does not align itself to the UNFCCC but plays a big role in the conservation of Fiji's terrestrial and marine habitat and its ecosystem. One of the major drawbacks to this is the lack of awareness of the convention.
- The department is segmented and compartmentalized. Their differentiated roles do not augur well with implementation and facilitation of Fiji's obligation under the convention.
- In practical term, the government priority is economic development of these resources with little emphasis on the conservation side, for example the development of the tourism sector and water bottling industry in the western side of Viti Levu which are drought prone areas.

BOX 7 MINISTRY OF AGRICULTURE (LANDUSE & WATER RESOURCE MANAGEMENT SECTION)

Reason for inclusion

- Focal point for UNCCD
- Direct links to UN Conventions –FCCC and CBD
- The increased frequencies of floods and droughts are the challenges facing Fiji from the agricultural sector prospective, this need to be addressed in a manner that reflects on sustainable development of land and water resources to ensure that the future generations will continue to reap the fruits that Fiji enjoy today.
- Involve with desertification, degradation of forests through agricultural practices, responsible for ALTA lands under the sugar cane growing area.
- Involve with practices that can pose detrimental impact on marginal land
- It carries out land capability studies for integrated resource management and planning.
- The Development of Sustainable Agriculture in the Pacific (DSAP) promotes and implements sustainable agriculture that will improve food production thereby enhancing food security and income generation in the Pacific.
- At National level, the project by a National Steering Committee (NSC) comprising partners and stakeholders in Agriculture and includes NGOs working in local communities, other government departments, educational institutions, women's groups, youth groups and farmers themselves who represent farmer groups
- DSAP also targets strengthening national capacity building of extension officers, enabling them to identify farmer problems in a participatory manner, ensuring that the farmer's interests are at the center of the solution. Upgrading national capacity to produce extension information and ensuring that the information is communicated effectively and is accessible to farmers is also an integral part of the project's program. Sharing lessons, ideas and information about sustainable agriculture is central to DSAP activities. (*E.g-Extension programmes in Sigatoka farming communities for integrated farming is proving to be a success on small scale farming*)
- The land and Water Resources Management Division operating principle links with policy and strategies set out in the ministry strategic development plan. It intends to strategize policy that will ensure sound management programs to enhance sustainable watershed development for food security and improving the living standard of all the people. To ensure constructive progress in the key areas, areas identified are: watershed management, water resource development, river engineering, coastal engineering, land drainage and research and development on irrigation

Assessment of Role

- Cross cutting issues with UNCCD in the area of adaptation and mitigation are interrelated but uncoordinated for example ICM and Landuse Capability Studies.
- The role of the extension offices are too comprehensive to deal with alignment to the UNFCCC. Too many areas to cover for few officers, for example for the entire Western Division Fiji, there is only one principal officer with less than 10 officers to provide service to the public
- The funds to monitor and evaluate projects are limited to core corporate goals of the department.
- Overall the implementation of UNFCCC is limited due to the above constraints.
- National steering committee are interlinked and intertwined with steering committee of the UNFCCC. These tend to induce duplication and inconsistency of project implementation

BOX 8 DEPARTMENT OF ENVIRONMENT

Reason for inclusion

- Focal point of UNFCCC implementation since 1992 when Fiji signed the UNFCCC
- Secretariat of DNA for CDM since the ratification of the Kyoto Protocol in 1998 and signature of the Marrakech Accord in 2002
- Responsible for overall CC facilitation and implementation
- Coordination role for NCSA
- Facilitation of PICCAP
- Establishment of the Carbon Trading Unit

Assessment of Role

- The inconsistency of the focal point in its facilitation role has been linked to the lack of funding and support from the central government since the ratification of the convention in 1993 in particular the ongoing PICCAP after the USCountry Studies Programme
- The sustainability of project coordination for technical projects is limited to project timeline; this is due to the lack of human resources to provide technical expertise to the government. These are in the area of GHGs, weather and climatic variability studies, V/A and mitigation. This capacity is lacking at the senior management level of DOE.
- The timeframe for implementation of initial obligations under the Convention was derailed due to reporting difficulties pertaining to article 12. For example the delay in producing the first initial communication which was submitted in 2005, almost 13years after ratification.

- Opportunities that Fiji have missed in the area of bi-lateral and multi-lateral agreements enjoyed by regional and international organizations through donor agencies funding of climate change projects.
- Opportunities existing in the CDM market under the compulsory carbon trade market since 1998 for renewable energy have not been realized since 2002.
- The lost opportunities in the carbon market that Fiji is losing out since 2002.

BOX 9 MINISTRY OF FOREIGN AFFAIRS (MoFA)

Reason for inclusion

- Responsible for signing of the UNFCCC
- Advice to the Government regarding the formulation and implementation of its foreign and trade policies.
- The Ministry implements government's foreign and trade policies by maintaining and expanding friendly relations with other countries and through proactive participation in international organisations to which it is a member.
- In short, it exists to represent Fiji's interests to the world.

Assessment of Role

- There is lack of integration between DOE and MoFA during the initial signing and ratifying of the UNFCCC
- During facilitation and implementation of the convention's obligation, the role of MoFA is confined to paper work with very little exchange of data for capacity building in human resource and information.
- There is very little alignment of Fiji's obligation under the convention with the corporate goals of UNFCCC.

BOX 10 NATIONAL PLANNING

Reason for inclusion

- They are the focal point of WSSD and facilitate strategic planning on MDGs for government.
- The major theme, in the Plan of Implementation, contains targets and timetables to spur action on a wide range of issues, including halving the proportion of people who lack access to clean water or proper sanitation by 2015, to restoring depleted fisheries to the preserving biodiversity by 2015, and phasing out of toxic chemicals by 2005.
- In addition, for the first time countries adopted commitments toward increasing the use of renewable energy "with a sense of urgency (Johannesburg summit, 2002)

Assessment of Role

- National planning has a key role to implement strategic plans under the WSSD; this seemed very unlikely due to the downsizing of the public sector in both budget and human resource.
- Very little alignment of its corporate goals to the UNFCCC obligations.
- There is lack of integration between the DOE and National Planning.
- Awareness programmes and data sharing is non existent

BOX 11 FORESTRY DEPARTMENT

Reason for inclusion

- The Forest Act (Chapter 150) enacted in 1953 and in force at Fiji's independence in 1970, was replaced by the Forest Decree 1992. The previous Forest Act established a number of different classified areas −reserved forests, nature reserves, protected forests and silvicultural areas− which could be created by Ministerial declaration over land held under different forms of land tenure. For each classified area certain forestry activities were forbidden, but in each case licences could be issued authorising those activities. Further provisions on licences were set out in the Forest Regulations of 1955 and subsequent amendments (Jim Fingleton, 2002)
- Report to the Government in 1992 identified major problems with this forestry legislation, including that the forest categories were inadequate for Fiji's current needs, that it was difficult to identify the rules which applied to each forest category, and that the law lacked a coherent structure for forest planning and management (FAO 1992: 28-31).
- The report contained a draft Forest Act and Forest Regulations, which were the basis for the Forest Decree 1992. Notably, however, the Decree left out the parts dealing with national forestry planning and agreements for joint management of forests, contained in the draft Act (FAO 1992: 4-5).
- The Decree is relatively brief, as current forestry legislation goes (39 sections). It sets up a Forestry Board, whose main task is to advise on preparation of the National Forestry Plan. Nothing is said, however, about the legal status of this document. The felling of timber, extraction of forest produce and clearing of land is prohibited with respect to different categories of land unless authorised by the Conservator of Forests, usually by way of a licence.
- The Decree thus preserves the basic methodology of the previous Act (see above). Certain consents are required before a licence is issued, depending on the land category. In the case of native land, for example, the prior consent of the Native Land Trust Board is required. Before a timber licence is issued, a logging plan prepared by the applicant must be approved by the licensing officer, specifying various matters (e.g., annual allowable cut, roads layout, reforestation requirements). Certain customary rights are preserved over native land.
- The Forest Decree is, in most respects, a continuation of the previous forestry regime. While the forest categories and applicable rules have been clarified, the mechanisms advocated by the FAO to improve forestry planning were omitted from the final version of the law (Jim Fingleton, 2002).
- Due to pressures towards further deforestation such as population increase, demand for new settlement, and greater agriculture production for food security has compounded high incidence of soil erosion, siltation and subsequent flooding of low-lying plains.
- Involve with desertification, degradation of habitats for terrestrial and marine ecosystems through logging, and deforestation.
- Involve with practices that can pose detrimental impact on marginal land such as steep slopes (>45^0)
- Promotion of sustainable forestry management practices by improving resource utilization through enforcement guidelines under the code of logging practices and EIA
- Completion of National Forestry Inventory will provide sound basis on status of forestry resource in Fiji, this is important for Carbon Trading under the Voluntary Market in particular, reforestation, biomass, afforestration and REDD
- National interests vs. resource owners interest has been the determining factor of conservation and commercialization
- Target commercial harvesting in Mahogany and Pine will increase. It has been forecasted that Forestry Sector has contributed to GDP increasing from 1.1% in 2006 to 1.6% in 2011 (Strategic Goals, 2006)
- Increase involvement of resource owners is increasing with a forecast of secured contracted logging licensing of not less than 40% by 2010 (Strategic Goals, 2006)..
- German Technical Cooperation (GTZ) and national partners Forestry Department main counterpart funded the Drawa Project at Macuata

Assessment of Role

- There is low awareness about UNFCCC
- Legislations need revision to adequately meet Fiji's need in the area of conservation, sustainable forest management and protection of biological marine and terrestrial ecology.
- Licensed contractors vie for virgin forest with very low premium prizes ranging from FJD15 to FJD30 for m^3 of logs with minimum benefit for resource owners and at the same time depleting Fiji's last stock of virgin forests.
- Lack of value added training for staff in the area of implementation of the CDM under the Afforestration, Reafforestration, REDD and Biomass.
- Lack of technical manpower to conduct proper ME on logged trees
- Lack of financial resources to man extension posts
- Minimum downward communication due to lack of proper communication tools and apparatus such
- Lack of adequate skilled manpower
- High turnover in skilled graduates to private companies, regional institutions and other sector of the economy such as in the area of GIS and remote sensing.

BOX 12 FISHERIES DEPARTMENT

Reason for inclusion

- The Department has been closely working with WWF for conservation of the –qoliqoli areas and in 2003, The National Biodiversity Strategic Action Plan (NBSAP) identified priority marine areas for protection, as well as recommends the establishment of a representative network of Marine Protected Areas (MPAs) in ecological and biological sites. WWF Fiji was part of the coalition of national stakeholders that produced the NBSAP.
- It is through these recommendations that, in January of 2005, at the World Summit on Small Islands Developing Nations in Mauritius, the Fiji government declared a commitment to protect 30% of its waters by 2020
- It also works with NGOs on a project called A Locally Managed Marine Area (LMMA). This is an area of nearshore waters actively being managed by local communities or resource-owning groups, or being collaboratively managed by resident communities.
- An LMMA strategy offers an alternate and complementary approach to the centrally-managed system where a body (such as a national government agency) largely uses "command-and-control" to manage a marine area, often from a remote location. As of 2007, 200 LMMAs involving more than 300 communities had been declared in Fiji, covering about 30% of the country's inshore fishery.
- The LMMAs in Fiji protect reefs, sea grasses, and mangroves. Management plans associated with LMMAs include income-generating activities. Under this guise, contractual arrangements between private companies and communities have been entered into for bioprospecting, artificial live rock harvesting, and SCUBA diving.
- This case study will explore these arrangements as a means to augment local incomes and create tangible value in protecting the marine environment through LMMAs
- Fiji Tuna Development and Management Plan
- The purpose of this plan is, in recognition of regional and global international fisheries agreements, to create the appropriate conditions such that all Fijians derive the maximum benefit from the nation's tuna resources over the long term. This statement implies the government will create; a catch limit at level that is sustainable; a limit on the number of licenses issued to maximize return to each license; a set of criteria for distribution of licenses according to government objectives; a set of license fees to support the management of the fishery and provide some benefit for all Fijians; a development programme addressing shortcomings in port facilities, legislation, training, social and gender issues, and coordination with other government agencies.

Assessment of Role

- The fishery legislation is outdated and needs updating. At the national level, the Fiji Fisheries Department (a department of the Ministry of Fisheries and Forests) is responsible for fishery management, through the Fisheries Act (Chapter 158 of the Laws of Fiji) and the Marine Spaces Act. These acts have been drafted and enacted since January 1942, with amendments and insertions made between 1950's to the 1990's.
- The fisheries acts needs updating in the area of environmental conservation, policing, greater local participation, reduction of overfishing and monitoring of fisheries boundaries by international poachers. There is a lot of sensitivity at local-level fishery management. Traditional measures for the community-level management of reef and coastal fisheries are comparatively strong in Fiji. This is in no small measure due to the early recognition of customary "native" fishing rights by the British colonial administration from the very first Fisheries Ordinance in the late 19th century.
- However, ownership of the actual seabed had always been invested in the Crown throughout historical times (latterly the State, since the institution of a Fijian head of State following the 1987 military coups), but a bill is currently (2005) before the Fiji Parliament which would see this ownership pass to the traditional fishing rights owners registered by the Native Fisheries Commission.
- The Commission would manage these areas on behalf of the traditional owners in the same way that Native Land is currently managed by the Native Lands Trust Board (NLTB)
- However this on a hold, due to very little research and feasibility studies carried out to assess the feasibility of the above arrangement. Fear of NLTB land tenureship issues will be replicated.
- There is lack of awareness about UN Conventions in regard to the UNFCCC.
- Non alignment of convention provisions in national acts, this is due lack of staff to streamlined obligations to suit the department's corporate goals and strategic plans.
- High turnover of qualified staffs to regional institutions such as SPC i.e. Good positions available outside for qualified staffs
- There is Lack of enforceability of multi-lateral Agreements, this tend to duplicate work
- There is a high donor dependency for example Fiji Tuna Development and Management Plan (Anon 2002) in 2002. The Fisheries Department began the revision of this Plan with assistance from the Forum Fisheries Agency and SPC to refine the Plan to meet the current circumstances in the local tuna fishery in 2006. This assessment is yet to be completed and still ongoing

BOX 13 MINISTRY OF FINANCE

Reason for inclusion

- Responsible for budgetary allocation of governmental funds
- Greater role facilitation would be anticipated once a shift of economic paradigm from tourism to carbon trading takes places.
- Expenditures will be controlled by increasing productivity & accountability in the use of government resources on clearly stated priorities.
- Priorities will be maintained by focusing budget resources on clearly stated priorities of : i. the core priority areas of health, education and infrastructure, ii, promoting export growth and investment in the ***resource-based sectors and addressing poverty reduction*** through the creation of employment opportunities for all, particularly those in the rural area and outer islands (Strategic planning, 2007).

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Policy to generate income is lacking and lack of maximum utilization of user pay to provide financial sources for most of the stakeholders in government is needed

BOX 14 MINISTRY OF HEALTH

Reason for inclusion

- Protecting health from climate change is very relevant and is designed to put health at the centre of Government policies on global warming Fiji, like all the other small island states, is concerned with the undesirable effects of global climate change that will see impact of natural disasters such as hurricanes, cyclones, rising sea levels and flooding.
- The ministry is committed to raising awareness and public understanding on the consequences of the climate change. It is committed to send out messages of hope and encouragement to everyone in Fiji to take action to limit greenhouse gases in particular by supporting the global Earth Hour initiative by turning off all non-essential lights in the office and at home,
- The ministry has well-projected public health interventions and plans which would deal with the outcome of the global climate change; there is still a need to change the lifestyles and mindsets of the overall health status in the country. In doing so the ministry needs to conduct a rejuvenated campaign to reverse what climate change and its adverse effects on people.
- For example it has a National Health Research Operations consisting of the National Health Research Council (NHRC). Its functions have been resumed in 1998 after a lapse of several years. The National Health Research Committee of the NHRC comprises of the Health Research and Finance committee; and The Health Research Ethics committee. One of programmes called the Mini-Grants Programme has a TOR under their strategic goals is in the area of Environmental Health (pollution, water & sanitation, vector control).

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding and human resources
- Very little integration between DOE such as data sharing and awareness issues

BOX 15 MINISTRY OF REGIONAL DEVELOPMENT AND DISMAC

Reason for inclusion

Resource based economic developments such as rice, copra, sugar, cocoa, cassava, vanilla, ginger, and pineapple etc are vital to the subsistence and economic livelihood of rural dwellers and the changing weather pattern nowadays has made it difficult to predict if any natural disaster is approaching Fiji which has been a crippling factor to development of these resources.

- Natural disasters often leave behind psychological scars on the people in terms of loss of property, livestock and root crops. This has led the National Disaster Management Committee (DISMAC) to take a more pro-active role in coming up with measures that can reduce risks such as that there is a need to:

    - ❖ Review the building code as it does not apply to the rural areas.
    - ❖ Take a more pro-active role rather than waiting for natural disasters to hit Fiji than take action.
    - ❖ Work very closely with the Rural Housing Unit of the Ministry of Provincial Development in teaching our carpenters to know the law and to build houses that can withstand cyclones and hurricanes.

- Government will provide rural Fiji with equal opportunity, equal access to infrastructure and services through: leading change, smart partnerships, community empowerment, increased service delivery initiatives, innovative and transparent processes, and information technology.

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Very little integration between DOE such as data sharing and awareness issues
- Recognition of the vast disparities that exist, the ministry strive to ensure that Fiji's rural areas are provided with the access to opportunities and basic amenities that are enjoyed by the urban areas, and that this is done by working within the unique framework of the cultures at play, and with an increasing focus on building community capacity and resilience through the active pursuit of smart partnerships with all stakeholders.
- Plans to teach proper building codes to reduce the impact of cyclones at rural and local level lacks assistance from Government,
- Greater assistance from Government enables people in being more pro-active during rehabilitation.
- focus more on being reactive and less on proactive responses on adaptation and mitigations options

BOX 16 MINISTRY OF LABOUR (OHS)

Reason for inclusion

- Occupational Health & Safety regulations were develop based on the concept of the "duty of care". The primary objective is to create a proactive OHS risk management culture with all potential risk creators in the labour market to ensure that those who create the risks in the workplace and those who work with them have the primary responsibility to solve them (rather than relying on Government Inspectors as encouraged in the former statutory and administrative arrangements).
- The Occupational Health and Safety Service establish relations in partnership with all the agencies of the public administration, with universities and non-governmental organizations whose activities are related, whether closely or not, with occupational health and safety matters. "For example, the complimentary link with the Department of Environment for the national management of hazardous substances/chemicals, it basically stipulates impact assessment and penalizes offenders (FJD100k) for spillage.
- Under the Employment Relations Promulgation 2007 and subsidiary Legislation 2007, Section 3 on Employment relations (Labor-Management consultation and Cooperation Committee-Legal notice No.54) all industrial, commercial and private companies and/or employers of any business in nature, are to comply with productivity and GREEN PRODUCTIVITY & ISO14001 are the measures of productivity

Assessment of Role

- There is no alignment to the UNFCCC obligations due to lack of integration in the area of public awareness and data sharing
- Duplication of the work in the area of ozone act with national management of hazardous substances/chemicals, it basically stipulates impact assessment
- Very little integration between DOE such as data sharing and awareness issues

BOX 17 PUBLIC SERVICE COMMISSION

Reason for inclusion

- The purpose of the Public Service Commission is to promote excellence in public service delivery. To achieve this, the PSC has the statutory powers to review the Machinery of Government in order to ensure its efficiency and effectiveness in fulfilling Government's public sector management objectives. The PSC also has the Constitutional and Statutory powers to be the central personnel authority in the Public Service. Following the delegation of much of its Constitutional authority to Departments, the PSC focus is now on Strengthening Leadership Capacity in Departments and developing a Human Resource Management Framework for the Public Service workforce that ensures continuing innovation and improvement in Public Service delivery.
- The Public Service Commission's statutory functions that fall under the responsibility of the Management Improvement Division (MID) is outlined at Part 3, Section11(1)(g) of the Public Service Act 1999 which states: "to review, and advise the Government on the structure, size and composition of the public service, including the creation, amalgamation and abolition of Ministries and Departments, the functions of departments, and staffing levels in Ministries and Departments"

Assessment of Role

- The PSC, function to provide sound strategic management plans and decision making specifically its statuary functions under the MID lacks corporate vision and management.
- The fact that DOE has been relocated from one location to another, downsizing and upgrading and downsizing again from a ministry and finally department shows lack of commitment and vision to integrate sustainable development with economic development

BOX 18 PUBLIC WORKS DEPARTMENT

Reason for inclusion

- Monitoring and evaluation of maintenances and upgrading of governmental infrastructures such as roads, bridges, wharves, jetties, water reservoirs, sewerage treatment plants, sewer lines, have a major impact on the terrestrial and marine habitats.
- Extension services around Fiji are responsible for some of the upgrading of these utilities, with the sourcing of the private sectors on contract works.

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Very little integration between DOE such as data sharing and awareness issues
- Most of the road works and infrastructural construction are carried out without EIAs

BOX 19 MINISTRY OF TOURISM

Reason for inclusion

- Climate Change, Only recently, research on climate change in Fiji has been undertaken specifically in a tourism context (Becken, 2004).
- Climate impacts on tourism both directly and indirectly. Most directly, tourists are attracted by certain climatic conditions such as sunshine, warm temperatures and little precipitation. At the same time, adverse conditions impact on tourists' experience and in extreme situations on their health and safety. In the sun-and-sea tourism segment, which is so important to tourism in Fiji, climate is a key attraction. Changes to climatic conditions could affect overall arrivals or result in a seasonal shift of tourism activity.
- Tourism infrastructure and local businesses could be impacted upon by climate change, especially considering that they are mostly located in highly vulnerable coastal areas.
- Tourism is also a highly seasonal activity, and changes in demand patterns caused by altered climatic conditions (either at the destination or in tourists' home countries) can have major impact in tourism employment and supply, affecting related services and sectors (e.g. agriculture).
- Indirectly, climate change can have significant impact on tourism activities by altering the natural environment, which constitutes one of the most important resources tourism draws on (beaches, scenic areas, coral reefs, etc.). For example, changes in precipitation patterns can cause flooding or draught that can lead to desertification or water shortages, storm surges can cause shoreline erosion or saline intrusions affecting coastal ecosystems, animal populations can be affected by environmental stress or changes, habitat fragmentation and biological invasions, and increased seawater temperatures can impact on highly sensitive coral ecosystems.
- The coral reefs in Fiji are a major attraction for tourists to visit, and the bleaching events in 2000 highlighted the vulnerability of those reefs to any changes in environmental parameters.

- The coral reefs show how tourism, when poorly managed, can impact considerably on the natural environment. Inadequate sewage treatment, overuse of diving spots and cutting back of mangroves for tourist development led to a severe deterioration of reefs and marine life in a number of places in Fiji.
- More recently, resorts joined forces to address this situation (e.g. in the Mamanuca Islands), for example by reducing water pollution, instructing divers and rotating diving spots.
- Reducing the pressure on coral reefs means that reefs are better able to cope with increased water temperatures resulting from global warming. It becomes clear that the tourism industry, as well as governments and local communities have a vested interest in conserving and enhancing the natural resource bases, including biodiversity.
- Tourism can be a powerful ally for nature conservation; by generating much needed revenues for the maintenance of natural areas and reserves, and through environmental education and awareness for both locals and tourists.
- Other projects that are related to climate change issues are:
- Strategic Environmental Assessment of the Tourism Master Plan from 2004-2006 (WWF and ADB)
- A case –study of Yasawa -Tourism impact on the environment, economic, political and culture. This is a joint programme with WWF and IAS, USP – 2006 (Vanualailai, 2006)
- Green Globe 21 – Environmental Accreditation and Certification 2004 - 2006
- Fiji Green – Accreditation and Certification

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding and human resources
- Very little integration between DOE such as data sharing and awareness issues
- Public awareness of climate change issues appreciation at senior management level is good but needs more realignment with DOE's core obligation on VA, and mitigation options

- The tourism sector specifically the private sector under Fijian Hotel Association have involved with environmentally friendly sustainable practices such as:

  Accreditation & Certification
  for example: Sonaisali is one of only two large hotels in Fiji to adopt the green globe 21 principle of Accreditation) which basically looks at reduction of fossil fuel use by energy saving practices, use of renewable solar energy alternative, natural siltation pond for sewer and use of bio-degradable substances for toilet, laundry and bathing detergents.

  Green Productivity and ISO 14001
  Under the new Employment Relations Promulgation 2007 and Subsidiary Legislation. The above productivity attributes are part of this new legislation which was passed in April 2007.

- Environmental impact assessment (EIAs) are mandatory for all new and existing hotel developments with adaptation and mitigation options utilized as buffers for civil engineering developments, habitat degradation and depletion and reckless destruction of the ecosystems.

BOX 20 MINISTRY OF SOCIAL WELFARE

Reason for inclusion

- The Department of Culture and Heritage provides policy advice on issues related to the safeguarding and enhancement of cultural and natural heritage, in tangible and intangible, moveable and immovable forms. This ensures the protection and management of Fiji's national heritage, flora, fauna and national amenities; archaeological sites and cultural heritage collections and the development of the crafts and arts sector.

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Very little integration between DOE on data sharing and awareness issues

BOX 21 MINISTRY OF TRANSPORT WORKS AND ENERGY

Reason for inclusion

- **The Department of Transport's** vision is to provide a transport system that is safe, affordable, accessible to all, efficient, cost-effective and environmentally sustainable
- LTA Introduction of alternative fuel powered vehicles reducing annual CO_2 emissions per capita reduced from 1.6mt to 1.0mt
- **The Department of Energy** (DOE) focuses on four strategic areas for the development of a sustainable energy sector in Fiji namely;
  i. Energy Planning;

ii. Renewable energy;
iii. Energy security; and
iv. Power sector

- Within these Strategic areas, the following are encompassed;
  v Energy Information and Database;
  vi Energy Conservation Efficiency;
  vii. Petroleum and Transport;
  viii. Renewable Energy Development;
  xv. Environmental and Gender Mainstreaming; and Rural Electrification
- The Rural Electrification Unit (REU) within DOE specifically looks at the electrification of the rural communities, schools and services centers such as hospitals, community centers, shops, churches, etc. as stipulated by the 1993 Rural Electrification Policy.
- Water and Sewerage (see Department of Water and Sewerage above)

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Very little integration between DOE such as data sharing and awareness issues
- Public awareness of climate change issues appreciation at senior management level is good but needs more realignment with DOE's core obligation on VA, and mitigation options
- Core functions of providing alternative and renewable energy sources are part of the CDM project under the Kyoto Protocol

A carbon emission database was created but its functions are independent of the DOE's realignment to the GHG inventory component of the convention

The following stakeholders are NGOs:

BOX 22 WORLD WIDE FUND FOR WILDLIFE (WWF)

Reason for inclusion

- Support DOE in the area of Increasing resilience, raising awareness, public outreach, and climate outreach
- Projects under these include the following:

❖ F*iji's first Earth Hour*: Millions Switch Off and Switch On to Climate Change- 9 April 2008. WWF co-ordinate this fight against climate changes. More than 370 cities, councils and towns around the world participate in this global event. Fiji was the first nation where people and businesses from all over the country "switched off" for Earth Hour.

❖ *WWF Climate Witness Programme* demonstrates the present and growing impact of climate change and to push governments to act swiftly to curb greenhouse gas emissions. Kabara Island is seeing climate change related impacts such as coastal erosion, changing rainfall patterns and less fish and garden crops. The accumulative impacts are forcing many of the younger people on the island to leave for the larger centers of Fiji.

❖ WWF held media briefing in November 2007 so that the Pacific public is well informed, in order to facilitate in-depth reporting of the proceedings and outcomes of the regional climate change event in Bali, the COP 13, WWF encourages Pacific Island nationals to check if their government attends this event and to find out what are their stand.

❖ WWF South Pacific Programme have initiated in 2007 for Pacific countries to ally with APEC developing countries at Climate negotiations, Pacific Island countries, as developing island states, may find potential allies in Asia Pacific Economic Cooperation (APEC) developing countries to start negotiating a global agreement to keep climate change well below dangerous levels.

❖ WWF advised Pacific government to begin negotiating a new global deal on climate change accepted a safe range for emission reductions of harmful climate pollution in September 2007, Vienna, Austria.

❖ Fiji makes it to the Climate change series such as "Meltdown - a ground-breaking series focuses on the havoc already being wreaked on ordinary people at the frontline of climate change, one of the four episodes produced for the global satellite channel Al Jazeera English around the world, e.g. Environment in Kabara, Fiji in 2006

Assessment of Role

- Strong alignment to UNFCCC obligation due to availability of funding & human resources
- Very strong Public Awareness programmes on UNFCCC
- Smart and small scale CC projects at rural level are well organized with high success rates such as the Kabara Projects
- At times there is a high level of competition with other NGOs to secure project funding from one financial source e.g. such as World Conservation Society competing for local projects ownership under the Packard Foundation in the area of MPA in Macuata Province

BOX 23 CONSERVATION INTERNATIONAL (CI)

Reason for inclusion

- CI, terrestrial work in Fiji focuses on the Sovi Basin Nature Reserve, the islands' most important land ecosystem and a cradle for much of Fiji's biodiversity and natural heritage. CI is also working closely with local partners, in particular the National Trust of Fiji, to build capacity for and implement effective conservation action.
- CI is supporting research to help to local communities improve their management of these areas. This work is led by CI's *Marine Managed Area Science* Program which aims to build national capacity to protect and manage marine biodiversity in a number of key sites around the world.
- CI is also engaged with premium bottle water supplier FIJI Water. Together they are developing a sustainability initiative to include an ambitious multi-benefit carbon offset plan that, in addition to addressing climate change issues, will also benefit Fiji's local communities and its biodiversity.

Assessment of Role

- Alignment to UNFCCC obligation with DOE is maintained through but it is more inclined to BCD
- Very little integration between DOE on data sharing and awareness issues
- Smart and small scale CC projects at rural level are well organized with Landowners at Sovi Basin

BOX 24 LIVE AND LEARN

Reason for inclusion

- Live & Learn work with rural schools along the Sigatoka and coral coast to establish a network of schools to monitor the waterway, coastlines, and human practices.
- The network initiates actions along the Sigatoka River and Coral Coast with the aim to improve the health of the freshwater and marine environments as well as promote sustainable behavior and attitudes.
- The RiverCare team from Live & Learn is currently conducting follow- up visits and professional development sessions in all registered school
- Live & Learn: Identify pollution hot-spots; Investigate the pollution cause; Analyze the socio-economic and cultural impacts of water pollution; Present the test to the community, the church and chiefs; Network with NGOs and government departments on possible solutions to the problem; Initiate a debate in the community for solving the problem and Initiate action through practical problem solving strategies.

Assessment of Role

- Alignment to UNFCCC obligation with DOE is maintained through but it is more inclined to BCD
- Very little integration between DOE on data sharing and awareness issues
- Smart and small scale projects at rural level are well organized with villagers along sigatoka and coral coast on water quality monitoring

BOX 25 Organization for Industrial, Spiritual and Cultural Advancement (OISCA)

Reason for inclusion

- This project offers training for young people in Fiji within the framework of the Fiji Government's human development program.
- The training farm covers 11.7 hectares, of which 8 hectares are planted with crops.
- The trainees receive instruction on growing various vegetables.
- To improve conditions on the farm, trainees work to enrich the soil in the fields by introducing Sesbania (green manure), and have started organic farming on an experimental basis.
- Trainees also learn how to promote the Children's Forest Program (CFP) and gain practical experience by planting trees in mountain areas and mangroves on seashores.

Assessment of Role

- Very little integration between DOE on data sharing and awareness issues
- Smart and small scale projects at rural level are well organized with villagers along sigatoka valley on mountain areas and mangroves on seashores.
- Alignment to UNFCCC obligation with DOE is very little or none at all

BOX 26 PARTNERS IN COMMUNITY DEVELOPMENT (PCDF)

Reason for inclusion

- PCDF, was formerly Foundation Society of the Pacific (FSP-Fiji) Their work involves the following:

❖ Work with Pacific communities through people-centered programs to foster self-reliance within a changing world. This mission statement is translated into action on the ground through the work of their country affiliates and community partners. The focus of PCDF work at national and regional level is the local community. The overarching aim is to encourage community members to take responsibility for their own development. This involves assisting them identify self-determined priorities and goals and to assert their right to influence and access public services and decision-making processes. Projects in Fiji include:

❖ Coral Garden initiatives

The project is designed to empower resource-owning communities to take full responsibility for the wise utilization of their own marine resources, and in accordance with existing traditional and governmental structures. Coral Gardens thus seeks to work with governmental departments and with like-minded non-governmental organizations towards this common goal of enhancing community-based marine resource management.

❖ Blue forest initiatives

The Blue Forests: Protecting Biodiversity through Sustainable Farming of Reef Corals aims to pilot community based coral culture techniques for reef restoration and potentially the aquarium market. This work is nested in establishment of community based management areas (CBMAs). The project commenced in July 2003 and completes in December 2005.

Assessment of Role

- Lack of alignment to UNFCCC obligation due to scarcity of funding & human resources
- Very little integration between DOE such as data sharing and awareness issues
- Public awareness of climate change issues appreciation at senior management level is good but needs more realignment with DOE's core obligation on VA, and mitigation options

The following institutions are ACADEMIC INSTITUTIONS:

BOX 27 (PACE, USP)

Reason for inclusion

- The **AIACC** project-Integrated Methods and Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in Pacific Island Countries was carried out to enhance the technical and human capacity of the Pacific Island countries to assess vulnerability and adaptation to climate change, including variability

- Climate Change Adaptation in Rural Communities of Fiji include the following:
  - ❖ *Water Shortages in Bavu, Western Viti Levu*
  - ❖ *Coastal Erosion and Water Problems in Votua, South West Viti Levu,*
  - ❖ *River Bank Erosion and Inundation in Buretu, Southeastern Viti Levu*
  - ❖ *Coastal Erosion & Inundation in Navukailagi, Lomaiviti*
  - ❖ *River Bank Erosion & Flooding in Korotasere, Vanua Levu,*
  - ❖ *Water Problems in Druadrua Island, Vanua Levu*

USP -NASA/NOAA Ozone Project

This is an on-going initiative since 1997, started as part of NASA's PEM-Tropics (Pacific Exploratory Mission to the Pacific) mission to provide ground based ozonesonde measurements of the vertical profile of ozone. Ozone is an atmospheric trace gas whose concentration affects the energy balance in the atmosphere, the amount of dangerous UV-B radiation that reach the surface of the earth and the oxidation budget of the troposphere. The project is being funded by NASA, NOAA and USP.

USP-NIWA NZ Greenhouse Gas Project

This is a joint effort between USP and the National Institute of Water and Atmospheric Research (NIWA), New Zealand. Started in a small way in 1994, with the Director, Professor Koshy as the Principal Investigator, this project has since grown into a successful international collaborative effort, which has also developed in-house capacity at the chemistry department for the measurement of ambient methane concentrations. Dr. M. Maata is the partner in this project and the postgraduate student, Francis Mani, joined the project in 2002 and graduated with his Masters degree in April 2004. The postgraduate student also received some funding assistance from START

- **El Nino and Sugar Project**

Examines meteorological data from Fiji MET service and sugar production information from the Fiji Sugar Corporation, to help determine the relationship between climate and variability and Assuming the worse scenario, a 10-year plan has been drawn . This study followed the political instability in 2000 and 2006. Ever since, the project has discontinued

Assessment of Role

- PACE is quite a new institution within USP's science group mainly focusing on the study of environmental science specifically in climate change research in the region in regard to vulnerability assessment, adaptation and mitigation works etc.
- PACE is also understaffed but engages graduates students to undertake project works as part of their master's thesis and certificates.
- Pace is still facilitating USP-NASA/NOAA Ozone Project, but this needs technical expertise and staff which is becoming an issue with USP in the recent downsizing of its financial budget and support for 2008.
- Adaptation at rural Fiji is ongoing and is looking at local solutions to adapt to local problems. Adaptation measures such as relocation of villages to other locations are very critical to low-lying villages due to inundation and flooding from the advancing sea. These deals with land tenureship which is a very sensitive and complex issue.
- USP-NIWA has been successfully implemented but data from study is still with the department with very little realignment and information exchanges with the DOE.
- The El Nino and Sugar Project is one of the most important studies that was ever carried out using raw data from Fiji MET to assess the correlation of sugar cane production and El Nino. This basically shows that existing raw data can be utilized for important information gathering since baseline scientific quantitative and qualitative data are very much lacking in the Pacific including Fiji.
- Most of the adaptation options in Fiji lacks baseline information, thus compounding existing problems rather than fixing it. For example replanting of mangrove where they are not naturally occurring, in exposed areas are detrimental to marine habitats and littoral drifts.
- The project which was supposedly to have relocation programmes culminating in 2009 was derailed due to the political upheaval of the 2000s and 2006

BOX 28 INSTITUTE OF APPLIED SCIENCE-(IAS-USP)

Reason for inclusion

- The Institute focuses on 5 project areas, environment, food, water quality, marine natural products and community based resource management.
- They have been actively engaged with NGOs and CBOs in providing technical expertise to complex climate change issues in adaptation, conservation and assessment of their environment from impact of economic developments.
- IAS markets the facilities of the South Pacific Regional Herbarium and does work in any area of expertise that can be provided by its professional staff. This includes expertise in laboratory-based research in a range of areas, including tissue culture, microbiology, animal physiology, plant physiology and electrophoresis
- Have a range of field equipment and relevant expertise. We are perfectly placed for field studies of tropical terrestrial, freshwater and marine systems

Assessment of Role

- They are aligned to DOE's commitment on ICM, but have been independently working for many years due to communication breakdown.
- IAS has played a major role in facilitating one of the main core objectives of the secretariat and that maintaining the status quo of a national steering body of the CZM.
- Have a very dynamic team of professionals but are not been fully utilized by DOE.

BOX29 THE DEPARTMENT OF GEOGRAPHY (NOW THE SCHOOL OF GEOGRAPHY). USP

Reason for inclusion

- Impacts of tropical cyclones on river Systems, (Dr. J. Terry)
- Early Humans - Environment Relationships (Prof. P.Nunn).
- Environmental Changes within the last 10,000 years (Prof. P. Nunn)
- Incidence and Significance of Accuvial Charcoal (Pro. Nunn & Roselyn Kumar)
- Assessment of coastal protection systems in the Pacific, 2004 (Dr. Paulo Vanualailai)
- Impact of sea level rise on coastal areas 2006 (Dr. Paulo Vanualailai)

Assessment of Role

- The School of Geography lack technical staff to continue with studies on the impacts of tropical cyclones on river systems when Dr. Terry left USP in April 2008

- Prof. Nunn is also tied up to academic work on Physical Geography but has shared a very good insight into ancient climatic conditions of Fiji which is important to Fiji's current and future climatic conditions in the field of academic research particularly in forecasting worse case scenarios and the resilience of Pacific people to adapt to these changes.
- Overall these studies ran in parallel with DOE's vulnerability assessment and adaptation study, however communications are directly between SPREP and USP, there is gap in information sharing with DOE

BOX 30 SCHOOL OF PURE AND APPLIED SCIENCES, DEPARTMENT OF PHYSICS USP.

Reason for inclusion

- Capacity building for Wind Power on RE
- SEREAD Project *(Scientific Educational Resources and Experience Associated with the Deployment of Argo) –joint project with Marine Science,IOI-Pacific Islands,SOPAC, IOC Perth office NIWA,UNESCO Office Apia, NOAA, ARGO Science Team and POGO*

Assessment of Role

- These are mostly public awareness issues and are not aligned to DOE awareness programmes in RE under the CDM program
- This is due to lack of CDM implementation at national level, i.e., the CDM unit is just activated in August, 2008 with the DOE.
- The data are basically the property of USP and related stakeholders (shown on the left) with very little information sharing with DOE. IAS has played a major role in facilitating one of the main core objectives of the secretariat and that maintaining the status quo of a national steering body of the CZM.

BOX 31 SCHOOL OF MARINE STUDIES (SMS), USP

Reason for inclusion

Coastal Management

- Coastal processes (joined program with IAS)
- Coastal/inshore inventories
- Integrated planning (with IAS)
- The IOI-Pacific Islands is one of twenty five operational centres, with others being in Canada (Halifax), China, Costa Rica, India (Madras), Japan, Malta, Senegal (Dakar), Australia, Thailand, Indonesia, Brazil (South and Western Atlantic Ocean), Egypt, Cuba, Germany, Islamic Republic of Iran, Kenya (Eastern Africa) Nigeria (Western Africa), Romania (Black Sea), Russian Federation (Caspian Sea) (Volga), Slovenia, Sweden (Baltic Sea), Ukraine and South Africa. IOI-Pacific Islands is based at the University of the South Pacific. It operates under a Memorandum of Agreement with the University of the South Pacific, and with the Government of Fiji, as an independent international NGO. IOI-Pacific Islands is a cooperative venture with the University of the South Pacific, through School of Marine Studies.
- Caring for the Environment and Mitigating Natural Extreme Events in Vanuaso Tikina: Gau Island: Fiji- a self-help community initiative
- Addressing Climate Change and Sea Level Rise in the Pacific Islands in collaboration with the *Research Center for the Pacific Islands, Kagoshima University, Japan*

Assessment of Role

- Weak alignment to UNFCCC obligation due to availability of funding & human resources
- Smart and small scale CC projects at rural level are well organized with high success rates such as the Gau projects
- More academic in implementation of CC VA, CZM and but very little data sharing and exchange of information with DOE

BOX 32 FACULTY OF SCIENCE AND TECHNOLOGY

Reason for inclusion

Renewable Energy

- The technical and economic sustainability of stand-alone photovoltaic systems for electrification in Tonga
- Analysis of coconut oil and its residues as alternative fuel for power generation in Solomon Islands
- Reactive power control of wind-diesel systems
- Studying technical and socioeconomic implications of using bio-fuel in rural communities in Fiji and Rotuma

- Characterization of fuel woods and forestry residues as biofuels
- Assessment and analysis of wind resource data in Fiji e. g.Wind characteristics and resource assessment around Laucala Bay, Suva.

Assessment of Role

- Weak alignment to UNFCCC obligation due to availability of funding & human resources
- Very little integration between DOE such as data sharing and awareness issues

BOX 33 SCHOOL OF BIOLOGICAL, CHEMICAL AND ENVIRONMENTAL SCIENCES (SBCES)

Reason for inclusion

- emphasis is on producing graduates ready to take on professional positions in various work areas in the region, strengthening of various research areas such as natural products, conservation and biodiversity, and environmental issues are
- The only institution involved in the Pacific with scientific research and monitoring of ozone is the University of the South Pacific (USP).
- It carried out in collaboration with NASA/GSFC/NOAA/CMDL. The lead agencies at USP for this major project are the Department of Chemistry and the Pacific Centre for Environment and Sustainable Development (PACE-SD).
- Relevant observational activity in Fiji involves monitoring of vertical ozone profiles using electrochemical concentration cell (ECC) ozonesondes and periodic UV-B monitoring using broad and narrow band UV meters**.**
- Since 1997, vertical ozone profiles have been measured on a weekly basis, using a model 6A ECC ozonesondes. The vertical profile data from these measurements are being used to obtain the total column ozone and stratospheric ozone levels over Fiji since 1997.
- At a national level collaborations with the ODS unit of The Department of Environment have provided a means of creating awareness of the ozone hole problems and use of ozone depleting substances such as CFCs.
- Collaborations within the Departments (Chemistry, Physics and PACE-SD) of the University have also enabled completion of a number of projects especially, for Master of Science students (Chandra, 2004; Mani, 2004; Gopal, 2000). Recent research at USP has looked into:
- Comparative study of ozone trends at all levels (surface, troposphere and stratosphere) in Fiji, Samoa, Tahiti, San Cristobal (Galapagos) and the South Pole (Amundsen-Scott Station) during 1997-2003, using data collected by NOAA/CMDL)
- Identifying the relationship between tropospheric ozone variations in the South Pacific and biomass burning by using clustered and individual trajectory analysis.
- Investigating vertical mixing of air by relating tropospheric ozone anomaly with surface 7Be levels in Fiji.
- Identifying widespread regional convection (SPCZ) as one of the important sources of variability in surface and tropospheric ozone.
- Investigating the influence of quasi-biennial oscillation and solar cycle on stratospheric ozone trends.
- Relating surface UV-B levels with stratospheric ozone variations

Assessment of Role

- Currently there is no continuous UV-B monitoring programme in place for Fiji. Some measurements are being done by the Department of Physics and by the Fiji Meteorological
- Services using a broadband meter. However, with the absence of a proper validation method the accuracy of the data is questionable.
- UV-B was continuously measured for nearly one year, from July 2003 to July 2004 by the Department of Physics using a narrow band UVB-1 pyranometer with a spectral response in the 280-320 nm range. After July 2004, no measurements were done and now the pyranometer is being moved to the Fiji Meteorological Services (Nadi) where continuous monitoring is being planned to be carried out.
- Since each ozonesonde is a new instrument, pre-launch procedures are designed to ensure valid data recording is done. The ozonesonde being used is a model 6A sonde provided by NOAA and it has taken part in sonde inter-comparison experiments such as stratospheric ozone inter-comparison (STOIC) in 1989 (Komhyr *et al*., 1995) and Julich ozonesonde inter-comparison experiment (JOSIE) in 1996 (Smit *et al*., 1996).
- There is currently no proper calibration method in place for any UV-B monitoring done.
- This international collaboration was aimed at studying the atmospheric chemistry over the Pacific region (over two seasons) and to build ozone database for satellite validation, processing and modeling. Moreover, ozonesondes are currently also launched to coincide with the Aura satellite overpass.

The following stakeholders include Regional Institutions:

BOX 34 SOUTH PACIFIC REGIONAL ENVIRONMENTAL PROGRAMME (SPREP)

Reason for inclusion

Regional mitigation activities: (SPREP response to Climate Change) (http://www.sprep.org/climate_change/pignauru.htm)**.**

SPREP noted that the Pacific Island Countries (PICs) region has minuscule emissions of GHGs on a global scale, even if looked at from a per capita emissions basis. The transportation sector in the PICs has grown rapidly in recent years while about 70% of PIC populations don't have access to electricity so emissions are expected to grow in the future, as the transportation sector continues to grow and Governments seek to improve the livelihoods of the communities

SPREP also noted, there are significant inefficiencies in the current power generation and transmission systems in the PICs, with losses calculated to around 30% of production. There are therefore opportunities for mitigation in the current energy mix and to ensure sustainable growth in energy production and access that does not increase the region's carbon footprint.

The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is a GEF-funded five-year regional GHG mitigation project that started in 2007. Eleven PICs are participating in the PIGGAREP. The PIGGAREP aims to remove the technical, institutional, financial, market, policy and awareness barriers to the widespread and productive utilisation of feasible renewable energy technologies in the PICs.

It is envisaged that these are to be carried through various national activities like resources assessments, feasibility studies, rehabilitation of existing renewable energy systems and the installations of new ones, various training and awareness programmes, the formulation and adoption of new policies and legislations and through various partnerships with donors, banks and agencies working on renewable energy in the region. The PIGGAREP aims to reduce the GHG emissions by 33% under the business-as-usual scenario by 2015**.**

SPREP also noted that energy efficiency also has economic and social benefits that often have been overlooked in the past. The increasing cost of fuel is impacting heavily upon lives in the Pacific, and the impact of this rising cost is transmitted through every aspect of daily lives. The electricity tariff has increased by about 20% in Tonga. RMI is currently in a state of economic emergency. The Solomon Islands government recently contributed US$400,000 to avoid the repeated power shutdowns at Honiara. Bus owners demanded a fare increase in Fiji. The price for a burger at McDonalds has gone up and Pacific Blue has just announced the introduction of a new extra baggage fee. Now, more than ever, is the need for renewable energy sources and improved energy efficiency becoming more of a reality.

SPREP noted that the oil crisis of 1973 and 1979 drew the attention of some Pacific Islands to invest on renewable energy. FEA have witnessed the impacts. More than half of the electricity generated in Fiji and Samoa were from renewable sources of energy. But this share is slowly eroding because the renewable energy momentum has not kept up with the increasing demand for energy.

SPREP also noted that the key energy problem in the PICs is the heavy reliance on the imported, expensive and polluting fossil fuel. A fossil fuel energy path is not a sustainable one. Getting cheaper oil prices are therefore short to medium measures. Renewable energy is a medium to long-term measure. SPREP recommended that PICs should invest on it now for the many crises that are yet to come. Recently Fiji Cabinet approved an electricity tariff increase of 1 cent per unit. This increase will be used for the construction of the Nadarivatu Hydro Power project where hundreds of new jobs will be created during its construction but also diesel cost savings as a result of a reduction in diesel imports. It is interesting to note the current commitments to renewable energy in the region.

SPREP stated that the FEA has a vision of becoming a renewable energy power utility by 2011. The power utility in Vanuatu (UNELCO) has a target of generating 25% of its electricity from renewables by 2020. Samoa aims to increase the current share of renewable energy by 20% by

2030. Tonga has just announced a US$50 million that will generation 50% of the country's electricity from renewable sources of energy in the next three years.

SPREP recommended that it is appropriate for PICs to take measures now and make the long-term commitments to pursue a Renewable Energy path and then work with development partners to try and utilize the vast potential that the region has for renewable energy. Renewable Energy should not be taken as a reactive measure to the rising costs of fuel as it is well known that a fossil fuel energy path is not a sustainable one. A visionary concept like a Pacific Fossil Fuel Free Future or P4F is therefore not a bad starting point.

The international negotiations on Climate Change offer avenues where assistance can be provided to the region's renewable energy developments. The tidal, wave and OTEC energy that could be derived from our vast ocean remains virtually untouched and should be an area that PICs should raise as a priority for research, monitoring and development

Regional adaptation activities include: (http://www.sprep.org/climate_change/pignauru.htm)
Growing evidence of climate change impacts in the region has been documented for many years. Various initiatives have been started to assist the region assess and document vulnerabilities and to find solutions that are acceptable to the local communities. This requires an approach that combines awareness raising and training, as well as capacity building within institutions and for personnel. Much more needs to be done however, and building on past experiences the region will commence implementation of a regional project that will introduce adaptation options in the areas of water resources management, food security and coastal zone management and infrastructure.

The Pacific Adaptation to Climate Change Project (PACC) is a regional project focusing on climate change adaptation. It is one of the few projects globally to access the Special Climate Change Fund of the GEF. In the April session of the GEF Council, the PACC Project Inception Form was approved which secures USD13.125 million of adaptation funding to the region. The objective of the PACC is to enhance the resilience of a number of key development sectors (food production and food security, water resources management, coastal zone, infrastructure etc.) in the Pacific islands to the adverse effects of climate change. This objective will be achieved by focusing on long-term planned adaptation response measures, strategies and policies. To ensure sustainability of the project, regional and national adaptation financing instruments will also be developed.

Thirteen Pacific Island Countries (PICs) will take part in the PACC project. They are as follows: i) Cook Islands; ii) Federated States of Micronesia; iii) Fiji; iv) Marshall Islands; v) Nauru; vi) Niue; vii) Palau; viii) Papua New Guinea; ix) Samoa x) Solomon Islands; xi) Tonga; xii) Tuvalu; and, xiii) Vanuatu. Kiribati currently has a national adaptation project and did not wish to be part of the regional project.

Regional climate change science activities (http://www.sprep.org/climate_change/pignauru.htm)
The main programme in the region is the Pacific Islands Global Climate Observation System (PI-GCOS). In addition to work on adaptation in the region, serious gaps exist in the scientific and meteorological work that the region requires in order to address climate change and climate variability and predict extreme events.

In response to interest from the regions, WMO embarked on work to assist SIDS in all regions to access the GCOS network. In the Pacific PI-GCOS has been in existence since 2002 with a steering committee forming its Action Plan and Implementation Plan.

Under the latter, a list of 31 projects were identified (with initial indicative budgets) to meet needs in areas ranging from research and policy development, to technical capacity building in observation networks and enhancement of operational early warning systems.

Its main achievements to date have been the enhancement of the capacity in nine PICs in seasonal climate prediction, the rescue and management of historical climate data and improvement of access to data, as well as a marked improvement in the maintenance and increased output from GCOS identified GUAN and GSN stations in the Pacific. These achievements have been undertaken also in ways that have built local capacities in consideration also of the need for sustainability and appropriateness of these works. Thus cooperation and partnership for climate change work particularly in taking stock of, and supporting, the technical and scientific level needs for climate information and applications is important. At its formative meetings in 2000-2003 the then PI-GCOS Steering Committee decided to prepare project proposals with concrete and achievable targets, and with full budgets. These include pilot projects assessing the impacts of climate variability and change on ocean and island ecosystems, expansion and enhancement of climate prediction, along with operational training programmes to incorporate some of the new knowledge gained from this research within national climate centres of PICs. Unfortunately, the large majority of the most key projects identified have not received funding and this remains a major barrier for work in the region.

The Implementation Plan reaffirms that PI-GCOS is intended to be a long term, user driven operational system capable of providing the comprehensive observations required for monitoring the climate system, for detecting and attributing climate change, for assessing the impacts of climate variability and change, and for supporting research toward improved understanding, modelling and prediction of the climate system. Its nesting within the climate change programme of SPREP ensures that the gaps in scientific knowledge and information in this area are

addressed and that it provides and builds linkages across to other areas of efforts in climate change.

Financing of climate change activities (http://www.sprep.org/climate_change/pignauru.htm)

At the international level most climate change financing has come through the GEF. In past years this was largely limited to enabling activities for fulfilling the reporting requirement under the FCCC. The establishment of the LDC Fund and the Special Climate Change Fund further added to the opportunities for financing. However, political considerations initially limited the outflow of resources from these funds. The 5 PIC LDCS have now all accessed their National Adaptation Plan of Action (NAPA) funding from the LDCF and the reports have been completed. Within the NAPA each country has identified projects that are eligible for funding. Samoa was the first to seek funding for implementation of some of these projects, but a lack of resources within the fund will create a backlog.

All future disbursements under the GEF will be handled under the GEF-PAS, which makes available to the region over $30 million for adaptation and $14 million for mitigation initiatives over the next 4 years. Operationally this will create greater predictability for GEF resources but it may not increase the overall funding availability. However, the possibilities for additional co-financing and leveraging of funds should not be overlooked.

As mentioned, a NAPA process has been available for the PICs that are LDCs, funded under the GEF LDC Fund and with technical support from the LDC Expert Group. Other PICs have seen the benefit of this support and have called for a similar activity to be made available to non-LDC SIDS. At the recent FCCC subsidiary bodies meeting an agreement was reached that in principle approves such a process. However, the details such as financing and sourcing of technical support need to be worked out. If this support was to be disbursed on a bilateral basis, then action can occur fairly soon. However, if the GEF is to be involved a decision on GEF guidance must be taken at COP-14 in Poznan followed by acceptance by the GEF Council, which could delay action until mid-2009. There may therefore be a need to develop a concept paper for submission to interested donors.

SPEP recently submitted a series of climate change adaptation project concepts to AusAID, in order to benefit from the recently announced Australian adaptation funding. This funding will also be available to the PICs on a bilateral basis.

SPREP has also secured funding from the EC to build capacity for Multilateral Environment Agreement, and a key part of that project will be the Climate Change Convention. There are further opportunities for financing climate change projects under other EC funds. The Secretariat is also working with other UN agencies to access capacity building funds for adaptation

Assessment of Role(http://www.sprep.org/climate_change/pignauru.htm)

SPREP contribution to Fiji under the Climate change project is the PICCAP. Most of these took place from 1998 to 2005. Under **PIGGAREP** activities identified for Fiji build on 2 key initiatives:
(1) **Govt of Fiji Rural Electrification Programme** and (2) the **Pacific Islands Cooperation Programme with the Government of Italy.**

Govt of Fiji Rural Electrification: DOE's 2008 Business Plan has over forty activities. Of the 40 activities, 15 are renewable energy activities with a total budget of FJD2 million. These are the co-financing activities in Fiji and include the following:
i) Renewable Energy Database
ii) Renewable Energy Statistics
iii) Capacity Building
iv) Solar Home Systems (SHS) Programme
v) Somosomo Hydro Project
vi) Nabouwalu Hybrid (Wind/Solar) Project
vii) Biogas Programme
viii) Wind Programme (Survey & Long term monitoring)
ix) Hydro Programme (Survey & Long term monitoring)
x) Wave Programme (Survey & Long term monitoring)
xi) Solar Insolation Programme (Survey & Long term monitoring)
xii) Renewable Energy Standards
xiii) Compilation of Hydro Potential Report (based on 500 sites already being surveyed)
xiv) Hydro Detailed Designing (2 projects per year)
xv) RED Infrastructure Framework (Standard Operating Procedures)

Pacific Islands Cooperation Programme with the Government of Italy (http://www.sprep.org/climate_change/pignauru.htm)
Fiji has signed the cooperation's communiqué and submitted proposals, including 10 biogas digesters. Activities which have been proposed to the Italian government include i) Enactment of Fiji's Energy Bill & review/adoption and re-enactment of relevant policies, frameworks and

legislations for RETs, ii) Detailed designing for hydro projects in the Bua (Navakasali/Naruwai), Cakaudrove areas and iii) Detailed designing and construction of hybrid (wind/diesel) project on Gau Island (Vadravadra) - to include maintenance, management, etc.

NB* It has to be noted here that ITALY (under EU banner) has pulled back on most of these funding due to the current political crisis in Fiji. The Government of China has stepped in to finance some of these include the Nadarivatu Hydro Scheme by FEA and Somosomo Hydro Project.

SPREP in 2002 also provided support for the following under the World Bank

- Development of Pacific Islands
- Climate Change Integrated Model (PACCLIM)
- Scenario modeling for climate change, variability
- Assessment of sectoral impacts
- (water, coastal, agricultural, health, fisheries)
- Economic valuation of incremental impact of CC
- Adaptation options two case studies, Viti Levu and Yasawa

These studies have been undertaken by the DOE with technical support from IAS (USP) and SOPAC. This provided the gist for the first national communication report in 2005 (http://www.sprep.org/climate_change/pignauru.htm).

BOX 35 SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

Reason for inclusion

- Development of Sustainable Agriculture in the Pacific (DSAP) is funded by the European Union and implemented by the Secretariat of the Pacific Community (SPC).
- The project commenced in 2003 in the 16 Pacific countries of Fiji, French Polynesia, Tuvalu, Tonga, Vanuatu, Wallis & Futuna, Solomon Islands, Samoa, Kiribati and Papua New Guinea. The other 6 ACP countries are Cook Islands, Niue, Marshall Islands, Nauru, Federated States of Micronesia and Palau.
- At regional level, DSAP works with other sections within SPC to deliver services whether it is the SPC Plant Protection Services for advice on agricultural pests and diseases or the Animal Health Unit, DSAP seeks the services of other sections within SPC to respond to identified farmer needs.
- OFCCP GLOBEC- Investigate the effect and consequences of climate change on the productivity and distribution of oceanic tuna stocks and fisheries in the Pacific Ocean 2002-2009
- Pacific Leaders have recognised the urgency of addressing climate change impacts and have prioritised action on climate change under the Pacific Plan in 2008 and 2009.
- Regional Land Resources Working Group is established for coordination and cooperation of regional organisations at national level to to assist member countries and territories identify and implement appropriate adaptation strategies in the agriculture and forestry sectors.

Assessment of Role

- SPC LRD is approaching CC from various sides including food security (adaptive agriculture), genetic resources (e.g. development of drought resistant local crop varieties, propagation through tissue culture of resistant native varieties etc.), biosecurity (incurrence of invasive plants and pests, quarantine etc.), awareness & training on CDM mechanisms, SLM etc.
- Early this year 2008 SPC conducted a regional awareness workshop on CDM-Forestry. This is linked to carbon trading under the voluntary market.
- SPC works with SPREP in assisting countries in the development of their UNDP/GEF PACC project.
- GTZ is positioning itself to assist the Forestry on projects related to Biomass Conversion, that is replanting of fuelwood and woodlots under the armpit of renewable energy for carbon trading for CDM purpose. Projects that can come under these are afforestation and reforestation. For example the Drawa Project in Macuata can be the ideal sample to replicate nation wide.
- The vision and mission are geared toward regional implementations of UNCCD such as on Landuse issues.
- Realignment to DOE's obligation under the UNFCCC is weak and there is very little data sharing and integration
- Little exchange of information occurs between DOE and SPC, let alone Forestry project with GTZ.

BOX 36 PACIFIC ISLANDS FORUM SECRETARIAT

Reason for inclusion

- Activities are mainly to advocate the climate change and sea level issue at the global level and advising our members at international negotiations.
- Have a component of Capacity Building, Research Science and Monitoring, Staff II assessment, Stage III-Response, Stage V-Policy, Planning and Mainstreaming on CC
- From time to time they reaffirm and inform the public of the Forum decision and responses to international events regarding climate change through a press statement issued by the Secretary General.
- Observer at the UNFCCC Conference of the Parties.
- Participate in various regional and global forums to advance the common position of the Leaders as stated in their communiqué.

Assessment of Role

- Have little linkages to DOE corporate goals in facilitating its obligation under the convention
- Most of the work has been carried out at Diplomatic level with high powered delegations for forum meetings on CC, this translates very little to Fiji's national projects
- Funding to Small Island countries have been lack in the area of environmental conservation, most has been toward policy and economic developments.

BOX 37 SOUTH PACIFIC GEOSCIENCE COMMISSION (SOPAC)

Reason for inclusion

- Strengthening Community Resilience through Applied Community Risk and Vulnerability Analysis Duration: 2 years (1999-2001)
- Community Risk Community Lifelines Oceans and Islands (Reducing Vulnerability of Pacific ACP States Duration: 4 years Status: Finance Proposal Completed Mid 2001. EU funded
- Community Lifelines: Pacific Islands Regional Biomass Energy Resource Assessment Project: (US & Taiwan Funded) 2002-2003
- Community Lifelines: Energy Demand Side Management 2002-2004 (US-Trusties fund)
- Coastal Erosion, public awareness initiatives for atoll islands in Kiribati and Tuvalu. June 1999 (Funded: British High Commission –Suva)
- Ocean Research Coordination Project for Pacific Small Island Developing States July 1999 (Taiwan Funded)
- Regional Implementation Services – Project "Capacity building on technology and economic integration of wind energy and other relevant renewable energy technologies into the electricity systems of Pacific Island Countries" 2001-2004, funded by UNEP/Denmark
- Establishing Land Boundaries for harmonizing Land Use, August 1999, funded by ADB
- A Co-operative Study Project for the Evaluation of the Reserves including Environmental Assessment for Deep-sea Mineral Resources in selected areas of the SOPAC Region. 1999-2005 (Funded by Japanese Govt)
- Environmental Vulnerability Index (EVI) Project Phase III Development of a robust global environmental Vulnerability index. March 2009m funded by New Zealand, Ireland, Norway and Italy
- Community Based Reduction of Vulnerability to Natural Hazards in the South Pacific Nations. 2001 funded by US
- Development of a Regional Improvement Strategy for Disaster/ Risk Information Management, August 2001 NZ funded
- Strategic action Plan on Wastewater in the Pacific May 2001, NZ and Belgium funded
- Coastal Erosion on Tongatapu and Atata, Kingdom of Tonga. Funded by COSMEC
- Pilot project on Empowering Women in Rainwater Harvesting in the Pacific Atoll Islands, 2001, UNEP
- Developing an Oceans Resource Management System for Pacific Large Ocean Islands States, 2001 Taiwan & Republic of China (ROC)
- Regional Capacity building through Institutional Strengthening to support Sustainable Water Resources Management in Pacific Island Countries. June 2001 Taiwan & ROC
- Regional Biomass Resource Assessment as an indicator for Sustainable Energy Development June 2001. Funded by Taiwan & ROC
- Building Capacity to insure against Disasters in Pacific Islands Countries. June 2001. Funded by Taiwan & ROC
- South Pacific Sea Level & Climate Monitoring Project (SEAFRAME)

Assessment of Role

- Have little linkages to DOE corporate goals in facilitating its obligation under the convention
- Most of the work has been carried out at regional level are technical with very little dissemination of information to the DOE. These are

in the area of coastal vulnerability, climate simulation, remote sensing, GIS and mineral exploration (both land and sea).

- In the area of exploration, most of the fund is geared toward exploration of seabed mineral deposits, oil deposits and natural gas deposits.
- Data extracted from these remain confidential and are disclosed only to donor institutions and countries who fund these researches, for example, the information on oil deposits in Fiji was funded by the Australian government since 1900s, most of these data are not available for small island countries but the property of the federal government of Australia
- Data are also extracted from the Mineral Resources Department for their own assessment
- Have a major role to play in containing the constraints and gaps for technical human resources and capacity building
- Have worked a lot on projects for Tuvalu and Kiribati on coastal profiling to assess the impact of sea level rise on these vulnerable low lying atolls.
- Have assisted member countries in the area of geology, geophysics and mineralogy

The international organization which has direct link to weather and climatic observations and studies in the Pacific is the World Meteorological Organisation. Box 38 outlines the projects:

BOX 38 WORLD METEOROLOGICAL ORGANISATION (WMO)

Reason for inclusion

- Strengthening Climate Observing Systems The overall objective of this project is to achieve improved, nationally and regionally integrated and mutually complementary networks of observations to support the provision of weather and climate services in the Pacific. Projects included the following for 2002-2005

❖ *Upgrade ground-surface climate observation systems*
❖ *Provision of Data Collection Platform(DCP) and Automatic Weather Stations(AWS)*
❖ *Marine meteorological and climate data reporting, collection, dissemination and training.*
❖ *Training in climate observations.*
❖ *Restore and upgrade regional and upper-air climate and meteorological network.*
❖ *Provision of high resolution satellite imaging systems.*
❖ *Lightning detection systems.*
❖ *Radar network*
❖ *Technical maintenance back-up*

- Strengthening Telecommunication network: The means of timely collection of raw and processed meteorological, including climate data and products are a necessary prerequisite for the provision of all weather and climate services. In the case of specifically of severe weather warnings, delays and inaccuracy can result in serious consequences. *Project include the following:*

❖ *Provision of high frequency radio transceivers for the collection of weather reports from outer islands.*
❖ *Provision of Local Area Network (LAN).*
❖ *Provision of Emergency Managers Weather*
❖ *Information Network (EMWIN) receiving terminals.*

- Improve Severe Weather Warnings: the objective of the project is to enhance the capacity of Pacific island countries in analyzing and interpretation of data and information relating to severe weather events. The following projects are:

❖ *Human resource development*
❖ *Profession meteorological training*
❖ *Training of support forecasters*
❖ *Training in tropical cyclone analysis, forecasting and warnings*
❖ *Training in the provision of meteorological service to the aviation industry*
❖ *Public education and awareness on severe weather events*
❖ *Public awareness on severe weather to small boats operators Storm surge prediction models*
❖ *High resolution numerical weather forecasts for Pacific island countries*

- Climate Data Management, Analysis and Application. In view of concerns about climate change and variability, availability of useful seasonal and interannual climate prediction and information as most important to agriculture, forestry, fisheries, disaster management and energy sectors. The projects are:

❖ *Climate analysis and applications*
❖ *Training in climatology.*
❖ *Pacific Regional Climate Bulletin*

❖ *Expanding and enhancing the prudent use of climate*

- Institutional Strengthening, Including Infrastructure Support. A Programme to Meet Hydrological Training Needs of Small Island Countries in the Pacific. To provide training to Pacific island countries enabling them to assemble ,maintain and supply data and information on water resources to the following personnel:

❖ *SPREP Meteorological Officer*
❖ *Regional meeting of meteorological service Directors*

- Hydrological Cycle Observing System for the Pacific. Island Countries – Pacific-HYCOS To attain a common level of ability(capacity) to assess and monitor the status and trend of water resources and to provide water related information and hazard warnings to support national social and economic development and environment management; and establish databases and information archives. Projects include:

❖ *Building infrastructure*
❖ *A Programme to Meet Hydrological Training Needs of Small Island Countries in the Pacific*
❖ *Pacific-HYCOS- HYDROLOGICAL CYCLE OBSERVING SYSTEM-*

Assessment of Role

- Lack of information on water quantity and quality prevents small island countries from conducting proper planning, development and sustainable management of their limited and vulnerable water resources.
- Specific calls have been made by Pacific Island Countries' (PICs) for increasing water resources management capacity with respect to their vulnerability to climatic extremes, including droughts, due to El Niño Southern Oscillation (ENSO) events, and flooding, due to the occurrence of cyclones.
- Fiji Meteorology Department which is the focal point for WMO have been coordinating a lot of regional research with SPREP, whilst exchange of information between FM

Stakeholders in statuary bodies include the following:

BOX 39 FIJIAN AFFAIRS (FAB)

Reason for inclusion

- FAB is responsible for Fijian governance and administration.
- This institution is one of the critical stakeholders of the UNFCCC, since it administer a large population of Fijian landowners and resource owners who owns the majority of the terrestrial and marine resources

Assessment of Role

- There is no alignment to the UNFCCC obligations due to lack of integration in the area of public awareness and data sharing
- Conservation is quite a complex issue since a lot of players are involved in the decision making.
- Lack of technical expertise and finance proved to be major issues confronting FAB
- The bureaucratic nature of the institutional framework provides too much red tape, inconsistency and duplication of work.

BOX 40 NATIVE LAND TRUST BOARD (NLTB)

Reason for inclusion

- NLTB is responsible for Fijian governance and administration of native reserve land.
- This institution is one of the critical stakeholders of the UNFCCC, since it administer a large portion of native reserve land owned by indigenous landowners and resource owners who owns the majority of the terrestrial and marine resources

Assessment of Role

- There is no alignment to the UNFCCC obligations due to lack of integration in the area of public awareness and data sharing
- Conservation is quite a complex issue since a lot of players are involved in the decision making.
- Lack of technical expertise and finance proved to be major issues confronting NLTB
- The bureaucratic nature of the institutional framework provides too much red tape, inconsistency and duplication of work.

United Nations Framework Convention on Climate Change (UNFCCC)

The overarching aim of the Framework Convention on Climate Change is to stabilise the concentrations of Green House Gases (GHGs, e.g. carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, perflurocarbons and sulphur hexafluoride) in the atmosphere that are related to human induced interference with the climate system. GHGs are thought to exacerbate climate change and alter agricultural / eco zones e.g. mid-latitude regions are expected to shift 200 - 300 km for each one degree Celsius increase in temperature. Due to glacial melt and thermal expansion of the sea, sea levels are predicted to rise by as much as 65 cm by 2100, threatening both coastal and low lying areas. The frequency and intensity of extreme natural events e.g. storms and hurricanes are also expected to increase

Although the evidence for climate change has continually been bought into question the 1990 First Assessment Report of the IPCC is held to present the first confirmation of the threat of climate change. More recent evidence has confirmed the effects of climate change on the world's oceans with rising sea temperatures. The Second World Climate Conference held in Geneva later that year called for the creation of a global treaty. The General Assembly responded by passing resolution formally launching negotiations on a convention on climate change, to be conducted by an Intergovernmental Negotiating Committee (INC).

The INC first met in February 1991 and its government representatives adopted the United Nations Framework Convention on Climate Change, after just 15 months of negotiations, on 9 May 1992. At the Rio de Janeiro United Nations Conference on Environment and Development (or Earth Summit) of June 1992, the new Convention was opened for signature. The overall objective of the United Nations Framework Convention on Climate Change (UN FCC) is to manage climate change through "***stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system***". The Convention establishes a framework for intergovernmental efforts to tackle climate change, acknowledging the rate of change in natural systems. As such the Convention allows for "a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

3.1 Parties to the Convention

The UNFCC was opened for signature at the Nations Conference on Environment and Development Earth Summit in 1992 in Rio de Janeiro and came into force on 21 March 1994.The Convention currently has 186 signatories. In addition, the Kyoto Protocol representing a substantial extension to the Convention was adopted at the Convention of the Parties in Kyoto, Japan, in December, 1997. The Protocol outlines legally binding commitments and basic rules, although it did not include details on how they would be

applied. The Protocol also required a separate, formal process of signature and ratification by national governments before it could enter into force,

The Convention recognizes three main groups of countries, which are afforded different obligations and commitments under the provisions of the Convention. These are based on countries respective commitments under the Convention, their abilities and contributions to green house gases. According to these groups the differing commitments are:

ANNEX I Parties includes the industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, plus countries with Economies in Transition (EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States. Under their commitments, these Parties are required to set an example of firm resolve to deal with climate change.

ANNEX II Parties consist of the OECD members of Annex I, with exclusion of the EIT Parties. They are required to provide financial resources to enable developing countries to Undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channelled mostly through the Convention's financial mechanism.

NON-ANNEX I Parties includes mainly developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) are more vulnerable to the potential economic impacts of climate change response measures. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology-transfer.

The Convention acknowledges the 48 countries defined by the United Nations as Least Developed Countries (LDCs). These are given special consideration under the convention on account of their limited capacity to respond to climate change and adapt to its adverse effects.

In addition, Parties to the Convention are urged to take full account of the special situation of LDCs when considering funding and technology-transfer activities.

3.2 Fiji - Ratification status

Date of signature of UNFCCC: 09 October 1992
Date of ratification UNFCCC: 25 February 1993

Date of entry into force UNFCCC: 21 March 1994
Date of signature of Kyoto Protocol: 17 September 1998
Date of ratification Kyoto Protocol: 17 September 1998
Date of entry into force Kyoto Protocol: 16 February 2005

3.3 Obligations of Fiji as Non-Annex 1 member

Commitments for Non-Annex 1 Parties as set out in Article 41.
All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

- Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of *anthropogenic emissions by sources* and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;
- Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;
- Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;
- Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;
- Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;
- Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;
- Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations; and

- Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;
- Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas

Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12

- Article 12 defines the required elements of information
- Article 12. Communication of Information Related to Implementation

In accordance with Article 4, paragraph 1, each Party shall communicate to the Conference of the Parties, through the secretariat, the following elements of information:

(a) A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;

(b) A general description of steps taken or envisaged by the Party to implement the Convention; and

(c) Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

4 United Nations Convention on Biological Diversity (UNCBD)

Specific government commitments to ensuring sustainable development and translation of the ideals contained within the Rio Principles and Agenda 21 were defined in different international agreements. These define specific government commitments towards the following issues:

- Biodiversity
- Climate Change
- Desertification

The overarching aim of the Convention on Biological Diversity (CBD) is the conservation and sustainable use of biological resources. The Cartagena Protocol on Bio-safety establishes a regulatory framework to control the harm arising from Genetically Modified Organism (GMOs) on biodiversity and human health. Biological resources, both habitats and species, are being critically threatened. Key habitats are being lost at a rapid rate. For example a third of coral reefs are expected to be lost within 10– 15 years and over half the land area of mangroves, the coral reef neighbour has been destroyed in last thirty years. Species are disappearing at a rate 50 – 100 times the natural rate.

34,000 plant and 5,200 animal species face extinction, and 30% of the principle breeds of farm animals are now subject to the high risk of extinction.

4.1 Key obligations of Fiji as signatory to UNCBD

Fiji signed the CBD in 1992.As a signatory to the UN CBD, Fiji has assumed certain commitments and obligations in the area of global environmental management which have specific capacity requirements. These include the following areas:

As a signatory nation, Fiji obliged to develop national strategies, plans or programmes, a national biodiversity strategy & action plan (NBSAP) (1997-2007) and a national capacity self-assessment program (NCSA) (2008) – i.e. finding out if Fiji has the capacity to fulfil its obligations under the convention

The Dept of Environment is the national focal point for the CBD and obligations of Fiji include:

- integrate conservation and sustainable use into national plans and programmes
- identify, monitor & protect nationally important components of biological Diversity
- develop protected areas + guidelines for management
- promote the protection of ecosystems & natural habitats and maintain viable populations of species within them
- promote environmentally sound development in areas next to protected areas
- rehabilitate & restore degraded ecosystems
- promote recovery of threatened species by implementing management strategies
- manage risks of release of living modified organisms that may affect the natural system
- prevent the introduction of, control or eradicate, alien (exotic) species that threaten natural ecosystems, habitats or native species
- respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities, embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity
- develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations
- cooperate in providing financial and other support for on-site conservation

5 United Nations Convention to Combat Desertification (UNCCD)

The Convention to Combat Desertification seeks to not only tackle the impacts of desertification but also to mitigate the effects of droughts. Under the convention desertification refers to dry land areas vulnerable to over-exploitation and inappropriate land-use as a result of poverty, political instability, deforestation, overgrazing and improper irrigation. Currently the livelihoods of over 1.2 billion people are threatened or at risk because of drought and desertification, impacting 110 countries.

5.1 Key Obligations under UNCCD

Fiji signed the UNCCD in 1998. As a signatory to the UNCCD, Fiji has assumed certain commitments and obligations in the area of global environmental management which have specific capacity requirements. These can be considered in the following areas:

- Design and implementation of programmes to combat desertification and/or mitigate the effects of drought are taken with the participation of populations and local communities and that an enabling environment is created at higher levels to facilitate action at national and local levels; improve cooperation and coordination at sub-regional, regional and international levels, and better focus financial, human, organizational and technical resources where they are needed; develop, in a spirit of partnership, cooperation among all levels of government, communities, non-governmental organizations and landholders to establish a better understanding of the nature and value of land and scarce water resources in affected areas and to work towards their sustainable use (Article 3);
- Provide an enabling environment by strengthening, as appropriate, relevant existing legislation and, where they do not exist, enacting new laws and establishing long-term policies and action programmes (Article 4);
- Establishment and/or strengthening, as appropriate, of early warning systems, including local and national facilities and joint systems at the sub-regional and regional levels, and mechanisms for assisting environmentally displaced persons; strengthening of drought preparedness and management, including drought contingency plans at the local, national, sub-regional and regional levels, which take into consideration seasonal to inter-annual climate predictions; establishment and/or strengthening, as appropriate, of food security systems, including storage and marketing facilities, particularly in rural areas; establishment of alternative livelihood projects that could provide incomes in drought prone areas; and development of sustainable irrigation programmes for both crops and livestock (Article 10);
- Enhance national climatologically, meteorological and hydrological capabilities and the means to provide for drought early warning; promote policies and strengthen institutional frameworks which develop cooperation and coordination, in a spirit of partnership, between the donor community, governments at all levels, local populations and community groups, and facilitate access by local populations to appropriate information and technology; provide for effective participation at the local, national and regional levels of nongovernmental organizations and local populations, both women and men, particularly resource users, including farmers and pastoralists and their representative organizations, in policy planning, decision making, and implementation and review of national action programmes (Article 10) organizations, in policy planning, decision-making, and implementation and review of national action programmes (Article 10);
- Strengthening training and research capacity in the field of desertification and drought by establishing and/or strengthening support and extension services to disseminate relevant technology methods and techniques more effectively (Article 19);

- Effective operation of existing national institutions and legal frameworks and, where necessary, creation of new ones, along with strengthening of strategic planning and management; and by means of exchange visitor programmes to enhance capacity building in affected country; through a long-term, interactive process of learning and study conduct, and competent intergovernmental and non-governmental organizations, for an interdisciplinary review of available capacity and facilities at the local and national levels, and the potential for strengthening them (Article 19);
- Full participation at all levels of local people, especially women and youth, by training field agents and members of rural organizations in participatory approaches for the conservation and sustainable use of natural resources; by fostering the use and dissemination of the knowledge, know-how and practices of local people in technical cooperation programmes, by adapting relevant environmentally sound technology and traditional methods of agriculture and pastoralist to modern socio-economic conditions (Article 19);
- Strengthen the capacity of affected developing country by providing appropriate training and technology in the use of alternative energy sources, particularly renewable energy resources, aimed particularly at reducing dependence on wood for fuel; (Article 19); and
- Parties to develop and implement programmes in the field of collection, analysis and exchange of information through innovative ways of promoting alternative livelihoods, including training in new skills; by training of decision makers, managers, and personnel who are responsible for the collection and analysis of data for the dissemination and use of early warning information on drought conditions and for food production

6 Capacity Assessments

The three Rio Conventions are related. Climate change affects biodiversity and desertification. The more intense and far-reaching climate change is, the greater will be the loss of plant and animal species and the more dry land and semi-arid terrain around the world will lose vegetation and deteriorate .Lack of capacity is the single most important obstacles in meeting the obligations of the three Rio Conventions. Accordingly capacity assessment was done for all three thematic areas including SWOT analysis and projects visits etc were undertaken commonly for all conventions .A single approach for capacity assessment was undertaken for all three conventions

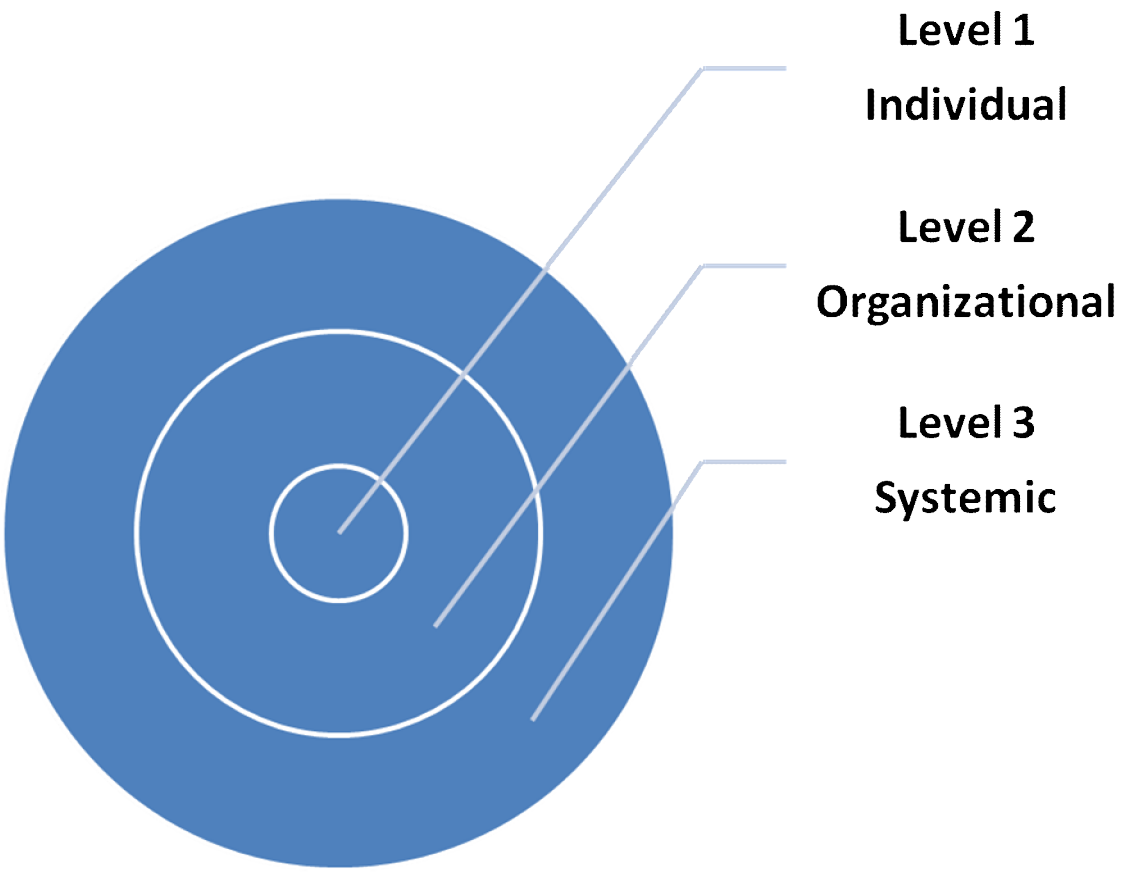
6.1 Three Levels of Capacity

UNDP has defined ***Capacity*** as the ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner.

Capacity Development (CD) is the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time. It is a concept which is broader the organizational

development since it includes an emphasis on the overall system, environment or context within which individuals, organizations and societies operate and interact. There seems to be an emerging consensus that CD involves the long term, contributes to sustainable social and economic development and also suggests a shift towards enhancement and strengthening of existing capacities.

In the development context, capacity exists at three levels- Individual, Organizational and Systemic.



Individual Capacity refers to specific attributes enabling individuals to perform functions, make decisions and ensure these are implemented in an effective, efficient and sustainable manner. Common definitions include human resources, ecological and geographical conditions, scientific and technological capacities, levels of education, formal and informal skills development programmes, levels of responsibility,

participation and accountability in decision making, understanding of roles and functions, incentives, salary structures, motivation and morale

Organizational Capacity refers to institutional levels, focusing on the overall performance and functional capabilities of an organisation, access to finances, information, technology, infrastructure and other resources, building linkages with other organizations and stakeholders, its organizational structure and its ability to adapt to change.

Systemic Capacity refers to organizational concerns in creating "enabling environments". This includes policies and plans, economic, regulatory and accountability frameworks within which institutions and individuals operate, the relationships that exist, both formally and informally, between institutions and the distribution of institutional responsibilities.

6.2 Tools for Capacity Assessment

The various tools used for capacity assessment at three levels – Systemic, organizational and individual include but not limited to the following:

- Desk Study
- Interview
- Questionnaires
- Workshops
- Capacity Development Training
- Stake holder consultations
- Field Trips/Visits
- SWOT Analysis
- Root Cause Analysis
- Gap Analysis

TOOLS FOR CAPACITY ASSESSMENT

6.2.1 Desk Study

The desk study and literature review was conducted from available documents and publications, but not limited to the following:

- UNFCCC , UNCBD & UNCCD
- Project Document of NCSA
- Information paper on the Project

- Selected reports already available in Environment Ministry
- Legal and regulatory framework study including Environment Management Act
- Mission and Vision statements
- Stock Take Report prepared by local Consultants
- Overview of literature available on the thematic areas

6.2.2 Interview

Discussions and interviews were a part of the process from the very inception as interview provides first hand and best information not otherwise available easily. Mostly questions pertaining to all three levels- systemic, organizational and individual were posed to officials during visits and response solicited on challenges, constraints and capacity needs based on their ground experience

6.2.3 Questionnaires

Questionnaires were prepared and sent to various Ministries before Capacity Development training was imparted (Annexure - 1). Also questionnaires on various areas covering three levels of capacity were prepared and administered during SWOT Analysis (Annexure-2)

6.2.4 Workshops

Two workshops were conducted as under:

- July 29-30, 2008 – Southern Cross Hotel Suva (24 Participants from various Ministries, INGOs, Embassies , USP etc)
- Aug 12, 2008 – Hotel Takia, Labasa (For benefit of officials from Northern Province . 10 participants from various Ministries and Fiji Development Bank attended)

The objectives of the workshops were:

- Capacity building: definitions of key concepts
- Concept of Capacity Development at three levels-Individual, Institutional and systemic
- National Capacity Self Assessment
- Review of existing frameworks and guidelines for Capacity Assessment
- Obligations under three conventions and Fiji's Baseline Stocktake information
- National Capacity Self Assessment Constraints
- Share lessons of experience in the application of Capacity Assessment
- Gathering thoughts on Capacity Development Strategy & Action Plan

6.2.5 Capacity Development Training

As lack of capacity has been increasingly recognized as a main obstacle to sustainable development capacity training programme for 2 hours duration for various key stake holders were planned covering areas such as concept of capacity, levels- systemic, organizational and individual, NCSA concepts etc. The programme was conducted in the following departments.

- Department of Fisheries
- Ministry of Mineral Resources Development
- Department of Land
- Ministry of Agriculture
- Department of Forest, Suva
- Department of Forest, Labasa
- Department of Environment, Suva

6.2.6 Stakeholder Consultations

Discussions/consultations with key stake holders were one of the important component of this assignment and consultations has been held through:

- Meeting representatives from Departments
- Discussions during meetings/workshops
- Brainstorming sessions
- Interaction during capacity development training programmes

6.2.7 Field Visits including Projects

As a part of the assessment field/project visits were undertaken to have a first hand information on the ground realities .Besides it also provided an opportunity to interview the key officials and understand the challenges, constraints they face in execution of projects and their capacity development needs. Projects visited include:

- Draketi Rice Irrigation Project(Ministry of Agriculture)
- Forest Department , Labasa
- Macuata Tikina Holdings Limited, Labasa
- Fiji Forest Industries, Labasa
- DRAWA (Sustainable Forest Management) Project
- Forestry Nursery Project, Korotari
- Sea Qua Qua Research Centre, Ministry of Agriculture
- Fisheries Department, Savu Savu

(Details of visits and points brought out during discussions are in Annexure-4)

6.2.8 SWOT ANALYSIS

6.2.8.1 Purpose and Method

SWOT Analysis is a strategic planning method used to evaluate the **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats involved in a project. It involves specifying the objective of the project and identifying the internal and external factors that are favourable and unfavourable to achieving that objective

The SWOT analysis is aimed at consolidating and interpreting the findings from the review of commitments contained in the UNFCCC and Fiji's response as Party to the Convention. The SWOT was based on consolidation and interpretation of findings from the stock-take review and assessment culminating in a consultative analysis with key stakeholders. The SWOT aids in identifying gaps, by looking at strengths and weaknesses in existing structures, policies and approaches in relation to the Conventions obligations and commitments.

In SWOT strengths and weaknesses are internal where as opportunities and threats are external. The nature of the Conventions means that internal factors reside largely in government structures and processes, whilst external factors refer primarily to matters outside of the government

SWOTs are used as inputs to the creative generation of possible strategies, by asking and answering each of the following four questions:

- How can we use each Strength?
- How can we stop each Weakness?
- How can we exploit each Opportunity?
- How can we defend against each Threat?

SWOT analysis was conducted for all three levels of capacity – Systemic, Organizational and Individual. It was conducted at several organizations during training and discussions and the synopsis is as under with reference to the UNFCCC.

SWOT Analysis was conducted in the following organizations:

- Department of Fisheries
- Ministry of Mineral Resources Development
- Department of Land
- Ministry of Agriculture
- Department of Forests, Suva
- Department of Environment, Suva

6.2.8.2 Overview of findings from the SWOT Analysis

STRENGTHS	WEAKNESSES
➢ Signatory to all UN Conventions – UNCCD,UNFCCC and UNCBD ➢ Strong legal and financial commitment to principles of sustainable development ➢ Technical capacity exists nationally ➢ Comprehensive Policy framework ➢ Institutional framework strong & clearly defined ➢ Active awareness programme ➢ Capacity exists within areas of expertise under the UN FCCC ➢ Community structures strong ➢ Good available capacity ➢ Institutions good ➢ Policy / legislation exists ➢ Public awareness and educational system strong ➢ Size of the country being small , easy to monitor ➢ Strong commitment to principles of sustainable development ➢ Tertiary level course available on environment in USP etc ➢ Individual commitment ➢ Lots of awareness for conservation of nature ➢ Comprehensive Policy framework ➢ Technical capacity available for preparation of national action plans ➢ Vision and Mission Statements available in key Ministries ➢ Job related training imparted ➢ Sustainable Forest Management Projects available	➢ Lack of awareness of UN Conventions ➢ Lack of specific mandates relating to Conventions ➢ Organizational structures poorly articulated ➢ No specific law on climate change and only a policy exists ➢ Plethora of laws available on biological diversity , but only very few are relevant ➢ Policy – institutional linkages poorly defined ➢ Policy & legislation difficult to apply ➢ Lack of incentives ➢ Lack of skilled manpower ➢ Lack of any assured career progression ➢ Less sharing info among colleagues at work ➢ Lack of institutional linkages ➢ Lack of coordination of research activities ➢ Implementation slow ➢ Lack of finance ➢ Lack of implementation ➢ Weak penalties for violation ➢ No established link between policy development & economic planning ➢ No integrated research & monitoring strategy ➢ Reliance on consultants for reporting ➢ Limited training facilities environmental issues ➢ Lack of specific mandates relating to Conventions ➢ Communication and linkages ➢ Overlapping responsibilities & policies ➢ Little knowledge about UN Conventions, though some awareness is there. ➢ Mission and vision statements too broad /generic ➢ International conventions have not

	been incorporated in to Fiji's Laws and regulations ➢ Organizational structures poorly articulated ➢ Policy – institutional linkages poorly defined ➢ Weak penalties ➢ Policy & legislation difficult to apply ➢ Weak penalties ➢ Government not taken research seriously ➢ Minimum downward communication ➢ Lack of adequate skilled manpower ➢ Lack of technology ➢ Too many agencies with conflicting agenda ➢ Low participation at high level decision making ➢ No integrated research & monitoring strategy ➢ Lack of coordination with focal points ➢ Gap in sharing information with key stakeholders
OPPORTUNITIES	**THREATS**
➢ The UN Conventions ➢ Strong international & regional policy environment ➢ Non-enforceable multi-lateral agreements ➢ Strong regional research on environment ➢ Non-enforceable multi-lateral agreements ➢ Funding available through international organizations ➢ Some networking exists between stake holders	➢ Lack of enforceability of multi-lateral agreements ➢ Poor performance of focal points in reporting as per obligations ➢ Lack of objective self analysis & criticism ➢ Donor dependency ➢ Possible changes in Government Policy ➢ High Turn over of skilled personnel due to better job opportunities outside ➢ Donor time frames and lack of clarity ➢ Lack of enforceability of multi-lateral Agreements ➢ Changes in Government policies ➢ Political Instability ➢ Funding priorities might change

6.2.9 Root Cause Analysis

During workshops and training programmes stakeholders participation was critical and the same was facilitated through brainstorming and conducting plenary sessions underpinning the root cause of the specific weaknesses which are constraints capacity development. Some of the issues emerged were:

- Lack of awareness is one of the biggest challenges. Lot of people are vaguely aware of UN conventions , but not knowledgeable enough to understand responsibilities in the correct perspective
- Technical and skilled manpower is another common constraint in all departments including the focal points.
- Retention of staff is a constraint identified by many institutions in the government sector. A lack of incentives seems to cause attrition from the public service
- Lack of finances is often cited as another common problem. The problem is that there are competing factors all vying for the same funds, which are limited.
- It was agreed by all that greater communication among all stakeholders is key to ensuring greater participation and involvement
- Lack data/information on climate change, Land degradation etc with insufficient coordination among and within the relevant agencies was identified as another root cause

6.2.10 Gap Analysis

The purpose of gap analysis was to find out the various areas where there exists gap between existing and desired capacity level. Some of the issues identified during the analysis are:

- Lack of definition of Convention requirements (Awareness is there, but specific requirements are not widely known)
- Lack of appropriate mandates to implement (Climate Change policy is generic and no specific legislation exist on climate change, Lack of specific legislation to address climate change
- Plethora on laws and legislation available , but very few are relevant and top of that weak penalties do not deter violators
- Lack of skilled staffs to address obligations under the convention (high turnover of staffs in technical category is a matter of concern for almost all departments. There is acute shortage of staffs in DOE itself which is the focal point for UNFCCC & UNCBD and most works being done through volunteers)
- Fiji Environmental Management Act is yet to include specific acts and legislations critical to climate change issues
- Inadequate policy linkages across the Conventions (specific actions required to develop policies for each convention followed by procedures for meticulous implementation)

- Inefficient information collation and dissemination by Focal Points(more coordination required between focal points and other stake holders)
- Difficult and time consuming reporting mechanisms (collation and synthesis for the purpose of reporting is time consuming and laborious. It often involves a repetitive process of re-starting and reviewing with each reporting period)
- Inadequate feedback mechanisms to stakeholders (tasks are being done by various departments needs mapping and duplication of efforts avoided)
- Poor financial access and support for implementation (though funds are available both through government and international agencies like GEF & UNDP etc. but donors have their own timeframes and conditions and therefore more than one agency at times compete for the same fund)
- Poor institutional knowledge and redundancy due to high levels of staff turn-over (the skilled staffs take away intuitional memory as other were not trained for technical tasks)
- Insufficient capacity enhancement / mobilization as a result of unfocused capacity development (capacity exists , but needs to further reinforced, developed and strengthened)
- Limited research framework / strategy to provide baseline data (especially in government level limited research facilities available. But other INGOs and academic institutes are also conducting research which could be used. Government may like to enter in to MOUs with INGOs /Research Institutions. In some cases MOUs exists but need better monitoring and coordination)
- Inadequate integration of activities related to conventions (many organizations-NGOs, government , INGOs and USP etc are working in field of environment and their synergy needs to be integrated)
- Low levels of awareness and participation by stakeholders (adequate awareness and knowledge is sine qua non for proper implementation)
- Lack of training and material in environmental management (at all level training on environment issues is a definite requirement to comprehend the UN conventions in the correct perspective)
- Poor utilization of the media to advocate the Conventions and raise awareness (media has great role to play in raising awareness)

7 Analysis & Recommendations

The pace of development is determined by the volume of available resources and the effectiveness and efficiency with which those resources are used. Capacity development means addressing these effectiveness and efficiency challenges at the individual, organizational, and institutional levels. In the past, capacity development has emphasized building individual skills and creating or reorganizing government units.

In recent years, however, the development community has turned to a broader and more holistic approach, recognizing that public and private sector capacity in many countries is still deficient and that the quality of governance is a crucial success factor. This approach defines capacity development as a long-term process requiring both

supply- and demand-side solutions—the supply of well-structured and efficient public and private organizations and institutions, and civil society's demand for government accountability and improved public sector performance.

At the systemic level capacity assessment focuses on governance, policy, rule of law, effective functioning of subsystems within the system, interaction with civil society, exploring how policies, incentives, and norms in these and other institutions shape individuals' and organizational goals and actions, norms, laws, rules, or policies that enable organizations and individuals to achieve development results

Focus at Organizational level requires efforts to strengthen management systems and business processes. How task-oriented organizations interact (or fail to interact) to achieve results determines overall organizational capacity besides organizations to manage resources, perform functions, and achieve and sustain outcomes

And at the Individual level it involves works with partners, to develop key skills and knowledge, as well as the means for delivering and assessing learning. The emphasis is on targeted skills and knowledge required for individuals to perform functions

7.1 United Nations Frame Work Convention on Climate Change (UNFCCC)

7.1.1 Systemic Capacity

The analysis & recommendations include:

- There is no legislation governing the major thematic area of Climate change except Fiji's Climate change Policy that in generic explains the governing policy for implementation through institutional legislation and framework. Existing environmental legislation such as the Fiji Environmental Management Act is yet to include specific acts and legislations critical to climate change issues
- Mitigation of greenhouse gas emissions may not be a high priority, in Fiji as there are limited industries. However, it should be addressed where possible. Application and development of appropriate technologies should be developed.
- Fiji is having a policy framework centred around principles of sustainable development and environmental management, although there are no specific legislative measures addressing the issue of climate change though some attempts to address the issues do exist in Environment Management Act
- There is generally very limited understanding of climate change issues in Fiji at all levels. One of the biggest challenges facing realization of the objectives behind the UNFCCC is related to awareness. Awareness raising, education, and training on climate change should be enhanced at all level.
- Adaptation capacity, especially of rural people and farmers, has to be strengthened. It is understood that diversifying choices and building broader bases for livelihoods help build adaptation capacities.
- Lack of quantitative and qualitative technical and scientific data to fully assess the impact of climate change in Fiji and the region, in particular sea level changes and its impact on low lying coastal areas makes policy and decision

making difficult for appropriate mitigation and adaptation options and requires more research. Some climate change specific research and technical capacities need to be developed. Currently most such work is carried out by international scientists and consultants.

- Negotiation is key to clinching successful deals. Action should be taken to strengthen negotiation skills of Fijian professional and diplomatic staff at the COPs and other relevant fora so as to negotiate successful instruments/deal in favor of the country.
- Socio-economic gains that can be derived from implementation of the UNFCCC which needs to be highlighted and aggressively published for information of all concerned. Besides national capacity be developed to mainstream related issues into general planning and strategy formulation
- A thorough understanding and commitment at government level is a must to implement the provisions contained within the Convention. The issues and implications as a result of climate change are long-term changes. The development of an enabling environment for engaging the UN FCCC requires political support that extends beyond the initial signing and ratification of the convention and need to be prioritized at Government level
- A contribution to the United Nations Framework Convention on Climate Change from the private sector also needs to be included in all determinations, requiring strong collaborative mechanisms. These are needed to facilitate the sharing of information and facilitating partnerships between government and industry.
- There is very little utilization of academic, research or regional environmental institutions to provide substantive support in the process; (lack of coordination, lack of manpower due to lack of finance ,research already done by institutions are duplicated at times) which requires to be streamlined.
- Continued financial support to the Department of Environmental is needed to guarantee that all reporting obligations can be met. Many of these assignments are outsourced due to staff bottlenecks
- Department of Environment would also facilitate the development of an enabling environment by increasing awareness and linkages between government, NGOs and the private sector. This would help to overcome the legal, institutional and individual challenges in accessing funding and strengthen support in negotiations with other Parties to the Convention.
- There is also need to prepare a comprehensive national action plan focused on capacity building that will identify follow-up projects, overall goals, specific objectives to be achieved and course of action;
- Steps need to initiated to identify ways to coordinate and harmonize overlapping activities among the three Conventions and to help ensure effective national measures to protect the environment

7.1.2 Organizational Capacity

The analysis & recommendations include:

- A strong focus on research initiatives and models on best practices experimented in other countries (preferably in pacific region) needs to be extrapolated and tried under Fijian conditions to determine it's viability
- Individual institutions need clearly defined lines of responsibilities, mandates, mission statements, organizational visions and directions. This is required to fulfil their mandated under the conventions
- Training of technical staffs is an ongoing requirement and supporting delegations to attend meetings of the COP and thus, developing institutional memory should be done more often which is now done at a very limited level
- Through appropriate training measures evaluation and implementation of climate change policies and measures could be further enhanced
- DOE needs to be strengthened with respect to integration and interaction with other departments and ministries, particularly where the impact of climate change impacts directly on these institutions to fulfil their national mandates. The DOE should be given the resources and mandate to coordinate and champion national action plans in relevant sectors.
- Strengthening dialogue, information exchange and cooperation among all relevant stakeholders including governmental, non-governmental, academic, and private sectors is required for better understanding and coordination
- At the organizational level there is a need to ensure sufficient financial resources to fund activities inherent to the UNFCCC as NCSA is only a starting phase and continued monitoring and evaluation would go a long way in meeting the obligations.
- Mitigation measures and move toward the reduction of emissions, organizational investment and support for the development and implementation of cleaner technologies would require institutional support. These need to be tried, tested and subsequently promoted through the development of appropriate policy and incentive mechanisms. This can only be achieved if there is a single agency with access to the right information and the key decisions makers.
- Communication of policies and policy instruments should be disseminated to regional and local level to raise awareness and commitment
- Effective implementation of policies and policy instruments will ensure adherence to fulfilling obligations.
- Greater communication among all stakeholders is key to ensuring greater participation and involvement
- Retention of staff is a constraint identified by many institutions in the government sector. A lack of incentives seems to cause attrition from the public service which needs to be addressed

7.1.3 Individual Capacity

The analysis & recommendations include:

- Continued skills development and other forms of training for key officials.
- Fostering understanding of importance of experiences and attitudes to bring about changes in quality of work.

- Individual capacity is central to successful realization of the provisions of the UN FCCC. Capacity requirements therefore need to address human resources management, such as career progression and security of tenure, providing opportunities for accessing training, networking opportunities etc..
- The specialized skills required addressing issues of climate change, and the limited availability of these may result in significant "brain drain". This is a common problem in most of the departments where attrition rate in skilled and qualified staff is very high. To arrest the trend measures, such as appropriate incentives, skills refreshment programmes, career progression, are needed to ensure that such staff is retained.
- Climate change issues need to be included in school curriculum and further developed at tertiary institutions. Individuals with responsibilities under the UN FCCC require clearly defined mandates and job descriptions with associated responsibilities for incumbents. This will afford a sense of empowerment and ownership and engender greater responsibility. This is required under the provisions for training and education Article 6 of the Convention along with Article 12 which requires information to be communicated.
- Security of tenure applies to government, academics, local consultants and practitioners. Given the specialized nature of skills required to address issues of climate change, and the limited availability of these within the country, there is a high probability of loosing staff to the private sector or neighbouring countries. Measures are needed to ensure that such staffs are retained and institutional memory is not lost.
- The enhancement and development of individual capacity, in terms of realizing the objectives of the Convention can be achieved through development of clearly defined mandates and job descriptions with associated responsibilities for incumbents. This will afford a sense of empowerment and ownership and engender greater responsibility.

7.2 United Nations Convention on Biological Diversity (UNCBD)

7.2.1 Systemic Capacity

The analysis & recommendations include:

- There is a plethora of legislations on conservation. But only few of those are relevant in the present context. Revision and updating is an inescapable requirement
- The comprehensive body of legislation and the existing policies also need to be reviewed to ensure harmonization
- Dissemination of information at the national level not efficient. Apart from that loss of biodiversity and the corresponding goods and services it provides is not properly understood and documented
- Realization of the objectives under the UNCBD requires the development of an enabling environment and widespread recognition of the economic value of

biodiversity protection in Fiji which needs to be brought out in all possible forum including TV and media

- There is a clear need for full utilization of existing scientific and traditional knowledge, public education and awareness at all levels. This will remain an ongoing activity
- Biodiversity is a key component of the tourism industry in Fiji, which is also likely to contribute to the greater awareness and towards that end. industries and personnel working in tourism industry should be targeted for awareness programmes on biological diversity and conservation.
- There is an acknowledged need for greater political awareness to engender a political commitment and will to ensure implementation and sustainability at the national level. Political commitment needs to be translated into national interventions that address the overall economic, policy, legislative, political and national infrastructure to ensure sustainable development and sufficient protective measures.
- Tax incentives for the private sector for use and implementation of conservation measures and alternative technologies, community management and quotas through community based systems are needed for greater participation.
- The legislative and policy measures in place need to be continually revised to incorporate these economic instruments and respond to market changes.
- There is also a need to prepare a comprehensive national action plan focused on capacity building that will identify follow-up projects, overall goals, specific objectives to be achieved and course of action
- Public education efforts must continue and mechanisms found to ensure its sustainability and coordination and integration with the other Rio Conventions. Special emphasis to be placed on the judiciary, police, local government organizations and communities in protected areas.
- Steps need to initiated to identify ways to coordinate and harmonize overlapping activities among the three Conventions and to help ensure effective national measures to protect the environment

7.2.2 Organizational Capacity

The analysis & recommendations include:

- According to the comprehensive framework for biodiversity protection and management capacity under the provisions of the Convention, improved institutional frameworks, linkages, and communication among all stakeholders are required. There are a number of organizations responsible for the conservation and sustainable use of biodiversity. Central to successful realization of the objectives of the UN CBD is the articulation of clearly defined mandates and organizational autonomy.
- Fiji had made progress in revising and re-aligning the organizational framework and institutional arrangements in relation to biodiversity.
- Greater communication among all stakeholders ensuring greater participation and involvement.

- There is need for improved institutional frameworks and linkages. The legislative framework currently assigns responsibilities for the conservation of biodiversity among numerous institutions. which are often these have overlapping, and at times conflicting
- Facilitating harmony and stability within institutions and among stakeholders will help catalyze beneficial conservation activities according to the UN CBD.
- DOE needs to be strengthened with respect to integration and interaction with other departments and ministries, particularly where the impact of climate change impacts directly on these institutions to fulfill their national mandates. The DOE should be given the resources and mandate to coordinate and champion national action plans in relevant sectors.
- DOE which is the focal point for UNCBD is having acute shortage of skilled staffs and most works being carried out by un-established staffs and volunteers and this affects their efficiency to some extent
- The integration of organizational stakeholders through an appropriate information management system would assist in streamlining and harmonizing the efforts of different organizations.
- The establishment of mandatory and standardized reporting procedures would help disseminate information to stakeholders and assist organizations in maximizing time efficiency and reporting to the COP.
- Organizations are typically under-staffed in comparison with normally 10 percent cut on established strength and
- Lack of financial resources was identified as a primary contributing factor. However, it was acknowledged by participants that funding often exists and that the constraints are in identifying and accessing sources of funding.
- Sustainability of funding and the methods for accessing resources are also major obstacles.
- Insufficient biological information on flora and fauna with insufficient coordination among and within the relevant agencies would make implementation of policies and policy instruments difficult which needs to be addressed.
- Organizational reforms also need to address the issue of staff retention. There is also a lack of institutional memory in many organizations and a discontinuity of staff, owing in large part, attractive opportunities in international organizations, NGOs and outside the country.
- Communication of policies and policy instruments should be disseminated to regional and local level to raise awareness and commitment
- Effective implementation of policies and policy instruments will ensure adherence to fulfilling obligations.
- Greater communication among all stakeholders is key to ensuring greater participation and involvement
- Retention of staff is a constraint identified by many institutions in the government sector. A lack of incentives seems to cause attrition from the public service which needs to be addressed

7.2.3 Individual Capacity

The analysis & recommendations include:

- Fiji's history of conservation and wildlife management is widely influenced by individual capacity success of national initiatives is inherently linked to the commitment and capacity of individuals.
- There is a significant need for a national strategy to coordinate individual and organizational efforts and facilitate the development of capacity appropriate to national needs.
- Continued skills development and other forms of training is key to accomplishment of the objectives
- Responding to global changes in biodiversity conservation concepts and management practices, Fiji will need to strengthen its individual capacity
- Wildlife management training for territorial forestry staff so that can employ fundamental wildlife management knowledge and skills;
- Given the limited number of individuals the ability to respond and absorb changes in the development of issues pertaining to biodiversity is limited. In the absence of a large pool of suitable skilled personnel and with low staff/skills turnover, investments need to be made in skills development in an area that is changing rapidly.
- There is an acknowledged need to invest further in capacity relating to trade policy and legal mechanisms, data / information management and skills relating to negotiations around issues covered under the UNCBD and international agreements.
- The DOE has been mandated with responsibilities of the UN Conventions, although the staff allocations appear to be insufficient given the time required for reporting, collation of information and day-to-day management. To meet these requirements in a timely and effective manner requires a significant investment in increasing individual capacity (quantity and quality) and/or the generation of additional organizations/structures to account for these limitations.
- The development of these individual capacities must be developed in tandem with systematic and organizational capacities. Many general organizational issues of human resource management, security of tenure, continued training and career development along with financial incentives, are all instruments that need to be developed to ensure that such capacity is developed and retained within the national context.

APPENDIX 8-2: QUESTIONNAIRE SURVEY OF IMPLEMENTATION EFFORTS

APPENDIX 8-3: PROCEEDINGS OF THE UNFCCC CONVENTION COP 13 (BALI PLANS OF ACTION)

APPENDIX 8-4: INSTITUTIONS, PROJECTS AND CONTACTS OF STAKEHOLDERS

CONVENTION LISTED Programs / Projects UNFCCC						
Fiji Projects Initiated Under Implementation of UNFCCC						
Project Title	**Donor Agencies**	**Implemented by**	**Year of Implementation**	**Contact Person**	**Contact Details/ Email**	**Objective**
The South Pacific Sea Level and Climate Monitoring Project (SPSLCMP)	AusAID	SOPAC/Geoscience Aus.,NTC,MC	2006-2010(4th phase)	Andrick Lal	andrick@sopac.org	Was developed as an Australian response to concerns raised by Pacific Island countries about the potential impacts of human-induced global warming (the "Greenhouse Effect") on climate and sea levels in the Pacific.
The South Pacific Sea Level and Climate Monitoring Project (SPSLCMP)	AusAID		2001-2005(3rd phase)	Andrick Lal	andrick@sopac.org	same as above
South Pacific Sea Level & Climate Monitoring Project (SEAFRAME)	AusAID	SOPAC	1992 - 31 December 2010	Andrick Lal	andrick@sopac.org	Monitor changes in sea level and climate in the Pacific
Kabara Climate Witness Project	WWF US/WWF Indonesia	WWF	ongoing	Ms. Kesaia Tabunakawai	ktabaunakawai@wwfpacific.org.fj.	A global program that works to capture and provide information in relation to indigenous knowledge regarding climate change
Reducing Community Risk against Climate Change Disasters in the Pacific		WWF	2007-2008	Jyotishma R Naicker		Aims to produce a communications tool for use in and by communities linking climate change and disaster risk reduction
Pacific Island Climate Update (ICU) Bulletin		SOPAC	ongoing	Linda Yuen	linda@sopac.org	Aims to produce monthly bulletin for public awareness on regional climate, impact of el-nino and rainfall predictions
Pacific Island Climate Data Rescue (PI CDR) Project		SOPAC	Ongoing	Linda Yuen	linda@sopac.org	To assistin five countries in the Pacific dealing with the harsh realities of our natural environment, including drought, floods, fires, storms, tsunami and tropical cyclonesf
Pacific Hydrological Cycle Observing System Project (Pacific HYCOS)		SOPAC	Ongoing	Linda Yuen	linda@sopac.org	To attain a common level of ability (capacity) to assess and monitor the status and trend of water resources and to provide water related information and hazard warnings to support national social and economic development and environment management; and establish databases and information archives
Rainwater Harvesting Pilot		SOPAC	Ongoing	Linda Yuen	linda@sopac.org	Aim to outline the many urgent issues in the

Project						water sector that was thought to require urgent attention by responsible organisations nationally and regionally
Fiji's Seasonal Rainfall Prediction Model	AusAID	FMS	ongoing	Ravind Kumar, Ph: 6724888, 6736040		AUSAID-funded project allowing the Australian Bureau if Meteorology's National Climate Centre (NCC) to work with FMS to produce a stand-alone, PC-based prediction scheme for Fiji seasonal rainfall
Sustainable Growth Initiative: Fiji Water Project		Fiji Water	Ongoing 1/1/2008	Sangeeta Ph. 331-4486x8210	singhSK1@state.gov	FIJI Water's Sustainable Growth Initiative is a multi-pronged effort that includes reduction of CO_2 emissions associated with the company's operations, purchase of permanent and verifiable carbon offsets to cover 120% of the emissions that cannot be reduced directly, and protection and permanent preservation of the largest remaining area of pristine rainforest in Fiji.
Adaptation to Climate Change in the Tourism sector in Fiji Islands	GEF/SCCF	UNEP	Ongoing 2007	Manoa Malani	mmalani@govnet.gov.fj	A demonstration project which will reduce the vulnerability of the tourism sector to the impacts of climate variability and change
Piloting Climate Change Adaptation to Protect Human Health (PCCAPHH)	GEF/SCCF	UNDP / FSM	Ongoing 2007	NA		To implement a range of strategies, policies and measures that will decrease health vulnerability to current climate variability and future CC
Climate Change Adaptation in Rural Communities of Fiji	AusAID	IAS/PACE-SD,USP	Ongoing 2006	Leone Limalevu, 3232892	l_limalevu@yahoo.com	Community based climate change adaptation
Water Shortages in Bavu, Western Viti Levu	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009	Leone Limalevu 3232892	l_limalevu@yahoo.com	Adaptation to reduce impact of water shortage
Coastal Erosion and Water Problems in Votua, South West Viti Levu	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009	Leone Limalevu 3232892	l_limalevu@yahoo.com	Assessment of coastal vulnerability and identification of mitigation options appropriate for the site
River Bank Erosion and Inundation in Buretu, Southeastern Viti Levu	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009	Leone Limalevu 3232892	l_limalevu@yahoo.com	Assessment of shoreline erosion and identifying soft and hard mitigative option for flooding control
Coastal Erosion & Inundation in Navukailagi, Lomaiviti	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009	Leone Limalevu	l_limalevu@yahoo.com	Assessment of shoreline erosion and identifying soft and hard mitigative option for

				3232892		coastal inundation and wave impact on the village shore
River Bank Erosion & Flooding in Korotasere, Vanua Levu	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009	Leone Limalevu 3232892	l_limalevu@yahoo.com	
	AusAID	IAS/PACE-SD,USP	Ongoing 2006-2009		l_limalevu@yahoo.com	
Climate Change in the Pacific Countries (AIACC) -Navua town&Natadola area	START	PACE-GCI(UoW),USP Geography Department	Completed 2004	Professor Koshy Kanayathu,	N/A-Left USP, 2008	
Climate Change Variability - Community Relocation Project	APN	IAS/PACE-SD(USP),(UoW)	Completed 2005	Professor Koshy Kanayathu,	N/A-Left USP, 2008	
The impact of tropical cyclones on river flows, morphology and sedimentation in Fiji	USP,University of Guelph	USP Geography Department, in collaboration with University of Guelph in Canada and Fiji's Public Works Department (PWD)	ongoing	Dr James Terry, USP	N/A-Left for Bangkok	
Water quality assessments Water Wastage Study	JICA	IAS,USP	ongoing	Prof. Bill Allsbersberg	aalbersberg@usp.ac.fj Tel: +67-9-212416 Fax: +67-9-212416	Study to assess the impact of wastewater on
USP -NASA/NOAA Ozone Project	USP/NASA/NOAA	PACE-SD, and USP's	ongoing from1997	Dr Matakita Maata,Chem		Data for ground based ozonesonde measurements of the vertical profile of ozone

		Chemistry Department		Dept,USP		has been collected since 2002
USP-NIWA NZ Greenhouse Gas project	USP,NIWA	PACE-SD, and USP's Chemistry Department	ongoing from 1994	Dr Matakita Maata,Chem Dept,USP		Project has grown and developed the in-house capacity of the USP chemistry department for measuring ambient methane concentrations.
Ozone and Methane Project	NASA	Professor Koshy Kanayathu,PACE-SD and USP Chemistry Department	ongoing	Professor Koshy Kanayathu,	N/A-Left USP, 2008	Monitor levels of atmospheric ozone and methane
El Nino and Sugar Project	START/NOAA	Professor Koshy Kanayathu,PACE-SD and USP	2001-2002	Professor Koshy Kanayathu,	N/A -Left USP, 2008	Examines meteorological data from Fiji MET service and sugar production information from the Fiji Sugar Corporation, to help determine the relationship between climate and variability and agricultural production
ODS-Ozone Depleting Substance	MLFS via UNEP	DOE	ongoing	Epeli Nasome	ENasome2@environment.gov.fj	Fiji reported that labelling of containers for transportation and storage is part of the development strategy and framework for the National Ozone Unit 2005-2008
Butoni Windmill Farm (Sigatoka)	CDM	FEA	Completed	Jone Feresi	<JoneF@fea.com.fj > 6664555 Western Division	Butoni Wind power is one example of that renewable Energy development under taken by the present management to tackle the fuel crisis in future.
Wailoa Basin Hydropower		FEA	Completed	Jone Feresi	<JoneF@fea.com.fj > 6664555 Western Division	A project aimed at identifying and maximising the potential for energy from hydropower projects based on the Wailoa river and its tributaries
Nadarivatu Renewable Energy EPC Project	IRBD and EIB	FEA	Ongoing	Jone Feresi	<JoneF@fea.com.fj > 6664555 Western Division	The second largest hydro dam project in Fiji, fund from Sino-Hydro, a Chinese firm
Rural Electrification Scheme	Fiji Gov/FEA	FEA/Dept of Energy	Ongoin	Inia Saula	**inia**.**saula**@fdoe.gov.fj	FEA and Department of Energy have set aside budget allocations to help fund the costs of bringing electricity to rural areas
ADB/CIDA Climate Change Adaptation in the Pacific (CLIMAP) Program	Canadian Cooperation Fund for	Asian Development Bank,Pacific	2002-2004	Kanyathu Koshy and Biman Prasad	chand_b@usp.ac.fj	CLIMAP is a unique and first attempt at addressing climate adaptation mainstreaming as part of a multilateral lending institutions

	Climate Change	Department				country strategy, programming, and project preparation processes
CIDA Capacity Building for the Development of Adaptation Measures in Pacific Island Countries (CBDAMPIC) project	CIDA	SPREP,National Gov.	Jan 02-Mar 05	Kanyathu Koshy and Biman Prasad	chand_b@usp.ac.fj	Project focuses on improving the livelihood of Pacific Island people by increasing their adaptive capacity to climate-related risks.
Biofuel Projects in Taveuni and Vanua Balavu, Fiji	SPC(Rural Energy Development Programme), Fiji Government through DOE & French Embassy	SOPAC	2000 &2001	Vilimone Vosarogo	vvosarogo@fdoe.gov.fj Tel: +679-3386006 ext 102	The projects composed of two specially-modified biofuel engines to use coconut oil and diesel as fuel
Establishment of a Climate Change Unit within the Department of Environment	Fiji Gov	DOE	proposed project	Epeli Nasome	ENasome2@environment.gov.fj	That it is able to provide policy and technical advice, which the GOF will need, to implement the climate-change programmes and fulfil its obligations under the UNFCCC
Promotion of Renewable Energy	CDM	Dept of Energy	proposed project	Makereta Sauturaga	msauturaga@fdoe.gov.fj	To reduce the emissions of GHG by enhancing the use of renewable energy and at the same time improve quality of life of people in rural areas
National vulnerability and adaptation assessment study – Phase II	SPREP		proposed project	Bill Allsbersberg	aalbersberg@usp.ac.fj Tel: +67-9-212416 Fax: +67-9-212416	To expand the information available on the potential effects of climate change to enable the Fiji Government to identify appropriate policies and strategies to effectively respond to the effects of climate change and sea-level rise.
Watershed management project for the sugarcane drought-prone areas	Fiji Govt	Landuse Department	proposed project	Mary Mcgoon		The introduction of ecologically sound natural-resources management and soil conservation practices by sugarcane farmers to improve productivity and reduce the adverse effects of climate change.
Integrated Coastal Zone Management Programme for Fiji	UNDP/GEF	IAS-USP	proposed project	Prof. Bill Aalsbersberg	aalbersberg@usp.ac.fj Tel: +67-9-212416 Fax: +67-9-212416	To provide an appropriate context for sustainable development in the assessment, protection and monitoring of coastal and marine ecosystems and provide a policy framework upon which all developments

						within the coastal zones are assessed and regulated
Vaturu (Nadi) Hydro Project	CDM	SEL	Now trading at CDM 5/1/2004	Epeli Nasome	ENasome2@environment.gov.fj	Consists of a new power station that makes use of the water pressure to develop up to 3MW of renewable electricity, the generation technology is a single horizontal Pelton-type two jet turbine coupled to a generator rated at 3MW.
Wainikasou (Wainimala-Naitasiri) Hydro Projects	CDM	SEL	Now trading at CDM 5/1/2004	Epeli Nasome	ENasome2@environment.gov.fj	Involves the construction of a 6.5 MW hydroelectric power station to make use of the existing energy potential currently dissipated at one of the valves of the system collecting water from the Wainisavulu Creek.
PACCLIM	IGCI/SPREP		Ongoing 6/21/1995	Jone Feresi	<JoneF@fea.com.fj > 6664555 Western Division	A climate change computer modelling program used to create scenarios to predict cliimate change and sea level rise in the Pacific
FIJICLIM	IGCI/SPREP/ World Bank		Ongong	Kay, R.C. and Hay, J.E., 1993:	hay@waikato.ac.nz	FIJICLIM (an offshoot of PACCLIM) was developed to facilitate Climate Change Vulnerability and Adaptation Assessment in Fiji and provides modelling capacity to assess climate change and sea-level rise impacts on the coastal zone, the agricultural sector, water resources and public heath in Viti Levu, Fiji.
Renewable Energy Hybrid Power Systems, Nabouwalu, Bua	GEF/UNDP	Fiji Gov & Japan Gov	oingoing	Asenaca Ravuvu,UNDP,	asenaca.ravuvu@undp.org	The operational experience from Nabouwalu renewable energy hybrid system demonstrates that such a renewable system is technically viable, and can reduce diesel consumption by 80%. The result will be a reduction in diesel imports for rural electrification and a reduction in Fiji's CO2 emissions.
Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)	GEF/UNDP	UNDP/SPREP	Ongoing 7/1/2007	Asenaca Ravuvu,UNDP	asenaca.ravuvu@undp.org	The global environment and development goal of PIGGAREP is the reduction of the growth rate of greenhouse gas (GHG) emissions from fossil fuel use in the PICs through the removal of the barriers to the widespread and cost effective use of feasible

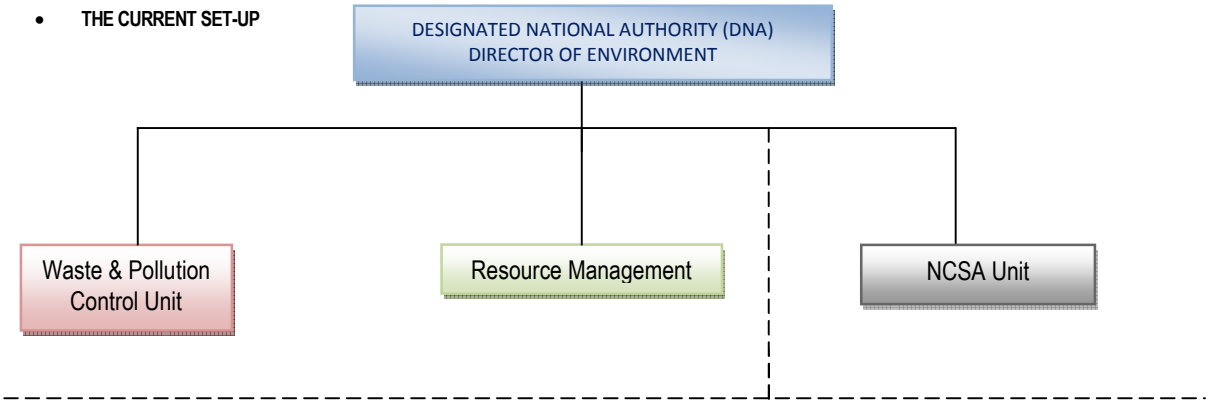
						renewable energy (RE) technologies.
Pacific Islands Climate Change Assistance Project (PICCAP):Climate Change Enabling Activity, Fiji	GEF/UNDP	SPREP,USP, Ibaraki Uni, SOPAC	Ongoing 1997	Asenaca Ravuvu,UNDP	,asenaca.ravuvu@undp.org	Assistance to the countries in reporting to the UNFCCC and capacity building
Pacific Islands Renewable Energy Programme (PIREP)	GEF/UNDP	SPREP,Fiji Gov, Pacific Island Forum Secretariat, SOPAC, SPC, USP	May 03-Dec 05 (extended to Aug 06)	Asenaca Ravuvu,UNDP	,asenaca.ravuvu@undp.org	The purpose of the project is the acceleration of the adoption and commercialisation of feasible and applicable Renewable Energy Technologies (RETs)
Community climate change and energy reduction program, Fiji	GEF	Soqosoqo ni Marama, Macuata	Ongoing 2007	N/A		

APPENDIX8-5: INITIAL NATIONAL COMMUNICATION

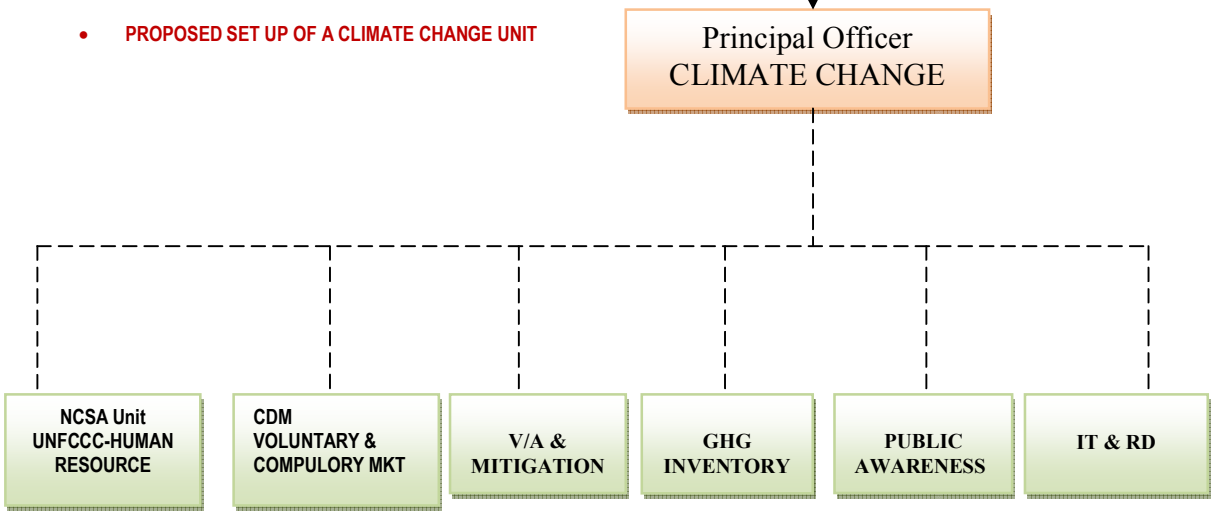
APPENDIX 8-6: PROPOSED INSTITUTIONAL RESTRUCTURE

AT NATIONAL STEERING COMMITTEE LEVEL-CLIMATE CHANGE CARBON TRADING UNIT FOR CDM

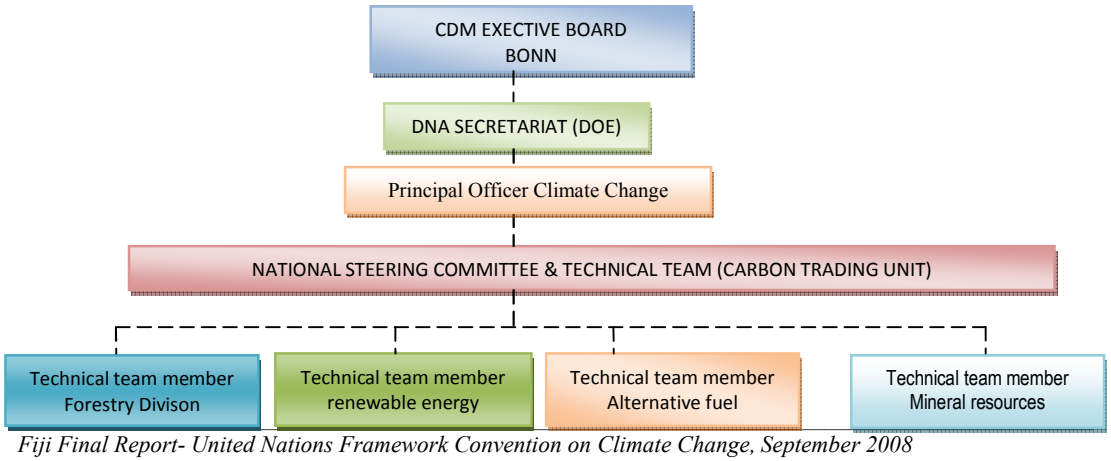
- **THE CURRENT SET-UP**



- **PROPOSED SET UP OF A CLIMATE CHANGE UNIT**



- **PROPOSED CLIMATE NATIONAL CHANGE STEERING COMMITTEE FOR POST KYOTO COMMITMENTS ON CDM**



APPENDIX 8-7: NATIONAL TRAINING INSTITUTIONS

UNIVERSITY OF THE SOUTH PACIFIC

- **PACIFIC CENTRE FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT (PACE)**

PACE can be enhanced to developed studies on Integrated Methods and Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in Pacific Island Countries to enhance the technical and human capacity of the Pacific Island countries to assess vulnerability and adaptation to climate change, including variability.

- **MARINE STUDIES**

This centre has the capacity building in the area of *Coastal Management, which includes the following:*

- Coastal processes (joined program with IAS)
- Coastal/inshore inventories
- Integrated planning (with IAS)

- **CHEMISTRY DEPARTMENT**

This is the only institution involved in the Pacific with scientific research and monitoring of ozone in the Pacific. The emphasis is on producing graduates ready to take on professional positions in various work areas in the region, strengthening of various research areas such as natural products, conservation and biodiversity, and environmental issues.

- **MATHEMATIC DEPARTMENT**

The mathematics department has developed state of the art technologies in surveillance and forecast simulation software technologies of national, regional and global weather systems. All studies of this nature should be focused to build capacity building in Fiji, and as such Fiji is not dependant on other regional institutions and international university centers that have these technologies to provide these.

- **SCHOOL OF GEOGRAPHY**

The School of Geography should be enhanced to carry out research and studies in the impacts of tropical cyclones on Pacific river systems. Another area of capacity building is the study of ancient climatic conditions of Fiji which is important to Fiji's current and future climatic conditions in the field of academic research particularly in forecasting worse case scenarios and the resilience of Pacific people to adapt to these changes.

- **INSTITUTE OF APPLIED SCIENCE**

IAS have capacity building in the area of environmental impact assessment, they also have a wide variety of expertise in the area of water quality assessments, DNA specifications and assessments, community programmes that include in the area of vulnerability assessments and adaptations. Specific programmes are linked with the Department of fisheries on FLEMMA and MPAs. The Fiji government should enhance most of these initiatives and streamlined them as training opportunities for CC VA and Adaptation. IAS currently is the focal point of coordinating the ICM programme in Fiji.

- **SCHOOL OF PURE AND APPLIED SCIENCES, DEPARTMENT OF PHYSICS USP**

The department has the Capacity building development to train the public with innovative renewable energy technologies such as wind, hydro and solar. Project enhancement should be focused to new areas of this technologies such as biodigesters, waves and geothermal. This is a big opportunity for the government of Fiji to take the initiative in light of the post Kyoto commitments on CDM.

- **FACULTY OF SCIENCE AND TECHNOLOGY**

This is another department that concentrates on Renewable Energy. Capacity building should be focused on the developments of the public in the area of solar energy, biofuels such as coconuts oils for biodiesel, and reactive power of integrated wind-diesel power systems, Studies also include assessment of technical and socioeconomic implications of using bio-fuel in rural communities in Fiji and Rotuma, in particular characterization of fuel woods and forestry residues as biofuels.

FIJI INSTITUTE OF TECHNOLOGY

The School of Civil Engineering provided courses in Advanced Diploma in Civil Engineering. These studies include specific topics in environmental engineering, hydraulics, applied mathematics, structural mechanics and fluid mechanics. These are training opportunities that could alleviate technical expertise in the area of adaptation and mitigation. In particular in the area of environmental coastal engineering, now that the impacts of sea level rise is a big concern around low-lying coastal areas in Fiji.

FIT also provides diploma and degree studies in environmental science, this covers almost the area of environmental management, impact assessment and general observation and diagnostic skills. The government of Fiji should introduce climate change related studies such as coastal profiling, tidal and wave studies and computer simulations of national and regional weather scenarios etc.

UNIVERSITY OF FIJI

University of Fiji is one of the only two universities in Fiji and has yet to incorporate environmental studies in its curriculum, this is one area that the Fiji government can specifically increase its capacity building in the area of climate change studies due to its location to many of the booming economic and commercial zones in Fiji, in particular the tourism and real estate sector. Joint study proposals with the University of the South Pacific, should be enhanced for transfer of knowledge and capacity building of the institution.

FIJI METEREOLOGICAL SERVICES

The Government of Fiji through the Meteorological Service should provide technical institution in Fiji for the following areas which at the moment has been coordinated mainly by WHO/SPREP. These should not be restricted only staff working for the FMS, but for creation of curriculums and projects that are streamlined for graduates coming out from USP or FIT. Infact FMS should begin a special school for this.

For example the following programmes Fiji should take advantage of:

- *Regional SPREP, National Institute of Water and Atmospheric Research (NIWA). SPREP/WMO*
- *Training in climate observations WMO & the Government of Fiji*
- *Training in climate observations WMO & Government of Fiji*
- *Training in support of forecasters JICA and the Government of Fiji*
- *Training in support of forecasters*

TRAINING PRODUCTIVITY AUHTORITIES IN FIJI (TPAF)

There are immense training opportunities in Fiji for OHS and productivity, what need to be stressed here that Climate Change programmes on the CDM should be introduced at TPAF. The following are some of the private sector need that integrates environmental conservation and heath safety into the working environment of the private sector; this is in fact addressing the adaptation and mitigation issues under the UNFCCC.

❖ **OCCUPATIONAL HEALTH & SAFETY PROGRAMS**

- Occupational Health & Safety Modules I & II For Safety
- Integrated Management System(OHSAS 18001, ISO 14001, ISO 9001)
- Basic Occupational Health And Safety Induction For Construction Workers
- Fundamentals Of Occupational Health And Safety
- OHS Risk Management Supervisors & Managers
- Managing Occupational Health And Safety Effectively
- Safe, Healthy And Productive Enterprise(SHAPE)
- Basic Food Safety, Handling And Hygiene Application Of OHS Management System (OHSAS 18001)

❖ **ENVIRONMENTAL MANAGEMENT/GREEN PRODUCTIVITY PROGRAM**

- Zero Pollution For Industry
- 5S: Steps To Total Quality Environment
- Total Quality Environmental Management(TQEM): Tools And Techniques
- Workshop On Green Productivity
- Developing And Implementing HACCAP
- Environmental Auditing - Fundamentals
- ISO 14001: 2004 Environmental Management System
- Environmental Risk Management